

*Placer County
2021 Local Hazard Mitigation Plan Update
June 2021*





Executive Summary

This 2021 Local Hazard Mitigation Plan (LHMP) Update serves to update the 2016 Federal Emergency Management Agency (FEMA) approved Placer County LHMP. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Placer County, 5 incorporated communities, and 20 special districts prepared this LHMP Update to the FEMA approved 2016 Placer County LHMP, in order to make the County and its residents less vulnerable to future hazard events.

This LHMP Update demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed, among other things, to ensure Placer County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards.

LHMP Plan Development Process

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This LHMP Update documents the hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County will use to decrease vulnerability and increase resiliency and sustainability in the community.

This is a multi-jurisdictional plan with the following seeking approval of the plan by FEMA:

- Placer County*
- City of Auburn*
- City of Colfax*
- Town of Loomis*
- City of Lincoln*
- City of Rocklin*
- Alta Fire Protection District
- Alpine Springs County Water District*
- Foresthill Fire Protection District*
- Foresthill Public Utility District
- Nevada Irrigation District*
- Newcastle Fire Protection District

- Northstar Community Service District/Fire Department
 - North Tahoe Fire Protection District*
 - North Tahoe Public Utility District
 - Olympic Valley Fire and Public Utility District (was Squaw Valley Fire and Public Utility District)*
 - Placer County Flood Control & Water Conservation District*
 - Placer County Resource Conservation District
 - Placer County Water Agency*
 - Placer Hills Fire Protection District*
 - San Juan Water District
 - Sierra Joint Community College District
 - South Placer Fire Protection District (absorbed Loomis FPD, also a participant in the 2016 LHMP)*
 - Tahoe City Public Utilities District*
 - Truckee Fire Protection District*
 - Placer County Air Pollution District
- * Participated in 2016 Placer County LHMP

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. The County and all participating jurisdictions followed a planning process prescribed by FEMA as detailed in Table ES-1.

Table ES-1 Local Hazard Mitigation Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

The planning process began with the organizational phase to establish the Hazard Mitigation Planning Committee (HMPC) comprised of key County representatives, and other local and regional stakeholders; to involve the public; and to coordinate with other departments and agencies. A detailed risk assessment was then conducted followed by the development of a focused mitigation strategy by all participating

jurisdictions or the Placer County Planning Area. Once approved by Cal OES and FEMA, this LHMP Update will be adopted and implemented by the County and all participating jurisdictions over the next five years.

Risk Assessment

The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the County and participating jurisdictions, assessed the vulnerability of the Placer County Planning Area to these hazards, and examined the existing capabilities to mitigate them.

The Placer County Planning Area is vulnerable to numerous hazards that are identified, profiled, and analyzed in this Plan. Floods, earthquakes, drought, levee failures, landslides, wildfires, and other severe weather events are among the hazards that can have a significant impact on the County. Table ES-2 details the hazards identified for this Placer County LHMP Update.

Table ES-2 Placer County Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Significant	Highly Likely	Critical	Medium	Medium
Avalanche	Limited	Likely	Limited	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Critical	High	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Limited	Occasional/Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Seiche	Limited	Unlikely	Limited	High	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	High	Low
Tree Mortality	Extensive	Likely	Limited	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

Mitigation Strategy

Based on the results of the risk assessment, the participating jurisdictions and the HMPC developed a mitigation strategy for reducing the County's and all participating jurisdictions' risk and vulnerability to hazards. The resulting Mitigation Strategy for the Placer County Planning Area is comprised of LHMP goals and objectives and a mitigation action plan which includes a series of mitigation action projects and implementation measures. Based on the risk assessment, the HMPC identified goals and objectives for reducing the Placer County Planning Area's vulnerability to hazards. The goals and objectives of this multi-hazard mitigation plan are:

Goal 1: Minimize risk and vulnerability of Placer County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment

- Minimize loss of life and injury and protect public health and safety of all Placer County residents and visitors, including at-risk populations
- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards
- Minimize impacts to natural and cultural resources
- Minimize impacts to watersheds/promote watershed health

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

- Harden critical facilities, infrastructure, and utilities; create redundancy and reliability to prevent or minimize loss and facilitate recovery
- Design and/or retrofit critical facilities, infrastructure, and utilities necessary for continuity of government to allow them to remain operational during and following a disaster
- Minimize impacts of extended power outages

Goal 3: Improve public awareness, education, communication, and preparedness for all hazards.

- Enhance public outreach, education, and preparedness program to include all hazards of concern
- Increase public knowledge of the risk and vulnerability to identified hazards and their recommended responses to disaster events to reduce losses
- Utilize multiple public outreach avenues and modern communication platforms, such as new technologies, social media, and others
- Provide information and alerts about potential, developing, and ongoing emergency situations through extensive alert and warning systems that convey information to all residents, in multiple languages and formats to ensure it is widely accessible
- Educate public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities including multi-jurisdictional efforts
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels, at a minimum
- Develop funding mechanisms to enhance emergency services for additional staffing and enhanced services
- Increase first responders' awareness of vulnerable populations and other priority needs during a hazard event; (use of enhanced technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Ensure a more resilient County that can adapt to the hazards created or exacerbated by Climate Change

- Integrate the results and adaptive policies of the Climate Vulnerability Assessment (prepared under the Placer County Sustainability Plan) into the implementation of the Local Hazard Mitigation Plan
- Reduce the County's greenhouse gas (GHG) emissions as specified in the Placer County Sustainability Plan in order to reduce the hazards exacerbated by climate change
- Consider climate change adaptation strategies in flood and inundation hazard planning
- Consider climate change adaptation strategies in planning for very high fire hazard severity zones
- Protect groundwater and reduce the impacts from drought and climate change

Goal 6: Reduce fire severity and mitigate undesirable fire outcomes in Placer County

- Reduce life safety issues, property loss, and damages associated with wildfires
- Prevent and reduce wildfire ignitions and wildfire-related losses
- Restore and maintain fire resilient landscapes on both public and private lands
- Create fire adaptive communities by facilitating interagency cooperation and communication and support between agencies and the public
- Mitigate undesirable fire outcomes for the environment, watersheds, and quality of life

Goal 7: Maintain FEMA Eligibility/Position the communities for grant funding

- Maintain requirement of updating LHMP every 5 years
- Continue to increase number of participating jurisdictions in future LHMP Updates to provide eligibility for FEMA pre- and post-mitigation funding and eligibility for other related funding sources
- Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP's Community Rating System (CRS) where feasible

Actions to support these goals are shown on Table ES-3.

Table ES-3 Placer County Planning Area Mitigation Actions

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Placer County						
Multi-Hazard Actions						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Unincorporated Placer County	2016 Action	X	X		Prevention
Action 2. Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Public Information
Action 3. Critical Facility Infrastructure Improvements	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. Protect Sewer Infrastructure and Utilities	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 5. Trail System Way Finding and Directional Signage	Unincorporated Placer County and all jurisdictions	2016 Action	X	X		Public Information Emergency Services
Action 6. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.	Unincorporated Placer County and all jurisdictions	New Action	X	X		Public Information Emergency Services
Action 7. Evacuation Warning	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Public Information Emergency Services
Action 8. Battery Back-up Systems to provide building resiliency	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 9. Emergency Generator / Installation, Maintenance, & Upgrade of Emergency Generators at Road Maintenance Yards	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Property Protection Emergency Services
Action 10. Earthquake Retrofit / Seismic Assessment of County Infrastructure	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Action 11. StormReady Certification for Placer County	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Agricultural Hazard Actions						
Action 12. Agriculture – A-rated Invasive Insect Pest Infestation	Unincorporated Placer County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Avalanche Actions						
Action 13. Update local ordinances and development standards to reflect updated avalanche hazard information.	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention
Climate Change Actions						
Action 14. Green Waste	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 15. Reduce Organic Waste Disposal	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Natural Resource Protection
Dam Failure, Flood: 1%, 0.5%, 0.2% annual chance, Flood: Localized Flood, and Severe Weather: Heavy Rains and Storms Actions						
Action 16. Elevate Repetitive Loss Structures in 100-year Floodplain	Unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects
Action 17. Elevate Remaining 95 Homes in the Dry Creek Watershed	Unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 18. Community Rating System (CRS) Maintain and Enhance	Unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services Public Information
Action 19. Bridge and Culvert replacement and drainage improvements	Unincorporated Placer County and all jurisdictions	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 20. Bell Drive Sewer Pipeline Repair	Unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 21. Annual Flood Exercise	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Emergency Services
Drought & Water Shortage, Severe Weather: Extreme Heat, Tree Mortality, and Wildfire Actions						
Action 22. Improve and Protect Water Systems	Unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 23. Groundwater Sustainability Planning	Unincorporated Placer County	New Action	X	X		Prevention Natural Resource Protection
Action 24. Fuel Breaks - Wildland Urban Interface (WUI)	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 25. Public Education & Awareness	Unincorporated Placer County	New Action	X	X		Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 26. Fuel Break - Large Strategic	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 27. Natural Systems Protection / Education and Awareness Programs - Placer County Wildland Urban Interface (WUI) Strategic Planning	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 28. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 29. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 30. Defensible Space Programs	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 31. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Pandemic Actions						
Action 32. HHS Pandemic Planning	Unincorporated Placer County	New Action	X	X		Prevention Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Auburn						
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Auburn	2016 Action	X	X	X	Public Information
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Auburn	New Action	X	X		Prevention
Action 3. Continue Annual Weed Abatement Ordinance	City of Auburn	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Implement Wildland-Urban Interface Planning and Risk Mitigation Project	City of Auburn	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Integrate community and ecological resiliency to climate change hazards, such as drought, extreme heat, flood, and vector-borne diseases.	City of Auburn	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
City of Colfax						
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Colfax	2016 Action	X	X		Public Information
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Colfax	New Action	X	X		Prevention
Action 3. Continue Annual Weed Abatement Ordinance	City of Colfax	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Colfax Schools Evacuation Site Shaded Fuel Break	City of Colfax	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District	City of Colfax	2016 Action	X	X		Prevention Property Protection
Action 6. Drought and Water Shortage Mitigation	City of Colfax	New Action	X	X		Prevention Property Protection Natural Resource Protection
City of Lincoln						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Lincoln	2016 Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Lincoln	New Action	X	X	X	Public Information
Action 3. Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge	City of Lincoln	2016 Action	X	X	X	Structural Projects
Action 4. McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span	City of Lincoln	2016 Action	X	X	X	Structural Projects
Action 5. Lakeview Farms Regional Volumetric Mitigation Facility	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 6. Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream Restoration And Culvert Improvement	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 7. "O" Street Drainage Improvements	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 8. 7th Street Drainage Improvements	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 9. Auburn Ravine at State Route 193 Bridge	City of Lincoln	2016 Action	X	X	X	Property Protection Natural Resource Protection
Action 10. Auburn Ravine at State Route 65 Bridge	City of Lincoln	2016 Action	X	X	X	Property Protection Natural Resource Protection
Action 11. Ingram Slough – Orchard Creek Return Channel	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 12. Markham Ravine – Updated FEMA Analysis And Mapping	City of Lincoln	2016 Action	X	X	X	Prevention
Action 13. Markham Ravine Drainage Improvements – Union Pacific Railroad & State Route 65 Crossings	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 14. Auburn Ravine Stream Restoration Projects (Analysis and Repairs)	City of Lincoln	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 15. Markham Ravine Streambed Restoration Projects (Analysis Only)	City of Lincoln	2016 Action	X	X	X	Prevention
Action 16. Coon Creek Streambed Restoration Projects (Analysis Only)	City of Lincoln	2016 Action	X	X	X	Prevention
Action 17. Fire Prevention and Fuels Management Plan	City of Lincoln	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Town of Loomis						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Town of Loomis	2016 Action	X	X		Prevention

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Town of Loomis	New Action	X	X	X	Public Information
Action 3. Renewal Of Town of Loomis RMA permit	Town of Loomis	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 4. Climate Change Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 5. Drought and Water Shortage Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 6. Earthquake Mitigation and Preparedness	Town of Loomis	New Action	X	X		Prevention Public Information
Action 7. Pandemic/Epidemic Mitigation	Town of Loomis	New Action	X	X		Prevention Public Information
Action 8. Severe Weather - Heavy Rains Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 9. Tree Mortality Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Wildfire Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Rocklin						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Rocklin	2016 Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Rocklin	New Action	X	X	X	Public Information
Action 3. Open Space Fire Prevention and Vegetation Management Prescribed Grazing	City of Rocklin	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Creek Channel and Draining Way Clearing and Maintenance	City of Rocklin	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 5. GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents	City of Rocklin	2016 Action	X	X		Prevention Emergency Services
Alta Fire Protection District						
Action 1. Reflective Addressing	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Emergency Services
Action 2. Alta FireWise Community Established and Continuing	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection
Action 3. Apparatus Water Fill & Drafting Location Improvements	AFPD and unincorporated Placer County	2016 Action	X	X		Property Protection Natural Resource Protection Emergency Services
Action 4. Emergency Communications and Information System Improvements (HAM Radio and GMRS communications)	AFPD and unincorporated Placer County	2016 Action	X	X		Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Evacuation / Reunification Center Improvements	AFPD and unincorporated Placer County	2016 Action	X	X		Emergency Services
Action 6. Home Hardening Education and Projects	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects Public Information
Action 7. Natural Systems Protection /Community Fuel Breaks	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 8. Natural Systems Protection / Education and Awareness Programs	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Public Information
Alpine Springs County Water District						
Action 1. Fire Fuels Mitigation	ASCWD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Emergency Electrical Generator Replacement Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Emergency Services
Action 3. Water Storage Tank Replacement Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Project Natural Resource Protection
Action 4. Mineral Springs Soil Bank Stabilization Project	ASCWD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Alpine Meadows Consolidated Defensible Space Continuation Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Foresthill Fire Protection District						
Action 1. Chipper Program for Foresthill FPD	FFPD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Foresthill Public Utility District						
Action 1. Drought, Dam Failure/ additional of radial gates to dam	FPUD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Nevada Irrigation District						
Action 1. 2015 Agricultural Water Management Plan – Updated 2021	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Avalanche Mitigation	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 3. Canal Culvert Replacement Program	NID and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 4. Centennial Water Supply Project	NID and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Combie Phase 1 Replacement	NID and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 6. Continuity of Operations Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Emergency Services
Action 7. Pandemic Planning	NID and unincorporated Placer County	New Action	X	X		Prevention
Action 8. Dam Failure Mitigation	NID and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 9. Water Conservation and Drought Preparedness	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Drought Contingency Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Flood Mitigation	NID and unincorporated Placer County	New Action	X	X	X	Prevention Emergency Services
Action 12. Healthy Forest Management and Wildfire Mitigation Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 13. Forest Resilience Program	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 14. Injury and Illness Prevention Program	NID and unincorporated Placer County	New Action	X	X		Prevention

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 15. Public Safety Plan (FERC)	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 16. North Auburn Treatment Plant VFD's and Permanent Backup Generator	NID and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 17. Orr Creek Diversion	NID and unincorporated Placer County	2016 Action	X	X	X	Structural Projects Property Protection
Action 18. Owner's Dam Safety Program, Revision 3.0	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Emergency Services
Action 19. Raw Water Master Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Raw Water Replacement Program	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 21. Reservoir Cleaning	NID and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 22. Resilient Headwaters Forests	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 23. Tree Mortality Mitigation	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 24. 2015 Urban Water Management Plan – Updated 2021	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 25. Vegetation Management Plan (Hydroelectric Facilities)	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 26. Water Planning Projections	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 27. Water Service Auburn Valley CSD	NID and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 28. Forest Resilience and Wildfire Risk Reduction	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Newcastle Fire Protection District						
Action 1. Private roadway and driveway vegetation clearances.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Address signage for residential and commercial structures.	NFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 3. Provide Advanced Life Support (ALS) services utilizing paramedics on the engine company.	NFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Defensible space inspection and implementation throughout the District.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Relocate and construct a new fire station for the Newcastle Fire Protection District.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects
Action 6. Participate and collaborate with the Greater Auburn Area Fire Safe Council (GAAFSC) and contribute to the Community Wildfire Protection Plan (CWPP)	NFPD and unincorporated Placer County	New action	X	X		Prevention
Action 7. Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation	NFPD and unincorporated Placer County	New action	X	X	X	Prevention Emergency Services
Northstar Community Services District and Fire Department						
Action 1. Tree Mortality	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Wildfire Mitigation	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Critical Power Interruption Emergency Response Plan	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 4. Emergency Action Plan – Reservoir A Dam	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
North Tahoe Fire Protection District						
Action 1. Avalanche: Risk Reduction, Response Plan, and Pre-Incident Training	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Communications: Upgrades, Development, Maintenance, and Enhancement of Interoperability Radio Systems	NTPFD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 3. Community Wildfire Prevention Plan Implementation: Forest Management, Fuels Reduction, Defensible Space, Home Hardening, Curbside Chipping, Greenwaste Disposal, Tree Marking, Fire Adapted and Firewise Communities, Outreach & Education	NTPFD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information
Action 4. GIS Technology, Equipment, Database and Mapping Improvements	NTPFD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 5. Pandemic Preparedness and Response Plan	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 6. Tahoe Emergency Notifications System (TENS)	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 7. Water for Fire Suppression Collaborative	NTPFD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information Emergency Services
North Tahoe Public Utility District						
Action 1. Backup Generator Installation at Critical Facilities	NTPUD and unincorporated Placer County	New action	X	X		Prevention Property Protection Emergency Services
Action 2. Fuels Reduction around Critical Infrastructure and Access Roads, and within the North Tahoe Regional Park	NTPUD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 3. Increased Fireflow Capacity and Reliability for Dollar Cove and Carnelian Water Systems	NTPUD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information
Action 4. Cybersecurity Assessment and Improvements	NTPUD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 5. Seismic Analysis and Retrofit of Critical Infrastructure	NTPUD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects
Action 6. Sewer Main Replacements in Shorezone of Lake Tahoe	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 7. Water Booster Pump Station Rehabilitation/Replacement	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 8. Water System Interties	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 9. Joint Grant Application with North Tahoe Public Utilities District (NTPUD) for an Emergency Back-up Generator System at the North Tahoe Event Center (NTEC) located at 8318 North Lake Blvd, Kings Beach, CA 96143.	NTPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 10. Kings Beach Grid Watermain Replacement and Fire Hydrant Installation Project	NTPUD and unincorporated Placer County	New action	X	X		

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 11. NTPUD Water System Infill and Fire Suppression Improvements Project	NTPUD and unincorporated Placer County	New action	X	X		
Olympic Valley Fire Department/Olympic Valley Public Service District						
Action 1. Community-Wide Emergency Notification System	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 2. Emergency Water Supply Interconnection to Martis Valley	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 3. OVPSD/Mutual Water Company Intertie	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. Squaw Creek Siphon	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 5. Water Tank Earthquake Retrofit Projects	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Emergency Services
Action 6. Easement Abatement/Maintenance of Emergency Access	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 7. Towable Generator for Powering Booster Stations	OVFD/OVPSD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 8. Emergency Water Supply Interconnection to Martis Valley	OVFD/OVPSD and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Placer County Flood Control District						
Action 1. FEMA CTP DFIRM Mapping Study	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection
Action 2. Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. Update the Flood Control Plan for the Cross Canal Watershed	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection
Action 4. Upgrade Flood Warning System to ALERT 2, Add Additional Gage Locations and Flood Forecasting Capabilities	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Emergency Services
Placer County Resource Conservation District						
Action 1. Fuel Breaks - Wildland Urban Interface (WUI)	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Fuel Break - Large Strategic	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Defensible Space Programs (Placer County Chipper Program)	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Landowner Technical Assistance (Healthy Soils/ Carbon Farm Management Program)	PCRCO and unincorporated Placer County	New Action	X	X		Prevention Natural Resource Protection Public Information
Placer County Water Agency						
Action 1. Develop Operable Dam Spillway Gates at Hell Hole Reservoir	PCWA and unincorporated Placer County	New Action	X	X	X	Structural Projects Emergency Services
Action 2. Alternate Intake for Alta Water Treatment Plant	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. Canal Access for Fire Fighting and water source	PCWA and unincorporated Placer County	New Action	X	X		Emergency Services
Action 4. Back-up and Stand-By Power Generation for critical community drinking and fire suppression water supply.	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Emergency Services
Action 5. Lake Arthur Pumping Station	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 6. Monte Vista Spill Improvements and Cedar Creek Canal Encasement in Pipe	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 7. Pulp Mill Canal Pipeline Encasement	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 8. Permanent Pumps in Rock Creek Reservoir (PG&E Reservoir)	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 9. Vegetation Management at PCWA Wooden Flumes	PCWA and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas.	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 11. Wildfire prevention or Wildfire firefighting enhancements.	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 12. Replace Wooden Flume Structures	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 13. Reservoir - dam capacity and water management improvement projects. (was De-Silt Reservoirs)	PCWA and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects
Action 14. Rockfall anchoring, stabilization, rockfall netting and slide debris mitigation. (was Hillside Slope Stabilization)	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 15. Zone 3 Automation	PCWA and unincorporated Placer County	New Action	X	X	X	Prevention Property Protection Structural Projects
Action 16. Pumps at Halsey Forebay	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 17. Backup Electrical Generation at American River and Ophir Road Pump Stations	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services
Action 18. Sierra Forest Restoration Partnerships	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 19. Colfax to Applegate Water Reliability Project	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Emergency Evacuation / Transit Priority Lane Infrastructure – Highways 89 and 267	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services
Placer Hills Fire Protection District						
Action 1. Address signage for residential and commercial structures.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 2. Defensible space inspection and implementation throughout the District.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Private roadway and driveway vegetation clearances.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Participate and collaborate with the Placer Sierra Fire Safe Council (PSFSC) and contribute to the Community Wildfire Protection Plan (CWPP)	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation	PHFPD and unincorporated Placer County	New action	X	X	X	Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
San Juan Water District						
Action 1.Updating the 2015 Urban Water Management Plan	SJWD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2.Dam Failure Mitigation	SJWD and unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects
Action 3.Earthquake Mitigation	SJWD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects
Action 4. Redundant/backup power system	SJWD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 5. Water main bridge crossing replacement/strengthening	SJWD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects
Sierra Joint Community College District						
Action 1. Campus safety: fire, earthquake, active shooter, power outage, health emergencies, and pandemics.	SJCCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 2. Storm Water Flooding Mitigation	SJCCD and unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects
Action 3. Drought Tolerant Landscaping	SJCCD and unincorporated Placer County	New action	X	X		Prevention Property Protection Public Information
Action 4. Fuel Reduction	SJCCD and unincorporated Placer County	New action	X	X		Property Protection Natural Resource Protection
Action 5. Emergency Power Generation	SJCCD and unincorporated Placer County	New action	X	X		Prevention Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
South Placer Fire Protection District						
Action 1. Vegetation Management in Open Space Areas	SPFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Shaded Fuel Break along west shore of Folsom Lake - Granite Bay	SPFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Backup Generator Installation for Fire Stations	SPFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Tahoe City Public Utility District						
Action 1. West Shore Storage Augmentation Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 2. Tahoe Cedars Water System Interconnection and Distribution Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 3. Madden Creek Water System Interconnection and Distribution Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. West Lake Tahoe Regional Water Treatment Plant	TCPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Truckee Fire Protection District						
Action 1. 2022 CWPP	TFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Placer County Air Pollution Control District						
Action 1. Wildfire Smoke Impact Response – Public Education & Outreach	PCAPCD and unincorporated Placer County	New action	X	X		Emergency Services Public Information
Action 2. Local Air Quality Sensors to provide instantaneous public information on local PM concentrations due to wildfire smoke.	PCAPCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services Public Information
Action 3. Wildfire Smoke Impact Response – Clean Air Centers for Vulnerable Populations	PCAPCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services Public Information



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Annex P: Placer County Flood Control & Water Conservation District

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Annex T: San Juan Water District

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Appendix C: Mitigation Strategy

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Appendix E: Threatened and Endangered Species

Appendix F: Critical Facilities

Appendix G: Fire History

Abbreviations and Acronyms

Acronym	Definition
AB	Assembly Bill
ACS	American Community Survey
APG	Adaptation Planning Guide
APN	Assessor Parcel Numbers
AQI	Air Quality Index
BAM	Best Available Map
BCEGS	Building Code Effectiveness Grading Schedule
BLM	Bureau of Land Management
BRACE	Building Resilience Against Climate Effects
BRIC	Building Resilient Infrastructure and Communities
CAC	Community Assistance Contact
CAISO	California Independent System Operator
CBC	California Building Code
Cal DWR	California Department of Water Resources
Cal OES	California Office of Emergency Services
CAS	Climate Adaptation Strategy
CAV	Community Assistance Visit
CCHPR	Climate Change and Health Profile Report
CCSM3	Community Climate System Model Version 3
CDAA	California Disaster Assistance Act
CDC SVI	Center for Disease Control Social Vulnerability Index
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Health
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CGS	California Geological Survey
CNNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNRA	California Natural Resource Agency
CPUC	California Public Utilities Commission
CRS	Community Rating System
CRV	Contents Replacement Values
CVP	Central Valley Project

Acronym	Definition
DAC	Disadvantaged Community Status
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act
DSOD	Division of Safety of Dams
EF	Enhanced Fujita
EOP	Emergency Operations Plan
ESF	Emergency Support Function
F	Fujita
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHSZ	Fire Hazard Severity Zones
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FMMP	Farmland Mapping and Monitoring Program
FRA	Federal Responsibility Area
FRAP	Fire and Resource Assessment Program
GFDL	Geophysical Fluid Dynamics Laboratory
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GRASP	Geospatial Research, Analysis & Services Program
HMGP	Hazard Mitigation Grant Program
HMPC	Hazard Mitigation Planning Committee
IBC	International Building Code
ICC	Increased Cost of Compliance
IPCC	Intergovernmental Panel on Climate Change
IRC	International Residential Code
IRWM	Integrated Regional Water Management
LAFCO	Local Agency Formation Commission
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LHMP	Local Hazard Mitigation Plan
LRA	Local Responsibility Area
MERS	Middle East Respiratory Syndrome
MHDP	Multi-Hazards Demonstration Project
MHI	Median Household Income
MMI	Modified Mercalli Intensity

Acronym	Definition
MPH	Miles Per Hour
MSL	Mean Sea Level
MW	Megawatts
NBHCP	Natomas Basin Habitat Conservation Plan
NCDC	National Climactic Data Center
NDMC	National Drought Mitigation Center
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWS	National Weather Service
OES	Placer County Office of Emergency Services
OHP	Office of Historic Preservation
PA	Public Assistance
PDM	Pre-Disaster Mitigation
PG&E	Pacific Gas and Electric
PM	Particulate Matter
PNAS	Proceedings of the National Academy of Sciences
PSPS	Public Safety Power Shutoff
RCP	Representative Concentration Pathways
RL	Repetitive Loss
SAC-SJ	Sacramento-San Joaquin
SB	Senate Bill
SBA	Small Business Administration
SDAC	Severely Disadvantaged Community
SFHA	Special Flood Hazard Area
SGMA	Sustainable Groundwater Management Act
SH	State Highway
SR	State Route
SRA	State Responsibility Area
SRL	Severe Repetitive Loss
SWP	State Water Project
UBC	Uniform Building Code
UCERF	Uniform California Earthquake Rupture Forecast
ULOP	Urban Level of Flood Protection
URM	Unreinforced masonry

Acronym	Definition
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WHO	World Health Organization
WSOC	Wildfire Safety Operations Center
WRCC	Western Regional Climate Center
WUI	Wildland Urban Interface

Chapter 1 Introduction

1.1 Purpose

Placer County, 5 incorporated communities, and 20 special districts prepared this Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved 2016 Placer County LHMP. The purpose of this LHMP Update is to guide hazard mitigation planning to better protect the people and property of Placer County from the effects of natural hazards. This LHMP Update demonstrates the Placer County communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed, among other things, to ensure Placer County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the FEMA Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and the Flood Mitigation Assistance Program (FMA).

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters because additional expenses incurred by insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be reduced or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$6 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2019 Report).

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This plan documents Placer County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability throughout the community.

This Placer County 2021 LHMP Update is a multi-jurisdictional plan that geographically covers the entire area within Placer County's jurisdictional boundaries (hereinafter referred to as the Planning Area). The following jurisdictions participated in the planning process and are seeking FEMA approval of the LHMP Update:

- Placer County*
- City of Auburn*
- City of Colfax*
- Town of Loomis*
- City of Lincoln*
- City of Rocklin*
- Alta Fire Protection District
- Alpine Springs County Water District*
- Foresthill Fire Protection District*
- Foresthill Public Utility District
- Nevada Irrigation District*
- Newcastle Fire Protection District
- Northstar Community Service District/Fire Department
- North Tahoe Fire Protection District*
- North Tahoe Public Utility District
- Olympic Valley Fire and Public Utility District (was Squaw Valley Fire and Public Utility District)*
- Placer County Flood Control & Water Conservation District*
- Placer County Resource Conservation District
- Placer County Water Agency*
- Placer Hills Fire Protection District*
- San Juan Water District
- Sierra Joint Community College District
- South Placer Fire Protection District(absorbed Loomis FPD, also a participant in the 2016 LHMP)*
- Tahoe City Public Utilities District*
- Truckee Fire Protection District*
- Placer County Air Pollution District

* Participated in 2016 Placer County LHMP

All plan participants from the 2016 Placer County Plan are participating in this LHMP Update, with the exception of Tahoe-Truckee Unified School District.

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). This planning effort also follows FEMA's 2013 Plan Preparation Guidance. Because the Placer County Planning Area is subject to many kinds of hazards, access to FEMA grant programs is vital.

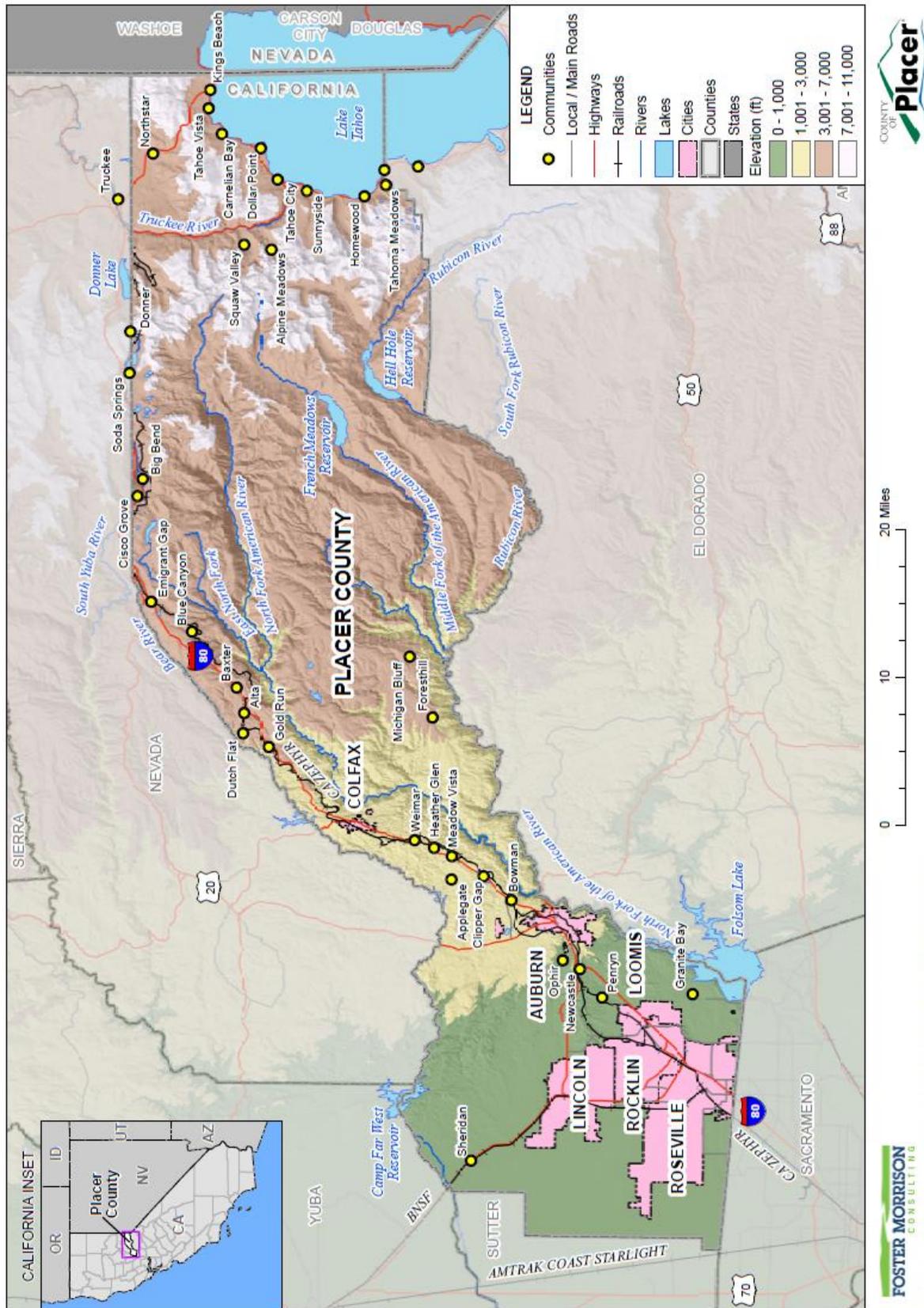
Information in this LHMP Update will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The

Placer County Planning Area has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

1.3 Community Profile

Placer County is located in northern California and stretches from Sacramento County to Lake Tahoe and the Nevada border. The Counties of Sacramento, El Dorado, Sutter, Yuba, and Nevada border Placer County. Regional access to the County is provided via Interstate 80 (I-80), which runs east-west through the entire County. Placer County includes the incorporated communities of Auburn, Colfax, Lincoln, Loomis, Rocklin, and Roseville. A map of the County is shown in Figure 1-1.

Figure 1-1 Placer County



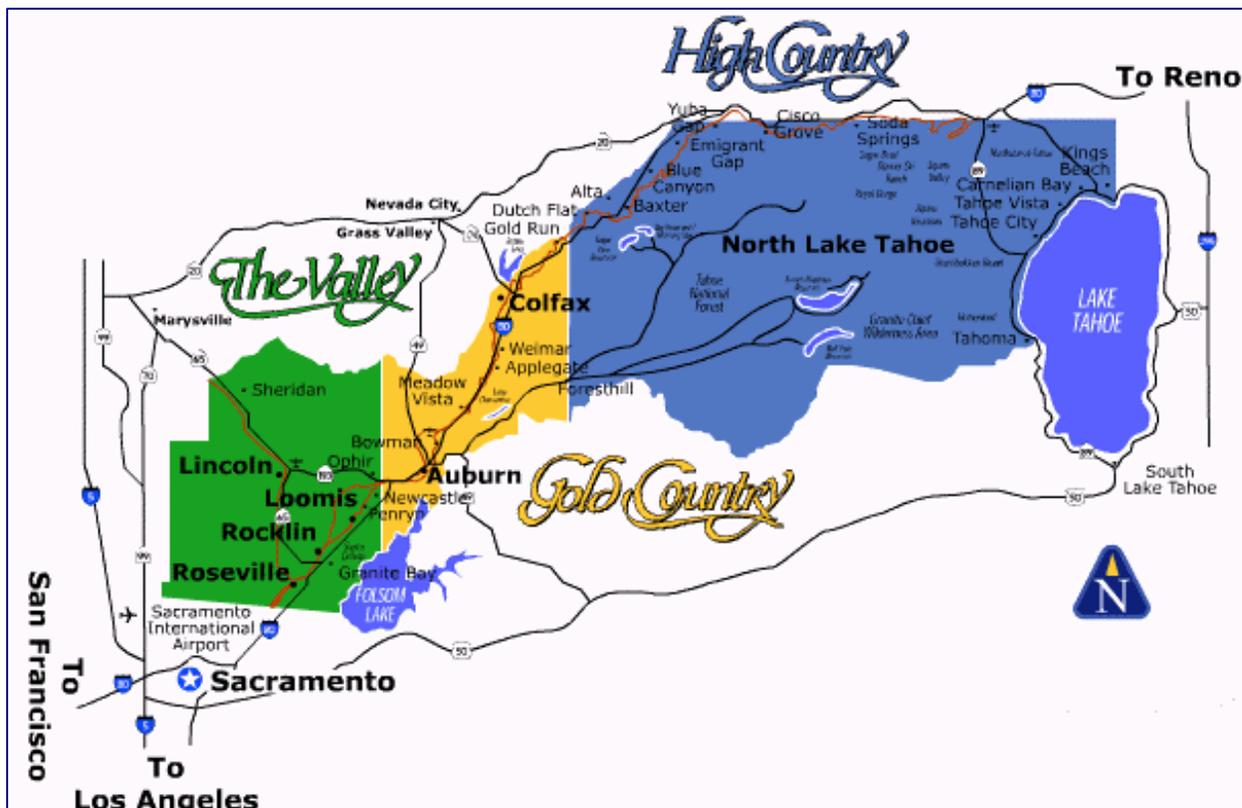
1.3.1. History

Placer County was home to the Nisenan Native Americans for hundreds of years before the discovery of gold in 1848 when multitudes of miners migrated to the area. Auburn was settled in 1848 upon the discovery of gold and later became a shipping and supply center for the surrounding gold camps. Three years after the discovery of gold in the region, the fast-growing county was formed from portions of Sutter and Yuba Counties on April 25, 1851, with Auburn as the County seat. The name Placer comes from the Spanish word meaning “sand and gravel deposits containing gold.” Gold mining remained a major industry through the 1880s, eventually overtaken by the industries of farming, timber, and the Southern Pacific Railroad. The commercial fruit industry also expanded rapidly in western Placer County in the late 1870s and early 1880s, with the Central Pacific Railroad providing a wide market in the east for California’s agricultural products. Among the produce raised were citrus, apples, peaches, pears, plums, cherries, olives, almonds, and walnuts.

1.3.2. Geography and Climate

Placer County, spanning the eastern part of the Central Valley of California, increases in elevation from urban South Placer, through Western Placer, to the High Sierras of North Lake Tahoe, and the Nevada state line. Located on an area of over 1,500 square miles, 98 square miles of which are comprised of water, the County is generally divided into three geographically distinct areas: the Valley – Roseville to Penryn; the Gold Country - Newcastle to Dutch Flat; and the High Country - Alta to Tahoe. Figure 1-2 illustrates these areas.

Figure 1-2 Placer County Geographic Areas



Source: Placer County 2021

The County’s topography is characterized by broad, relatively flat valley floors (the Valley) in the southwest; valley floors giving way to the foothills areas (Gold Country) heading east; and foothills and high mountains (Sierra Nevada) in the east. Elevations range from 160 to 400 feet above mean sea level in the valley near Roseville to approximately 2,000 feet near Colfax in Gold Country, to more than 9,000 feet in the Sierra Nevada. Water resources within Placer County include approximately 700 miles of rivers and streams and 97,000 acres of lakes.

The climate varies throughout the County, primarily based on elevation. Summers are longer, relatively hot, and dry in the lower elevations and are relatively cooler in the higher elevations of the Sierra Nevada. There is little precipitation in the County during the summer. Winters in the lower elevations are shorter and precipitation is primarily in the form of rain. In the higher elevations of the Sierra Nevada, winters vary from short and mild with moderate snowfall to moderately severe with frequent snowfall. Most of the seasonal precipitation throughout the County occurs between October and April. More specific information about Placer County’s climate can be found in Chapter 4 Risk Assessment.

1.3.3. Population and Demographics

The California Department of Finance population estimates for the County and incorporated jurisdictions are shown on Table 1-1.

Table 1-1 Placer County Population Estimates – July 1, 2020

Jurisdiction	2020
Auburn	14,594
Colfax	2,152
Lincoln	49,317
Loomis	6,888
Rocklin	70,350
Roseville	145,163
Balance of County	115,247

Source: California Department of Finance, 2020 E-1 Report

Select social and economic information for the County and participating jurisdictions are shown in Table 1-2.

Table 1-2 Placer County – Select Social and Economic Statistics

Statistic	Number
Populations	
Population under 5	5.3%
Population over 65	19.8%
Median Age	42.4
Racial Makeup	
White	82.8%
Black or African American	2.0%
American Indian or Alaska Native	0.6%
Asian	8.2%
Native Hawaiian or Pacific Islander	0.2%
Some Other Race	1.4%
Two or more races	5.0%
Income	
Median income	\$97,723
Mean Income	\$124,843
Poverty rate	
All families	6.2%
All people	7.7%

Source: 2010 US Census, 2019 US Census Bureau American Community Survey, California Employment Development Department

1.3.4. Economy and Tax Base

Placer County has a diverse economy. US Census estimate show economic characteristics for the County. These are shown in Table 1-3.

Table 1-3 Placer County Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	491	0.3%
Construction	12,108	6.4%
Manufacturing	10,835	5.7%
Wholesale trade	4,096	2.1%
Retail trade	23,175	12.2%
Transportation and warehousing, and utilities	9,583	5.0%
Information	3,642	1.9%
Finance and insurance, and real estate and rental and leasing	16,023	8.4%
Professional, scientific, and management, and administrative and waste management services	25,759	13.5%
Educational services, and health care and social assistance	42,730	22.4%
Arts, entertainment, and recreation, and accommodation and food services	18,396	9.7%
Other services, except public administration	9,572	5.0%
Public administration	14,211	7.5%

Source: US Census Bureau American Community Survey 2018 Estimates

Major employers in the County are shown in Table 1-4.

Table 1-4 Major Employers in Placer County

Employer Name	Location	Industry
Alpine Meadows Ski Resort	Alpine Meadows	Resorts
Backyard Bar & BBQ	Truckee	Restaurants
Composite Engineering Inc	Roseville	Engineers-Professional
Costco Wholesale	Roseville	Wholesale Clubs
Golfland Sunsplash Roseville	Roseville	Water Parks
Hewlett-Packard	Roseville	Computers-Electronic-Manufacturers
Kaiser Permanente Roseville MD	Roseville	Hospitals
Northstar California	Truckee	Resorts
Oracle	Rocklin	Computer Software-Manufacturers
Placer County Food Stamps	Auburn	County Government-Social/Human Resources
Placer County Sheriff	Auburn	Government Offices-County
Placer County Sheriff Dept	Tahoe City	Government Offices-County
PRIDE Industries	Roseville	Employment Agencies & Opportunities
Q I P-Roseville	Roseville	Real Estate Management
Resort At Squaw Creek A	Alpine Meadows	Hotels & Motels
Ritz-Carlton Club Lake Tahoe	Truckee	Hotels & Motels

Employer Name	Location	Industry
Roseville Toyota & Scion	Roseville	Automobile Dealers-Used Cars
Sheriff's Training	Auburn	Government Offices-County
Sierra Joint Community College	Rocklin	School Districts
Stagg Howard A Pro Corp	Roseville	Attorneys
Sutter Auburn Faith Hospital	Auburn	Hospitals
Sutter Roseville Medical Center Foundation	Roseville	Hospitals
TASQ Technology	Roseville	Importers (wholesale)
Thunder Valley Casino	Lincoln	Casinos
Union Pacific Railroad Co	Roseville	Railroads

Source: California Economic Development Department, retrieved 4/14/2021

The County has a wide and varied tax base. Tax base information is tracked and maintained by the Placer County Assessor's Office. Table 1-5 shows the tax base for the County as well as for the incorporated jurisdictions.

*Table 1-5 Unincorporated Placer County – Distribution of Value by Property Use**

Property Use	2020 Value (\$)	Percent of Current Roll
Agricultural	\$471,564,018	0.6%
Commercial	\$8,164,549,392	9.7%
Industrial	\$2,228,164,376	2.6%
Institutional	\$1,685,871,001	2.0%
Miscellaneous	\$938,799,592	1.1%
Natural / Open Space	\$532,279,280	0.6%
Residential	\$70,273,188,400	83.4%
Total	\$84,294,416,059	100.0%

Source: Placer County 2020 Assessor's Office data

*includes land and structure values

1.4 Plan Organization

This Placer County LHMP Update is a multi-jurisdictional plan that geographically covers the entire area within Placer County's jurisdictional boundaries (i.e., the Planning Area). The Placer County Local Hazard Mitigation Plan update is organized as follows:

Base Plan

- Chapter 1: Introduction
- Chapter 2: What's New
- Chapter 3: Planning Process
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy

- Chapter 6: Plan Adoption
- Chapter 7: Plan Implementation and Maintenance

Annexes

- Annex A: City of Auburn
- Annex B: City of Colfax
- Annex C: Town of Loomis
- Annex D: City of Lincoln
- Annex E: City of Rocklin
- Annex F: Alta Fire Protection District
- Annex G: Alpine Springs County Water District
- Annex H: Foresthill Fire Protection District
- Annex I: Foresthill Public Utility District
- Annex J: Nevada Irrigation District
- Annex K: Newcastle Fire Protection District
- Annex L: Northstar Community Service District/Fire Department
- Annex M: North Tahoe Fire Protection District
- Annex N: North Tahoe Public Utility District
- Annex O: Olympic Valley Fire and Public Utility District (was Squaw Valley Public Utility District)
- Annex P: Placer County Flood Control & Water Conservation District
- Annex Q: Placer County Resource Conservation District
- Annex R: Placer County Water Agency
- Annex S: Placer Hills Fire Protection District
- Annex T: San Juan Water District
- Annex U: Sierra Joint Community College District
- Annex V: South Placer Fire Protection District
- Annex W: Tahoe City Public Utilities District
- Annex X: Truckee Fire Protection District
- Annex Y: Placer County Air Pollution Control District

Appendices

- Appendix A: Planning Process
- Appendix B: References
- Appendix C: Mitigation Strategy
- Appendix D: Adoption Resolution
- Appendix E: Threatened and Endangered Species
- Appendix F: Critical Facilities

The **Base Plan** provides the overall framework for this multi-jurisdictional LHMP. It is the umbrella document that includes the planning process, methodologies, and procedural requirements for all participating jurisdictions (i.e., unincorporated County and all Jurisdictional Annexes). As such, Chapters 1-7 of the Base Plan apply to the unincorporated County, the five incorporated communities, and the six special Districts as participants to this LHMP Update seeking FEMA approval of the Plan. Because this is a multi-jurisdictional plan, the Base Plan addresses the LHMP hazard mitigation planning elements specific to the Placer County Planning Area which includes data, information and analysis specific to all participating jurisdictions and also includes data, information, and analysis specific to unincorporated Placer County.

The **Jurisdictional Annexes** detail the hazard mitigation planning elements specific to each additional participating jurisdiction to this Placer County LHMP Update. Each annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan document. As such, all Chapters 1-7 of the Base Plan, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction. The annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy.

The **Appendices** provide additional information, data, and planning process documentation that applies to all participating jurisdictions (i.e., unincorporated County and all jurisdictional annexes) to this Placer County LHMP Update.

Chapter 2 What's New

Requirements §201.6(d)(3) and §201.7(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The 2016 Placer County Local Hazard Mitigation Plan (LHMP) contained descriptions of their planning processes, the risk assessments of identified hazards for the Placer County Planning Area and mitigation strategies for reducing the risk and vulnerability from these hazards. Since approval of this Plan by FEMA, progress has been made by the County, the 5 incorporated communities, and 20 Special Districts on implementation of the 2016 mitigation strategies. As part of this LHMP Update, a thorough review and update of the 2016 County LHMP was conducted to ensure that this Plan Update reflects current community conditions and priorities in order to realign the updated mitigation strategy for the next five-year planning period. This section of this LHMP Update includes the following:

- **What's New in the Plan Update.** Section 2.1 provides an overview of the approach to updating the Plan and identifies new analyses, data and information included in this LHMP Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the Placer County Planning Area as well as information on current and future development trends affecting community vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respected sections within this LHMP Update.
- **Summary of Significant Changes to Current Conditions and Hazard Mitigation Program Priorities.** Section 2.2 provides a summary of significant changes in current conditions, changes in vulnerability, and any resulting modifications to the community's mitigation program priorities.
- **2016 Mitigation Strategy Status and Successes.** Section 2.3.2 provides a description of the status of mitigation actions from the 2016 LHMP and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2021 mitigation strategy. This section also highlights key mitigation success stories of the County and other participating jurisdictions since the 2016 LHMP.

This What's New section provides documentation of Placer County Planning Area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this LHMP Update further provides documentation of the Placer County communities' continued commitment and engagement in the mitigation planning process.

2.1 What's New in the Plan Update

This LHMP Update involved a comprehensive review and update of each section of the 2016 Plan and includes an assessment of the success of the participating communities in evaluating, monitoring, and implementing the mitigation strategy outlined in the 2016 LHMP. Only the information and data still valid from the 2016 LHMP was carried forward as applicable into this LHMP Update.

Also to be noted, Chapter 7 Implementation and Maintenance of this LHMP Update identifies key requirements for updating future plans:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new action recommendations or changes in action prioritization.

These requirements and others as detailed throughout this Plan were addressed during this LHMP Update process.

As part of its comprehensive review and update of each section of the 2016 LHMP, Placer County and participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this LHMP Update is identified below in this section and is also sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this LHMP Update. This new data and associated analysis provided valuable input for the development of the updated mitigation strategy presented in Chapter 5 of this LHMP Update.

Highlights of new information and analyses contained in this combined LHMP Update includes the following:

- Most hazards from the 2016 Plan were profiled in this LHMP Update. New hazards include localized climate change, pandemic, and tree mortality. Soil bank erosion was moved into the flood hazard. Hazards dropped from consideration include fog, subsidence, and hazardous materials transport.
- A new critical facility definition was created. The County created a new list of critical facilities that were spatially quantified in GIS, and then overlaid on each mapped hazard.
- Future development data was updated and collected from the County. This was spatially quantified in GIS, and then overlaid on each mapped hazard.
- Disaster declarations were updated, including federal, state, and USDA disaster declarations.
- The NCDC Storm Events and FEMA/Cal OES disaster declaration tables were updated.
- A new section on Power Shortage/Failure was added. Public Safety Power Shutoff events were also added.
- Cal-Adapt and Placer County Sustainability Plan data was added to the climate change section, as well as to other hazards that are exacerbated by climate change.
- New dam data provided by Cal OES was used for the dam inventory and analysis. This data included an updated hazard classification for identified dams and updated inundation mapping. Values at risk to dam inundation was analyzed. Critical facilities and populations at risk to dams were tabulated.
- An updated GIS analysis was performed for earthquake, including a Hazus earthquake run to show risk and provide potential loss estimates to the County from earthquake.

- An updated GIS analysis using the 2018 DFIRMs was performed for the flooding hazard for the 1%/0.2% annual chance floods, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.
- An updated GIS analysis was performed for landslides, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.
- More detailed GIS analysis was performed for the wildfire hazard, including values at risk, critical facilities at risk, population at risk, historic, cultural, and natural locations at risk, and general community impacts.
- An entire rework of the risk assessment for each identified hazard to reflect new information and to reflect the updated FEMA plan review tool. This included reworking the hazard profile and adding sections on location, extent, and new hazard event occurrences; redoing the entire vulnerability analysis to add additional items and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment to develop loss estimates.
- To better meet the revised FEMA plan review tool, a more extensive analysis of the extents to identified hazards was conducted and included in this LHMP Update.
- Utilizing updated critical facility GIS mapping for the Planning Area, an analysis was conducted to provide an updated inventory of critical facilities and those that fall within mapped hazard areas.
- An enhanced vulnerability assessment was conducted, which added a GIS analysis of updated future development areas in the Planning Area and specific to each of the mapped hazards.
- A greater study of County mitigation capabilities was added.
- Incorporation and analysis of the updated California Department of Finance population data was utilized for this LHMP Update.
- Environmental justice concerns were addressed in portions of this Plan Update.
- Also, as required by current FEMA planning guidance, an analysis of ongoing and continued compliance with the NFIP was included in this LHMP Update.

2.2 Summary of Significant Changes to Current Conditions, Planning Area Vulnerability, and Hazard Mitigation Priorities

This section provides a summary by hazard of significant changes in current conditions, Planning Area vulnerability, and any resulting modifications to the community’s mitigation program priorities since the 2016 LHMP:

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Agricultural Pests and Disease			X

- Significant and pervasive drought conditions in the County continue to stress the agricultural crops and adversely affecting the agricultural industry in the County.
- Recent drought conditions stressed crops making them more susceptible to insect infestation
- Reduced water supply resulted in land being left out of production reducing overall crop yields

- Noxious weeds are more drought tolerant – better able to compete for water over local crops
- Drought increased the tree mortality in the County further impacting the timber industry. Timber is the #2 Ag product in the County.
- In addition, there is a lack of infrastructure, such as timber mills, online to process product.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Avalanche		X	

- The avalanche conditions in the County are dynamic and change from season to season and often from day to day resulting in ever changing increases and decreases in vulnerability.
- Different avalanche mitigation techniques, such as propane-based Gaz-Ex that can be used remotely, are being used in areas near highways, such as Alpine Meadows, that have been effective in reducing the risk and impacts to roads and infrastructure.
- More people recreating in back county areas will increase the number of people at risk to a back county avalanche

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Climate Change			X

- Climate change was not addressed in 2016. Regardless, the effects of climate change are becoming more apparent in the Placer County Planning Area and all of California.
- NWS data indicates temperatures are increasing resulting in more extreme heat days. 2020 temperatures were some of the hottest.
- Weather extremes, including precipitation have become much more variable – the Planning Area is seeing increased precipitation and intensity as well as abnormally dry conditions.
- Data also suggests that changing climate conditions influence the severity of multiple hazards, such as heat, flooding, wildfire, drought, and others, identified in Placer County.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Dam Failure			X

- With more people moving into dam inundation areas, the vulnerability increases due to an increase in potentially affected populations. Also, with more varied precipitation occurring in the County, this hazard will continue to change.
- Risk increases over years due to aging dam infrastructure. This was evident by the 2017 Oroville spillway incidence.
- Non-jurisdictional dams pose the biggest risk and, over time with little regular maintenance and often located in remote areas with little security, result in an increase in vulnerability to Placer.

- With newer regulations, other dams are now required to do inundation mapping, develop EAPs, and conduct exercises which helps mitigate the risk.
- Post fire conditions create excess debris and sediment issues which can affect the functionality of area dams. In fact, various water supply districts such as PCWA and NID have been incurring costs associated with monitoring and debris removal around area dams and waterways. Thus there is a potential increase in vulnerability with heavy storms in wildfire burn scar areas.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Drought and Water Shortage			X

- Drought conditions since the 2016 LHMP, including water supply issues such as a diminished water table, have had an impact on the Placer County Planning Area and California. As a result, the drought hazard continues to be a significant priority for mitigation planning.
- Recent drought conditions have contributed to an increase in dry fuels (and tree mortality), and general increase in wildfire conditions.
- Given the cumulative effects of drought since the 2016 Plan, drought continues to have a significant economic impact on recreation in the County. With Lake Tahoe and rivers running substantially lower, less people have been vacationing and undertaking water dependent recreational activities, such as boating, rafting, etc.
- Water quality concerns are exacerbated in drought conditions.
- Drought conditions are depleting smaller high county reservoirs taking some water sources out of use making firefighting more difficult.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Earthquake		X	

- Overall, Placer County is in a relatively low to moderate seismically active area.
- The Eastern side of the County continues to experience an increase in earthquake occurrences over the last several years.
- The primary factor that might change the earthquake vulnerability is additional development and more people moving to the area. However, adherence to current California building codes should ensure sound development in new development areas.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: 1%/0.2% events		X	

- The risk and vulnerability of 1% and 0.2% flood events remain somewhat constant, changing from year to year based on weather, location, and new development in the Planning Area.
- With the winter storms of 2017- 2019, heavy rains resulted in full reservoirs and high rivers. This contributed to flooding around the County, including within identified FEMA floodplains.

- Effective land use planning and requirements for development in identified floodplains have minimized additional exposure to this hazard in the County. Participation in the NFIP CRS program also helps manage floodplains in the County thus reducing flood vulnerability to County residents.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: Localized Stormwater Flooding			X

- Climate change issues may result in more localized flooding as the climate warms and more frequent, wetter, and greater intensity storms create more runoff.
- 2017-2019 winter storms, including significant, greater intensity rains, resulted in more localized flooding throughout the Planning Area.
- Outdated and aging drainage infrastructure also contributes to a greater vulnerability to localized, stormwater flooding.
- Recent drought conditions in some areas have hardened soils and predisposed areas to worse flooding.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Landslide, Mudslide, and Debris Flows			X

- Over the last several years of severe drought, much of the vegetation along slopes areas is failing to thrive, thus there is a lack of vegetation to hold soil contributing to the landslide/mudslide potential.
- Post fire conditions have left areas more susceptible to landslides and debris flows, especially with the heavy storms associated with El Nino winters.
- Even outside of post-fire areas, recent wet storms in 2017-2019 have increased the incidents of landslides and road closures.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Levee Failure		X	

- There are limited areas outside of Roseville that are affected by levees, thus this hazard has seen little change.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Pandemic		X	

- Pandemic is a new hazard to the 2021 LHMP Update.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Seiche (Lake Tsunami)		X	

- The vulnerability of this hazard is primarily affected by changes in development to lakefront properties. There has been little new development in these areas; most changes are the result of redevelopment which has not effectively changed the vulnerability of this hazard.
- Recent seismic activity continues which contributes to the risk of this hazard.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Heat			X

- There has been an increase in severe heat days in recent years. This last year (2020) was one of the hottest on record.
- Climate change issues will continue to increase heat related impacts.
- The heat, combined with drought conditions, has increased the potential for wildfires.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Freeze and Snow		X	

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season.
- Freeze events continue to occur in the County impacting area crops.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Heavy Rains and Storms (Hail, Lightning)		X	

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season. the heavy rains and storms of 2017-2019 had been significant, causing flooding and other adverse impacts to the County. 2020 experienced dryer weather overall.
- Climate change brings renewed concern moving forward for heavy and more intense rains, storms and associated issues to the County.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: High Winds and Tornadoes			X

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season.
- High winds exacerbate the spread and intensity of wildfires.
- High winds in recent years have contributed to the potential for a PSPS event to occur in the County.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Tree Mortality			X

- Drought conditions increase the tree mortality in the County.

2021 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Wildfire			X

- Compounded by current drought conditions, the wildfire hazard has substantially increased and is no longer just a seasonal issue. The wildfire season, including the potential for a catastrophic wildfire, is now a year around concern.
- The vulnerability of Placer County to increased occurrence of a devastating wildfire has increased as exacerbated by the recent drought, increases in tree mortality, and overall increase in wildfire conditions.
- The increased development in WUI areas within the County also contributes to an increase in vulnerability.
- Climate change continues to affect the nature and intensity of wildfires.
- Wind has been a major contributor to the potential for a catastrophic wildfire. And when combined with extreme heat, also can trigger a PSPS which leaves the community at risk in other ways.
- With large wildfires occurring throughout California, the Planning Area has seen a significant change in air quality from smoke resulting in more recorded bad air days.
- Catastrophic wildfires in northern California counties have created other issues in the County, as evacuees flee the fires and look to nearby communities for temporary housing.

2.3 2016 LHMP Mitigation Strategy Successes and Status

Placer County and participating jurisdictions have been successful in implementing actions identified in the 2016 Placer County LHMP Mitigation Strategies, thus, working diligently towards meeting their 2016 goals and objectives of:

Goal 1: Minimize risk and vulnerability of Placer County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards (through well-planned communities)
- Minimize impacts to natural and cultural resources
- Minimize impacts from climate change
- Minimize impacts to watersheds/Promote watershed health
- Prevent and reduce wildland fire risk and related losses
- Prevent and reduce flood risk and related damages, with a focus on repetitive loss structures and infrastructure

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

- Provide protection for critical infrastructure from the wildland fires, floods, and severe storms/weather (e.g., repeaters, cell towers, water tanks, utilities)
- Improve infrastructure/system reliability for critical lifeline utilities, including stormwater systems, roadways (evacuation routes, emergency services and supplies); rail lines, and pipelines.
- Minimize risk of loss of life and injury to At-risk Populations

Goal 3: Improve public awareness, education, and preparedness for all hazards.

- Enhance public outreach, education, and preparedness program to include all hazards of concern (e.g. fire restrictions, water conservation measures, hazardous vegetation, air and water quality issues)
- Increase public knowledge of the risk and vulnerability to identified hazards and their recommended responses to disaster events to reduce losses
- Educate general public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities to include defensible space, hazardous vegetation abatement projects, and forest management projects and practices to reduce flood risk on private property
- Utilize multiple public outreach avenues such as schools, new technologies, and social media
- Coordination with other regional jurisdictions to facilitate (consistent/coordinated) public information function prior to, during and after an event (e.g., Facebook, Twitter, Everbridge, web, tv, radio)

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event.

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities such as fuels reduction and other multi-jurisdictional wildland fire projects
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels/provide for enhanced service levels

- Increase first responder’s awareness of vulnerable populations and other priority needs during a hazard event;(use of technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.

- Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP’s Community Rating System (CRS) where feasible.

2.3.1. Success Stories

Hazardous Tree Removal

Placer County has removed 5,200 trees threatening county infrastructure, marking the completion of its hazardous tree removal project.

In 2015, then Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of dead and dying trees throughout the state resulting from years of drought and bark beetle damage. Placer County was among the 10 counties most affected. Dead trees falling into county roadways pose a high risk to motorists. They could also inhibit emergency response and evacuations.

In response, the Board of Supervisors approved the Hazardous Tree Removal Plan, which outlined the steps needed to address the identification and removal of drought-related hazardous trees that threaten county roads and infrastructure. Under the proclamation of a state of emergency, the governor authorized California Disaster Assistance Act funds to support those most-impacted counties by reimbursing up to 75% of costs to remove eligible hazardous trees under the county’s plan.

The tree removal program was a multi-agency, multi-jurisdictional effort. Partners from state and federal agencies, such as Caltrans, CAL FIRE, the U.S. Forest Service and the Bureau of Land Management, as well as private landowners, worked together to identify hazardous trees and get them removed.

Placer County Partnerships (various)

Placer County has engaged in multiple partnerships, as shown below:



Whether it is discussing the increasing cost of fire insurance, forest health, preparation and planning, or protecting county resources, everyone has a part in the conversation. Partnerships and coordination are critical to ensuring Placer County is prepared.

Coordinating with local and state partners to prepare for wildfire

Preparing for wildfire takes all forms in Placer County. CAL FIRE Nevada-Yuba-Placer Unit / Placer County Fire Department, local fire districts, federal fire partners, cities, fire safe communities and Placer County all work toward creating and maintaining defensible space around homes and infrastructure, regional fuel breaks, fire education campaigns and more. One example is CAL FIRE's recently completed North Fork American River Shaded Fuel Break. The project is designed to protect the residents of Placer County and help safeguard over 5,500 structures and critical infrastructure such as the Union Pacific Rail Line, Interstate 80, the Kinder Morgan Petroleum Pipeline, and Pacific Gas and Electric power and water infrastructure that serves approximately 500,000 customers.



Working together on forest restoration and water conservation



The French Meadows Project is a forest restoration and fuels reduction project located in the headwaters of the Middle Fork American River in the Tahoe National Forest. It is an extensive public-private partnership of numerous regional and federal partners - all working together to not only improve the health and resilience of a vital municipal watershed, but also to address critical barriers to increasing the pace and scale of forest restoration in the Sierra.



The Middle Fork Project is a multi-purpose water supply and hydro-generation project designed to conserve and control waters of the Middle Fork American River, the Rubicon River, and several associated tributary streams.

Combining efforts to reduce wildfire risk



Placer County partners with the Placer Resource Conservation District on multiple programs, one being the low-cost Chipper Program to help homeowners improve their defensible space.



Placer County Parks Division's goat grazing program is an environmentally friendly option for open space management and fire risk reduction.



The Placer County Office of Emergency Services runs the Tree Mortality program in coordination with the Public Works Department to remove dead or dying trees on county land.



Placer County Environmental Utilities Division's green waste recycling program helps residents reach their defensible space goals.

Placer County Firewise Communities

Placer County has one of the largest networks of Firewise USA communities in the state

Our county residents provide the most valuable opportunity for developing effective partnerships. The Placer County Fire Safe Alliance is made up of federal, state and local agencies and community partners, who support residents' preparedness efforts through Firewise Communities and Fire Safe Councils.

Visit placer.ca.gov/FiresafeAlliance or call (530) 886-5300 to get involved.



62
OFFICIAL
FIREWISE
COMMUNITIES

In 2020, Firesafe Community members



Completed **70,000** community service hours equaling **\$1,601,416**



Hosted **69** virtual educational meetings and **9** fire safe events



Invested **4,034,578** in Firewise Home improvements, received **\$1,351,073** of grant funding, and contributed to **\$6,987,067** of wildfire risk reduction investment



Cleared **152,261** cubic yards of potentially flammable debris throughout the county



Preparedness starts at home

The Placer Alert public notification system, operated by the Placer County Sheriff's Office, is vital for informing residents during an emergency. Be prepared and sign up for notifications at PlacerAlert.org.

Visit ReadyPlacer.org to learn more about what the county is doing and what you can do to ensure you are prepared. Put together emergency supply kits in an easy-to-carry "go bag" so you're ready to go at a moment's notice in the event of a wildfire or other disaster.

PlacerAlert

ReadyPlacer

Placer County Administrative Building Generator Project

This project was initiated in 2018 to upgrade the electrical distribution system for back-up power at the Placer County Administrative Building (Customs House), located at 775 North Lake Blvd., Tahoe City, CA. A grant application was approved in 2014 for a portable generator and limited electrical upgrades. The original scope of work entails rewiring the feeder lines to three subpanels on the first floor, and purchasing a trailer mounted generator to be delivered to the site in an emergency, when needed during emergencies or loss of electrical power for extended period of time. The generator can then be plugged into a new tap box installed in the parking lot landscape island and connected to a manual throw switch that will provide electrical power to the forward EOC and supporting spaces located on the first floor of this facility during emergencies if power is lost. The generator is a 100KW type (AEL # 10PE-00-PTSW (genset) and 10GE-00-GENR (generator)).

On August 14, 2018, the Placer County Board of Supervisors (BOS) approved Plans & Specifications and authorized the Director of Public Works and Facilities, or designee, to award and execute a construction contract not-to-exceed \$342,500. On January 18, 2018, a contract was executed with ABM Electrical & Lighting Solutions, Inc. in the amount of \$283,488. However, elevator work was also necessary and not in ABM’s scope of work. A second contract was issued to Elevator Industries for \$20,223.33, bringing the total contracted project cost to \$303,711.51.

This new scope of work utilized the existing 100kW portable generator to power the entire building (1st and 2nd floors) while modifying the building electrical system to consolidate all building loads on the Generator circuit.

Miners Ravine Sewer Pipeline Repair

An abutment holding a sewage pipeline over Miners Ravine was severely eroded and structurally compromised. The abutment was likely to fail during higher creek flows, which would cause the pipe to rupture and spill sewage into Miners Ravine. The abutment was successfully replaced with a sound structure. A potential sewage spill was avoided and the habitat for threatened species was protected. This can be seen in Figure 2-1. Placer County Environmental Utilities was responsible for this project.

Figure 2-1 Miners Ravine Before and After



Source: Placer County Environmental Utilities

North Tahoe Public Utility District Generator

The North Tahoe Public Utility District installed an emergency generator for our Base Administration building and connected two additional buildings and fuel pumps to the new generator utilizing two FEMA HMGP grants. With these projects, we can maintain power at our corporation yard to keep critical water and sewer equipment functioning during power outages.

Figure 2-2 North Tahoe Public Utility District Generator



Source: North Tahoe Public Utility District installed

Tahoe City Public Utility District Water Tank Replacement

The Bunker Water Tank Replacement project was completed in 2019. The nominal capacity of the tank was increased from 500,000 gallons to 1.2 million gallons providing much needed emergency storage and reduces risk by providing longer sustained fire flow capacity for areas served by the tank. An increase in nominal capacity of 700,000 gallons provides an additional six hours of reliable gravity based fire flow capacity at a fire flow demand of 2,000 gallons per minute. In addition, the existing tank was constructed of redwood and was seismically unstable. The new tank is constructed of steel and meets all current seismic codes. The change from redwood to steel greatly reduces risk of damage due to wildfire due to the previous flammable material construction and reduces earthquake risks due to the seismic deficiencies of redwood tank construction. The Bunker Water Tank will provide at least 50 years of risk mitigation to the residents, businesses, visitors and the environment served by it. Pictures can be seen in Figure 2-3 and Figure 2-4.

Figure 2-3 Bunker Water Tank



Source: Tahoe City Public Utility District

Figure 2-4 Bunker Water Tank



Source: Tahoe City Public Utility District

North Tahoe Fire Protection District

The District noted the following successes:

- North Tahoe Fire Protection District Interoperability Radio Upgrades – \$450,000 was spent with grant, capital improvement and general fund dollars to replace all base, mobile and portable radios. These radios were upgraded to meet 2018 FCC guidelines and DOHS SAFECOM 6 Levels of Interoperability. These radios also meet CALFIRE/CalOES standards and specifications which assists with interoperability during in-district and out of districts assignments. North Tahoe Fire also spends approximately \$145,000 annually for Grass Valley ECC Dispatch Services, and \$50,000 annually for communications general fund budget for radio repair, replacement, and maintenance. Communications is a crucial component of all risk emergency response to ensure timely dispatch and effective communication during an incident and with incoming resources from varying agencies.
- North Tahoe Fire Protection District GIS Improvements – A GIS specific laptop with ArcGIS license were purchased with general fund dollars. Incident view updates and Hydrant mapping GIS were improved. The improvements made to emergency response by enhancing our mapping has been instrumental in improving emergency response.
- North Tahoe Fire Protection District Facility Improvements – Replacement and maintenance of existing station infrastructure have been hampered by the ability to fund these cost prohibitive improvements. The District was able to complete an extensive interior remodel of our Homewood Station that was completed December of 2019.
- North Tahoe Fire Protection District Defensible Space Education – North Tahoe Fire Protection District secured \$1.3 Million in grant funding as a part of the Tahoe Network of Fire Adapted Communities and \$623,079 was spent since award in 2016. This project is ongoing and the current grant period of performance extends through 2023. Since 2016 NTFPD has coordinated the creation of 6 Firewise Communities, completed over 7,000 Defensible Space Inspections, received and completed over 3,800 chipping requests, assisted with tree removal permitting, and continued to conduct a robust outreach and education program to provide materials, and coordinate community events and workdays.

2.3.2. 2016 Mitigation Strategy Update

The 2016 Placer County LHMP mitigation strategy contained 165 separate mitigation actions for the County and participating jurisdictions. Of the 165 actions, 15 have been completed, 17 are completed but ongoing, 72 are ongoing, 4 are ongoing with portions not started, and 57 have not been started. 96 2016 Placer County actions have been identified for inclusion in this LHMP Update, and are carried forward in Chapter 5 in Table 5-4. Table 2-1 provides a status summary of the mitigation action projects from the 2016 Placer County LHMP. Following the table is a description of the status of each project.

Table 2-1 Placer County’s 2016 LHMP Update: Mitigation Action Status Summary

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Placer County				
Multi-Hazard Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	X	X		Y
Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Trail System Way Finding and Directional Signage		X		Y
Disaster Debris Management Plan		X		N
Agricultural Actions				
Pest Detection Programs		X		N
Noxious Weed Eradication Programs		X		N
Dam Failure Actions				
Cottonwood Dam Restoration			X	N
Drought Actions				
Retrofit of High Water Use Landscape & Irrigation		X		N
Drought Public Education and Outreach		X		N
Erosion Actions				
Bear Creek Bank Restoration	X			N
Lake Tahoe Basin Environmental Improvement Program (EIP)		X		N
Earthquake Actions				
Fire Station Seismic Upgrade			X	N
Dewitt Demolition		X		N
Health Care Facility Seismic Resiliency			X	N
Flood Actions				
Community Rating System (CRS) Maintain and Enhance		X		Y
Stream Channel Clearing – Western Placer County		X		N
Van Norden Dam Lowering and Meadow Restoration	X	X		N
Miners Ravine Sewer Pipeline Repair	X			N
Sewer System Management Plan Updates		X		N
Stormwater Drainage Improvements		X		N
Bridge and Culvert replacement and drainage improvements		X		Y
Urban Level of Flood Protection Mapping		X		N
Elevate Remaining 95 Homes in the Dry Creek Watershed			X	Y
Elevate Repetitive Loss Structures in 100-year Floodplain			X	Y
Hazardous Material Actions				
Natural Hazard Minimization Evaluation focusing on top 5 facilities in Placer County producing large quantities of hazardous waste/storage of such hazardous materials		X		N
Wildfire Actions				
Large Strategic Fuel Break		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Fuel Breaks in the Wildland Urban Interface (WUI)	X	X		Y
Wildfire Public Education		X		Y
Natural Systems Protection / Education and Awareness Programs – Placer County Wildland Urban Interface (WUI) Strategic Planning		X		Y
North Fork American River Fuel Break	X	X		Y
Defensible Space Programs		X		Y
Projects that focus on Open Space/Defensible Space		X		Y
Annual Multi-Agency Wildland Fire Drill	X	X		Y
Vegetation Management – Ongoing Maintenance of Fuel Breaks		X		Y
City of Auburn				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Lincoln Basin (Downtown) Drainage Infrastructure			X	N
Creek and Stream Cleaning and Maintenance Program		X		N
Implementation of Storm Water Treatment Plan			X	N
Electric Street Diversion Project		X		N
Old Town Auburn Storm Drain System		X		N
American River Canyon Shaded Fuel Break		X		N
Community Education on Wildfire		X		N
Residential Home Inspections for Compliance of Fire Safe Standards; Defensible Space.		X		N
Maintenance of the Private Lands Portion of the Shaded Fuel Break Along the Rim of the American River Canyon and the Auburn State Recreation Area (ASRA)				N
City of Colfax				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Continue Annual Weed Abatement Ordinance		X		Y
Colfax Schools Evacuation Site Shaded Fuel Break	X	X		Y
Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District		X		Y
City of Lincoln				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	X			Y
Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge			X	Y
McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span		X		Y
Lakeview Farms Regional Volumetric Mitigation Facility		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream Restoration And Culvert Improvement			X	Y
"O" Street Drainage Improvements			X	Y
7th Street Drainage Improvements			X	Y
Auburn Ravine at State Route 193 Bridge		X		Y
Auburn Ravine at State Route 65 Bridge			X	Y
Ingram Slough – Orchard Creek Return Channel			X	Y
Markham Ravine – Updated FEMA Analysis And Mapping		X		Y
Markham Ravine Drainage Improvements – Union Pacific Railroad & State Route 65 Crossings			X	Y
Auburn Ravine Stream Restoration Projects (Analysis and Repairs)		X		Y
Markham Ravine Streambed Restoration Projects (Analysis Only)			X	Y
Coon Creek Streambed Restoration Projects (Analysis Only)			X	Y
Fire Prevention and Fuels Management Plan			X	Y
City of Rocklin				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	X			Y
Federal Emergency Management Agency (FEMA) Floodplain/Community Rating System (CRS)			X	N
Creek Channel and Drainage Way Clearing and Maintenance		X		Y
High Water Use Landscape and Irrigation Retrofit	X			N
Open Space Fire Prevention & Vegetation Management Prescribed Grazing		X		Y
GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents		X		Y
Town of Loomis				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Local Bridges Evaluation Program			X	Y
Address signage for property addresses		X		Y
Delmar Avenue Headwall Reconstruction Project			X	Y
Creek Maintenance Secret Ravine & Antelope Creek		X		N
Reconstruction of Brace Bridge at Secret Ravine			X	Y
Raise Flood-Prone Houses Along Loomis Creeks			X	N
Alta Fire Protection District				
Apparatus Water Fill & Drafting Location Improvements			X	Y
Evacuation / Reunification Center Improvements		X	X	Y

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Natural Systems Protection / Education and Awareness Programs and Community Fuel Breaks		X	X	Y
Natural Systems Protection / Education and Awareness Programs		X	X	Y
Emergency Communications and Information System Improvements.		X	X	Y
Alta Fire Protection District CERT Team	X			N
Reflective Addressing		X		Y
Alpine Springs County Water District				
Emergency Electrical Generator Replacement Project			X	Y
Water Storage Tank Replacement Project			X	Y
Mineral Springs Soil Bank Stabilization Project			X	Y
Alpine Meadows Consolidated Defensible Space Continuation Project			X	Y
Foresthills Fire Protection District				
Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.		X		N
Foresthill Biomass Project			X	N
Assess and Enhance Foresthill Fire Protection District (FFPD) New Subdivision, Hazard Fuels Clearing and Maintenance Ordinance. Put Programs in Place with Homeowners Associations in CC&R's and Maintenance Contracts.		X		N
Todd Valley Shaded Fuel Break		X		N
Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.		X		N
Loomis Fire Protection District				
Identify and inspect ALL bridges in LFPD			X	N
Vegetation Management for Open Areas			X	N
Address Signs for Rural Residences			X	N
Adopt 2016 CFC, CBC, and local standards			X	N
Nevada Irrigation District				
Combie Phase 1 Replacement		X		Y
Centennial Water Storage and Power Supply Project		X		Y
Water Service Auburn Valley CSD			X	Y
NID Headquarters Office Generator	X			N
Orr Creek Diversion		X		Y
Reservoir Cleaning		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Canal Culvert Replacement Program		X		Y
Northstar Community Services District				
Martis Landing Drainage Swales and Catch Basins	X			N
Continue Easement Access Road Water Bar Maintenance and Replacement Program		X		N
Fuels Reduction @ Sawmill Reservoir		X		N
Fuels Reduction Program		X		N
Storm Water Drainage Inlet Maintenance		X		N
Siphon Line		X		N
Provide Power from Mobile Generator		X		N
Green Waste Recycling Program		X		N
Enhance our current Defensible Space Program by seeking funding to hire a part-time employee to assist the Fire Prevention department in running this program	X			N
District Water Conservation Program	X			N
North Tahoe Fire Protection District				
FCC P-25 Interoperability Radio Systems		X		Y
District GIS Technology, Equipment, Database and Mapping Improvements		X		Y
North Tahoe Fire Protection District Critical Facility Infrastructure Improvements		X		Y
Seiche Wave Warning Systems, Signs and Public Education			X	N
Defensible Space Inspection, Tree Marking, Chipping Program, and Public Education		X		Y
Hazardous Wood Roof Replacement Program			X	N
Regional Water System Fire Protection Upgrades and Interoperability			X	Y
Skid Steer Loader with Transport Trailer, Fuels Reduction Masticator Attachment and Snow Blower Attachment			X	Y
Hydrant Risers, Replacements and Markers		X		Y
North Tahoe Public Utility District				
Update SCADA Equipment and Telecommunications Infrastructure	X			N
IT and Telecommunications Improvements for Disaster Preparedness			X	Y
Update Emergency Response Plan			X	N
Backup Generator Installation at Critical Facilities		X		Y
Fuels Reduction around Critical Infrastructure and North Tahoe Regional Park		X		Y
Kingswood West Subdivision Emergency Evacuation Access			X	N

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
North Tahoe Regional Park Road Improvements for Emergency Access			X	Y
Seismic Study and Retrofit of Critical Infrastructure			X	Y
Sewer Main Replacements in Shorezone of Lake Tahoe			X	Y
Water Booster Pump Station Rehabilitation/Replacement			X	Y
Increased Storage Capacity for Dollar Cove Water System			X	Y
Water System Interties			X	Y
Placer County Flood Control District				
FEMA CTP DFIRM Mapping Study	X	X		Y
Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds	X	X		Y
Update Hydrology and Hydraulic Models within the Cross Canal Watershed			X	Y
Upgrade of Flood Warning System to Include Additional Gage Locations and Flood Forecasting Capabilities	X	X		Y
Placer County Water Agency				
Hillside Slope Stabilization	X	X		Y
L.L. Anderson Dam Spill Way Modification	X	X		N
Water System Interties	X	X		N
Vegetation Management and Brushing	X	X		Y
Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas	X	X		Y
Replace Wooden Flume Structures	X	X		Y
De-Silt Reservoirs.			X	Y
Placer Hills Fire Protection District				
Assess And Enhance Placer Hills Fire Protection District (PHFPD) Onsite Water Requirements For Minor Lot Splits	X			N
South Placer Fire Protection District				
Vegetation Management for Open Areas		X		Y
Address Signs for Rural Residences		X		N
Adopt 2016 CFC, CBC, and local standards	X			N
Squaw Valley Public Service District				
Emergency Water Supply Interconnection to Martis Valley			X	Y
Truckee River Siphon	X			N
Squaw Creek Siphon			X	Y
Easement Abatement/Maintenance of Emergency Access		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Develop a Community-Wide Emergency Notification System Capable of Providing Information to Both Residents and Visitors by Utilizing Permanent, Roadside Changeable Message Boards and a Low-Power Radio Transmitter			X	Y
SVPSD/Mutual Water Company Inter-tie			X	Y
Water Tank Earthquake Retrofit Project			X	Y
Tahoe City Public Utility District				
Bunker Water Tank Replacement	X			N
West Lake Tahoe Regional Water Treatment Plant		X		Y
Tahoe Main Emergency Water Supply			X	N
Tahoe Truckee Unified School District				
North Tahoe High School and Middle School, Tahoe Lake Elementary School Emergency Generators.			X	N
School Site and Community Education of Procedures Related to Safety and Emergency Situations. Improvement of District Wide Emergency Communication and Alert Systems.			X	N
HVAC Control Upgrades			X	N
Truckee Fire Protection District				
Community Wildfire Protection Plan	X	X		Y
Severe Winter Weather and Propane Issues Mainly in Serene Lakes		X		N

Placer County Mitigation Actions

Multi-Hazard Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The 2016 LHMP was incorporated by reference into the Safety Element of the General Plan in 2016. The integration contributed to reduce risks as the LHMP was used as a reference source document for the Placer County Sustainability Plan as well as other plans/planning processes done by the County.

Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County OES conducts public education and awareness of natural hazards and public understanding of disaster preparedness efforts throughout the year through posting of current information on the County website and social media platforms. Additionally, Placer County OES also participate in the annual National Preparedness Month in September. The County developed the “Ready Placer” website and public education campaign which promotes individual and family preparedness.

Trail System Way Finding and Directional Signage

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing. It is being carried forward in this Plan Update.

Disaster Debris Management Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The draft Debris Management Plan was submitted to CalOES for review in 2019 under FEMA Alternative Procedures Pilot Program, however FEMA suspended the program in 2020. The draft DMP was resubmitted in February 2021 to CalOES for review, which is currently in progress.

Agricultural Actions

Pest Detection Programs

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Agriculture and US Department of Agriculture to conduct a comprehensive pest detection program for a variety of specific insect species determined to be highly-detrimental to agriculture and the environment (including urban and rural landscapes). Should one of these pests become established in Placer County, specific protocols would be followed to delimit the

extent of the infestation, and then implement a treatment and monitoring plan to mitigate the infestation. This plan is in place.

Noxious Weed Eradication Programs

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County Agriculture Department conducts annual surveys and treatments to find and eradicate specific noxious weeds that if established would be detrimental to agriculture and the environment. This program is fully operational.

Dam Failure Actions

Cottonwood Dam Restoration

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has not been implemented. District staff continues to seek funding opportunities and coordinate with project stakeholders to pursue implementation.

Drought Actions

Retrofit of High Water Use Landscape & Irrigation

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing as landscape is replaced.

Drought Public Education and Outreach

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): In 2016 there were Drought Emergency Water Conservation regulations that restricted the use of water. Education and outreach material was provided to the community to inform customers of restrictions (no washing sidewalks/driveways; no runoff allowed; shut off nozzle must be used for washing vehicles; fountains must have recirculating system; limit irrigation; etc.). Continued education and outreach will be conducted, as needed, in drought years.

Erosion Actions

Bear Creek Bank Restoration

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): 30 acres of mountain meadow and 3,000 ft of stream restored – by restoring streams to their natural channels, we allow the meadow to once again ‘hold water’—a natural function of a healthy meadow. Improving water quality and aquatic habitat - when functioning, this meadow can filter as much as 60% of the sediment as water flows through, making the water downstream more fishable, drinkable, and swimmable. Enhance meadow hydrology and habitat - by slowing erosion and preventing soil loss, we are encouraging the development of mature soils. This supports

more diverse vegetation to restore the meadow's ability to sustain life. A portion of Bear Creek began flood plain restoration activities in 2020. The 'bank' area has not been addressed yet, but should start in 2021 or 2022.

Lake Tahoe Basin Environmental Improvement Program (EIP)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This is an ongoing effort to reduce sediment discharge to Lake Tahoe. Over 40 erosion control projects have been completed in the Placer County portion of the Lake Tahoe Basin since the 1980s. Five more projects to address erosion and stormwater quality are scheduled over the next 10 years

Earthquake Actions

Fire Station Seismic Upgrade

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): There is no plan at this time to seismically upgrade the County's fire stations. The County is in one of the lowest risk regions for earthquake damage.

Dewitt Demolition

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): As of February 16, 2021, demolition of most of the unoccupied buildings dating back to World War II are being demolished, in accordance with the County's PCGC Master Plan Update. The project is scheduled for completion by the Fall of 2021.

Health Care Facility Seismic Resiliency

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): There is no plan at this time to seismically upgrade the County's healthcare facilities. The County is in one of the lowest risk regions for earthquake damage, and none of our facilities qualify as hospitals.

Flood Actions

Community Rating System (CRS) Maintain and Enhance

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County continues to participate in the CRS program. It is an ongoing effort to help reduce flood losses and provide affordable flood insurance.

Stream Channel Clearing – Western Placer County

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is implemented on a yearly basis. The project reduces flooding risks by maintaining overgrown vegetation and removing blockages, such as

downed trees and debris, at road crossings and within stream channels located in flood prone areas of Western Placer County.

Van Norden Dam Lowering and Meadow Restoration

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The notching of the spillway (i.e., dam lowering) was completed in 2019. The spillway notching portion of the project reduced flooding risks by reducing the volume of water impounded by the dam and mitigating for the potential for dam failure. The previous dam was determined by the State Department of Safety of Dams (DSOD) as being noncompliant with safety standards due to deterioration of the dam. The completion of the spillway notching removed the dam from DSOD jurisdiction. The meadow restoration has not begun and is currently going through the planning and design process with the South Yuba Citizens League (SYRCL) as the lead agency.

Miners Ravine Sewer Pipeline Repair

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project was implemented to repair a pipeline abutment at the creek bank edge, which was severely structurally compromised by bank erosion. Higher creek flows could have caused movement of the abutment and failure of the sewage pipeline over the creek that was habitat for threatened species. The new abutment was completed in 2015 and prevented pipeline failure in the creek.

Sewer System Management Plan Updates

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Sewer System Management Plan is updated every 5 years. It contains Sanitary Sewer Overflow Response Procedures, which were last revised in October 2016. The plan contains required actions to respond and contain overflows, which will reduce severity of events.

Stormwater Drainage Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Numerous drainage improvements have been implemented across the county, and additional sites will be addressed with improvements over the next five years. One focus area will include Squaw Creek where floodplain restoration projects will continue over the next five years along with replacing/upgrading drainage infrastructure on Squaw Valley Road. It likely that ‘Squaw’ will be replaced with the name ‘Olympic’ within the next five years.

Bridge and Culvert replacement and drainage improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County maintains over 120 bridges and thousands of culverts. Numerous bridges and culverts were replaced since 2016, and additional ones will be repaired or replaced based on their structural and functional condition over the next five years

Urban Level of Flood Protection Mapping

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is ongoing, but will not be carried forward in the Plan Update.

Elevate Remaining 95 Homes in the Dry Creek Watershed

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Will be completed when funding opportunities are available.

Elevate Repetitive Loss Structures in 100-year Floodplain

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is not started. It is being carried forward in the Plan Update.

Hazardous Material Actions

Natural Hazard Minimization Evaluation focusing on top 5 facilities in Placer County producing large quantities of hazardous waste/storage of such hazardous materials

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is ongoing. Project will not be carried forward in this Plan Update.

Wildfire Actions

Large Strategic Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The French Meadows Forest Restoration Project is a 22,000-acre forest treatment in and around French Meadows reservoir and dam and was started in 2019 and is scheduled to be completed in 2023. Fire modeling was performed and two years of treatments have shown dramatic risk reduction of fire.

Fuel Breaks in the Wildland Urban Interface (WUI)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Multiple areas were worked on. This can be seen on the image below.

Figure 2-5 Placer County Fuel Break Areas

Grantor	Grant Type	Grant Name	\$ Applied	Grant Writer	FSC / Area	Fiscal Sponsor	Submit	Apprvd	\$ Funded	Complete	Status (agreements, linked grants, etc.)
CA Fire Foundation	Fuels Reduction	GL Roadside Disking Project	\$ 5,054	George Alves	GLFSC	RCD	11/15/19	01/15/20	\$ 5,054		
Cal Fire Prevention Grant	Fuels Reduction	Placer Chipper Program	#####	Sarah Jones	RCD	Placer RCD	12/03/19	03/10/20	\$ 874,848		
MFP	Fuels Reduction	Todd Valley II SFB	\$ 49,500	Luana Dowling	FH/IH	IHCC	03/02/20	04/07/20	\$ 49,500	Yes	
MFP	Fuels Reduction	Ridge View SFB	\$ 49,500	Luana Dowling	FH/IH	IHCC	03/02/20	04/07/20	\$ 49,500	Yes	
BLM	Hazard Fuels Reduction	Iowa Hill	\$ 300,000.00	Luana Dowling	FH/IH	IHCC	08/14/19	09/26/19	\$ 213,040	Yes	
BLM	Hazard Fuels Reduction	Michigan Bluff Planning and Implementation Grant	\$ 308,000.00	Luana Dowling	FH/IH	IHCC	04/27/20	Pending			
PG&E	Hazard Fuels Reduction	Forest Hill Fuel Break Phase II	\$ 98,000.00	Luana Dowling	FH/IH	IHCC	05/05/20	06/27/20	\$ 75,000	Yes	
MFP	Fuels Reduction	Ridge View SFB Phase II	\$ 49,500.00	Luana Dowling	FH/IH	IHCC	07/10/20	09/25/20	\$ 49,500	Yes	
TOTALS			\$ 2,159,554						\$1,316,442	61%	\$843,112.00
Grantor	Grant Type	Grant Name	\$ Applied	Grant Writer	FSC / Area	Fiscal Sponsor	Submit	Apprvd	\$ Funded	Complete	Status (agreements, linked grants, etc.)
Cal Fire Prevention Grant	Fuels Reduction	Placer County Coordinated Fuelbreak Phase 1	\$ 1,108,028	Elisa Noble/ Luana Dowling	RCD	Placer RCD	12/19/18	04/16/19	\$ 1,108,028		
MFP	Hazard Mitigation	Foresthil Tree Mortality Continuation 2019	\$ 49,550	Luana Dowling	FH/IH	IHCC	02/25/19	04/16/19	\$ 49,550	Yes	
MFP	Fuels Reduction	Baltimore Mine SFB Maint. 2019	\$ 49,550	Luana Dowling	FH/IH	IHCC	02/25/19	04/16/19	\$ 49,550	Yes	
PG&E	Fuels Reduction	Pipeline SFB	\$ 98,000	Luana Dowling	FH/IH	IHCC	05/31/19	07/22/19	\$ 98,000	Yes	
MFP	Fuels Reduction	Michigan Bluff SFB	\$ 49,500.00	Luana Dowling	FH/IH	IHCC	07/16/19	08/14/19	\$ 49,500	Yes	
BLM	Hazard Fuels Reduction	Iowa Hill	\$ 300,000.00	Luana Dowling	FH/IH	IHCC	08/14/19	09/26/19	\$ 40,090	Yes	
TOTALS			\$ 1,654,628						\$1,394,718	84%	\$259,910.00
Grantor	Grant Type	Grant Name	\$ Applied	Grant Writer	FSC Area	Fiscal Sponsor	Submit	Apprvd	\$ Funded	Complete	Status (agreements, linked grants, etc.)
MFP	Hazard Mitigation	Foresthil to Michigan Bluff Tree Mortality Removal Continuation	\$ 49,500	Luana Dowling	FH/IH	IHCC	02/07/18	04/10/18	\$ 49,500	YES	
MFP	Hazard Mitigation	Todd Valley Phase I Maint. Phase I	\$ 49,500	Luana Dowling	FH/IH	IHCC	02/08/18	04/10/18	\$ 49,500	YES	
PG&E	Fuels Reduction	Blackhawk & McKeon Ponderosa Roadside Clearing	\$ 75,000	Luana Dowling	FH/IH	IHCC	02/28/18	04/12/18	\$ 75,000	YES	
Cal Fire Prevention Grant	Fuels Reduction	Auburn Shaded Fuel Break	\$ 1,900,000	Elisa Noble/ Luana Dowling	RCD	Placer RCD	06/08/18	08/07/18	\$ 1,900,000		
MFP	Hazard Mitigation	Foresthil to Michigan Bluff Tree Mortality Removal Cont	\$ 49,500	Luana Dowling	FH/IH	IHCC	06/14/18	09/07/18	\$ 49,500	YES	
Total			\$ 2,123,500						\$2,123,500	100%	\$0.00
Grantor	Grant Type	Grant Name	\$ Applied	Grant Writer	FSC Area	Fiscal Sponsor	Submit	Apprvd	\$ Funded	Complete	Status (agreements, linked grants, etc.)
MFP	Hazard Mitigation	Foresthil to Michigan Bluff Tree Mortality Removal Continuation	\$ 49,900	Luana Dowling	FH/IH	IHCC	01/23/17	05/04/17	\$ 49,900	YES	
MFP	Hazard Mitigation	Todd Valley Phase I Maint. Phase I	\$ 49,900	Luana Dowling	FH/IH	IHCC	01/23/17	05/04/17	\$ 49,900	YES	
CAL FSC Clearinghouse	Hazard Fuel Reduction	Todd Valley II 30 acres	\$ 67,500	Luana Dowling	FH/IH	IHCC	04/18/16	03/07/17	\$ 67,500	YES	Pre-award submitted 2/28/17
PG&E	Hazard Fuels Reduction	Todd Valley II	\$ 75,000	Luana Dowling	FH/IH	IHCC	03/15/17	05/03/17	\$ 75,000	YES	
PG&E	Hazard Fuels Reduction	McKeon Ponderosa	\$ 33,333	Luana Dowling/ Elisa Noble	FH/IH	RCD	07/12/17	07/18/17	\$ 33,333	YES	
PG&E	Hazard Fuels Reduction	Gillis Hill	\$ 45,000	Luana Dowling/ Elisa Noble	PSFSC	RCD	07/12/17	07/18/17	\$ 45,000	YES	
Total			\$ 320,633						\$ 320,633	100%	\$0.00

Source: Placer County

Wildfire Public Education

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Firewise Program Stats from 2017 to Present: The Firewise program has added 62 new communities since 2016 and there are 131 communities currently in various stages of the program. These Firewise Communities have invested a significant amount of work hours and out of pocket costs to improving their communities Risk to Wildfire. Chipper Costs \$135,689.50, Other Equipment Costs \$90,699, Contractor Costs \$4,447,534, Home Improvement Costs \$1,499,015, Grants \$286,990, Vehicle Mileage \$4,304.88, Landscaping \$886,614, Miscellaneous \$418,326, Hours Worked Calculation \$3,501,815.66 Total Investment \$11,366,057.65

Every Firewise Community is a success story. Just getting Firewise education to communities and having community clean up days are success stories. There are so many. One that comes to mind is Trailhead Estates Firewise in Foresthill. The Trailhead Fire was contained at 5,646 acres. Trailhead Estates Firewise has been very involved with clean up days and maintaining their open space areas. This allowed firefighters to concentrate on the fire and not needing to clear around homes in the area. It also provided safe ingress and egress during evacuations.

Grand Oaks Firewise has worked with Auburn City Fire to develop a relationship with Union Pacific Railroad to get a fuels reduction project behind homes along the UPRR right of way. This has given several homeowners the 100' defensible space required and helped protect other areas of Auburn.

Ridge View and Michigan Bluff Firewise have been working with the Foresthill / Iowa Hill FSC, USFS, Cal Fire and BLM to complete a fuels reduction project in the Michigan Bluff, Ridge View Rd., Chicken Hawk Rd. area that connects over private and federal properties.

Firewise Community volunteers are helping staff education tables at events across the county. A great example was at the recent Auburn Home Show. There were volunteers from Pleasant Hill, Black Hawk Rd./Black Oak Ridge Estates, Cold Springs, and Falcons Point Firewise Communities, staffing the Placer Fire Alliance table at the Cal Fire Demonstration Building. They are not only educating their communities but reaching out to others to share the Firewise Program.

The Firewise program helps educate the community on defensible space, home hardening, flammable landscape, ingress – egress just to name a few. Community members meet to help complete the Risk Assessment and address common issues to enter in their Action Plan.

Natural Systems Protection / Education and Awareness Programs – Placer County Wildland Urban Interface (WUI) Strategic Planning

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is active. Strategic planning involves intense data collection and organization. Since 2017, strategic plans/evacuation plans have been built for the communities of Colfax and Foresthill. CAL FIRE defensible space inspectors now collect data during inspection such as gates and water sources that can also be integrated into the strategic planning project. The next step in this project is to further develop spatial data collection that will streamline and standardize the planning products and expand mapping coverage to additional communities.

North Fork American River Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Work on this project began in January of 2019. As of June 2021, approximately 900 acres have been completed using multiple treatments including cut/pile/burn, chipping, mastication, broadcast burning and herbicide application. Phase II is currently proposed as a CAL FIRE, fire prevention grant proposed by the Placer Resource Conservation District. The future phases of the project rely upon a Mitigated Negative Declaration with CAL FIRE as the Lead Agency. Full implementation of this project will require successive treatments over a 10 to 15 year period and a total of \$15 to \$20 million to complete the 5000+ acre project.

Defensible Space Programs

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The defensible space program is the first line of defense in wildland fire preparedness within Placer County. CAL FIRE has an active defensible space program that is growing in strength each year. Using a spatial data collection inspection process, defensible space data and other pre-fire structure information is collected that can be utilized for wildfire strategic planning and response. Information collected includes gate locations, water tanks and structure characteristics. The number of inspections, mainly on State Responsibility Area (SRA) land since 2017 are below:

Year	Number of Inspections	Percent Compliance
2020	4,868	94%
2019	2,544	95%
2018	3,303	77%
2017	1,147	65%

Source: Data extracted from CAL FIRE Defensible Space Database, 2021

Assembly Bill 3074, passed into law in 2020, implements a third zone for defensible space. This law requires the Board of Forestry and Fire Protection to develop the regulation for a new ember-resistant zone within 0 to 5 feet of the home by January 1, 2023. The intensity of wildfire fuel management varies within the 100-foot perimeter of the home, with more intense fuels' reduction occurring closer to the home.

Also in 2020, Placer County strengthen defensible space regulation within the County unincorporated areas. The Placer County Board of Supervisors unanimously voted to adopt a new Hazardous Vegetation Ordinance, which will govern the abatement of hazardous vegetation and combustible material on both vacant and improved parcels. This is a significant change from the previous county code which focused primarily on vacant land, leaving the state and local fire codes to govern land with structures. The new ordinance repeals and replaces the previous code and provides fire officials with consistent guidelines to ensure adequate defensible space is maintained on vacant land as well as around structures and enforcement mechanisms are in place to encourage compliance.

Projects that focus on Open Space/Defensible Space

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Placer County Board of Supervisors approved an ordinance in April 2021 that created the new Department of Parks and Open Space to better position the county to accommodate expanding park management responsibilities. With significant growth anticipated across the county in the coming years, the new department will be better positioned to grow and evolve and provide a more holistic strategy to the management of parks, trails and open space.

Among the department priorities is the commitment to ensuring defensible space on county land is managed in accordance with the Hazardous Vegetation Abatement Ordinance. Placer County is committed to being a good steward of its open space to protect the region from wildfire and to conserve sensitive habitats for generations to come.

Placer County has also been working in conjunction with the Cal Fire Washington Ridge Conservation Camp and the Placer CCC to complete fuel reduction projects on county owned open space.

Annual Multi-Agency Wildland Fire Drill

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Western Placer Fire Chief's organization continues to host the annual multi-agency wildland fire drill. It is a critical element to the strong interagency emergency response plan within Placer County. Due to Covid-19, the drill did not take place in 2020 or 2021, but plans are in place for it to resume in 2022.

Vegetation Management – Ongoing Maintenance of Fuel Breaks

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project by its nature is ongoing. Work done has reduced risks.

City of Auburn Mitigation Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The currently adopted Local Hazard Mitigation Plan (LHMP) was incorporated by reference into the 2021 Safety Element. The City council adopted the 2021 Safety Element on May 24, 2021. Due to the timeframe of release, there is no specific evidence that the project reduced risks or resulted in loss avoidance.

Lincoln Basin (Downtown) Drainage Infrastructure

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Lincoln Basin drainage infrastructure is estimated to be over 100 years old. The water from Electric Street and Lincoln Way travel in 36” – 48” CMP that has deteriorated in places along Lincoln Way for approximately $\frac{3}{4}$ of a mile. The City of Auburn has responded to some isolated failures with the most recent occurring January 2007 at the Auburn Journal building along Lincoln Way. The other most significant isolated failure was on East Placer Street in January 1995 when a 42” CMP storm drain collapsed when a garbage truck fell through the pavement. The project is ongoing due to many buildings were built directly on top of the storm drain infrastructure. The City’s efforts to repair reachable sections of the drainage is still in process and has no specific evidence of loss avoidance.

Creek and Stream Cleaning and Maintenance Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Implementation of Storm Water Treatment Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The City of Auburn in coordination between Placer County, the City of Roseville, the City of Lincoln, and the Town of Loomis developed the West Placer Storm Water Quality Design Manual. The City implements this consistent approach to address storm water management for the City of Auburn. The project is an ongoing effort to address storm water management there is no specific evidence of loss avoidance.

Electric Street Diversion Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Old Town Auburn Storm Drain System

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Old Town Auburn Storm Drain System is the one of the main drainage channels for Old Town consisting of 600 feet of old unreinforced and newer reinforced box culverts. The unreinforced portion of the channel is made up primarily of broken rock stacked vertically with a brick arch roof. The base of the channel consists of exposed bedrock, gravel, and new concert. Portions of the channel had eroded and undermined the vertically stacked rock walls creating risk for blockage or complete collapse of the system. The Old Town Auburn Storm Drain was replaced, where possible, with 4 to 7.5 foot diameter pipes which discharges into the natural drainage channel. The project is an ongoing process there is no specific evidence of loss avoidance.

American River Canyon Shaded Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The City of Auburn Fire Department in coordination with the Bureau of Reclamation, Cal Fire and California State Parks, has developed and implemented a fuel modification project known as the American River Canyon Shaded Fuel Break. This fuel reduction project encompasses both public lands and private lands and is strategically placed along the American River Canyon rim in effort to provide a "defense" against wildfire. The project was implemented in 2002 and is still in-progress today.

Community Education on Wildfire

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The City of Auburn Fire staff participates in ongoing training programs, designed to ensure that they stay current with codes, regulations, current issues and best practices. In addition, Auburn City Fire advocates the "Ready, Set, Go!" message to promote wildfire education and conduct outreach programs. This is of particular importance for residents in Wildland Urban Interface (WUI) areas within the City. The City's efforts to educate the community on the risk of wildfires is still an ongoing process and has no specific evidence of loss avoidance.

Residential Home Inspections for Compliance of Fire Safe Standards; Defensible Space.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Auburn City Fire Department as of 2019 offers free home consultations that focus on wildfire education, home hardening, and improving defensible space. The program is voluntary based and the efforts reduce wildfire risk but there is no specific evidence of loss avoidance.

Maintenance of the Private Lands Portion of the Shaded Fuel Break Along the Rim of the American River Canyon and the Auburn State Recreation Area (ASRA)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The City of Auburn Fire Department in coordination with the Bureau of Reclamation, Cal Fire and California State Parks, continues to provide

maintenance of the private land portion of the American River Canyon Shaded Fuel Break and Auburn State Recreation Area. Annual work is completed each year using a combination of mechanical and natural thinning processes. The project is still ongoing and the efforts reduce wildfire risk but there is no specific evidence of loss avoidance.

City of Colfax Mitigation Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This is scheduled to be completed in 2021.

Continue Annual Weed Abatement Ordinance

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing.

Colfax Schools Evacuation Site Shaded Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was completed in 2020, but continued maintenance is needed/

Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing.

City of Lincoln Mitigation Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Complete. The 2016 LHMP was integrated into the Safety Element of the City of Lincoln General Plan on March 28, 2017, through City Resolution 2017-63.

Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is currently in design. Construction is anticipated to begin in 2026.

Lakeview Farms Regional Volumetric Mitigation Facility

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is currently in design. Construction is anticipated to begin in 2023.

Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream Restoration And Culvert Improvement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

"O" Street Drainage Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

7th Street Drainage Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Auburn Ravine at State Route 193 Bridge

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Item will be mitigated with the McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span project which is currently in design. Construction is anticipated to begin in 2026.

Auburn Ravine at State Route 65 Bridge

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Ingram Slough – Orchard Creek Return Channel

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started. Schedule is dependent on the Nader Ranch/Village 7 development which has not begun.

Markham Ravine – Updated FEMA Analysis And Mapping

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The City of Lincoln is currently working on a project with Placer County Flood Control District to evaluate and update the FEMA mapping of Markham Ravine. FEMA review of the project is expected to be complete in 2021, with updated mapping to follow thereafter.

Markham Ravine Drainage Improvements – Union Pacific Railroad & State Route 65 Crossings

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Auburn Ravine Stream Restoration Projects (Analysis and Repairs)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): City of Lincoln is in preliminary discussions with the California Department of Fish and Wildlife to implement a fish habit project on Auburn Ravine that could also potentially provide some of the necessary creek restoration improvements.

Markham Ravine Streambed Restoration Projects (Analysis Only)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Coon Creek Streambed Restoration Projects (Analysis Only)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited funding resources.

Fire Prevention and Fuels Management Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not started due to limited staffing and funding resources. New development projects are required to produce a Fire Prevention and Fuels Management Plan for any new areas in the city, however.

City of Rocklin Mitigation Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): On November 8, 2016, the Rocklin City Council adopted Resolution No. 2016-250, which approved the 2016 Local Hazard Mitigation Plan (LHMP) and adopted the LHMP by reference into the Safety Element of the City of Rocklin General Plan. There is no specific evidence that the project reduced risks or resulted in loss avoidance.

Federal Emergency Management Agency (FEMA) Floodplain/Community Rating System (CRS)

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project was not implemented. The City Engineer at the time reviewed and evaluated the CRS program and determined it was not worthwhile to pursue.

Creek Channel and Drainage Way Clearing and Maintenance

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Depending on the location, this work happens every 1-3 year and will continue to be a task of ongoing maintenance well into the future. These efforts reduce flooding risk but there is no specific evidence of loss avoidance.

High Water Use Landscape and Irrigation Retrofit

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This task has been completed. It is undetermined whether this task reduced risks.

Open Space Fire Prevention & Vegetation Management Prescribed Grazing

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Seasonal work is completed each year using a combination of grazing and weeding. These efforts reduce wildfire risk but there is no specific evidence of loss avoidance.

GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): As new development occurs, these layers are updated to reflect the changes that are made to the community. These efforts allow the City to better plan and be prepared for responses to emergency incidents, but there is no specific evidence that the project reduced risks or resulted in loss avoidance.

Town of Loomis Mitigation Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has not completed a comprehensive update of its General Plan since 2001. Incorporating the LHMP into the Safety Element will be implemented during the current General Plan Update.

Local Bridges Evaluation Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has not yet started this program because of funding limitations. The Town hopes to implement this program in the future. Part of being able to inspect and evaluate the local bridges that cross over water channels is dependent on the renewal of the Town's Routine Maintenance Agreement (RMA) permit. The Town is in the process of obtaining the RMA Permit.

Address signage for property addresses

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has slowly been implementing this program because of funding limitations. The Town hopes to implement this program in the future.

Delmar Avenue Headwall Reconstruction Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has not yet started this program because of funding limitations. The Town hopes to implement this program in the future and will build it into future Capital Improvement Plans.

Creek Maintenance Secret Ravine & Antelope Creek

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town is also in the process of renewing their RMA permit with California Fish and Wildlife.

Reconstruction of Brace Bridge at Secret Ravine

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has not yet started this program because of funding limitations. The Town hopes to implement this program in the future.

Raise Flood-Prone Houses Along Loomis Creeks

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Town has not yet started this program because

of funding limitations. The Town hopes to implement this program in the future, can address in the 2021 GP Update, Public Services and Safety Element.

Alta Fire Protection District Mitigation Actions

Apparatus Water Fill & Drafting Location Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has not yet been started/implemented.

Evacuation / Reunification Center Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has been implemented and is ongoing. The fire district has made improvements to the Community Hall / Fire Department both on its own and in coordination with PG&E. The Community Hall / Fire Department is an alternate evacuation location for the Alta Dutch Flat Elementary school, and is a designated location for off-campus Child Reunification location. PG&E has also designated the Community Hall / Fire Department as a PSPS community resource center.

Natural Systems Protection / Education and Awareness Programs and Community Fuel Breaks

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing the Alta Community but most of the tasks related to this have been realigned to the Alta Firewise Community group.

Natural Systems Protection / Education and Awareness Programs

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing the Alta Community but most of the tasks related to this have been realigned to the Alta Firewise Community group.

Emergency Communications and Information System Improvements.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has not yet been implemented, but more recent interest in the community has been to upgrade local communications including, but not limited to HAM radio and GMRS radio communications. Many Firewise communities are making use of GMRS for communications during emergencies and the Alta Fire Protection district has a communications/antennae pole that could be used as an antennae location.

Alta Fire Protection District CERT Team

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The CERT team completed the necessary training to be an active and certified CERT team, however lack of implementation by Placer County emergency services resulted in the CERT members losing interest and the CERT team membership dropped to just a couple members, so CERT was disbanded by its membership.

Reflective Addressing

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This is an ongoing project taken on by the Alta Residents, Alta Firewise Community and the Alta Fire Protection District.

Alpine Springs County Water District

Emergency Electrical Generator Replacement Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not started and will not be carried forward in this Plan Update.

Water Storage Tank Replacement Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not started and will not be carried forward in this Plan Update.

Mineral Springs Soil Bank Stabilization Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not started and will not be carried forward in this Plan Update.

Alpine Meadows Consolidated Defensible Space Continuation Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not started and will not be carried forward in this Plan Update.

Foresthills Fire Protection District Mitigation Actions

Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Fuels Management for these areas will continue for years to come. Every year fuel reduction is done in the North and Middle Fork of the American Rivers to protect the communities along the ridge of the canyons.

Foresthill Biomass Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): No update was available on this project.

Assess and Enhance Foresthill Fire Protection District (FFPD) New Subdivision, Hazard Fuels Clearing and Maintenance Ordinance. Put Programs in Place with Homeowners Associations in CC&R's and Maintenance Contracts.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): FFPD enacted ordinance 2020-02 – Hazardous Vegetation Abatement and signed an agreement with Placer County Code Enforcement for the ability to enforce the County's hazardous vegetation ordinance as well. The Fire Safe Council, Firewise Communities as well as HOA are working to educate residents the benefits of Defensible Space and Home Hardening. Foresthill has 14 Firewise Communities and they have done very well.

Todd Valley Shaded Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Shade Fuel Breaks from Mosquito Ridge to McKeon/Ponderosa are 90% completed. These Fuel Breaks need maintenance. The fuel breaks were used as anchor points for the Trailhead Fire 5 years ago to protect the Todd Valley area.

Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Ongoing.

Loomis Fire Protection District Mitigation Actions

Identify and inspect ALL bridges in LFPD

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Loomis Fire Protection District was absorbed by South Placer Fire Protection District. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

Vegetation Management for Open Areas

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Loomis Fire Protection District was absorbed by South Placer Fire Protection District. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

Address Signs for Rural Residences

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Loomis Fire Protection District was absorbed by South Placer Fire Protection District. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

Adopt 2016 CFC, CBC, and local standards

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Loomis Fire Protection District was absorbed by South Placer Fire Protection District. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

Nevada Irrigation District Mitigation Actions

Combie Phase 1 Replacement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Bear River Siphon portion of the project has been completed and is in service. The replacement of the canal with reinforced concrete pipe started in 2019 and is scheduled to be completed by June of 2021. The overall cost for this multi-year project is \$27 million. Over 50% of the District’s water flows through this system, including two WTP. This will reduce the risk of failure due to rockslide, tree fall, and seismic events. Last winter, a large oak tree fell onto a section of completed pipe. No damage to the pipe was evident. Had this still been the thin walled concrete flume, this section would have failed due to the tree fall.

Centennial Water Storage and Power Supply Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The District has completed geotechnical and preliminary design of the proposed dam. The environmental studies are underway and development of the draft environmental impact report has begun. Cultural resources review and field studies have been done and the District is in consultation with several tribes as part of the AB52 consultation process. The Board of Directors have directed staff to focus on the District’s Plan for Water process so work on this project has slowed until the Plan for Water process is complete.

Water Service Auburn Valley CSD

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project has not begun as funding for this project is currently not available. The District overall has been working on annexation of parcels within the District boundary county wide.

NID Headquarters Office Generator

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project was completed in 2018. The District utilized this generator to maintain the entire Grass Valley complex, including operations, maintenance and customer service during several PSPS events and other power outages in 2018, 2019 and 2020.

Orr Creek Diversion

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project has not yet been implemented. District staff is currently working on a District wide reservoir storage study that will help guide the District in developing strategies regarding this complex problem.

Reservoir Cleaning

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The District has completed cleaning of several reservoirs including the Loma Rica Reservoir, which services the Loma Rica WTP since the last update. The cleaning of Loma Rica allows for more raw water storage for the WTP during outages, both planned and emergencies. District staff is currently working on a District wide reservoir storage study that will help guide the District in developing strategies regarding this complex problem.

Canal Culvert Replacement Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing. NID's Encroachment Unit continues to identify and remediate/replace multiple culverts on a continuous basis. Most replacements occur outside of the irrigation season (April 15 to Oct 15) unless a failure occurs that requires an emergency outage and replacement. Replacement of these culverts reduces the risk of failure and emergency outages on District facilities.

Northstar Community Services District Mitigation Actions

Martis Landing Drainage Swales and Catch Basins

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has been completed and has reduced channelized flows between the Martis Landing and Basque subdivisions. This work has successfully reduced the potential for localized flooding for homes in the Basque subdivision.

Continue Easement Access Road Water Bar Maintenance and Replacement Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Sewer and trail easement access roads are regularly maintained to prevent damaging channelized flow. Water bars are added/maintained by utility operations staff as necessary. One such recent water bar addition in the Big Springs subdivision has effectively prevented localized channelized flow damage to a residential property.

Fuels Reduction @ Sawmill Reservoir

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has been funded through a 2019 California Fire Safe Council Grant Cycle. The expected completion of phase I (Treatment One, 9.0 Acres) of this project will be by the fall of 2021. It is estimated that a total of three phases (Three Treatments) will be needed to place this project into a maintenance mode.

Fuels Reduction Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Defensible Space - Since 2016, the NFD has hired 3 inspectors to assist with defensible space and/or fuels reduction. 2-Inspectors for Defensible Space and one Forestry Assistant for Forest Fuels Reduction. The NFD has made a concerted effort in achieving its goals and has set new priorities in the 2021 updated Community Wildfire Protection Plan (CWPP). Since its inception, the CWPP was developed as guidance tool for the purposes of identifying and reducing the threat of wildfire hazards and restore the community forest to a healthy and sustainable condition.

Forest Fuels Reduction – Since 2008, a total of 1,400 acres has been treated within and outside the borders of the 1,855-acre community. A total of \$1,850,000 has been awarded in grant funding to help mitigate forest fuels and transition forested open space common areas into a “Maintenance Mode”.

Priority Number One of the updated CWPP is to reduce forest fuels along identified evacuation routes within the Community of Northstar. A 300’ buffer zone will be established along the identified routes to ensure safe passage in the event of a community wide evacuation while allowing emergency vehicles to respond by entering the community

Storm Water Drainage Inlet Maintenance

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County continues to maintain County-owned drainage facilities within District Boundaries. Maintenance includes utilization of a vactor truck to remove debris from drainage inlets annually. Benefits of these activities can be seen in the limited damage incurred during the flood events of winter 2017/2018.

Siphon Line

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The District's parallel sewer siphon mains were professionally cleaned and video inspected in summer 2020 per the maintenance schedule laid out in the Sewer System Management Plan. Routine maintenance of this critical infrastructure has been successful in preventing disturbances in sewer service in the community.

Provide Power from Mobile Generator

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not implemented. It was deemed an unnecessary cost based on the District's Emergency Backup Power Plan. It has been removed from the table above.

Green Waste Recycling Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Since the inception of the program in 2007, the facility has had multiple locations and has set record amounts of collected biomass annually. Collected material has been utilized at co-generation plants and used for erosion control practices. This program has been successful for residential and commercial property owners to have a place to take the material and help subsidize the cost of defensible space. The program looks to expand its operations by creating its own biomass facility to utilize its own material and provide its own heat source back into the community. The inception of the biomass facility is in its early stages of development.

Enhance our current Defensible Space Program by seeking funding to hire a part-time employee to assist the Fire Prevention department in running this program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Beginning in 2018, NFD hired its first Seasonal Fire and Life Safety Inspector. Since then, NFD now has 2 inspectors assisting the department with our defensible space program. The ability to have 2 inspectors onboard for a season has allowed NFD to pursue bringing 1/3rd of District (approx. 250-300 residential properties) under defensible space compliance each year. Additionally, the work of the inspectors (focusing on residential properties) allows for the Division Chief to focus efforts towards bring commercial properties under defensible space compliance. Inspectors are charged with finding property corners/lines, marking brush with blue paint indicating removal, performing inspections, educating the property owner and helping manage the Green Waste Recycling Center.

District Water Conservation Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): A water conservation program was successfully implemented by the District after several years of regional drought were experienced. Although water supplies in the Martis Valley Groundwater Basin were not in jeopardy, water conservation remains an important practice as a steward of the aquifer.

North Tahoe Fire Protection District Mitigation Actions

FCC P-25 Interoperability Radio Systems

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Ongoing, nearly completed. \$450,000 spent with grant, capital improvement and general fund to replace all base, mobile and portable radios. These radios were upgraded to meet 2018 FCC guidelines and DOHS SAFECOM 6 Levels of Interoperability. These radios also meet CALFIRE/CalOES standards and specs which assists with interoperability during in-district and out of districts assignments. Models: Portable KNG p150c wd, Mobile KNG m150. North Tahoe Fire also spends approximately \$145,000 annually for Grass valley ECC Dispatch Services, and \$50,000 annually for communications general fund budget for radio repair, replacement, and maintenance. Communications is a crucial component of all risk emergency response to ensure timely dispatch and effective communication during an incident and with incoming resources from varying agencies (FPDs, FDs, USFS, CALFIRE...etc.).

District GIS Technology, Equipment, Database and Mapping Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Ongoing. A GIS specific laptop with ArcGIS license were purchased with general fund dollars. Incident view updates and Hydrant mapping GIS were improved. NTFPD still has significant improvements to make regarding this action to get up to date with GIS mapping and capabilities.

North Tahoe Fire Protection District Critical Facility Infrastructure Improvements

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Ongoing, unable to be completed. Barriers: funding, facilities master planning, property acquisition, funding studies, plan development and construction.

Seiche Wave Warning Systems, Signs and Public Education

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project was not started. North Tahoe Fire will be reworking this Mitigation Action into a larger warning systems, signs and public education mitigation action for wildfire, avalanche, seiche and other hazards/events. (all hazards)

Defensible Space Inspection, Tree Marking, Chipping Program, and Public Education

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is Ongoing and will remain a priority. NTFPD secured \$1,386,243 in grant funding as a part of the Tahoe Network of Fire Adapted Communities and \$623,079 was spent as of 2016 with the grant period of performance extending through 2023. This Mitigation Action (regardless of funding) is planned to continue into perpetuity where NTFPD offers Defensible Space Inspections, Chipping, Tree permitting assistance, and outreach and education. Yes, this

projected was implemented. Yes, the project reduced risks. NTFPD can provide metrics of Defensible Space Inspections completed (compliant and non-compliant), Chipping requests received (with estimations of cubic yards biomass removed), Number of neighborhood leaders recruited, and Number of Firewise Communities Recognized. We have had ignitions (wildfire and structure fire) successfully suppressed, We have not had a large wildfire transition from our community to the forest or conflagration which may be interpreted as evidence of loss avoidance.

Hazardous Wood Roof Replacement Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This Project was not started. NTFPD did have a successful wood roof replacement program funded by FEMA in 2010. We will be removing this Mitigation Action and adding “Home Hardening” as a component of the Defensible Space Project.

Regional Water System Fire Protection Upgrades and Interoperability

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not started. Water system upgrades fall to the responsibility of water purveyors. NTFPD will be combining this action with the Hydrant risers/replacement/markers into a “Water for Fire Suppression Collaborative” where NTFPD plans to work with its water purveyors to flow test, paint, and notify of deficiencies in order to support increased water supply during structure and wildfires.

Skid Steer Loader with Transport Trailer, Fuels Reduction Masticator Attachment and Snow Blower Attachment

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not Started. Funding was the limitation. NTFPD will rework this mitigation action into the 2021 update as increased capacity for snow removal and fuels mastication will remain important.

Hydrant Risers, Replacements and Markers

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Ongoing – Started but not completed. NTFPD has created a beta testing system for new hydrant markers and a pilot program was rolled out to install tall, reflective hydrant markers with a single bolt on the bonnet of the hydrant. Previous methods involved standing on tail boards of engines to drive in tall stakes within 3’ of hydrants, which posed a safety hazard and did put fire personnel within 3’ of the hydrant. The new system would locate the exact hydrant location to aid in quicker access time with extreme snowpack. This also aids in finding hydrants at night (reflective marker) and when they are buried or blocked by snow. Quickly finding hydrants, especially during extreme snow events is crucial to maintaining adequate water flow for fire suppression capabilities. NTFPD is not responsible for hydrant replacement, maintenance, risers, or markers but we will be adding this mitigation action item into a “water for fire suppression collaborative” project since water for fire suppression is important and crucial during wildland and structure fire events, as well as a source of domestic water and fire protection systems.

North Tahoe Public Utility District Mitigation Actions

Update SCADA Equipment and Telecommunications Infrastructure

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): SCADA and Telecommunication infrastructure has been updated & replaced.

IT and Telecommunications Improvements for Disaster Preparedness

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not been implemented. Need to develop plan to evaluate needs for implementation.

Update Emergency Response Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Emergency Response Plans follow the completion of the Risk and Resilience Assessment (RRA). The RRA is currently under development and will be complete by June 30, 2021, per AWIA 2018 Federal Regulation. The Emergency Response Plan update to be completed by 12/31/2021 per AWIA 2018 Federal Regulation.

Backup Generator Installation at Critical Facilities

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Installed backup generator at NTPUD Base Facility; working on plan for generator at the Kingswood West water storage tank site; applied for FEMA grant at the North Tahoe Event Center (emergency shelter/evacuation center), but did not get recommended by CalOES due to funding priorities.

Fuels Reduction around Critical Infrastructure and North Tahoe Regional Park

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Fuels reduction work has begun in the North Tahoe Regional Park; Vulnerability Assessment (VA) is underway for critical infrastructure through a Proposition 1 grant. Once the VA is completed, design will be completed by a Forester, followed by implementation.

Kingswood West Subdivision Emergency Evacuation Access

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not implemented. Is not within NTPUD's jurisdictional authority.

North Tahoe Regional Park Road Improvements for Emergency Access

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not yet begun. Has not been a high priority with NTPUD or North Tahoe Fire Protection District.

Seismic Study and Retrofit of Critical Infrastructure

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Completed Seismic Study of critical buildings at NTPUD Base Facility and applied for FEMA grant, but project was not recommended by CalOES due to funding priorities. Still need to perform Seismic Studies at other critical infrastructure.

Sewer Main Replacements in Shorezone of Lake Tahoe

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not yet begun. Has not been a high priority with NTPUD due to relocation constraints.

Water Booster Pump Station Rehabilitation/Replacement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not yet begun. Project is in District's long-term CIP plan.

Increased Storage Capacity for Dollar Cove Water System

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not yet begun. Options need to be studied.

Water System Interties

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Not yet begun. Intertie locations being analyzed.

Placer County Flood Control District Mitigation Actions

FEMA CTP DFIRM Mapping Study

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): FEMA updated the Digital Flood Insurance Rate Maps (DFIRMs) for Placer County in 2018. This updated mapping included updated and new mapping for several streams studied with the Cooperating Technical Partners No. 1 and 2 (CTP1 and CTP2) projects. The next phase of updated mapping is currently ongoing with CTP3. CTP3 also includes updated and new mapping for several additional streams. These projects help reduce risk through the assessment and identification of flood hazards.

Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Antelope Creek Flood Control Project, Phase 1 Upper Weir was completed in 2018. This project is the first of the final two phases of regional detention projects planned for the Dry Creek watershed. The completed Phase 1 of the project reduces risks by reducing the peak flow rates downstream of the project. Implementation of Phase 2 of the project is ongoing and will reduce risks by further reducing peak flows downstream of the project. District staff continues to seek funding and coordinate with agencies within the watershed to pursue implementation of Phase 2.

Implementation of regional retention within the Cross Canal watershed is ongoing. District staff continues to coordinate with agencies within the watershed to pursue implementation.

Update Hydrology and Hydraulic Models within the Cross Canal Watershed

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has not been implemented. District staff continues to seek funding and coordinate with agencies within the watershed to pursue implementation.

Upgrade of Flood Warning System to Include Additional Gage Locations and Flood Forecasting Capabilities

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The initial upgrade of the Flood Warning System including two new gage installations was completed in 2019. This included District base station and software upgrades. The second phase is ongoing that will upgrade the District's remaining transmitters and install two additional gages. This project will reduce risks when complete by providing additional gage monitoring locations in the system in addition to providing faster and more reliable data collection.

Placer County Water Agency Mitigation Actions

Hillside Slope Stabilization

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): There are several examples of failed slopes under the Landslide, Mudslide, Debris Flows section of this report. These slides restrict travel. Many of these roads are not owned by the Agency, but impact both electricity production and recreational access. Since 2016 the Agency has spent more than \$2.1-million in rock fall protection at Hell Hole, the Middle Fork and Ralston locations and it has been extremely effective in preventing losses. Figure R-8 Rockfall Netting in the PCWA annex above Hell Hole is an example of rock fall netting protecting a roadway and bridge.

The District is unaware of any loss in a protected area. Just outside of a protected area on Interbay Road the Agency had a slide that was cleaned up and mitigated in 2018-19. This loss was about \$1.2 million. Because we owned that section of the road insurance funding covered the loss including the stabilization of the hillside that made the area safe for travel. Insurance funding for this type of loss is no longer available to the Agency.

LL Anderson Dam Spill Way Modification

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County Water Agency Middle Fork Power Finance Authority completed a \$200 million project to modify the spillway of the LL Anderson Dam. The widened spillway will safely pass the revised probable maximum flood determined by the US Army Corps of Engineers and increase operational flexibility of the French Meadows Reservoir. The project was completed in 2016 and helped to manage severe precipitation received in the winter of 2017-18.

Placer County Water Agency completed the core raise on the Hell Hole Dam in 2020. Spillway control for this Dam is in a planning phase but would allow a greater level of water management within the Hell Hole Reservoir. As severe weather events seem to be increasing, greater control at the top of the watershed prevents or minimizes flooding in lower watershed areas.

Water System Interties

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Water system interties create redundancy in the water supply should hazards or disruption damage the supply system. This is critical for all aspects of water including drinking water, firefighting and agricultural supplies. Three capital projects were completed in conjunction with the Nevada Irrigation District. Between 2017 and 2019 The Mt. Vernon, Locksley Lane and the Live Oak Interties all became functional interties between water systems. In addition to other existing interties, there have been no critical long-term disruption to water delivery. Interties have been successfully used for main line breaks, during maintenance, and for canal outages. The interties can be used from an operation standpoint, however interties by nature expand the redundancy and resilience of the water supply.

Vegetation Management and Brushing

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Placer County Water Agency owns over 150 parcels of property and has easements that extend the hundreds of miles of canal and water delivery systems. With increased wildfire frequency and severity, the Agency has responded proportionately in an attempt to reduce wildfire fuels and ignition sources around the Agency operations. In addition to our normal weed & brush control measures that include crew and goat work, multiple large projects have been completed with operational funding, capital funding and community partnerships with Cal-fire.

- By far one of the most publicized projects is French Meadows Forest Fire Restoration Project - Is a community partnership founded to reduce high-severity wildfires and promote watershed restoration through forest management. The French Meadows partnership restored forest health to 1,066 acres of critical headwaters in the first year of the French Meadows Forest Restoration Project reducing stand density by over 30% and harvesting over 3 million board feet of timber. This prevented a loss of unique wet meadow habitat critical for reducing the intensity and spread of wildfire. Willis, Towers, Watson Insurance in partnership with The Nature Conservancy is in the process of finalizing a white paper on the project that will demonstrate the wildfire mitigation results.
- Vegetation Management & Brushing of the surrounding area of the Maidu Field Office through the Canyon Fire Resiliency Project and 2020 Agency Capital funding.
- Vegetation Management & Brushing below American River Pump Station power lines was funded by 2020 Agency operational funding.
- 2019 Monta Vista Treatment Plant was thinned and brushed in cooperation with Cal-Fire and adjacent landowners to ensure water storage would be safe from wildfire and treefall. This was accomplished with operational funding and partnership with Cal Fire.
- In 2015, 33-acres around Lake Arthur were cleared and brushed in partnership with Cal-Fire and local landowners. 2016/17, 78 acres around Lake Theodore were cleared and brushed in partnership with Cal Fire and local landowners A Vegetation Management & Brushing project was completed on a large plot of un-developed Agency Land on Bill Francis Drive. The project was completed with a Cal-Fire partnership.

The Agency continues to perform vegetation management activities including maintenance of the areas previously treated working with the cooperation of Cal-fire and other community partners. We believe that this work has decreased wildfire potential through regular fuel management.

Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Canal systems can be overtopped in low areas when there is intense rain in combination with fall vegetation debris. Overtopping can erode the embankments jeopardizing the integrity and physical stability of the canal. In some cases, canals or canal spillways can be washed away or slide down hillsides jeopardizing the water supply and/or causing property loss and safety issues. Guniting the canal system can enhance the stability of earthen canals and reduces loss from water seepage in comparison to earthen systems. Pollution or hazardous spills are also easier to

control and remediate in gunite lined canals. The Agency budgets a million dollars a year to repair or gunite roughly two miles of earthen canals each year. This work reduces water and property loss.

Replace Wooden Flume Structures

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Flumes are a critical part of the canal system carrying water across valleys and ravines in a gravity fed canal system. The Agency seeks to replace wooden flume structures where practical to prevent wildfire and service interruption, including water supply to public and private treatment plants. In the last five years, the Long Ravine, Secret Town, Penryn #1 Flumes were put into pipe through internal Capital funding. In ground structures add resiliency to the raw water supply (canal) system since they are unlikely to be impacted by wildfire. We have no instance of a wildfire burning through flume, however the probability of this occurring in geographic areas designated as a high hazard for wildfire are very high. Other canal failures such as the PG&E Bear River Canal failure in April of 2011 did jeopardized the water supply system.

De-Silt Reservoirs.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): In 2020 the Sediment Removal project included removing accumulated sediment from Middle Fork Interbay, which is a regulating reservoir within the Middle Fork American River Hydroelectric Project. Work at Interbay was limited to the annual five-week-long system outage in October when reservoir levels were lowered. Work included sediment excavation, hauling, processing, and placement at select sacrificial sediment augmentation locations, permanent fill embankment, and temporary fill embankment location. Sediment removal increases storage capacity and dam safety allowing for increased levels of storm water, making low level outlets usable and increasing dam safety and the long-term water storage supply. The dams have successfully endured heavy precipitation and run off years like the winter of 2017-18.

Also in 2017-18 sediment was removed from the Ralston Afterbay. In early 2017, the Middle Fork Project experienced record historic storms that eroded large areas of recently burned terrain within the watershed resulting in the deposition of large volumes of sediment in project rivers and reservoirs. The winter sediment accumulation has been far greater than normal and impeded the ability to operate the low-level outlet at Ralston Afterbay Dam (see Figure 2-6). The low-level outlet slide gate was fully buried and was currently inoperable causing dam safety concerns. Up to 5,000 cubic yards of material is estimated for removal in order to reestablish normal operability. Some \$5-million dollars was spent on sediment remediation.

Figure 2-6 Ralston Afterbay



Source: PCWA

Placer Hills Fire Protection District Mitigation Actions

Assess And Enhance Placer Hills Fire Protection District (PHFPD) Onsite Water Requirements For Minor Lot Splits

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Since each lot split/development is unique; residential vs commercial, multiple structures, and single family dwellings, a single standard does not always apply to each situation in the same manner.

The Placer Hills Fire Protection District utilizes NFPA 1142, NFPA 22, Wildland Urban Interface Code (WUI), and Placer County development standards, as guidelines for each specific project requiring water for firefighting and for fire protection systems.

These are the standard guidelines used for development within the District.

South Placer Fire Protection District Mitigation Actions

Vegetation Management for Open Areas

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project has been implemented and continues annually. The greatest threat to our community is an uncontrolled vegetation fire and therefore it is always a top priority each year during fire season. To date the largest wildland fire we have had in our area has been approximately 5 acres.... Typically, these fires are limited to an acre or less and if any structures are involved it is usually just one. This is possible due to an aggressive attack from our Operations Division and strong support from our neighboring Fire Agencies but more importantly from vegetation management that limits flammable growth, ensures accessibility, and slows the rate of spread

Address Signs for Rural Residences

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): South Placer Fire District implemented a program where Rural Address Signs can be ordered directly from our website. Since implementation we have seen a far greater amount of readable and well-placed address signs and as such the risk of our crews missing an address or accessing the wrong property have been greatly diminished. Having an address sign that is clearly visible is a huge help to our crews and is especially important when a medical call has occurred at an address which is the type of emergency that cannot be seen from the roadway.

Adopt 2016 CFC, CBC, and local standards

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Since the last LHMP the South Placer Fire District adopted the 2016 CFC, CBC and local standards that make up our local Ordinance. This project reduces risk to our community by ensuring that both residential and commercial properties are built with the current and most up-to-date standards available. Our local ordinance plays a critical role for Fire Protection with our jurisdiction as well as it goes above and beyond State adopted standards and addresses items specific to our jurisdiction. Last year, Medical Emergencies accounted for roughly 72% of our calls where structure fires were limited to just 13% of our emergency response. Modern building codes and our local ordinance have made homes and commercial buildings much safer and as a result we are running fewer and fewer structure fire calls each year.

Olympic Valley (was Squaw Valley) Public Service District Mitigation Actions

Emergency Water Supply Interconnection to Martis Valley

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not moved forward due to funding.

Truckee River Siphon

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project was successfully completed in 2019. The project greatly reduced the risk of a sewer overflow into the Truckee River due to having redundant sewer lines.

Squaw Creek Siphon

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not moved forward due to funding.

Easement Abatement/Maintenance of Emergency Access

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is ongoing. Project has improved access to multiple assets in easement areas. Project work continues.

Develop a Community-Wide Emergency Notification System Capable of Providing Information to Both Residents and Visitors by Utilizing Permanent, Roadside Changeable Message Boards and a Low-Power Radio Transmitter

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not moved forward due to funding.

SVPSD/Mutual Water Company Inter-tie

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not moved forward due to funding.

Water Tank Earthquake Retrofit Project

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project has not moved forward due to funding.

Tahoe City Public Utility District Mitigation Actions

Bunker Water Tank Replacement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Bunker Water Tank Replacement project was completed in 2019. The capacity of the tank was increased from 500,000 gallons to 1.2 million gallons providing much needed emergency storage and reduces risk by providing longer sustained fire flow capacity for areas served by the tank. In addition, the existing tank was constructed of redwood and was seismically unstable. The new tank is constructed of steel and meets all current seismic codes, further reducing wildfire and earthquake risks.

West Lake Tahoe Regional Water Treatment Plant

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Design is complete, and the project is currently out to public bid as of February 16, 2021. Award of construction is scheduled for April 2021 and project completion is scheduled for early 2024. When complete the plant will be provide approximately 1 million gallons per day of drought resilient and reliable water supply to the West Shore communities of Lake Tahoe.

Tahoe Main Emergency Water Supply

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project currently stands at 50% design. Due to other priorities this project has been delayed and pushed out to 2024-2025 timeframe.

Tahoe Truckee Unified School District Mitigation Actions

North Tahoe High School and Middle School, Tahoe Lake Elementary School Emergency Generators.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Tahoe Truckee Unified School District is not a participant in this Plan Update. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

School Site and Community Education of Procedures Related to Safety and Emergency Situations. Improvement of District Wide Emergency Communication and Alert Systems.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Tahoe Truckee Unified School District is not a participant in this Plan Update. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

HVAC Control Upgrades

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Tahoe Truckee Unified School District is not a participant in this Plan Update. These actions were not tracked, so it is assumed they were not started. These will not be carried forward in this Plan Update.

Truckee Fire Protection District Mitigation Actions

Community Wildfire Protection Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Truckee Fire facilitated the CWPP with land managers, stakeholders and the community identifying over 3,000 acres of WUI that needed fuel reduction work. The plan was complete in 2017 and work has been ongoing to reduce wildfire fuels in the identified areas. The District was able to secure two significant grants totaling almost 3 million dollars to treat key areas. The area has not experienced a significant wildfire in areas where the work has been completed. CWPP is planned to be updated in 2022.

Severe Winter Weather and Propane Issues Mainly in Serene Lakes

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Truckee Fire continues to work with the HOA, PC Building Department, propane companies and homeowners to identify and recommend improvements to residential systems. During significant snow events the District conducts public outreach as well as coordination with PC OES to prepare for a possible response. There have been no significant areawide leaks since 2010/11 winter.

Chapter 3 Planning Process

Requirements §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;**
- 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and**
- 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Placer County recognized the need for and importance of the update process for their 2016 Local Hazard Mitigation Plan (LHMP) and initiated its development. After receiving a grant from the Federal Emergency Management Agency (FEMA), which served as the primary funding source for this Plan, the County contracted with Foster Morrison Consulting, Ltd. (Foster Morrison) to facilitate and develop the Plan. Jeanine Foster, a professional planner with Foster Morrison, was the project manager and Community Rating System (CRS) lead in charge of overseeing the planning process and the development of this LHMP update. Chris Morrison, also a professional planner with Foster Morrison, was the lead planner for the development of this LHMP Update. The Foster Morrison's team's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA);
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program's (NFIP) CRS and the Flood Mitigation Assistance (FMA) program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

3.1 Local Government Participation

Placer County, as the participating NFIP CRS community, and all the other participating jurisdictions, made a commitment to this 2021 multi-jurisdictional LHMP Update. The DMA planning regulations and

guidance stress that each local government (participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the Planning Area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For Placer County and all participating jurisdictions, “participation” meant the following:

- Attending and participating in the HMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on Plan process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on Plan drafts;
- Providing Draft documents of LHMP for public review;
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the Plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the Plan by the governing boards for each jurisdiction.

The County and all jurisdictions seeking FEMA approval of this LHMP Update met all of these participation requirements. Multiple representatives from the County and all jurisdictions attended the HMPC meetings described in Table 3-5 and also brought together an internal planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on Plan drafts. Appendix A provides additional information and documentation of the planning process.

In order to promote the integration of CRS into this planning process, the HMPC representatives from the County, as the CRS community, was selected based on their areas of expertise relative to the CRS mitigation categories as detailed in Table 3-1. In addition, the Placer County Community Development Resource Agency, Planning Services Division (Angel Green, Senior Planner), in association with Foster Morrison Planners were involved in the development of this LHMP Update through attendance at meetings, providing data, future land use planning support, and help with all LHMP planning elements. In addition to attending meetings, providing draft text for inclusion in the Plan, and reviewing Plan documents, Placer County planners, in addition to planners from other participating jurisdictions, also provided information on development since the 2016 LHMP, mapping, text, and details on future development areas, input on current mitigation capabilities, and a variety of documents and information specific to their jurisdictions.

Table 3-1 Placer County LHMP Staff Capability with Six Mitigation Categories

Jurisdiction/Departments	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Placer County							
Emergency Services, Rod Rodriquez, Emergency Services Coordinator	X	X	X	X	X	X	X
Community Development Resource Agency, Planning Services Division, Angel Green, Senior Planner	X	X	X		X	X	X
Department of Public Works/Stormwater and Floodplain Programs, Mary Keller, PE, CFM	X	X	X	X	X	X	X

Specific individuals representing Placer County and representatives from other participating jurisdictions participating in this LHMP Update were actively involved throughout the LHMP Update process as identified in Appendix A in the sign-in sheets for the meetings and as evident through the data, information and input provided by HMPC representatives to the development of this LHMP Update. This Chapter 3 and Appendix A provides additional information and documentation of the planning process and participants to this LHMP Update, including members of the HMPC.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the Placer County LHMP using the DMA planning requirements and FEMA’s associated guidance. This guidance is structured around a four-phase process:

1. Organize Resources;
2. Assess Risks;
3. Develop the Mitigation Plan; and
4. Implement the Plan and Monitor Progress.

Into this process, Foster Morrison integrated a more detailed 10-step planning process used for FEMA’s CRS and FMA programs. Thus, the modified 10-step process used for this Plan meets the requirements of six major programs: FEMA’s Hazard Mitigation Grant Program (HMGP); Building Resilient Infrastructure and Communities (BRIC) program; CRS program; FMA Program; Severe Repetitive Loss (SRL) program; and new flood control projects authorized by the U.S. Army Corps of Engineers (USACE).

Table 3-2 shows how the modified 10-step process fits into FEMA’s four-phase process. The sections that follow describe each planning step in more detail.

Table 3-2 Mitigation Planning Processes Used to Develop the Placer County Local Hazard Mitigation Plan

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

This LHMP Update involved a comprehensive review and update of each section of the 2016 Plan and includes an assessment of the success of the County in evaluating, monitoring and implementing the mitigation strategy outlined in the 2016 LHMP, as previously described in more detail in Chapter 2 and throughout Chapter 4 and Chapter 5.

The process followed to update the LHMP is detailed in the above table and the sections that follow and is in conformance with the latest DMA planning guidance and the CRS 2017 Coordinator’s Manual. As part of this LHMP Update, all sections of the Plan were reviewed and updated to reflect new data, processes, and resulting mitigation strategies. Only the information and data still valid from the 2016 LHMP was carried forward as applicable into this LHMP Update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With Placer County’s commitment to participate in the DMA planning process and the CRS program, Foster Morrison worked with the County’s Office of Emergency Services (County OES), as overall project lead, to establish the framework and organization for development of the Plan. An initial meeting was held with key community representatives to discuss the organizational and process aspects of this LHMP Update process.

The initial kick-off meeting was held on October 28, 2020. Invitations to these kickoff meetings were extended to key County departments, the two incorporated communities, special districts located within the

planning area, tribal governments, as well as to other federal, state, and local stakeholders, including representatives from the public, that might have an interest in participating in the planning process. Representatives from the HMPC members to the 2016 Plan, key County departments, and other identified stakeholders were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of initial invitees is included in Appendix A.

Hazard Mitigation Planning Committee (HMPC)

The HMPC was established as a result of these initial meetings, as well as through interest generated through the initial public meetings and outreach conducted for this project as detailed later in this section. The HMPC, comprising key county, city, special district, and other government and stakeholder representatives and the public, developed the plan with leadership from the County OES and facilitation by Foster Morrison. Table 3-3 shows who participated on the HMPC.

Table 3-3 Placer County HMPC Participants

Last Name	First Name	Agency	Title
Boulais	Brad	PC - Facilities	Deputy Director
Brewer	Brad	PC - DPW-Flood Control District	Manager
Fisher	Andy	PC - DPW-Parks	Parks Administrator
Gray-Garcia	Chris	PC - CEO-PIO	Deputy Director
Herrera	Stephanie	PC - CEO-PIO	Public Information Assistant
Hobbs	Ann	PC - Air Pollution Control District	Associate Planner
Hudson	Jim	CAL FIRE / PCF	Deputy Unit Chief
Hughes	Dennis	PC - Facilities	Superintendent
Lewis	Matt	PC - DPW-Roads	Assistant Road Superintendent
Martin	Tami	American Red Cross - Sierra Delta Chapter	Disaster Program Manager
Shawver	Matt	PC Office of Education	Coordinator, MOT Facilities and Construction
Williams	Wendy	PC - CEO-PIO	DH Director
Williams	Phil	PC Office of Education	Deputy Superintendent
Atkinson	Dave	PC - CEO - OES	Assistant Director
Kraatz	Peter	PC - DPW-Tahoe	Assistant Director
Brown	Chris	PC - CDRA-GIS	GIS Analyst - II
Butrym	Terry	PC - CEO-RM	Risk Management Administrator
Dowling	Luana	PC - CEO-OES-Fire Safe Alliance	Contractor
Foster	Jeanine	Foster-Morrison Consultant	Consultant/Principal
George	Mary	PC - Library	DH Director
Green	Angel	PC - CDRA-Planning	Planner - Senior

Last Name	First Name	Agency	Title
Hucks	Elsa	CAL FIRE NEU	Forester - Pre-Fire
Huntsinger	Josh	PC - Agriculture	DH Agricultural Commissioner/Sealer
Hutchings	John	US Bureau of Reclamation	Regional Wildland Fire Coordinator
Jones	Sarah	Placer Resource Conservation Dist	District manager
Kotey	Jim	PC - CEO-RM	Risk Management Manger
Morrison	Chris	Foster-Morrison Consulting	Consultant
Newsom	Steve	PC - Facilities	DH Director
Pedretti	Steve	PC - CDRA	DH Director
Pratt	Shawwna	PC - CEO-OES	Emergency Services Specialist
Rel	Ted	PC - DPW-Parks	Planner
Rodriguez	Rod	PC - CEO-OES	Emergency Services Coordinator
Storey	Brett	PC - DPW-Watershed	Principal Management Analyst
Thiessen	Jarrett	PC - IT	DH Director
Berbena	Felix	PGE	Sr. Public Safety Specialist
Cheney	Peter	PCWA	Risk & Safety Manager
Close	Chip	NID	Water Operations
Gow	Ian	Placer Hills Fire	Interim Fire Chief
Heathcock	Wes	City of Colfax	City Manager
Lee	Doug	City of Lincoln - Police / Fire	Public Safety Chief
Rizzi	Jason	City of Roseville - Fire	Division Chief Fire Marshal
Spencer	Dave	City of Auburn - Fire	Fire Chief
Watkins	Shawn	City of Rocklin - Fire	Deputy Fire Chief
White	Hank	Foresthill Public Utility District	General Manager
Williams	Reggie	City of Rocklin - Fire	Fire Chief
Alcantara	Scott	San Juan Water District	Safety/Regulatory Compliance Coordinator
Alves	George	Placer Resource Conservation Dist.	Contractor Resident
Angle	Erik	Sutter Roseville	Hospital Representative
Cochran	Neil	Foresthill Public Utility District	
Feagans	Amy	City of Colfax	
Jeff	Ingolia	South Placer Fire Protection Dist	Division Chief/Fire Marshal
Jones	Greg	NID	Interim General Manager
Neufeld	Roland	City of Lincoln - Public Works	Environmental Services Manager

Last Name	First Name	Agency	Title
Rabe	Sean	Town of Loomis	Town Manager
Schmidt	Christopher	PC - CDRA-Planning	Planner Supervising
Skinner	Erik	Sierra College	Vice President Administrative Services
Snider	Ed	Alta Fire Protection District	IT Specialist
Streegan	Nikki	PC - CDRA-Planning	Planner - Senior
Sweet	Eric	SPI Industries	
Walker	Brian	City of Roseville - PW	Floodplain Manager
Donahoe	Brad	City of Loomis - Public Works	Public Works Director
Wright	Shayne	PCSO - Capt	Captain - Field Ops
Mishler	Andrew	USFS Tahoe NF – American River	
Burks	Brandon	Olympic Valley Public Services District	Operations Manager
Howell	Brenna	Howell Consulting	Owner
Powers	Holly	Placer County OES	Assistant Director
Costa	Bob	County Resident	
Hornvedt	Eric	North Tahoe Fire Protection District	Forest Fuels Coordinator
Seline	Bill	Truckee Fire Protection District	Fire Chief
Baughman	Adam	Placer County Air Pollution Control District	Deputy APCO
Storey	Brett	Placer County Resource Conservation District	Principal Management Analyst
Keller	Mary	Placer County Department of Public Works, Stormwater and Floodplain Programs	
Crawford	Brian	USFS Tahoe National Forest	District Fuels Specialist
Riley	Allen	Olympic Valley Fire Department	
Holland	Erin	North Tahoe Fire	Public Information Officer
Kiolbasa	Lee	Liberty Utility	
Narker	Justin	City of Rocklin	Director, Public Services Department
Bailey	Sean	Northstar Fire/CSD	Fire Chief/Paramedic
Jacobsen	Crystal	Placer County Tahoe CDRA	
Gibbons	Suzi	North Tahoe Public Utility District	Contracts and Planning Coordinator
Tamo	Jen	Nevada County OES	
Brown	Chris	Placer County CDRA	IT/GIS
Andenberg	James	Placer County Office of Education	Chief Operations Officer, Administrative Services

Last Name	First Name	Agency	Title
Caldas	Sadie	Placer County Department of Public Works, Environmental Engineering Division	Environmental Resource Specialist
Mahoney	Robin	Placer County Department of Public Works, Environmental Engineering Division	
Hughes	Danielle	Tahoe-Transportation District	Capital Program Manager
Setzer	Emily	CDRA Tahoe	Sr. Management Analyst
Poindexter	Sarah	Placer County Executive Office, Management Analyst II	Management Analyst II
Sartain	Jesse	City of Rocklin	Environmental Services Technician
D'Amrogi	Mark	Placer Hills Fire District/ Newcastle Fire District	
Martinez	Jerry	BLM	Fire Management Officer
Garabedian	Mike	County Resident	
Matcham	Jed	Foresthill Fire Department	Assistant Chief/ Fire Marshall
Austin	Dannette	Nevada Irrigation District	
Enghusen	Karen	City of Rocklin	
Lewis	Dan	Tahoe City PUD	
Dillon	Pat	Liberty Utility	
Wakelee		Public/American Red Cross/ Friends of Auburn Ravine	
Dworak	Tolan	City of Lincoln Fire	
Gibeaut	Jason	Northstar Fire Department	
Anderson	Bonnie	Sutter Auburn Faith Hospital	Emergency Preparedness Coordinator
Ridley	Michael	Foresthill Fire Protection District	Fire Chief
Ursu	Emmanuel	City of Colfax	Planning
Dottai	Daniel	Public	
Botto	Jeff	Northstar Fire	Fire Engineer/Paramedic
Schmidt	Connie	Placer County Sheriff	
Laliotis	Tony	Tahoe City PUD	Director of Utilities
Rogers	John	City of Auburn	
Fonner	Dan	Placer County Parks and Open Space	
Randall	Matt	Placer County Department of Public Works, Road Maintenance Division	
Koty	Jim	Placer County Risk Management	Assistant Risk Manager

Last Name	First Name	Agency	Title
Prosser	Steve	City of Lincoln	Community Development Director
Mueller	Joe	Alpine Springs Water District	General Manager

Steering Committee

In addition to the HMPC, a Steering Committee to the HMPC was established to help guide LHMP development, including the CRS components of floodplain management planning and the overall development of the LHMP. The Steering Committee is comprised of key representatives from the County as the CRS community and includes non-local government and public representatives. The non-local government members of the Steering Committee (citizens and other outside stakeholders) represent more than 50% representation of the committee. See Table 3-4 and Appendix A for details on the makeup of the Steering Committee.

Table 3-4 Placer County LHMP Steering Committee to the Hazard Mitigation Planning Committee

Community/ Representative	Department/Organization	County	Public/ Resident	Stakeholder	# Meetings
Placer County					
Angel Green	Community Development Resource Agency, Planning Services Division	X			5
Mary Keller	Department of Public Works/Stormwater and Floodplain Programs	X			5
Bob Costa	County Resident		X		5
Erick Angle	Sutter Roseville Hospital		X	X	2
Brian Crawford	County Resident		X	X	4
Dan Dottai	County Resident		X		4
Lee Kiolbasa	Liberty Utilities		X	X	3
Mike Garabedian	County Resident		X		1

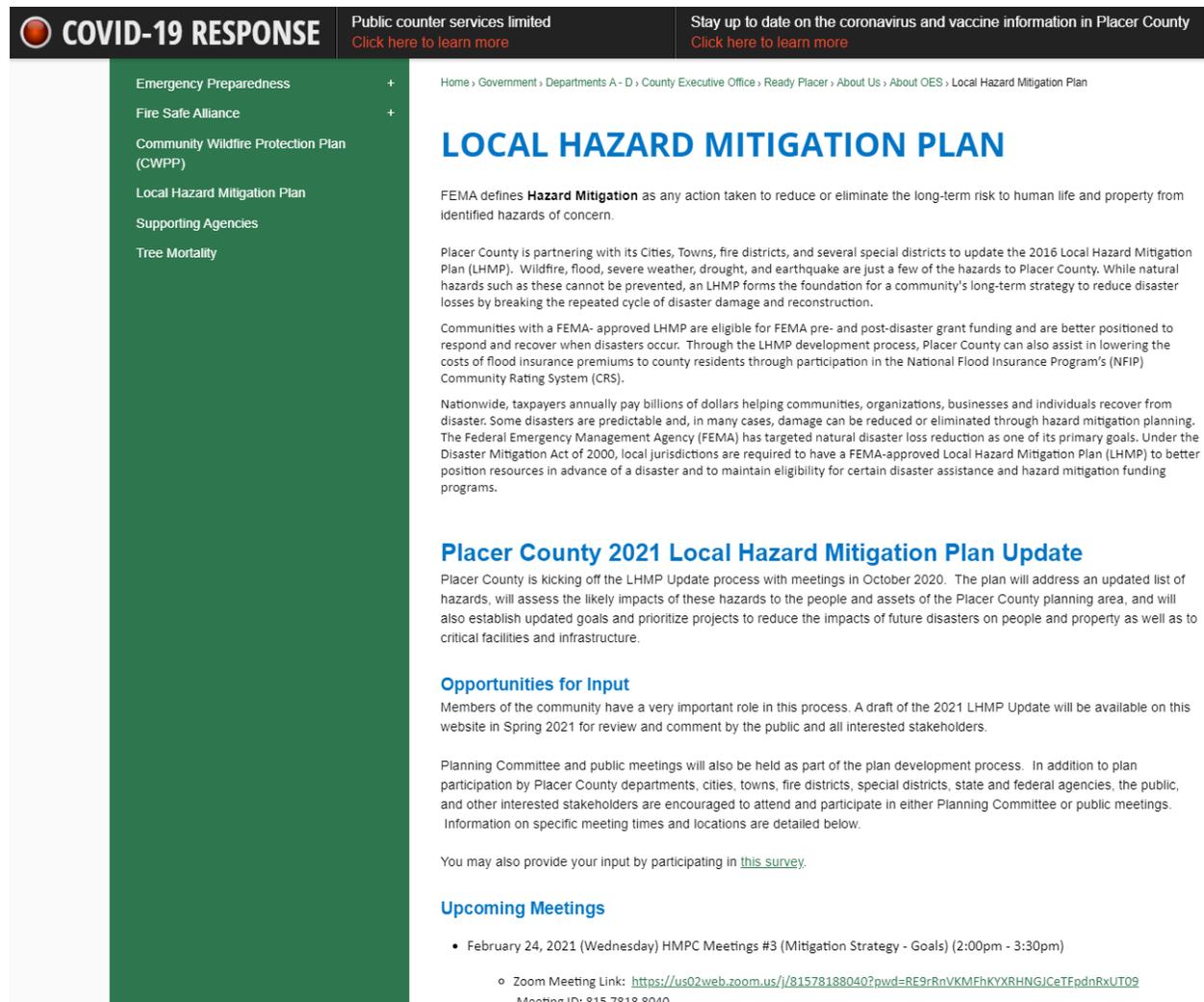
Meetings

The planning process officially began with a kick-off meeting held on October 28, 2020, followed by public kick-off meeting held the same day at 5:30 pm. The meetings covered the scope of work and an introduction to the DMA, CRS, and FMA requirements. During the HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the Plan. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to each of the participating jurisdictions, quantify values at risk to identified hazards, inventory existing capabilities, record possible mitigation actions, and to capture information on the status of mitigation action items from the 2016 Plan. A copy of the worksheets for this

project are included in Appendix A. Each participating jurisdiction seeking FEMA approval of this LHMP Update completed and returned the worksheets to Foster Morrison for incorporation into this LHMP Update.

During the planning process, the HMPC communicated through virtual Zoom meetings, email, telephone conversations, Dropbox websites, and through a County developed webpage dedicated to the Plan development process. This later website was developed to provide information to the HMPC, the public and all other stakeholders on the LHMP process. Draft documents were also posted on these websites so that the HMPC members and the public could easily access and review them. The LHMP website (shown on Figure 3-1) can be accessed at: Placer County – <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>.

Figure 3-1 Placer County Hazard Mitigation Plan Update Website



Source: Placer County

The HMPC met formally five times during the planning period (October 2020 – June 2021) which adequately covers the four phases of DMA and the 10-Step CRS planning process. The formal meetings

held and topics discussed are described in Table 3-5. Agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-5 HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
HMPC #1 Kick-off Meeting	<ol style="list-style-type: none"> 1) Introduction to DMA and the planning process 2) Overview of current LHMP; 3) Organize Resources (CRS Steps 1,2&3): the role of the HMPC, planning for public involvement, coordinating with other agencies/stakeholders 4) Introduction to Hazard Identification 	October 28, 2020	Zoom Meeting
HMPC #2	<ol style="list-style-type: none"> 1) Risk assessment overview and work session <ul style="list-style-type: none"> -CRS Step 4: Assess the Hazard -CRS Step 5: Assess the Problem 	February 3, 2021	Zoom Meeting
HMPC #3	<ol style="list-style-type: none"> 1) Review of risk assessment summary 2) Review and update of mitigation goals 3) Intro to Mitigation Action Strategy <ul style="list-style-type: none"> -CRS Step 6: Set Goals -CRS Step 7: Review possible activities 	February 24, 2021	Zoom Meeting
HMPC #4	<ol style="list-style-type: none"> 1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2016 Plan 3) Identify updated list of mitigation actions by hazard 4) Review of mitigation selection criteria 5) Update and prioritize mitigation actions 6) Mitigation Action Strategy Implementation and Draft Action Development <ul style="list-style-type: none"> -CRS Step 7: Review possible activities -CRS Step 8: Draft an Action Plan 	March 2, 2021	Zoom Meeting
HMPC #5	<ol style="list-style-type: none"> 1) Review of final HMPC, jurisdictional and public comments and input to plan 2) Review and documentation of changed conditions, vulnerabilities and mitigation priorities 3) CRS Step 8: Draft an Action Plan 4) CRS Step 9 & 10: Plan maintenance and Implementation Procedures 	June 10, 2021	Zoom Meeting

Zoom Meetings

As a result of the Covid-19 Pandemic, all of the HMPC and public meetings were conducted virtually via the online Zoom format. While these Zoom meetings presented a few challenges from a collaboration standpoint, holding these meetings online also had its advantages. First, it was observed that more people were available to attend an online meeting, including those out of area agencies where travel to Placer for a meeting was difficult due to the time involved. Another benefit was the use of the Chat function in the Zoom format. This allowed those individuals not likely to speak up in a face-to-face meeting or a Zoom meeting to provide input via Chat. Further, these Chat transcripts were recorded in a written retrievable format that allowed Foster Morrison to develop comprehensive notes detailing HMPC and public input.

Planning Step 2: Involve the Public

Public stakeholders are defined as any stakeholders not attached to local government in the Placer County Planning Area. Up-front coordination discussions with Placer County OES, the County floodplain manager and CRS coordinator for the Placer County established the initial plan for public involvement. Public involvement activities for this LHMP Update included press releases, social media communications, stakeholder and public meetings, development of an LHMP webpage and associated website postings, the collection of public and stakeholder comments on the draft Plan through a variety of mechanisms, and other public outreach activities as further described below, as well as specific targeted outreach to different groups of people and other agencies throughout the plan development process. Information provided to the public included an overview of the mitigation status and successes resulting from implementation of the 2016 Plan as well as information on the processes, new risk assessment data, and proposed mitigation strategies for this 2021 LHMP Update. As part of the Plan development process, a Public Involvement Strategy was also developed to ensure a meaningful public process and to focus efforts on maximizing CRS credits for public outreach.

Early Public Meeting

Public outreach for this LHMP Update began at the beginning of the Plan development process with an advertisement placed in the local newspaper, social media, and other local outreach methods (like the flyer shown in Figure 3-2) announcing the public meeting and to inform the public of the purpose of DMA, CRS, and the hazard mitigation planning process for the Placer County Planning Area. Members of the public were invited to join the HMPC meetings.

Figure 3-2 Public Outreach

The screenshot shows a website layout with a dark header. On the left is a green sidebar with white text listing various COVID-19 related items. The main content area has a white background with a blue header for a news article. The article title is 'Placer County is seeking community feedback for their 2021 local hazard mitigation plan update'. Below the title is the publication date 'Published Oct. 8, 2020'. The article text explains that Placer County is seeking community feedback to update its local hazard mitigation plan. It describes the plan's purpose, its FEMA approval, and the need for public participation. Two virtual meeting details are provided: one for the 'Planning committee virtual meeting' and another for the 'Public information virtual meeting', both on Wednesday, Oct. 28. At the bottom, there is a link to the LHMP webpage and contact information for Rod Rodriguez.

COVID-19 RESPONSE Public counter services limited [Click here to learn more](#) Stay up to date on the coronavirus in Placer County [Click here to learn more](#)

Joint air quality advisory
Hidden Falls town hall meeting
County seeks input on internet service levels
Outdoor urgency ordinance extended
Supervisors approve second round of grants
Halloween during COVID-19
Help Placer County update their hazards plan

Placer County is seeking community feedback for their 2021 local hazard mitigation plan update

Published Oct. 8, 2020

Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

Placer County is seeking members of the public to participate on the hazard mitigation planning committee for this plan update. Background experience on the issue is not required. Placer County is requesting attendance and participation from the community at the upcoming planning committee and public meetings to kick off the project.

Planning committee virtual meeting
Wednesday, Oct. 28
1:30 – 4 p.m.
<https://us02web.zoom.us/j/81109100563?pwd=K1lmSzdzcDd4YjZlc2NkNUdVWnJ3dz09>
Meeting ID: 811 0910 0563
Passcode: 479633
Or call in: +1 669 900 6833

Public information virtual meeting
Wednesday, Oct. 28
6 – 7:30 p.m.
<https://us02web.zoom.us/j/86599073886?pwd=MXJlVWnN6d1hqdml0MEhTbDNZbnQ2UT09>
Meeting ID: 865 9907 3886
Passcode: 165810
Or call in: +1 669 900 6833

Interested residents can find more information by visiting the LHMP webpage at <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or by contacting Rod Rodriguez at yrodrigu@placer.ca.gov.

Source: Placer County Website

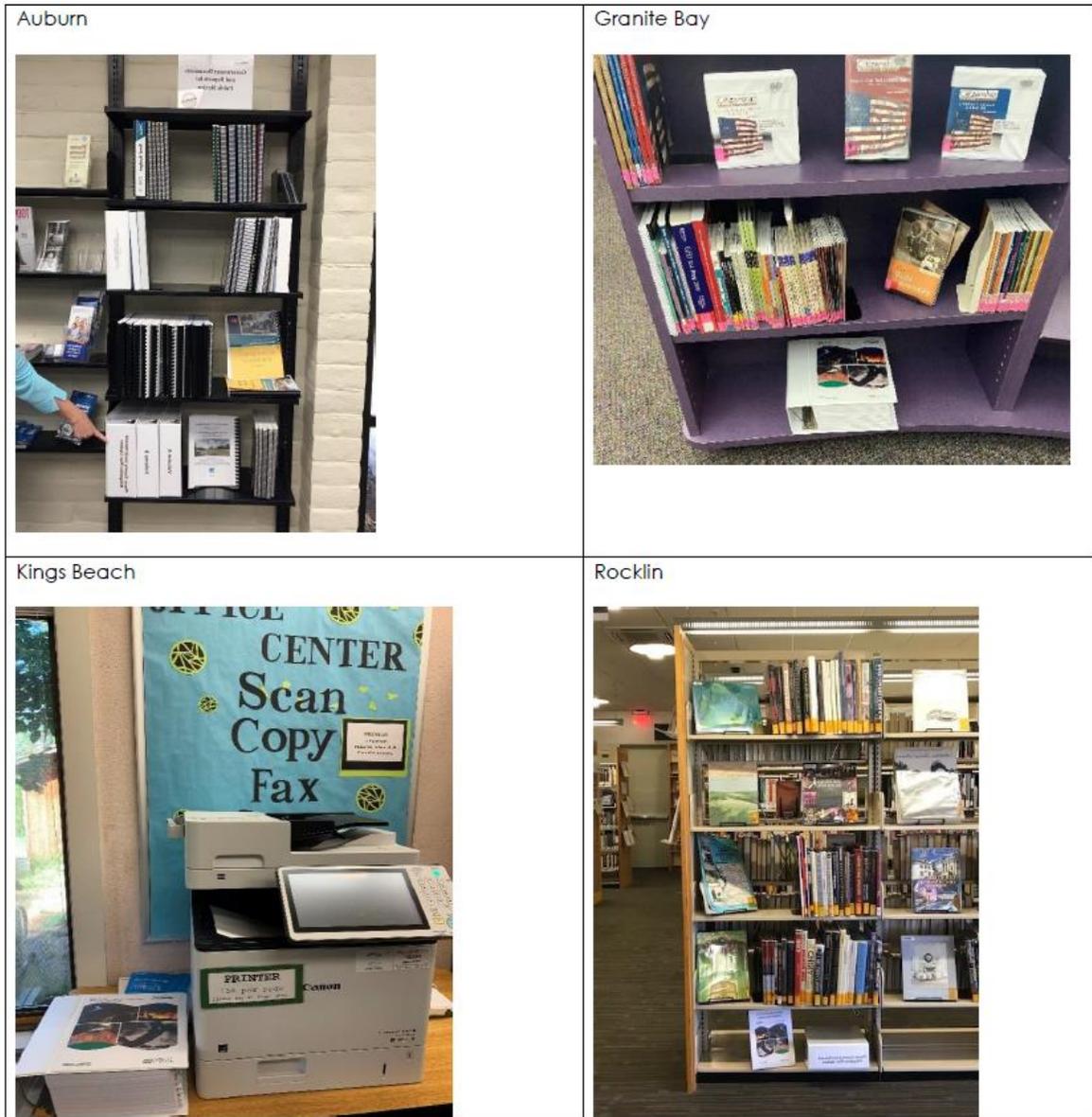
Final Public Meeting

The first draft of the Plan was provided to the HMPC in April of 2021, with a public review draft provided in May 2021. A public meeting was held on June 9, 2021, to present the draft LHMP and to collect public comments on the Plan prior to finalization and submittal to Cal OES/FEMA. The public meeting was advertised in a variety of ways to maximize outreach efforts to both targeted groups and to the public at large and included an advertisement in local newspapers inviting the public to attend either the formal public meeting or the planning team meeting at their convenience. The advertisement in the local newspapers included information on the date, location and time of the meeting, where the draft Plan could be accessed in the community, and how to provide comments on the draft LHMP Update. In addition to a copy of the draft Plan being placed on the County website in advance of these meetings, hard copies of the draft of the Plan were made available to interested parties at five Placer County Public Libraries:

Figure 3-3 Public Outreach at Placer County Libraries



Local Hazard Mitigation Plan Binder Location at Placer County Libraries

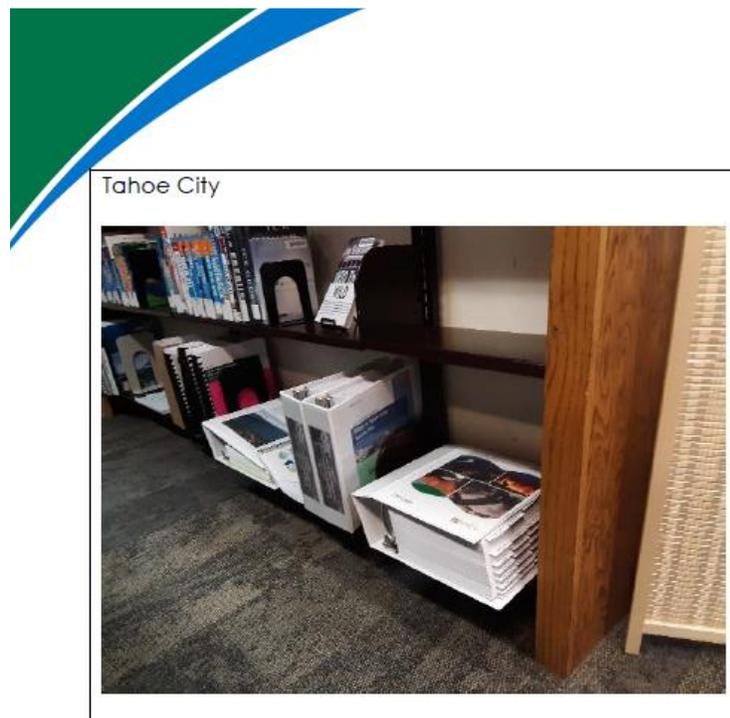


Placer County Library Administration ▪ 145 Fulweiler Avenue, Ste. 150 ▪ Auburn, CA 95603
530-886-4550 office ▪ 530-886-4555 fax



Source: Placer County

Figure 3-4 Public Outreach at Placer County Libraries



Source: Placer County

Documentation to support the final public meeting can be found in Appendix A. In addition to advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders with an interest in the Placer County Planning Area. The majority of these people reside in Placer County or in surrounding communities. Because this is a multi-jurisdictional planning effort, all public outreach activities for this LHMP Update were conducted in cooperation with and on behalf of Placer County, as the CRS community as well as for all participating jurisdictions.

The formal public meetings for this project are summarized in Table 3-6.

Table 3-6 Schedule of Public and Stakeholder Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Early Public Meeting	1) Intro to DMA, CRS and mitigation planning 2) 2021 LHMP Update Process	October 28, 2020	Zoom Meeting
Final Public Meeting	1) Presentation of Draft LHMP and solicitation of public and stakeholder comments	June 9, 2021	Zoom Meeting

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final Plan throughout the plan development process, including the sections that address mitigation goals and strategies. Various public comments were obtained throughout the planning process and prior to Plan submittal to Cal OES and FEMA. A table summarizing the formal public comments received and how they were addressed is included in Appendix A. All press releases, newspaper advertisements and articles, website postings, and public outreach efforts are on file with Placer County OES and are included in Appendix A.

The draft plan is currently available online on the Placer County website at: – <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>.

Other Public Outreach Efforts

Beyond these more formal public involvement activities, the update process also included the following public outreach activities included in

Table 3-7 which are further documented and described in Appendix A. The public outreach activities described here were conducted with participation from and on behalf of all jurisdictions participating in this Plan, including the CRS community of Placer County.

Table 3-7 Other Public Outreach Efforts

Effort	Description
Press Release October 8, 2020	A press release was developed and sent out by Placer County to inform the community of the upcoming LHMP kickoff meetings, and how they could get involved in the LHMP Update process.
Placer County eNewsletter Govdelivery October 8, 2020	Placer County sent out information on the LHMP Update process via their internal GovDelivery Newsletter to inform the community of the upcoming LHMP kickoff meetings, and how they could get involved in the LHMP Update process.
Article in Roseville Today Newspaper October 13, 2020	An article was published in Roseville Today Newspaper to make citizens in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Nextdoor Posting October 13, 2020	Information was posted on Nextdoor to make residents in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Article in Gold Country Newspaper (Auburn Journal) October 27, 2020	An article was published in Gold Country Newspaper to make citizens in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Public Outreach Flyer	An LHMP Update Public Outreach Flyer was developed as an outreach tool to inform the community of the LHMP Update process and how they can be involved.
Facebook Event outreach February 3, 2021	Placer County posted information on their Facebook Page, informing the public of the LHMP Update and inviting them to the Risk Assessment meeting of the Hazard Mitigation Planning Committee Meeting.
Placer County LHMP Update Website	Information on the Plan update process and location of documents, and HMPC and public meeting information were posted on the County website. Links to the County website were placed on websites from the other incorporated communities.

Effort	Description
Survey	A public survey was posted on the County's website inviting the public to comment on how prepared both the County and individuals are for a possible natural disaster, including flood events
Public Outreach at Placer County Public Library, Auburn location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Auburn location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Granite Bay location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Granite Bay location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Rocklin location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Rocklin location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Tahoe City location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Tahoe City location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Kings Beach location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Kings Beach location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach Flyer	An LHMP Update Public Outreach Flyer was developed as an outreach tool to inform the community of the LHMP Update Public Review Draft and how they can provide comments to the document prior to submittal to Cal OES and FEMA.
Facebook Posting on 5/27/2021	The public was invited to comment on the Public Review Draft of the LHMP Update.
Gold County Media Article 5/28/2021	Information on the LHMP was discussed in an article on Gold County Media. When the LHMP was discussed with the Board of Supervisors, a discussion on wildfire mitigation took place.
Placer County Newsletter 6/3/2021	Information on the Plan update process and location of documents, and final HMPC and public meeting locations were included in the Placer County e-newsletter informing interested parties on how to provide input to the draft plan prior to submittal to Cal OES/FEMA. This reaches over 30,000 subscribers.
Article in Local Newspaper: Roseville Today 6/2/2021	An article was published before the final public meetings, to make citizens in the County aware of the hazard mitigation update process and invite comment on the draft plan/attendance at public meetings prior to submittal to Cal OES/FEMA

Public Outreach Survey

An integral element in hazard mitigation planning is broad public participation. Information provided by residents fosters a better understanding of local hazard concerns and can spawn innovative ideas to reduce impacts of future hazard events. A public opinion survey was accomplished to gather information from Placer County Planning Area residents concerning local hazards. The survey was located on the County's LHMP website and survey participation was promoted through public meetings, program websites, press

releases, social media, and other public outreach events as previously described. Following is a summary of survey results.

- 231 individuals took the survey.
- 122 out of the 231 people who responded were extremely concerned about the possibility of the community being affected by a disaster.
- Wildfire, drought, and climate change were hazards of greatest concern.
- 3 out of 231 respondents noted that their house was in a floodplain, 61 out of 231 did not know if their home was in a floodplain.
- 201 of the 231 respondents do not have flood insurance, while 13 of them do.
- 78 out of 231 stated that communities are not doing enough to inform the public about hazards affecting the County, while 65 of the 231 stated the community was doing a good job. 85 did not know or had no opinion.
- Of the 231 respondents, 25 felt unprepared, 157 felt somewhat prepared, and 44 felt well prepared for a natural disaster.
- Email, direct mailings, social media, and the County website were the best choices to reach the public regarding disaster information and making homes more disaster resistant.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and Plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner status in the County, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate on the HMPC:

- American Red Cross
- Bureau of Reclamation
- Cal FIRE
- Cal Trans
- California Department of Fish and Game
- California Department of Water Resources
- California Highway Patrol
- California Office of Emergency Services
- California State Fire Marshall
- California State Parks
- City of Roseville
- Community Services Districts in the County
- FEMA Region IX
- Fire Protection Districts in the County
- Liberty Utilities
- Local FireWise communities
- National Weather Service/NOAA
- Pacific Gas & Electric
- SPI Industries
- Surrounding County OES leads
- Sutter Health
- United States Bureau of Reclamation
- United States Department of Agriculture
- United States Corps of Engineers

- United States Forest Service
- University of California Cooperative Extension

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies through a variety of mechanisms and informing them on how to participate in the LHMP Update process and if they had any expertise or assistance, they could lend to the planning process or specific mitigation strategies. Coordination with these groups included, holding meetings, sending outreach e-mails, some with follow up phone calls; and making phone calls alone to out of area agencies. All of these groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the LHMP Update process, and inviting them to HMPC meetings. This coordination with other agencies is documented in Appendix A and includes a summary table of who was contacted, the method of contact, and the purpose. Supporting documentation such as emails and meeting logs are also included.

In addition, as part of the overall stakeholder and agency coordination effort, the HMPC coordinated with and utilized input to the LHMP update from the following agencies:

- Cal-Adapt
- Cal Atlas
- Cal OES
- CAL FIRE
- Cal Trans
- California Department of Conservation
- California Department of Finance
- California Department of Fish and Wildlife
- California Department of Food and Agriculture
- California Department of Parks and Recreation
- California Department of Water Resources
- California Division of Mines and Geology
- California Employment Development Department
- California Geological Survey
- California Invasive Plant Council
- California Natural Resources Agency
- FEMA Region IX
- Library of Congress
- National Drought Mitigation Center
- National Levee Database
- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- Pacific Gas and Electric
- Public Policy Institute of California
- United States Army Corps of Engineers
- United States Bureau of Land Management

- United States Bureau of Reclamation
- United States Department of Agriculture
- US Department of Transportation
- United States Farm Service Agency
- United States Forest Service
- United States Geological Survey
- United States Occupational Health and Safety Agency
- Western Regional Climate Center

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to many of these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix A. Others assisted in the process by providing data directly as requested in the Data Worksheets or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public and HMPC meetings and to review and comment on the Plan prior to submittal to CAL OES and FEMA. In addition, as part of the review of the draft Plan, key agency stakeholders were contacted, and their comments specifically solicited as described further in this Section and included in Appendix A.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community’s risk and vulnerability to hazards. Placer County uses a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this LHMP Update establishes a credible and comprehensive Plan that ties into and supports other community programs. The development of this LHMP Update incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- CAL OES plans and data
- California Department of Finance demographic documents
- California Department of Water Resources plans and information
- California Geological Survey Plans
- CAL FIRE Fire Plans and data
- Climate Adaptation Plans
- CWPPs
- Emergency Operations Plans
- Evacuation Plans
- FEMA mitigation planning documents
- Flood Insurance Studies
- General Plans – County and Cities
- National Weather Service documents
- Stormwater Master Plans
- US Department of Agriculture Reports
- US Department of Interior Plans
- US Fish and Wildlife reports
- USGS Reports

Specific source documents are referenced at the beginning of each section of Chapter 4 and in Appendix B. These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and documents were incorporated into the risk assessment and hazard vulnerability sections of the Plan. Where the data from the existing studies and reports is used in this LHMP Update, the source document is referenced throughout this Plan. The data was also used in determining the capability of the community in being able to implement certain mitigation strategies. Appendix B, References, provides a detailed list of references used in the preparation of this LHMP Update.

3.2.2. Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact the Placer County Planning Area. Starting with the 2016 Plan, natural hazards of concern were added, deleted, and modified for this LHMP Update. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The HMPC also conducted a capability assessment to review and document the Placer County Planning Area's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified.

Also addressed in the risk assessment of this 2021 LHMP is an assessment of the County's floodplain management program and participation in the National Flood Insurance Program (NFIP), including a discussion of their continued compliance with NFIP requirements and their CRS program. However, it should be noted that this applies only to eligible NFIP communities. Participating special districts to this LHMP Update do not address their compliance with the NFIP as they are not eligible to participate in this program.

A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

3.2.3. Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Foster Morrison facilitated brainstorming and discussion sessions with the HMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5 Mitigation Strategy. Additional documentation on the process the HMPC used to develop the goals and mitigation strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, a complete first draft of the LHMP Update was developed. This complete draft was provided for HMPC review and comment via a Dropbox web link. Other agencies and the Public HMPC and Steering Committee members were invited to comment on this draft as well. HMPC and agency comments were integrated into the second public review draft, which was advertised and distributed to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for CAL OES and FEMA Region IX to review and approve, contingent upon final adoption by governing boards of all participating jurisdictions.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the LHMP Update, the Plan was adopted by the governing boards of each participating jurisdiction using the sample resolution contained in Appendix D.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the Placer County Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the implementation and ongoing success of this plan and mitigation in Placer County and is addressed further in Chapter 7.

Implementation and Maintenance Process: 2016

The 2016 Placer County Local Hazard Mitigation Plan Update included a process for Plan maintenance and implementation of the mitigation strategy as well as formal updates to the Plan document. The 2016 process called for quarterly reviews with the status of mitigation strategy implementation documented in an annual report. In addition, the 2016 process called for a formal plan update as required by DMA regulations every 5 years. While Placer County OES regularly forwarded information to the HMPC on grant opportunities and other related topics on LHMP, PDM, and HMGP, and discussed/conversed/assisted agencies with questions or interests on the subject, no reconvening of the HMPC to review has occurred since 2016 LHMP. This 2021 LHMP update, once complete, will meet the DMA formal 5-year update requirement.

Specifically, Placer County's existing plan was completed with a final approval date of June 13, 2016. It was anticipated that in compliance with the five-year update requirement, the next complete update of the

Plan would be completed in 2021. This current LHMP Update process was initiated in fall of 2020 and finished in June 2021 with the submittal of this LHMP update to Cal OES and FEMA Region IX.

In addition, the 2016 LHMP was relied on and integrated into other planning mechanisms in the County. Table 3-8 lists the planning mechanism the 2016 LHMP Update was integrated into by Placer County.

Table 3-8 Incorporation of 2016 Placer County LHMP Update into Other Planning Mechanisms

Planning Mechanism 2016 LHMP Was Incorporated or Implemented Through	Details
Incorporation of LHMP into Safety Element of General Plan (by reference)	Board of Supervisors approved resolution – 11/22/16
Placer County Sustainability Plan (2020)	The PCSP was adopted Jan 28, 2020. It includes a vulnerability assessment prepared to meet SB 375 requirements. It references the LHMP and other wildfire mitigation programs.
General Plan -Update to the Safety Element (in progress)	The SEU is currently being updated and will include background information and policy revisions related to the LHMP. The SEU is currently in admin review. We expect a public review draft to be released within the next month (Feb-March) with an anticipated May adoption date. This update does require approval by the State Forestry Board.
2021 (In process) Emergency Operations Plan	LHMP risk assessment data incorporated into the Base EOP; other LHMP data use in developing EOP Annexes for the 2021 EOP. Future EOP updates will continue to incorporate the most current version of the LHMPs. The current EOP update is scheduled to be finalized in fall 2021.
Updates of Placer County Community Wildfire Protection Plans	LHMP risk assessment data and mitigation projects, specific to wildfires are used and considered in the CWPP updates: likewise, this LHMP update will be implemented through CWPP updates
Capital Improvement Plans and Budgets	Mitigation projects are considered and included in annual CIPs as feasible
Placer County Evacuation Planning	LHMP mapping and risk assessment data are considered in updates to area evacuation plans
Disaster Debris Management Plan	LHMP was used to determine hazards to be considered.

The plan implementation and maintenance process as set forth in the 2016 Plan has been updated for this LHMP Update. The revised update implementation and maintenance process for the Placer County 2021 LHMP Update is set forth in Section 7 of this Plan document. A strategy for continued public involvement for this update process is also included in Chapter 7.

Chapter 4 Risk Assessment

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. “It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.”

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a community’s potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

1. Identify Hazards;
2. Profile Hazard Events;
3. Inventory Assets; and
4. Estimate Losses.

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1: Hazard Identification** identifies the natural hazards that threaten the Placer County Planning Area and describes why some hazards have been omitted from further consideration.
- **Section 4.2: Placer County Assets at Risk** identifies the property values; populations; critical facilities; and cultural, historical, and natural resources at risk. This information is not hazard specific and covers the entire Placer County Planning Area, with a focus on unincorporated Placer County.
- **Section 4.3: Hazard Profiles and Vulnerability Assessment** provides an overview of each hazard, its location and extent, and discusses the risk, vulnerability, and impacts of each natural hazard to the Planning Area. The hazard profile also describes previous occurrences of hazard events and the likelihood of future occurrences. The vulnerability assessment evaluates the Planning Area’s and the unincorporated County’s exposure to natural hazards; considering assets at risk, populations at risk, critical facilities, future development trends, and, where possible, estimates potential hazard losses.
- **Section 4.4: Capability Assessment** inventories existing local mitigation activities and policies, regulations, plans, and projects that pertain to mitigation and can affect net vulnerability of the Placer County Planning area.

This risk assessment covers the entire geographical extent of the Placer County Planning Area, including the incorporated communities and other participating jurisdictions. In accordance with FEMA requirements, this risk assessment describes how the hazards and risks vary across the Planning Area and from jurisdiction to jurisdiction. While these differences are noted in this chapter, they are expanded upon in the annexes of the participating jurisdictions. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Placer County Planning Area.

This LHMP Update involved a comprehensive review and update of each section of the 2016 risk assessment. Information from the 2016 LHMP was used in this Update where valid and applicable. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk assessment update are summarized in Chapter 2 What's New and are also detailed in this risk assessment portion of this Plan.

4.1 Hazard Identification

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

The Placer County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification assessment to determine the hazards that threaten the Planning Area. This section details the methodology and results of this effort.

Data Sources

The following data sources were used for this Hazard Identification portion of this Plan:

- California Office of Emergency Services (CAL OES)
- HMPC input
- National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database
- 2016 Placer County LHMP
- 2018 State of California Hazard Mitigation Plan
- FEMA Disaster Declaration Database

4.1.1. Results and Methodology

Using existing hazards data and input gained through planning meetings, the HMPC agreed upon a list of hazards that could affect the Placer County Planning Area. Hazards data from Cal OES, FEMA, the NOAA NCDC database, and many other sources were examined to assess the significance of these hazards to the Planning Area.

The following hazards in Table 4-1, listed alphabetically, were identified and investigated for this LHMP Update. As a starting point, the 2018 California State Hazard Mitigation Plan was consulted to evaluate

the applicability of hazards of concern to the State, to the Placer County Planning Area. Building upon this effort, hazards from the 2016 Placer County Local Hazard Mitigation Plan (LHMP) were also identified, and comments explain how hazards were updated from the 2016 Plan. Most hazards from the 2016 plan were profiled in this LHMP Update. Hazards dropped for this 2021 Plan Update include fog, subsidence, soil bank erosion (though it is included in the levee failure section), and hazardous materials transport. Severe Weather: Heavy Rains and Storms was broken up into two separate hazards. New hazards include climate change and pandemic.

Table 4-1 Placer County Hazard Identification and Comparison from 2016 LHMP

2021 Hazards	2016 Hazards	Comment
Agricultural Hazards	Agriculture Hazards	Similar analysis was performed. Updated information was placed, where available.
Avalanche	Avalanche	Additional information was added to the profile. Location and extent were fleshed out in greater detail.
Climate Change	–	New hazard
Dam Failure	Dam Failure	Additional analysis was performed. Dams inside and outside the County were analyzed with Cal OES and DSOD data. Structures, populations, and critical facilities were analyzed.
Drought and Water Shortage	Drought and Water Shortage	Additional data from the recent droughts were added. Public Safety Power Shutoff information was added to this hazard.
Earthquake	Earthquake	Hazus runs were updated. Two separate Hazus earthquake runs were performed – one for the eastern and one for the western County.
Flood: 1%/0.2% annual chance	Floods: 100/500 year	2018 DFIRMs were used as the basis for analysis. Structures, populations, and critical facilities were analyzed.
Flood: Localized Stormwater Flooding	Floods: Localized Stormwater	Similar analysis was performed, with localized flooding areas being updated by Placer County.
Landslides, Mudslides, and Debris Flows	Landslides and Debris Flows	Similar analysis was performed.
Levee Failure	Levee Failure	Additional data from the new Flood Insurance Study was added. National Levee Database risk data by levee was added to the vulnerability to levee failure.
Pandemic	–	New hazard
Seiche	Seiche	Similar analysis was performed.
Severe Weather: Extreme Heat	Severe Weather: Extreme Heat	Similar analysis was performed. Public Safety Power Shutoff information was added to this hazard.
Severe Weather: Freeze and Snow	Severe Weather: Freeze and Snow	Similar analysis was performed.

2021 Hazards	2016 Hazards	Comment
–	Severe Weather: Fog and Freezing Fog	Due to the limited number of events and the limited mitigation actions that could be put forth, this hazard was dropped from consideration.
Severe Weather: Heavy Rains and Storms	Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)	This hazard was broken up so that Heavy Rains and Storms was separated from High Winds and Tornadoes
Severe Weather: High Winds and Tornadoes	–	This hazard was broken up so that Heavy Rains and Storms was separated from High Winds and Tornadoes. Public Safety Power Shutoff information was added to this hazard.
–	Soil Bank Erosion	This was dropped as a standalone hazard. Erosion is dealt with in the flood and levee failure section of this Plan Update.
–	Subsidence	Due to the limited number of events and the limited mitigation actions that could be put forth, this hazard was dropped from consideration.
Tree Mortality	Wildfire	Tree mortality was separated from wildfire. A more detailed discussion on how this hazard affects the County was added.
Wildfire	Wildfire	Similar analysis was performed. Public Safety Power Shutoff information was added to this hazard.
–	Hazardous Materials Transport	Due to the focus on natural hazards, this hazard was dropped from consideration.

Certain hazards were excluded from consideration for this LHMP Update. They are shown in Table 4-2.

Table 4-2 Placer County – Excluded Hazards

Hazard Excluded	Why Excluded
Volcanoes	Due to the distance from volcano, the likelihood of future occurrence, and the lack of mitigation actions from the County and participating jurisdictions, this hazard was excluded from consideration.
Tsunami	The County is not on the coast.
Air Pollution	The County did consider this a hazard for this Plan, it is dealt with in other planning mechanisms in the County. Smoke (and air quality) is discussed in the wildfire hazard.
Coastal Flooding, Erosion, and Sea Level Rise	The County is not on the coast.
Aquatic Invasive Species	The County did consider this a hazard, it is dealt with in other planning mechanisms in the County.
Energy Shortage and Energy Resilience	The County did consider this a hazard, it is dealt with in other planning mechanisms in the County.
Sociotechnical/Technological Hazards	The County did consider this a hazard, but it is dealt with in other planning mechanisms in the County.

Hazard Excluded	Why Excluded
Threat and Disturbance Hazards	The County did consider this a hazard, but it is dealt with in other planning mechanisms in the County.
Subsidence	There are few areas of the County where subsidence is a risk. In addition, most subsidence is related to drought and water shortage, and is being discussed in that hazard profile and vulnerability assessment.

Table 4-3 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards. Those hazards identified as a high or medium significance are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact on the Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of a community to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the Placer County Planning Area, enabling the County to focus resources where they are most needed.

Table 4-3 Placer County Hazard Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Significant	Highly Likely	Critical	Medium	Medium
Avalanche	Limited	Likely	Limited	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Critical	High	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Limited	Occasional/Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Seiche	Limited	Unlikely	Limited	High	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	High	Low
Tree Mortality	Extensive	Likely	Limited	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

4.1.2. Disaster Declaration History

One method used to identify hazards was the researching of past events that triggered federal and/or state emergency or disaster declarations in the Placer County Planning Area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government’s capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments’ capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

Based on the disaster declaration history provided in Table 4-4, Placer County is among the many counties in California susceptible to disaster. Details on federal and state disaster declarations were obtained by FEMA and Cal OES and compiled in chronological order in Table 4-4. A review of state declared disasters indicates that Placer County received 25 state declarations between 1950 and 2020. Of the 25 state declarations: 16 were associated with severe winter storms, heavy rains, or flooding; 5 were from fire, 1 for drought; 1 was from economic disasters, 1 was from freeze, and 1 was from pandemic. A review of federal disasters shows 22 federal disaster declarations. Of these 22 federal declarations: 13 were associated with severe winter storms, heavy rains, or flooding, 6 were from fire, 1 was from drought, 1 was from pandemic, and 1 was for hurricane (a nationwide declaration for Katrina evacuations). A summary of these events by disaster type is shown in Table 4-5.

Table 4-4 Placer County State and Federal Disaster Declarations, 1950-2020

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2020	Covid-19	Pandemic	Pandemic	DR-4482	3/4/2020	1/20/2020
2017	California Severe Winter Storms, Flooding, And Mudslides	Flood	Storms	DR-4305	2/10/2017	3/16/2017
2014	King Fire	Wildfire	Wildfire	FM-5081	–	9/17/2014
2014	Applegate Fire	Wildfire	Wildfire	FM-5082	–	10/8/2014
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2010	Galleria Incident	Wildfire	Wildfire	GP 2010-12	10/22/2010	–
2009	49er Fire	Wildfire	Wildfire	FM-2832	–	8/31/2009
2008	Gladding Fire	Wildfire	Wildfire	FM-2786	–	9/1/2008

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2008	2008 January Storms	Flood	Storms	GP 2008-01	1/5/2008	–
2006	2006 June Storms	Flood	Storms	DR-1646	–	6/5/2006
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	–	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	–	9/13/2005
2004	Stevens Fire	Wildfire	Wildfire	FM-2541	–	8/8/2004
2002	Sierra Fire	Wildfire	Wildfire	FM-2463	–	9/19/2002
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	1/4/1997
1995	1995 Late Winter Storms	Flood	Storms	DR-1046	Proclaimed	1/10/1995
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1987	1987 Wildland Fires	Wildfire	Wildfire	GP	9/3/1987 9/10/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1983	Winter Storms	Flood	Flood	DR-677	12/8/82-3/21/83	2/9/1983
1980	1980 April Storms	Flood	Storms	80-01 – 80-25	4/1/1980	–
1977	1977 Drought	Drought	Drought	EM-3023	–	1/20/1977
1973	Southern Pacific Railroad Fires and Explosions (Roseville)	Fire	Explosion	–	4/30/1973	–
1973	1973 Floods and Storms	Flood	Storms	–	2/28/1973	–
1972	1972 Freeze	Freeze	Freeze	–	4/17/1972 5/22/1972 5/31/1972	–
1969	1969 Storms	Flood	Storms	DR-253	1/23/69-3/12/69	1/26/1969
1965	1965 Fires	Wildfire	Wildfire	–	9/18/1965	–
1964	1964 Late Winter Storms	Flood	Storms	DR-183	–	12/24/1964

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1963	1963 Floods	Flood	Storms	–	2/14/1964	–
1962	1962 Floods and Rains	Flood	Storms	–	10/17/1962 10/25/1962 10/30/1962 11/4/1962	10/24/1962
1961	1961 Widespread Fires	Wildfire	Wildfire	–	9/18/1961	–
1958	1958 April Storms and Floods	Flood	Storms	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Source: Cal OES, FEMA

Table 4-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977
Economic	1	2001	0	
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017
Freeze	1	1972	0	–
Hurricane	0	–	1	2005
Pandemic	1	2020	1	2020
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)
Totals	25	–	22	–

Source: Cal OES, FEMA

Disasters since 2016

As detailed above, there have been three federal disaster declarations and three state disaster declarations since the 2016 plan:

- 2017 Floods (federal and state)
- 2020 Pandemic (one state and one federal)

USDA Disaster Declarations

Another database of disaster declarations comes from the USDA. This database shows agricultural disasters that result from natural hazards. This database was searched from 2002 to 2020, and the results for Placer County are shown on Table 4-6.

Table 4-6 Placer County – USDA Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2002	N/A	N/A	Drought
2002	N/A	N/A	Rain and Wind
2003	N/A	N/A	Hail and Freeze
2003	N/A	N/A	Excessive Rain/Late Rain
2003	N/A	N/A	Drought
2003	N/A	N/A	N/A
2004	N/A	N/A	N/A
2004	N/A	N/A	N/A
2004	N/A	N/A	Fire
2005	N/A	N/A	Freeze
2005	N/A	N/A	Unseasonable Late Rain
2005	N/A	N/A	Heat
2006	N/A	N/A	Heat
2006	N/A	N/A	Rain/Hail
2007	N/A	N/A	Heat
2007	N/A	N/A	Freeze
2007	N/A	N/A	Drought
2008	N/A	N/A	Drought
2008	N/A	N/A	Freeze
2008	N/A	N/A	Wind
2009	N/A	N/A	Drought
2012	S3283	Contiguous	Drought-FAST TRACK
2012	S3379	Primary	Drought
2012	S3440	Contiguous	Drought-FAST TRACK
2013	S3462	Contiguous	Drought-FAST TRACK
2013	S3495	Primary	Drought-FAST TRACK
2013	S3569	Primary	Drought-FAST TRACK
2014	S3638	Contiguous	Drought-FAST TRACK
2014	S3626	Primary	Drought-FAST TRACK
2014	S3631	Contiguous	Drought
2014	S3637	Primary	Drought-FAST TRACK

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2014	S3797	Primary	Drought
2015	S3784	Primary	Drought-FAST TRACK
2015	S3789	Contiguous	Drought-FAST TRACK
2015	S3963	Contiguous	Drought
2016	S3952	Primary	Drought-FAST TRACK
2016	S3953	Contiguous	Drought-FAST TRACK
2016	S4164	Contiguous	Severe weather including excessive rainfall and high winds
2016	S4170	Contiguous	Severe weather including excessive rainfall and high winds
2017	S4163	Contiguous	Drought-FAST TRACK
2018	S4427	Contiguous	Drought-FAST TRACK
2019	S4565	Contiguous	Excessive rain
2020	S4697	Primary	Drought-FAST TRACK
2020	S4765	Contiguous	Drought-FAST TRACK

Source: USDA

EOC Activations since 2016

- 2016
 - ✓ Trail Head Fire (Todd Valley/Foresthill area) - 6/28 (Level 1 – Highest)
- 2017
 - ✓ Oroville Dam Failure (Butte Co), 2/12 – Level 3/OES & Public Health staffs only – Evacuation & mutual aid support to Butte Co & other affected nearby counties
- 2018
 - ✓ Winter storm period, Feb & Mar – Level 3/OES staff only
 - ✓ North Fire, 9/3 – Level 3
 - ✓ Sliger Fire, 9/4 – Level 3
 - ✓ Camp Fire (Butte Co), 10/14 – Level 3
 - ✓ PSPS 10/14 – Level 3
 - ✓ PSPS 11/8 – Level 3
- 2019
 - ✓ PSPS 9/13 – Level 3
 - ✓ PSPS 9/21 – Level 3
 - ✓ PSPS 10/2 – Level 3
 - ✓ PSPS 10/23 – Level 3
 - ✓ PSPS 10/26 – Level 3
 - ✓ PSPS 10/28 – Level 3
 - ✓ PSPS 11/20 – Level 3

- 2020
 - ✓ COVID-19, Mar – Apr (Level 1), May (Level 2), Jun (Level 3)
 - ✓ PSPS 9/7 -Level 3
 - ✓ PSPS 9/26 – Level 3
 - ✓ PSPS 10/14 – Level 3
 - ✓ PSPS 10/21 – Level 3
 - ✓ PSPS 10/25 – Level 3
 - ✓ Extreme Heat & Potential rolling blackout – Aug
 - ✓ Fork Fire (El Dorado Co, potential to cross over into Placer in direction of Foresthill), 9/8 – Level 3

4.2 Placer County Assets at Risk

As a starting point for analyzing the Placer County Planning Area’s vulnerability to identified hazards, a variety of data was used to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur, this section describes significant assets at risk in the Planning Area. Data used in this baseline assessment included:

- Values at risk;
- Critical facility inventory;
- Cultural, historical, and natural resources; and
- Growth and development trends.

Data Sources

Data used to support this assessment included the sources listed below. Where data and information from these studies, plans, reports, and other data sources were used, the source is referenced as appropriate throughout this vulnerability assessment.

- CalAtlas
- California Department of Finance
- California Department of Fish and Game
- California Department of Parks and Recreation Office of Historic Preservation
- California Natural Diversity Database
- Hazus MH 4.2
- State of California Department of Conservation
- US Census Bureau

4.2.1. Values at Risk

Parcel Inventory and Assessed Values

This analysis captures the values associated with assessed values located within Placer County. The 2020 Placer County Parcel/Assessor’s data, obtained from Placer County, was used for the basis of this analysis. This data provided by Placer County represents best available data.

Understanding the total assessed value of Placer County is a starting point to understanding the overall value of identified values at risk in the County. When the total assessed values are combined with potential values associated with other community assets such as public and private critical infrastructure, historic and cultural resources, and natural resources, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the County.

Methodology

Placer County's 2020 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the County. This data provides the land and improved values assessed for each parcel, along with key information such as property use. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Placer County and CalAtlas to support countywide mapping and analysis of values at risk.

The County GIS parcel data contained 182,358 records for the entire Placer County planning area, of which 148,646 parcels are improved parcels. The parcel dataset includes 53,151 records for the City of Roseville, which does not participate in the County's hazard mitigation planning update. Values are shown for Roseville in the 'Total Exposure by Jurisdiction' table to provide a comprehensive county-wide overview. City of Roseville parcels and values were excluded from all further hazards analyses and Values at Risk tables.

Data Limitations & Notations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the County. In the event of a disaster, structures and other infrastructure improvements are at the greatest risk of damage. Depending on the type of hazard and resulting damages, the land itself may not suffer a significant loss. For that reason, the values of structures and other infrastructure improvements are of greatest concern. As such, it is critical to note a specific limitation to the assessed values data within the County, created by Proposition 13. Instead of adjusting property values annually, no adjustments are made until a property transfer occurs. As a result, overall property value information is most likely low and may not reflect current market or true potential loss values for properties within the County.

Another limitation to this data is found in the Williamson Act, also known as the California Land Conservation Act of 1965, that enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. This further affects the County's overall values for assessed taxable lands.

The 2020 GIS parcel and Assessor data was obtained to perform the spatial analysis. GIS was used to convert the parcel polygons into centroids representing each record in the assessor database. For the purposes of this analysis, the centroids which were not coincident in locations were re-positioned to overlay on the corresponding polygons so that each assessor record (with a unique assessor parcel number) was

spatially positioned on the corresponding parcel. In addition, multiple parcels polygons in the GIS data were constructed as multi-part features, of which only one centroid was representative of each parcel polygon. The position of the centroids may result in less accurate hazard analysis overlay results.

3,403 records represent public right-of-way (PROW) parcels that do not contain assessment values. These are useful for corridor-analysis but do not affect values-at-risk analysis. These parcels were included in the Total Values at Risk Tables as well as the hazard analyses.

Property Use Categories

Placer County’s GIS data contained land use designations which provide detailed descriptive information about how each property is generally used, such as agricultural, commercial, government, industrial, institutional, recreational, residential, and right of way. The land use codes from County assessor data were refined and categorized into seven property use categories and linked back to the Placer County Assessor data. The final property use categories for Placer County are:

- Agricultural
- Commercial
- Industrial
- Institutional
- Miscellaneous
- Natural/ Open Space
- Residential

Once the land use descriptions were grouped into categories, the number of total and improved parcels, as well as land and improved structure values were inventoried for the County by property use.

Estimated Content Replacement Values

Placer County’s assigned property use categories were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA’s standard CRV factors were utilized to develop more accurate loss estimates for all mapped hazard analyses. FEMA’s CRV factors estimate value as a percent of improved structure value by property use. Table 4-7 shows the breakdown of the different property uses in the County and their estimated CRV factors.

Table 4-7 Placer County – Content Replacement Factors by Property Use

Placer County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Agricultural	Agricultural	100%
Commercial	Commercial	100%
Industrial	Industrial	150%
Institutional	Institutional	100%
Miscellaneous	Commercial	100%
Natural/ Open Space	Commercial	100%

Placer County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Residential	Residential	50%

Source: Hazus

Placer County Values at Risk Results

Values associated with land and improved structures were identified and summed in order to determine assessed values at risk in the Placer County Planning Area. Together, the land and improved structure values make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Content replacement values were then added to the assessed values, as described below, to provide an estimate of values at risk in the Planning Area.

Table 4-8 shows the values or total exposure for the Placer County Planning Area including estimated contents values (using CRV multipliers from Table 4-7). In addition, loss estimates contained in the hazard vulnerability sections of this Chapter will use calculations based on these values, including CRVs. It should be noted that Table 4-8 includes all of Placer County’s jurisdictions. The City of Roseville is not a participating jurisdiction to this Plan, as the City maintains its own LHMP. In the vulnerability assessment of each hazard in Section 4.3 below, the analysis will not include values from the City of Roseville.

Table 4-8 Placer County Planning Area – Total Values at Risk by Jurisdiction

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Auburn	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686
Colfax	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Lincoln	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308
Loomis	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508
Rocklin	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421
Unincorporated Placer County	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225
Total	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$22,135,839,982	\$80,715,115,535
Roseville	53,151	46,941	\$6,576,698,043	\$19,138,442,463	\$12,518,871,465	\$38,234,011,971
Grand Total	182,358	148,676	\$25,743,204,371	\$58,551,211,688	\$34,654,711,447	\$118,949,127,506

Source: Placer County 2020 Parcel/Assessor’s Data

The values for unincorporated Placer County are broken out by property use type and are provided in Table 4-9. More information on assets at risk for each jurisdiction can be found in their respective annexes.

Table 4-9 Unincorporated Placer County – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	1,329	267	\$395,087,021	\$61,249,725	\$61,249,725	\$517,586,471
Commercial	1,533	951	\$524,860,676	\$793,192,976	\$793,192,976	\$2,111,246,628
Industrial	704	354	\$234,494,247	\$389,232,140	\$583,848,214	\$1,207,574,601
Institutional	696	113	\$50,761,281	\$274,504,591	\$274,504,591	\$599,770,463
Miscellaneous	10,728	240	\$596,937,975	\$34,285,408	\$34,285,408	\$665,508,791
Natural / Open Space	2,520	458	\$193,888,774	\$218,046,988	\$218,046,988	\$629,982,750
Residential	55,746	51,194	\$10,510,522,061	\$20,510,871,677	\$10,255,435,783	\$41,276,829,521
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225

Source: Placer County 2020 Parcel/ Assessor's Data

4.2.2. Critical Facility Inventory

Of significant concern with respect to any disaster event is the location of critical facilities in the planning area. Critical facilities are often defined as those essential services and facilities in a major emergency which, if damaged, would result in severe consequences to public health and safety or a facility which, if unusable or unreachable because of a major emergency, would seriously and adversely affect the health, safety, and welfare of the public. Volume II of the Background Report to the Placer County General Plan, 1994 defines critical facilities as, “those services and facilities necessary during a major emergency.” This definition was refined by separating out three categories of critical facilities.

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery. Class 1 facilities include:

- Primary and alternate Emergency Operations Centers (EOCs),
- All Dispatch Centers,
 - ✓ Sheriff Auburn
 - ✓ Sheriff Tahoe
 - ✓ CHP Sacramento
 - ✓ CHP Truckee
 - ✓ CAL FIRE Grass Valley
 - ✓ Roseville City
 - ✓ Rocklin City
 - ✓ Lincoln City
 - ✓ Auburn City
- Emergency Services Communication Infrastructure,
- Primary and Alternate Computer Information Systems Infrastructure,
- Sutter Roseville Hospital Control Facility, and
- Major transportation corridors.

Class 2 facilities include those facilities that house Emergency Services capabilities. Class 2 facilities include

- All Police Stations,
 - ✓ Roseville
 - ✓ Rocklin
 - ✓ Lincoln
 - ✓ Auburn
- All CHP Stations,
 - ✓ Newcastle
 - ✓ Dutch Flat
 - ✓ Truckee
- All Fire Stations,
- All Hospitals,
 - ✓ Sutter Auburn Faith
 - ✓ Kaiser Roseville
 - ✓ Sutter Roseville
 - ✓ Tahoe Truckee
- All National Guard Armories,
- Coast Guard Facilities in Tahoe, and
- Airports:
 - ✓ Lincoln
 - ✓ Auburn
 - ✓ Blue Canyon
 - ✓ Truckee

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc. Class 3 facilities include

- All schools
- Water treatment plants
- Power generation infrastructure
- Fuel pipelines
- Fiber-optic lines
- Sewage infrastructure
- Fair Grounds in Auburn and in Roseville
- Memorial Halls
- Park Facilities
- Water-reactive materials

To support hazard analysis of critical facilities, Placer County GIS developed a critical facilities layer that pulled mapped critical facilities from existing GIS layers and organized them into a new critical facilities layer. Each facility was assigned one of the three different categories (each with a different symbology). County OES and others added additional mapped facilities to this layer as appropriate. The final critical facilities layer used for this analysis included facilities located in both unincorporated and incorporated communities. A summary of critical facilities in the Placer County Planning Area can be found in Figure

4-1 and Table 4-10. Table 4-11 details critical facilities by category. Additional details of individual critical facilities can be found in Appendix F of this Plan Update.

Table 4-10 Placer County Planning Area – Critical Facility Summary

Critical Facility Class/Jurisdiction	Facility Count
Auburn	
Class 1	2
Class 2	6
Class 3	11
Auburn Total	19
Colfax	
Class 2	3
Class 3	2
Colfax Total	5
Lincoln	
Class 1	2
Class 2	5
Class 3	17
Lincoln Total	24
Loomis	
Class 2	2
Class 3	3
Loomis Total	5
Rocklin	
Class 1	3
Class 2	4
Class 3	23
Rocklin Total	30
Unincorporated Placer County	
Class 1	24
Class 2	65
Class 3	119
Unincorporated Placer County Total	208
Placer County Planning Area Totals	291
Adjacent Counties	
Class 1	6
Class 2	19
Class 3	12
Adjacent Counties Total	37

Critical Facility Class/Jurisdiction	Facility Count
Grand Total	328

Source: Placer County GIS

Table 4-11 Placer County Planning Area – Critical Facilities by Facility Type

Critical Facility Class / Jurisdiction	Critical Facility Type	Facility Count
Auburn		
Class 1	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Airport	1
	Fire Station	3
	National/Coast Guard	1
	Police Station	1
Class 3	Fairground	1
	Hall	5
	School	5
Auburn Total		19
Colfax		
Class 2	Fire Station	2
Class 3	Police Station	1
	Hall	1
	Water Treatment Plant	1
Colfax Total		5
Lincoln		
Class 1	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Airport	1
	Fire Station	3
	Police Station	1
Class 3	Hall	3
	Hazardous Materials Facility	1
	School	12
	Water Treatment Plant	1
Lincoln Total		24
Loomis		
Class 2	Fire Station	1
	Police Station	1
Class 3	School	3

Critical Facility Class / Jurisdiction	Critical Facility Type	Facility Count
Loomis Total		5
Rocklin		
Class 1	Communication Transmission Sites	1
	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Fire Station	3
	Police Station	1
Class 3	Hall	2
	Hazardous Materials Facility	1
	School	19
	Water Treatment Plant	1
Rocklin Total		30
Unincorporated Placer County		
Class 1	Communication Transmission Sites	13
	Computer Information Systems Infrastructure	2
	Dispatch Center	2
	Emergency Operation Center	3
	Fire Station	1
	Hospital Control Facility	1
	Telecommunications	2
Class 2	Airport	1
	CHP Station	2
	Fire Station	51
	Hospital	3
	National/Coast Guard	2
	Police Station	6
Class 3	Fairground	1
	Hall	29
	Hazardous Materials Facility	8
	School	65
	Water Treatment Plant	16
Unincorporated Placer County Total		208
Adjacent Counties		
Class 1	Communication Transmission Sites	3
	Dispatch Center	3
Class 2	Airport	1

Critical Facility Class / Jurisdiction	Critical Facility Type	Facility Count
	CHP Station	1
	Fire Station	16
	Hospital	1
Class 3	School	11
	Water Treatment Plant	1
Adjacent Counties Total		37
Grand Total		328

Source: Placer County GIS

4.2.3. Cultural, Historical, and Natural Resources

Assessing Placer County’s vulnerability to disasters also involves inventorying the cultural, historical, and natural resource assets of the area. This information is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- In the event of a disaster, an accurate inventory of cultural, historical and natural resources allows for more prudent care in the disaster’s immediate aftermath when the potential for additional impacts is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, for example, wetlands and riparian and sensitive habitats which help absorb and attenuate floodwaters and thus support overall mitigation objectives.

Cultural and Historical Resources

Placer County has a large stock of historically significant homes, public buildings, and landmarks. To inventory these resources, information was collected from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California’s irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

- The **National Register of Historic Places** is the nation’s official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

- The **California Register of Historical Resources** program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance and identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act. The Register is the authoritative guide to the state’s significant historical and archeological resources.
- **California Historical Landmarks** are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Landmarks #770 and above are automatically listed in the California Register of Historical Resources.
- **California Points of Historical Interest** are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register.

Historical resources included in the programs above are identified in Table 4-12.

Table 4-12 Placer County Planning Area – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Allen & Sandhorfer Blacksmith, Auburn Iron Works (P619)			X	8/16/1983	Auburn
Auburn Grammar School, Auburn Civic Center Project (P693)			X	3/3/1988	Auburn
Auburn IOOF Hall (P803)			X	8/23/1994	Auburn
Auburn Public Library, Old Auburn Library (P838)			X	9/11/2000	Auburn
Baxter (P618)			X	8/16/1983	Dutch Flat
Buckner’s Bar (P354)			X	11/19/1974	Auburn
Burns Home, Howell Home (P656)			X	7/2/1985	Auburn
Butcher Ranch (P357)			X	11/19/1974	Auburn
City of Auburn (404)				4/14/1948	Auburn
Clipper Gap (P359)		X	X	11/19/1974	Auburn
Colfax Freight Depot (N2076)	X			12/17/1999	Colfax
Colfax Passenger Depot (N2044)	X			1/15/1999	Colfax
Dutch Flat Historic District (N219)	X			3/28/1973	Dutch Flat
Emigrant Gap (403)		X		4/14/1948	Emigrant Gap
Finnish Temperance Hall, Finn Hall (P664)			X	8/20/1985	Rocklin
First Transcontinental Railroad-Auburn (780)		X		11/20/1962	Auburn
First Transcontinental Railroad-Colfax (780)		X		11/20/1962	Colfax
First Transcontinental Railroad-Newcastle (780)		X		11/20/1962	Newcastle

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
First Transcontinental Railroad-Rocklin (780)		X		11/20/1962	Rocklin
First Transcontinental Railroad-Roseville (780)		X		11/20/1962	Roseville
Griffith Residence (P517)			X	12/1/1977	Penryn
Griffith House (N725)	X			12/19/1978	Penryn
Griffith Quarry (885)		X		5/9/1975	Penryn
Griffith Quarry (N522)	X			10/20/1977	Penryn
Grizzly Bear House (P355)			X	11/19/1974	Auburn
Haman House (N451)	X			11/17/1976	Roseville
Historic Gatekeeper's Log House (P228)			X	10/5/1971	Tahoe City
Iowa Hill (401)		X		4/14/1948	Iowa Hill
Lake Tahoe Dam (N948)	X			3/25/1981	Tahoe City
Lake Tahoe Outlet Gates (797)		X		9/16/1964	Tahoe City
Liberty House (P356)			X	11/19/1974	Auburn
Lincoln Public Library (N1660)	X			12/10/1990	Lincoln
Masonic Temple, Masonic Hall (P821)			X	5/15/1996	Auburn
Michigan Bluff-Last Chance Trail (N1779)	X			6/26/1992	Michigan Bluff
Mountain Quarries Bridge (N2227)	X			2/11/2004	Auburn
Newcastle Fruit Sheds (P836)			X	3/15/2000	Newcastle
Newcastle Portuguese Hall (P578)	X		X	12/21/1981	Newcastle
Old Auburn Historic District (N62)	X			12/29/1970	Auburn
Ophir (463)		X		8/30/1950	Auburn
Outlet Gates and Gatekeeper's Cabin (N198)	X			12/13/1972	Tahoe City
Overland Emigrant Trail (799)		X		9/16/1964	Soda Springs
Pioneer Express Trail (585)		X		5/22/1957	Folsom
Pioneer Ski Area of America, Squaw Valley (724)		X		1/18/1960	Squaw Valley
Sheridan Cash Store (P728)			X	8/17/1990	Sheridan
Spring Garden School (P361)			X	11/19/1974	Auburn
Stevens Trail (N2181)	X			11/20/2002	Colfax
Strap Ravine Nisenan Maidu Indian Site (N200)	X			1/8/1973	Roseville
Summit Soda Springs (N720)	X			12/15/1978	Soda Springs
Todd's Valley (P358)			X	11/19/1974	Auburn
Town of Dutch Flat (397)		X		4/14/1948	Dutch Flat
Town of Foresthill (399)		X		4/14/1948	Foresthill
Town of Gold Run (405)		X		4/14/1948	Gold Run
Town of Michigan Bluff (402)		X		4/14/1948	Michigan Bluff
U.S. Ranch (P360)			X	11/19/1974	Auburn

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Virginiatown (400)		X		4/14/1948	Newcastle
Watson Log Cabin (N798)	X			8/24/1979	Tahoe City
Woman's Club of Lincoln (N2134)	X			5/30/2001	Lincoln
Yankee Jim's (398)		X		4/14/1948	Foresthill

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/>; Retrieved January 26, 2020

A 1988 publication from the OHP identified five “ethnic historic sites” in Placer County. Five Views: An Ethnic Historic Site Survey for California was originally conceived to broaden the spectrum of ethnic community participation in historic preservation activities and to provide better information on ethnic history and associated sites. The five sites in Placer County identified in the OHP survey are listed below:

- Duke Luster House
- Auburn Chinese American Cemetery
- Auburn Chinese American Community
- Chinese Store
- Tsuda's Store

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Natural Resources

Natural resources are important to include in cost/benefit analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetland areas protects sensitive habitat as well as reducing the force of and storing floodwaters.

The geographic extent of Placer County spans from the Sacramento Valley to the crest of the Sierra Nevada Range eastward to the Nevada state line. The County in its entirety incorporates four physiographic regions, 14 watersheds, numerous biotic regimes, and approximately 89 rare plant and animal species listed as threatened, endangered, or potential candidates for protection under the Endangered Species Act.

Sacramento Valley Plains Region

Roughly the western one third of Placer County is located in the eastern portion of the Sacramento Valley. Much of this region has been impacted by or converted to urban or agricultural uses. The area is typified

by grasslands, oak savannah, and valley foothill riparian vegetation communities. Common plants across the Sacramento Valley Plains region include wild oats, ripgut brome, California poppy, lupines, clover and Valley oak. Common wildlife species include the California ground squirrel, Botta's pocket gopher, mourning dove, horned lark, and western meadowlark. Riparian zones in this region support Freemont's cottonwood, California sycamore, wild rose, California blackberry, blue elderberry, poison oak, and willows.

This region contains wetland types associated with valley floor topography, such as Northern hardpan and Northern volcanic vernal pools, alkali meadow and seep, wet meadow, and fresh emergent wetland.

Lower Foothill Region

The Lower Foothill physiographic region of Placer County is located to the east of the Sacramento Valley Plains at elevations ranging from 100 to 1,300 feet. Typical vegetation communities are Blue Oak woodland, Blue Oak-Digger Pine woodland, annual grasslands, Chamise chaparral, and valley foothill riparian. Blue Oak woodlands are located in areas of shallow rocky soils with understory shrubs including poison oak, California coffeeberry and buckbrush. Blue Oak-Digger Pine woodland is similar to Blue Oak woodlands but includes a mix of pine conifer species.

Common wildlife species in the lower foothills region include California quail, band-tailed pigeons, scrub jay, acorn woodpeckers, yellow-billed magpie, wild turkey, California ground squirrel, western gray squirrel, mule deer, and gray fox.

Upper Foothill/Low Mountain Region

The Upper Foothill/Low Mountain physiographic region is located east of the City of Auburn and includes elevations from 1300 to approximately 6000 feet. In general, forest cover is denser relative to the lower foothill region and tree species are more diverse. High variable factors including soil type, topography, slope and aspect, and human influences from grazing, hardwood harvesting, and other land clearing activities are indicators for forest density and composition. Moderate gradient perennial and intermittent streams and rivers support a varied amount of riparian habitat that provide valuable habitat for wildlife.

Montane Hardwood, Montane Hardwood-Conifer, Ponderosa, and Sierran Mixed Conifer are the dominant forest communities. Common tree species in this region includes canyon live oak, tan oak, Pacific madrone, black oak, Douglas fir, white fir, and incense cedar. Common types of shrubs from these forest types are deerbrush, chinquapin, mountain whitethorn, poison oak, and mountain misery.

Mixed chaparral communities composed of shrubs such as ceanothus, Manzanita, scrub oak, California buckeye and wildlife species such as western rattlesnake, California thrasher, California quail, gray fox, and mule deer are also present in this region. Montane riparian forests located in the Upper Foothill/Low Mountain physiographic region are made up of white alder, aspen, black cottonwood, dogwood, willows, and wild azalea.

High Sierra Region

The High Sierra physiographic region represents the highest elevations of Placer County. The region supports wildlife including Pacific tree frogs, California mountain king snake, dark-eyed junco, Steller’s jay, mountain chickadee, pygmy nuthatch, golden mantled ground squirrel, Allen’s chipmunk, Douglas squirrel, mule deer, black bear and mountain lions. Forest types include aspen, white fir, lodgepole pine, red fir, subalpine conifer, Jeffrey pine and eastside pine. The harsh environment that accompanies the highest elevations of the Sierra crest (9,000-11,000 feet) results in somewhat lower overall plant and wildlife diversity and lower incidence and volume of understory shrubs.

East of the Sierra crest, the drier climate regime supports Ponderosa pine, big sagebrush, rabbitbrush and bitterbrush, and High Sierra/Great Basin transition species. The High Sierra physiographic region is classified as major land resource area 22 under the USDA Soil Conservation Service description of land resource areas. Rivers and streams are at a higher gradient than their foothill or valley floor reaches and support a montane riparian habitat that, like the others, provides valuable habitat for resident and migratory wildlife.

Each physiographic region hosts specific habitats that together support a wide variety of vegetation and wildlife (see Table 4-13), and each region has different susceptibilities to hazards such as wildfire, flood, and drought. Placer County recognizes the importance of protecting, preserving, conserving, and restoring this biodiversity.

Table 4-13 Placer County Habitat Types by Physiographic Region

Sacramento Valley Plains Region	Lower Foothill Region	Upper Foothill/Lower Mountain Region	High Sierra Region
Urban, Agricultural and Rangeland	Urban, Agricultural and Rangeland	Montane Hardwood	Montane Chaparral
Annual Grasslands	Annual Grasslands	Montane Hardwood-Conifer	Montane Hardwood Conifer
Grassland (with Oak Woodland)	Grassland (with Oak Woodland)	Ponderosa	Montane Riparian Forest
Valley-Foothill	Valley-Foothill	Sierran Mixed Conifer	Sierran Mixed Conifer
Riparian/Riverine	Riparian/Riverine	Valley-Foothill	Ponderosa Pine
Valley Oak Woodland	Blue Oak Woodland	Riparian/Riverine	Jeffrey Pine
Northern Hardpan and Northern Volcanic Vernal Pools	Blue Oak-Digger Pine Woodland	Fresh Emergent Wetland	White/Red Fir
Fresh Emergent Wetland	Chamise Chaparral	Mixed Chaparral	Lodgepole Pine
Alkali Meadow and Seep Wet Meadow	Fresh Emergent Wetland Wet Meadow	Blue Oak Woodland	Sub-alpine Conifer
		Blue Oak-Digger Pine Woodland	Alpine Dwarf Scrub
		Fresh Emergent Wetland Wet Meadow	Bitterbrush
			Juniper
			Fresh Emergent Wetland Wet Meadow

Source: Placer County General Plan Background Report 1994

There are 17 primary ecosystem types in Placer County (not including barren, agricultural, and developed land) according to the state’s California Wildlife Habitat Relationships (CWHR) classification system, although many of these can be subdivided into specific habitats. The vulnerability assessment grouped local ecosystems into six categories. Table 4-14 lists these six wild vegetated areas as well as developed and wild unvegetated areas and their acre age in Placer County.

Table 4-14 Ecosystem Coverage in Placer County

Ecosystem	Acres	Percent of Wild Vegetated Area	Percent of All Unincorporated Area
Wild vegetated areas			
Chaparral	60,997	8.4%	6.8%
Conifer forests	526,822	72.8%	58.7%
Grasslands	69,290	9.6%	7.7%
Mountain meadows and scrub	2,195	0.3%	0.2%
Valley and riparian woodlands	61,677	8.5%	6.9%
Wetlands	2,866	0.4%	0.3%
All wild vegetated areas	723,847	100%	80.6%
Developed and wild unvegetated areas			
Agriculture	50,243	–	5.6%
Barren	18,613	–	2.1%
Urban	42,156	–	4.7%
Water bodies	62,876	–	7.0%
Total developed and wild unvegetated areas	173,888	–	19.4%
Total unincorporated area	897,735	–	100%

Source: California Department of Fish and Wildlife, 2021

Special Status Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the Planning Area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

The California Natural Diversity Database, a program that inventories the status and locations of rare plants and animals in California, was queried to create an inventory of special status species in Placer County. A summary list of these species is found below in Table 4-15. Appendix E list the name, federal status, state status, California Department of Fish and Wildlife (USFWS) status, and the California Rare Plant rank of species in Placer County.

Table 4-15 Placer County Planning Area – Summary of Special Status Species

Type	Number
Animals – Amphibians	10
Animals – Arachnids	1

Type	Number
Animals – Birds	46
Animals – Crustaceans	6
Animals – Fish	10
Animals – Insects	11
Animals – Mammals	20
Animals – Mollusks	5
Animals – Reptiles	2
Community – Terrestrial	5
Plants – Bryophytes	3
Plants – Vascular	74

Source: California Natural Diversity Database, retrieved January 20, 2021

Rare Natural Plant Communities

The Placer County General Plan Draft Background Report identifies five rare natural plant communities in the Planning Area:

- Big Tree Forest
- Alkali Meadow
- Alkali Seep
- Northern Hardpan Vernal Pool
- Northern Volcanic Mud Flow Vernal Pool

Significant Natural Areas of Placer County

From information provided in the Placer County General Plan Background Report, Table 4-16 below outlines the location, elements, and rationale for listing of significant natural areas in Placer County.

Table 4-16 Description of Significant Natural Areas in Placer County

Location	Elements	Rationale
Lower Miners Ravine	Fall-run chinook salmon stream	Best example
Roseville eastern vernal pools	Northern volcanic mudflow vernal pools, wetlands	
Roseville northern vernal pools	Roseville northern vernal pools, northern	Extremely rare
Pole Creek	Lahontan cutthroat trout stream	Extremely rare
Upper Secret Ravine	Fall-run chinook salmon stream	Best example
Long Canyon	Saw toothed lewisia, Stebbins' phacelia	
Upper Pleasant Grove Creek	Alkali meadow, alkali seep, hispid birds	

Location	Elements	Rationale
Martis Creek	Lahontan cutthroat trout stream	Best example
Blackwood Creek	Tahoe yellow cress	Extremely rare
Ward Creek	Tahoe yellow cress	Extremely rare

Source: Placer County General Plan Background Report (1994)

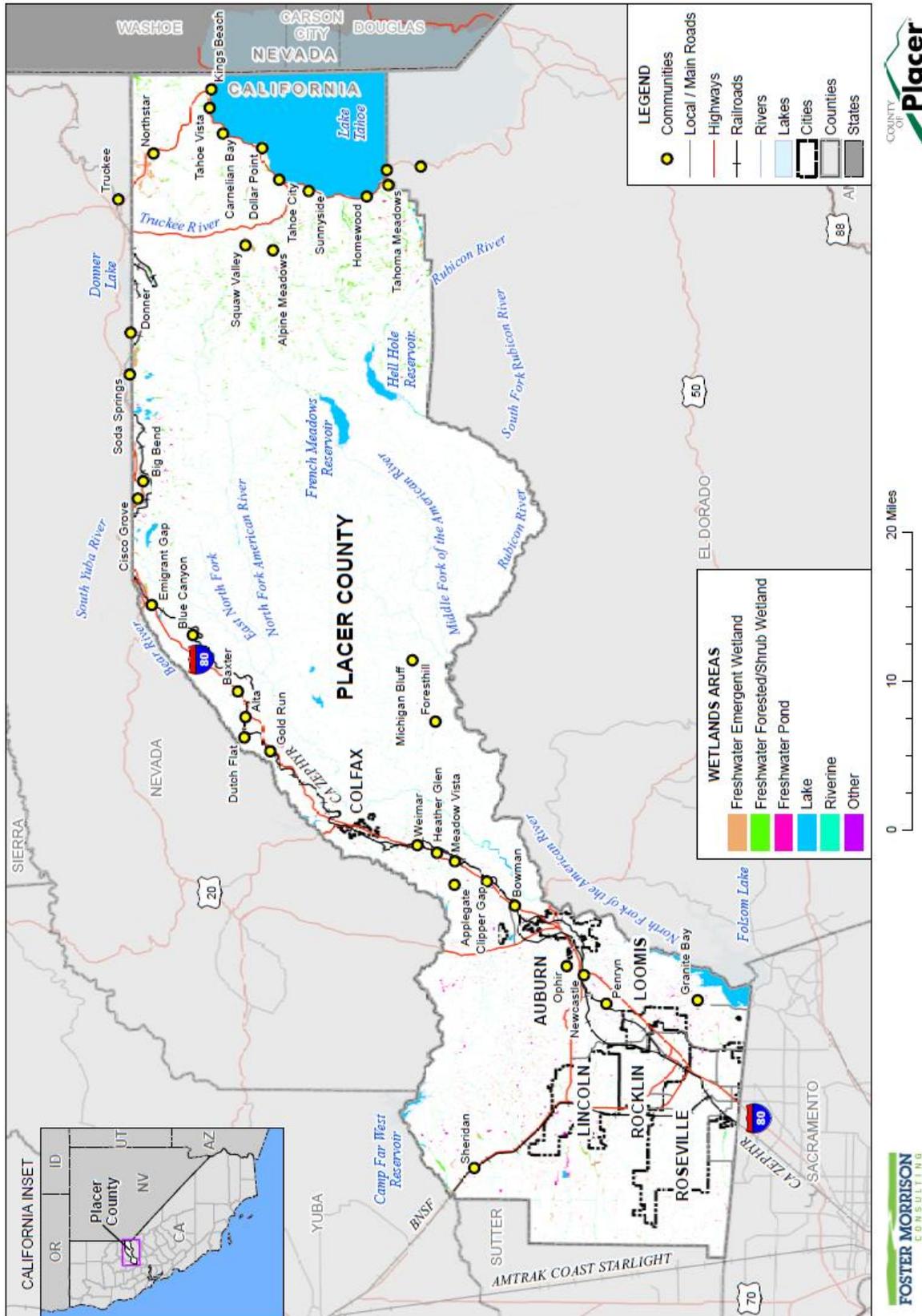
Wetlands

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife. Where the waters provide habitat for federally endangered species, the USFWS may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital, and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

The US Fish and Wildlife Service has mapped wetlands areas throughout the United States. Figure 4-2 shows the wetlands areas in the County. These areas are detailed in Table 4-17 by wetland type.

Figure 4-2 Placer County – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table 4-17 Placer County Planning Area – Wetlands Areas by Area Type

Wetlands Area Type	Wetlands Area (in Acres)
Freshwater Emergent Wetland	4,013
Freshwater Forested/Shrub Wetland	597,652
Freshwater Pond	2,136
Lake	59,072
Riverine	598,543
Other	1
Grand Total	1,261,417

Source: US Fish and Wildlife Service 10/2020

Natural and Beneficial Functions

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplains that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Placer County Planning Area.

Farmlands

Farmlands are important considerations in rural counties in California. Placer County is located within the northern portion of California’s Central Valley in the area known as the Sacramento Valley. It contains some of the richest soils in the State. These soils make the County’s agricultural resources very productive. Even though agricultural production is dependent on weather and economic market fluctuations, local agricultural market revenues continue to rise in Placer County.

Williamson Act

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. The County has designated areas as agricultural preserves within which the county will enter into contracts for the preservation of the land in agriculture. The County has 31,883 acres under Williamson Act Contract as of 2020.

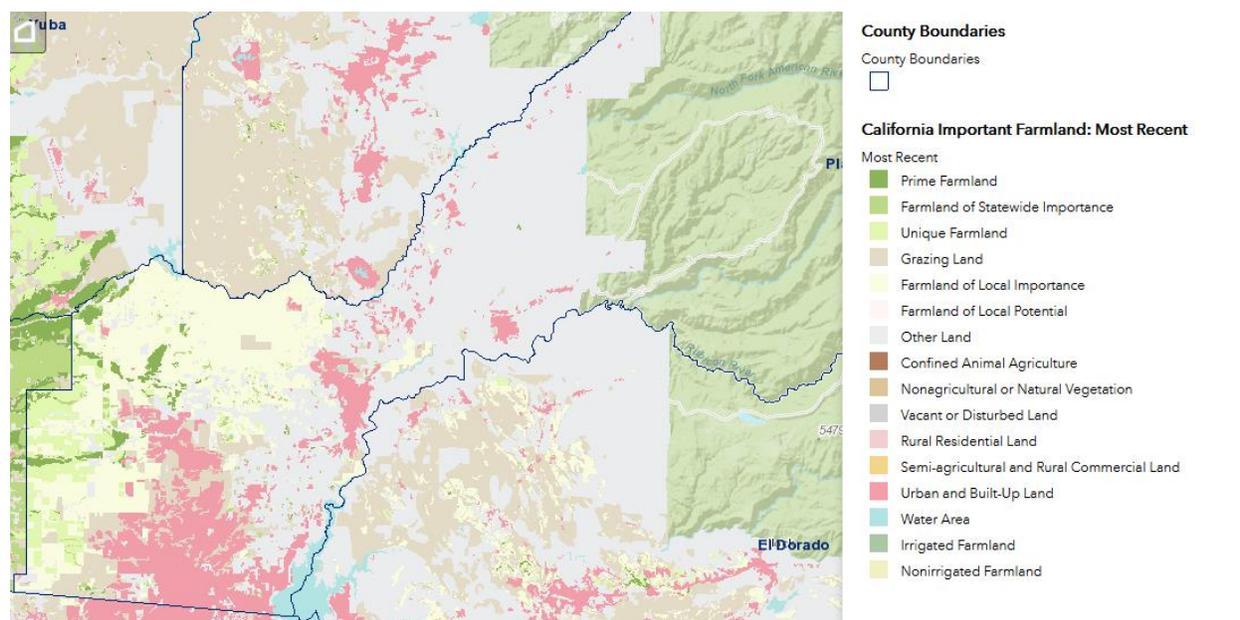
State Inventory of Important Farmland

The Farmland Mapping and Monitoring Program was established in 1984 to document the location, quality, and quantity of agricultural lands and conversion of those lands over time. The program provides impartial analysis of agricultural land use changes throughout California. For inventory purposes, several categories were developed to describe the qualities of land in terms of its suitability for agricultural production. The State Department of Conservation utilizes the following classification system:

- The Prime Farmland category describes farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Farmland of Statewide Importance is farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Unique Farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
- Farmland of Local Importance is either currently producing crops or has the capability of production. This farmland category is determined by each county's board of supervisors and a local advisory committee.

These lands and their locations in Placer County are shown in Figure 4-3.

Figure 4-3 Placer County – Farmland of Importance



Source: California Department of Conservation, Retrieved 1/18/2021

4.2.4. Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the Placer County General Plan Housing Element, the California Department of Finance, and the US Census Bureau form the basis of this discussion.

Current Status and Past Populations

The estimated population of Placer County for January 1, 2020 was 403,711, representing a seven-fold increase from just under 57,000 people in 1960. Table 4-18 and Table 4-19 illustrate the pace of population growth in Placer County dating back to 1940 along with more recent population trends for each jurisdiction. The data on population and housing growth shows that Placer County has seen tremendous growth during the last decades, especially in the incorporated areas of the County. Placer County is consistently one of the fastest growing counties in California.

Table 4-18 Placer County Population Growth 1960-2014

Year	Population	Change	% Change
1940	28,108	—	—
1950	41,649	13,451	48.2%
1960	56,998	15,349	36.9%
1970	77,632	20,308	36.2%

Year	Population	Change	% Change
1980	117,247	39,941	51.0%
1990	172,796	55,549	47.4%
2000	248,399	75,603	43.8%
2010	326,503	100,033	31.4%
2020	403,711	77,208	23.6%

Sources: Placer County Housing Element Background Report, California Department of Finance E-1 Report (2020)

Table 4-19 Population Growth for Jurisdictions in Placer County, 2000-2020

Area	2000	2010	2020	% Change 2000 to 2020
Auburn	12,462	13,330	14,594	17.1%
Colfax	1,520	1,963	2,152	42.6%
Lincoln	11,205	42,819	49,317	440.1%
Loomis	6,260	6,430	6,888	10.0%
Rocklin	36,330	56,974	70,350	93.6%
Roseville	79,921	118,788	145,163	81.6%

Source: US Census Bureau, California Department of Finance E-1 Report (2020)

Special Populations and Disadvantaged Communities

The HMPC noted that the 2020 Placer County Sustainability Plan contained information related to 14 special populations in the County. The following is sourced from that report.

- **Children:** Children ten years old or younger. According to the 2015 ACS, approximately 11,390 children live in the unincorporated areas of Placer County, or approximately 10.1 percent of the total population.
- **Homeless persons:** Persons who do not have a permanent home, including those who live in temporary shelters. There are approximately 580 homeless persons in Placer County, according to the County's 2018 homeless count, although most of these persons are likely in incorporated communities.
- **Households in mobile homes:** Households who live in mobile homes (not including recreational vehicles, or RVs). The 2015 American Community Survey (ACS) reports approximately 2,500 households in the unincorporated areas of Placer County who live in mobile homes, or approximately 6.0 percent of the total number of households.
- **Outdoor workers:** People who mostly work outdoors, including construction workers and people who work in agricultural operations.
- **Persons in poverty:** People living in households with an income below the poverty limit, which is \$25,100 for a household of four people. There are approximately 10,120 people in Placer County who live in poverty, or approximately 9.1 percent of the total population for whom poverty status can be determined, according to the 2015 ACS.
- **Persons in overcrowded households:** People living in households with more than one person per room in the house, not including bathrooms. The 2015 ACS reports approximately 1,180 households in the unincorporated areas of Placer County living in overcrowded or severely overcrowded (more

than 1 and a half people per room) conditions, or approximately 2.9 percent of the total number of households.

- **Persons with chronic health problems:** People who have a long term or permanent health condition that can create regular challenges in their day to day lives. These health problems include obesity, cancer, heart disease, and arthritis.
- **Persons with disabilities:** Persons with any kind of disability, including mobility challenges, hearing and/or vision impairments, behavioral disabilities, and challenges living independently or taking care of themselves. Some people may have more than one disability. According to the 2015 ACS, approximately 13,440 people in the unincorporated areas of Placer County have a disability, or approximately 12.1 percent of the total noninstitutionalized population. Approximately 10,270 households, or approximately 24.9 percent, have at least one household member with a disability.
- **Persons with limited English proficiency:** People who say they do not speak English “well”, or “very well,” although the Census Bureau does not formally define what these terms mean. The 2015 ACS reports that approximately 2,380 people in the unincorporated areas of Placer County who are at least 5 years old have limited English proficiency, or approximately 2.2 percent of the total population.
- **Persons without access to lifelines:** These are individuals who do not have access to basic technology or services, such as transportation or modern telecommunication. These persons may live in areas where these lifelines are not available or feasible, may not be able to afford these lifelines, or for personal reasons may choose not to have them. While data is not available on all persons without lifelines, the 2015 ACS reports that approximately 1,350 households do not have vehicles, or approximately 3.3 percent of all households.
- **Renters:** People who live in homes that they (or the head of their household) do not own. According to the 2015 ACS, approximately 8,920 households in the unincorporated areas of Placer County are renters, or approximately 21.6 percent of all households.
- **Senior citizens:** Persons 65 years of age or older. The 2015 ACS reports that there are approximately 21,260 senior citizens in the unincorporated areas of Placer County, or approximately 18.9 percent of the total population.
- **Senior citizens living alone:** Senior citizens who are the only people living in their homes, although they may have one or more caretakers. According to the 2015 ACS, approximately 4,220 senior citizens live alone in the unincorporated areas of Placer County, or approximately 19.8 percent of all senior citizens.
- **Undocumented persons:** People who do not have formal permission to live in the United States (they do not have citizenship, permanent residency, visas, or other similar status). There are no official counts of how many undocumented persons live in Placer County, but a 2017 study estimated that the total number of undocumented persons in Placer County (including those living in incorporated areas) was 11,600 (other studies have reported somewhat lower populations).

Center for Disease Control Social Vulnerability Index

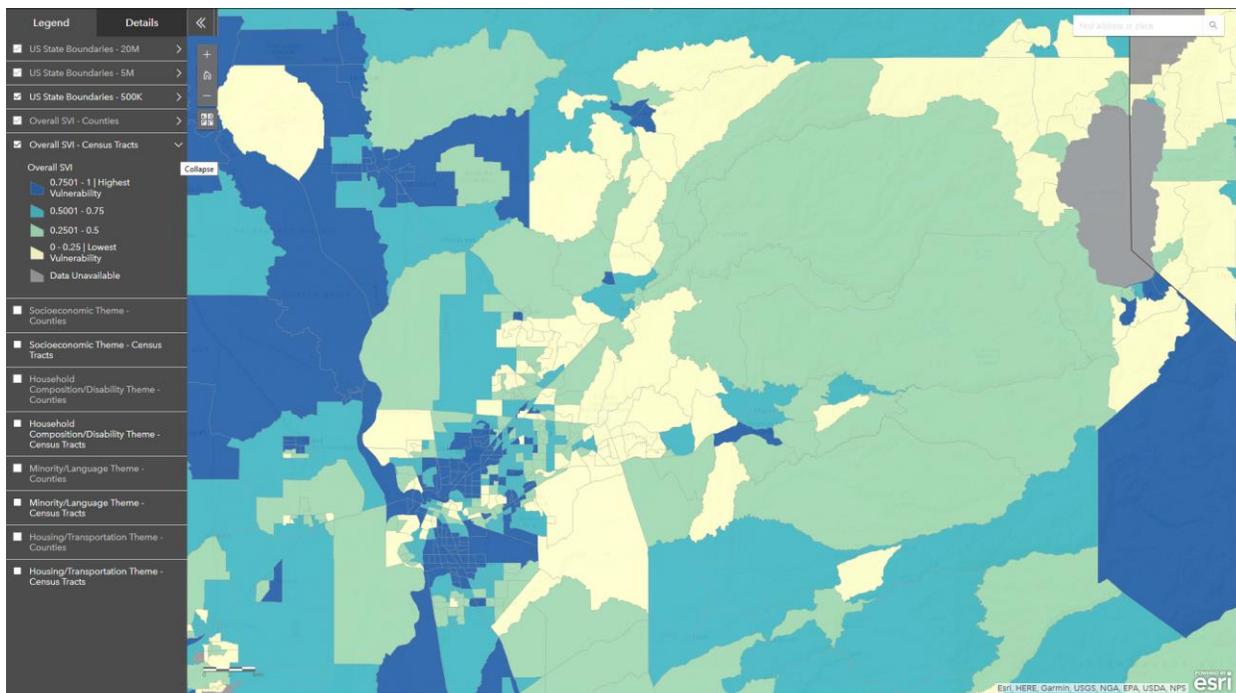
Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community’s ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing

social vulnerability can decrease both human suffering and economic loss. CDC Social Vulnerability Index (CDC SVI) uses 15 U.S. census variables to help local officials identify communities that may need support before, during, or after disasters.

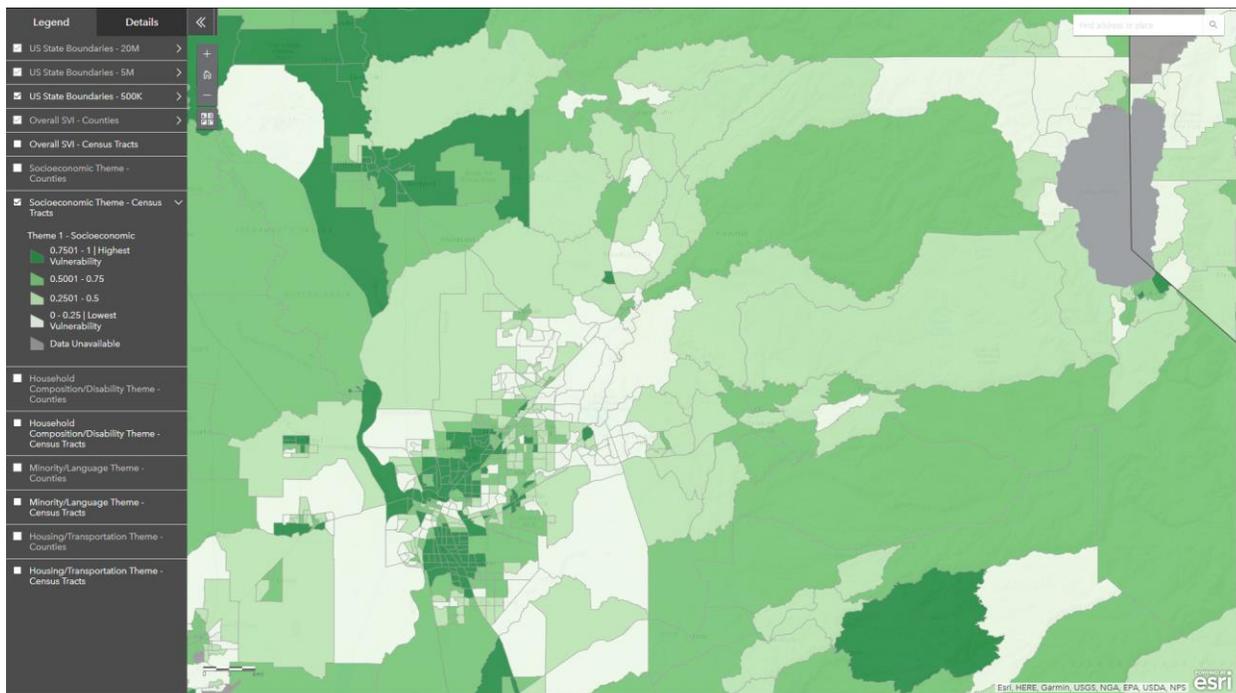
ATSDR’s Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes are shown in the figure below. The overall SVI map is shown in Figure 4-4; the socioeconomic SVI for the County is shown in Figure 4-5; the household composition SVI for the County is shown in Figure 4-6; ; the minority and language SVI for the County is shown in Figure 4-7; and the housing and transportation SVI for the County is shown in Figure 4-8.

Figure 4-4 Placer County – Overall Social Vulnerability



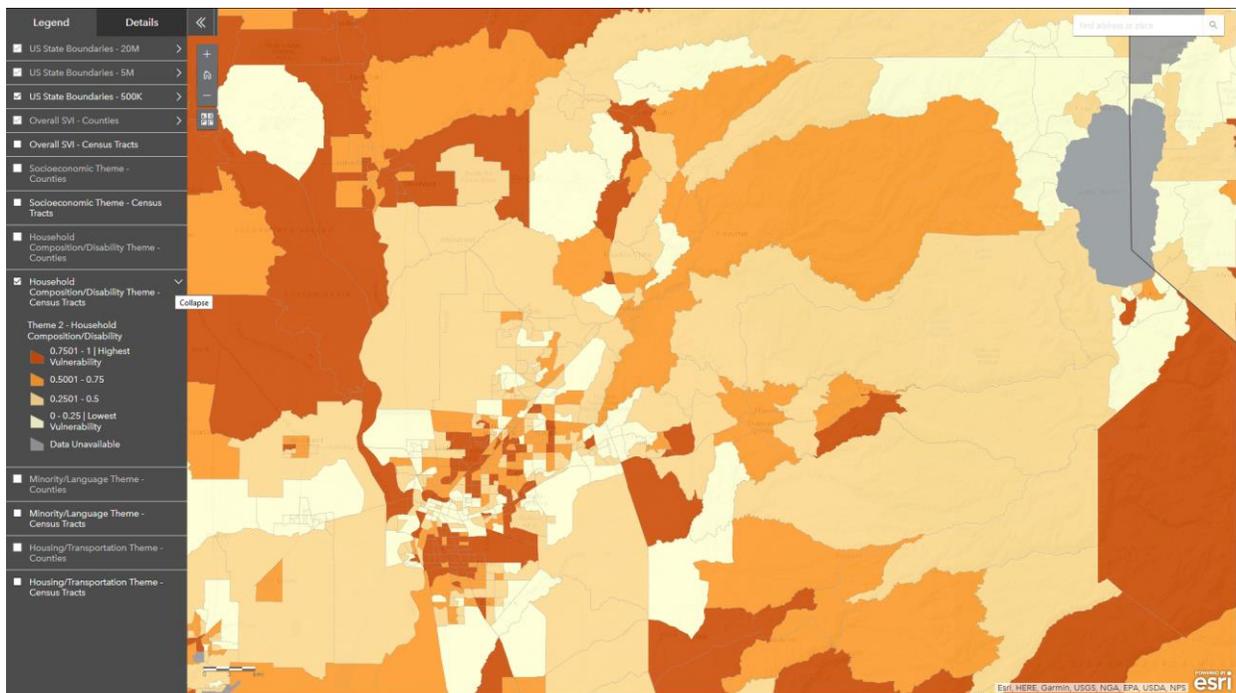
Source: CDC Social Vulnerability Index – map retrieved 11/30/2020

Figure 4-5 Placer County – Socioeconomic Status Vulnerability



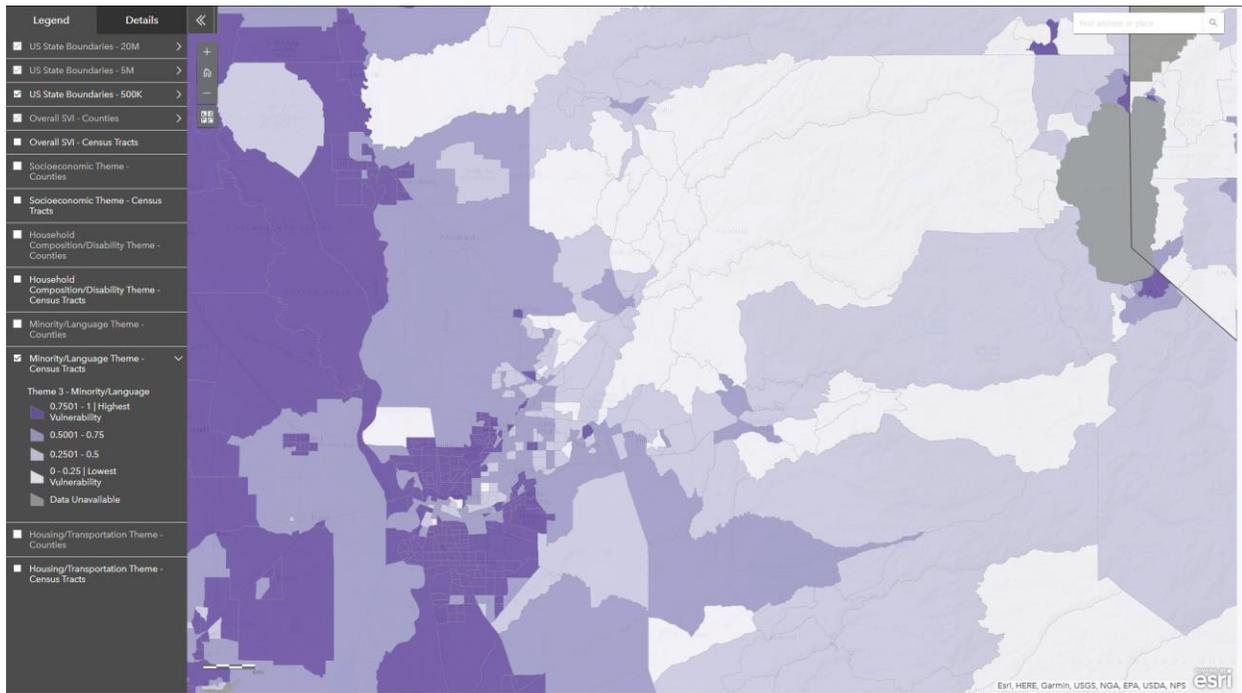
Source: CDC Social Vulnerability Index – map retrieved 11/30/2020

Figure 4-6 Placer County – Household Composition and Disabilities Social Vulnerability



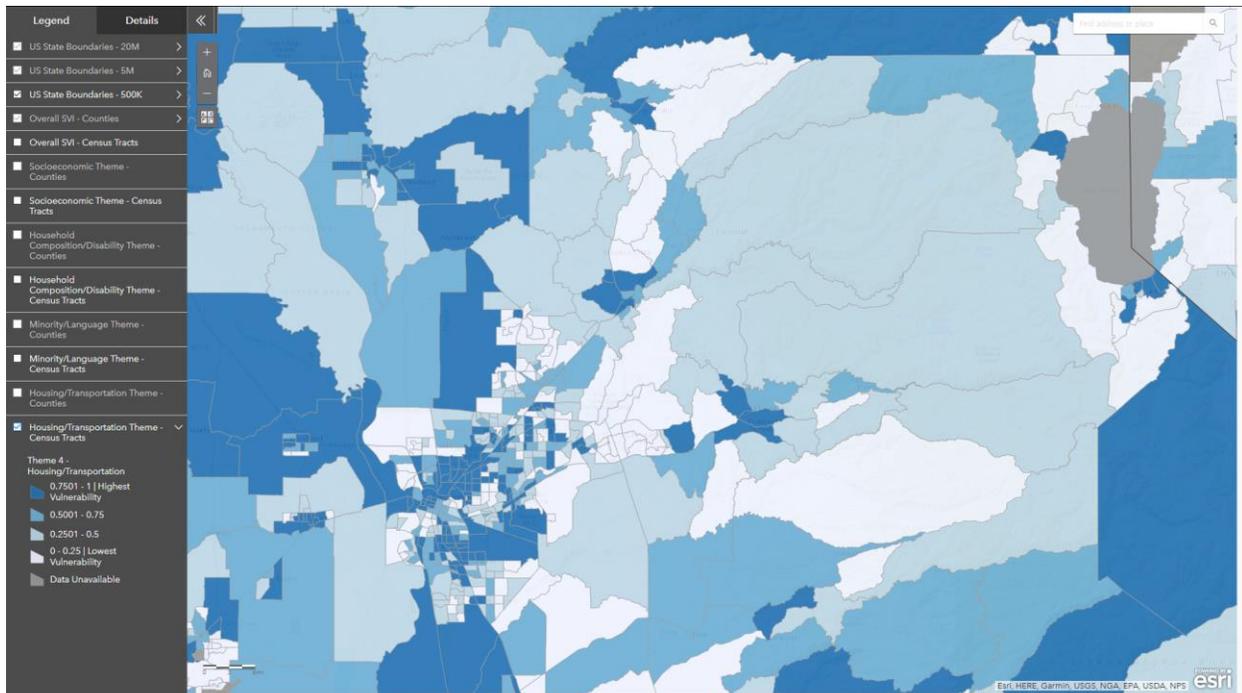
Source: CDC Social Vulnerability Index – map retrieved 11/30/2020

Figure 4-7 Placer County – Minority/Language Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 11/30/2020

Figure 4-8 Placer County – Housing/Transportation Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 11/30/2020

The Placer County Sustainability Plan noted areas in the County with high vulnerability scores. This includes:

➤ **West Placer County Communities with High Social Vulnerability Scores**

- ✓ **Sheridan:** Sheridan is in the northern part of Placer County’s western region, near the Bear River and Camp Far West Reservoir. It has high proportions of households with disabled persons, households living in poverty, English limited households, and households living in mobile homes.
- ✓ **North Auburn:** The unincorporated areas north of Auburn are split into two areas by State Route 49, each with a unique set of social vulnerability factors. The area west of State Route 49 has high numbers of children, persons in poverty, and rental households. The area east of State Route 49 has a high proportion of senior citizens, households with a disabled individual, and English limited households. Both parts of North Auburn have a high proportion of households in mobile homes.
- ✓ **Elders Corner:** Elders Corner is beyond North Auburn, in the area north of Bell Road and west of State Route 49. There are a large number of children living in this area, senior citizens (including seniors living alone), households with a disabled individual, English limited households, rental households, households in poverty, and households in mobile homes.

➤ **Central Placer County and Tahoe Basin Communities with High Social Vulnerability Scores**

- ✓ **Shady Glen:** Shady Glen is a community immediately north of Colfax, along the Interstate 80 corridor. It has a large proportion of seniors living alone, households with a disabled individual, persons in poverty, renters, and persons living in mobile homes.
- ✓ **Tahoe Vista:** Tahoe Vista is a community on the north shore of Lake Tahoe between Carnelian Bay and Kings Beach. It has a high level of social vulnerability due to a large proportion of children, English limited households, renters, overcrowded households, and households in mobile homes.
- ✓ **Kings Beach:** Kings Beach is a community clustered along the north shore of Lake Tahoe. It has a high proportion of English limited households, households in poverty, rental households, and overcrowded households.
- ✓ **Brockway:** Brockway is in north Lake Tahoe along the Nevada state border, directly east of Kings Beach. A high proportion of seniors living alone, English limited households, rental households, and severely overcrowded households contribute to its social vulnerability.

CA DWR Special Population and Disadvantaged Community Mapping

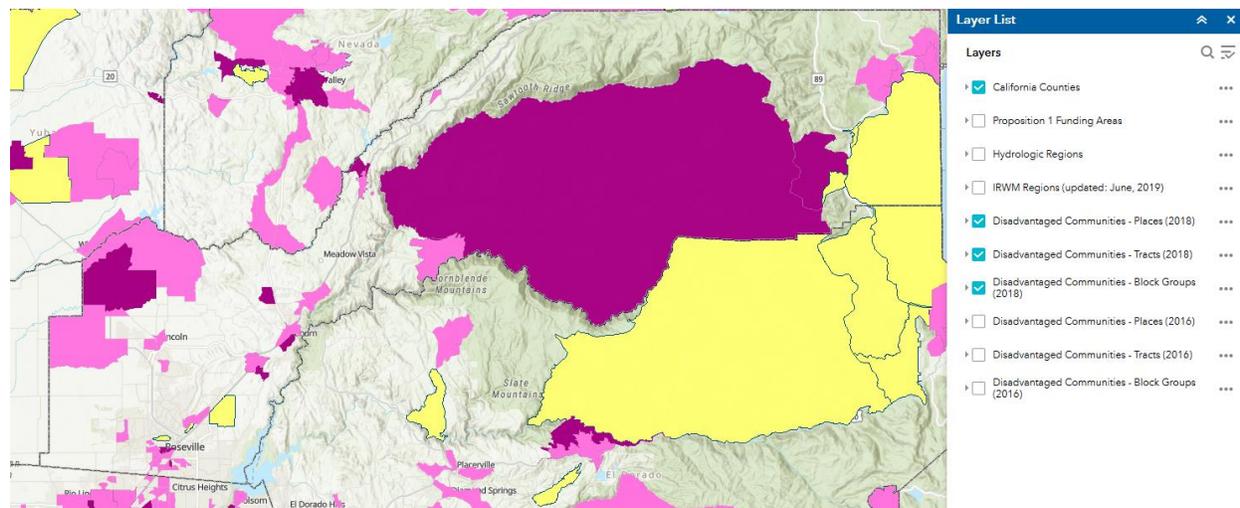
CA DWR has developed a web-based application to assist local agencies and other interested parties in evaluating disadvantaged community (DAC) status throughout the State, using the definition provided by Proposition 84 Integrated Regional Water Management (IRWM) Guidelines (2015). The DAC Mapping Tool is an interactive map application that allows users to overlay the following three US Census geographies as separate data layers:

- Census Place
- Census Tract
- Census Block Group

Only those census geographies that meet the DAC definition are shown on the map (i.e., only those with an annual median household income (MHI) that is less than 80 percent of the Statewide annual MHI (PRC

Section 75005(g)). In addition, those census geographies having an annual MHI that is less than 60 percent of the Statewide annual MHI are shown as "Severely Disadvantaged Communities" (SDAC). The DAC map for Placer County is shown in Figure 4-9.

Figure 4-9 Placer County – Disadvantaged Communities



Source: CA DWR, retrieved 11/30/2020

Climate Change and Health Profile Report – Placer County Special Populations

The 2017 Climate Change and Health Profile Report for Placer County was done by the California Department of Public Health and the University of California-Davis. The report noted that there are special populations in the County.

In 2010, the age-adjusted death rate in Placer County was nearly the same as the state average. Disparities in death rates among race/ethnicity groups highlight how certain populations disproportionately experience health impacts. Within the county, the highest death rate occurred among Whites and the lowest death rate occurred among Asians. In 2012, nearly 40% of adults (119,086) reported one or more chronic health conditions including heart disease, diabetes, asthma, severe mental stress or high blood pressure. In 2012, 16% of adults reported having been diagnosed with asthma. In 2012, approximately 18% of adults were obese (statewide average was 25%). In 2012, nearly 11% of residents aged 5 years and older had a mental or physical disability (statewide average was 10%).

In 2005-2010, there was an annual average of 50 heat-related emergency room visits and an age-adjusted rate of 15 emergency room visits per 100,000 persons (the statewide age-adjusted rate was 10 emergency room visits per 100,000 persons).

Among climate-vulnerable groups in 2010 were 20,851 children under the age of 5 years and 53,562 adults aged 65 years and older. In 2010, there were approximately 3,807 people living in nursing homes, dormitories, and other group quarters where institutional authorities would need to provide transportation in the event of emergencies.

Social and demographic factors and inequities affect individual and community vulnerability to the health impacts of climate change. In 2010, 3% of households (3,359) did not have a household member 14 years or older who spoke English proficiently (called linguistically isolated; statewide average was 10%).

In 2010, approximately 7% of adults aged 25 years and older had less than a high school education (statewide average was 19%).

In 2010, 7% of the population had incomes below the poverty level (the statewide average was 14%). Seventeen percent of households paid 50% or more of their annual income on rent or a home mortgage (statewide average was 22%). In 2012, approximately 19,000 (39%) low-income residents reported they did not have reliable access to a sufficient amount of affordable, nutritious food (called food insecurity; statewide average was 42%).

In 2010, Placer County had approximately 8,666 outdoor workers whose occupation increased their risk of heat illness. In 2010, roughly four percent of households did not own a vehicle that could be used for evacuation (statewide average was 8%). In 2012, approximately 98% of residents did not live within a half mile to frequent public transit.

In 2009, approximately 10% of households were estimated to lack air conditioning, a strategy to counter adverse effects of heat (statewide average was 36%). In 2011, tree canopy, which provides shade and other environmental benefits, was present on 19% of the county's land area (statewide average was 8%).

Development since 2016 Plan

Placer County Building Services tracks total building permits issued since 2016 for unincorporated Placer County. A summary of this development is shown in Table 4-20. Development by known flood fire, and other hazard areas is shown in Table 4-21. All development in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the County to identified priority hazards.

Table 4-20 Placer County Development 2016-2020 Summary

Property Use	2016	2017	2018	2019	2020	2021
Residential	151	440	462	407	485	189
Commercial	87	127	132	147	142	74
Total	238	567	594	654	627	263

Source: Placer County Building Services

Table 4-21 Placer County Development in Hazard Zones since 2016

Property Use	1% Annual Chance Flood	0.2% Annual Chance Flood	Wildfire Risk Area*	Other (Avalanche)
Residential	127	8	2,628	4
Commercial	99	46	741	28
Total	226	54	3,369	32

Source: Placer County Building Services

*Moderate or higher FHSZ

Future Development

Future development in the County is discussed in the sections below.

Future Population Projections

As indicated in the previous section, Placer County had been steadily growing from 1940 to 2010, with a recent slowing in population growth. Long term forecasts by the California Department of Finance project population growth in Placer County continuing through 2060. Table 4-22 shows the population projections for the County as a whole through 2060. Based on this data, population growth continues steadily through 2060.

Table 4-22 Population Projections for Placer County (incorporated and unincorporated), 2020-2060

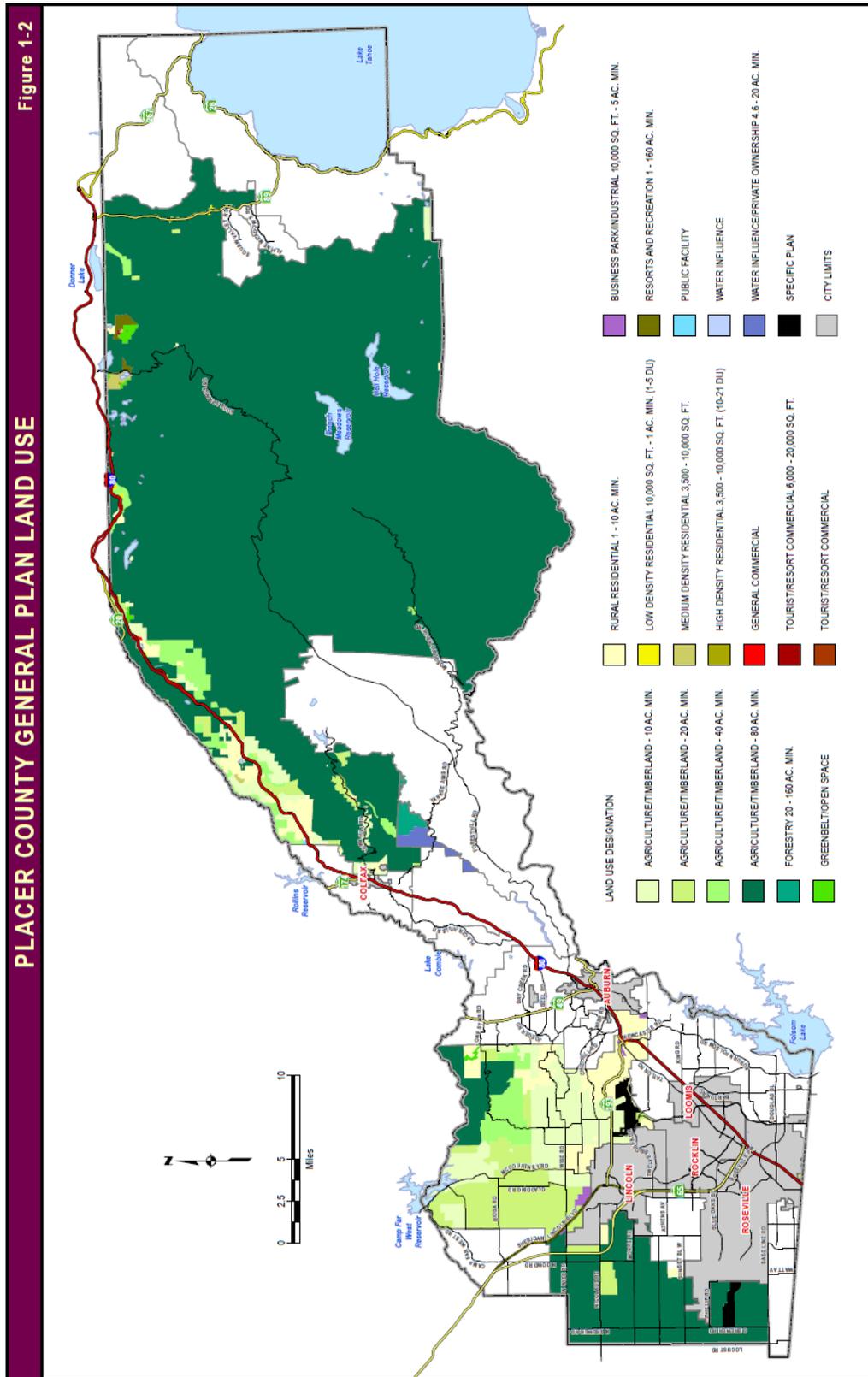
	2020	2030	2040	2050	2060
Placer County	400,434	456,935	511,683	556,006	604,522

Source: California Department of Finance P-2 Report

Future Land Use

The future use of land in the County is fundamental to attaining the vision of a balanced, self-sustaining community. A land use pattern which balances growth between rural and urban areas, as well as providing a balance between housing, employment, natural resources, and services in the County is a key element in maintaining the quality of life and unique character of the County. Descriptions of allowed uses for each classification are detailed in the Placer County General Plan Land Use Element. Figure 4-10 is sourced from this section.

Figure 4-10 Placer County General Plan Land Use



Source: Placer County General Plan Land Use and Circulation Element (updated in 2019)

Future Development GIS Analysis

Unincorporated Placer County has defined two types of future development in the County:

- Approved Planned Residential Project (29 areas)
- Approved Non-Residential Project (8 areas)

The above areas were provided by Placer County and were mapped into GIS format. Using GIS, the following methodology was used in determining parcel counts and acres associated with future development in the unincorporated Placer County Planning Area. Placer County's 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. Using the GIS parcel spatial file and the APNs, the 2 types and 37 future development projects were mapped. These areas can be seen on Figure 4-11 (for the western County), Figure 4-12 (for the eastern County) and detailed in Table 4-23. Analysis of future developments for each City in the County can be found in their respective annexes to this Plan Update.

Figure 4-11 Unincorporated Placer County – West Future Development

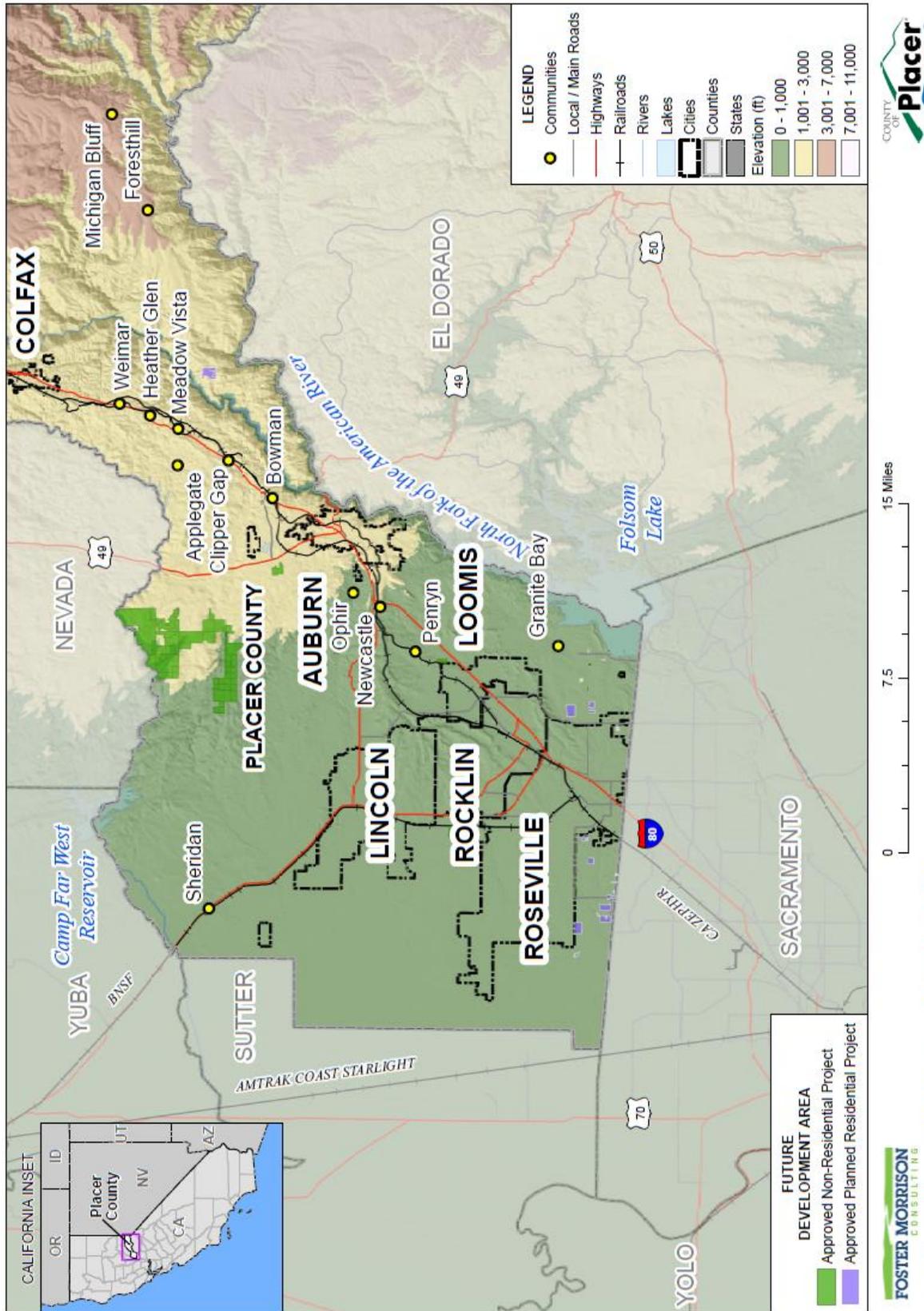


Table 4-23 Unincorporated Placer County – Future Development Acre and Parcel Counts

Future Development Type / Future Development Name	Total Parcel Count	Improved Parcel Count	Total Acres
Approved Planned Residential Project			
Alpine Sierra Subdivision	2	0	44.4
Alpine Village Apartments	1	1	1.7
Barton Ranch	13	0	10.0
Belcara Planned Development	3	2	170.7
Brady Estates	1	0	4.9
Brady Vineyard	2	0	32.6
Brookwood Estates	1	0	8.3
Dollar Creek Crossing	1	0	0.7
Double S Ranch	1	1	36.7
Glen Willow	1	0	84.0
Hopkins Village	2	0	0.2
Lake Vista Estates	2	0	35.5
Mariposa (Parcel J)	4	0	1.8
Mason Trails	1	0	77.5
Morgan Knolls	1	0	15.8
Morgan Place	1	0	11.5
Morgan Ranch (formerly Whisper Creek)	10	3	4.2
Palisades at Squaw	71	16	19.9
Park at Granite Bay	7	1	16.0
Placer Vineyards Property 4B	2	0	22.8
Placer Vineyards Property 7	1	0	92.2
Premier Soleil Townhomes	2	0	8.2
Rancho Del Oro	1	0	117.5
Saber City	2	0	5.0
Schaffer's Mill	2	1	43.3
Ventura at Granite Bay	1	0	6.1
White Wolf Subdivision	6	1	1,105.4
Whitehawk I	1	0	17.6
Whitehawk II	1	0	32.0
Approved Planned Residential Project Total	144	26	2,026.4
Approved Non-Residential Project			
Baseline Commercial Center	2	0	7.0
Catuna Residential Care Home	1	1	2.2

Future Development Type / Future Development Name	Total Parcel Count	Improved Parcel Count	Total Acres
Hidden Falls Regional Park Trail Expansion Project	63	9	5,263.9
Lakeside Redevelopment	7	7	1.9
Placer County Government Center Master Plan Update	2	0	106.5
Placer Gold Industrial Park	8	1	286.7
Quarry Ridge Professional Office Park	1	0	3.0
United Auburn Indian Community Tribal School	1	1	42.3
Approved Non-Residential Project Total	85	19	5,713.5
Grand Total	229	45	7,739.9

Source: Placer County GIS

4.3 Hazard Profiles and Vulnerability Assessment

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The hazards identified in Section 4.1 Hazard Identification, are profiled individually in this section. These Hazard Profiles set the stage for the Vulnerability Assessment, where the vulnerability is quantified for each of the hazards. The methodologies for the Hazard Profiles and Vulnerability Assessment is presented first in this section followed by the Hazard Profiles and Vulnerability Assessment for each identified hazard.

Hazard Profiles

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Placer County Planning Area and the unincorporated County. Where known, this includes information on the hazard location, extent, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical hazard events, including location, impacts, and damages where known. Hazard research, historical incident worksheets, and input from the HMPC were used to capture information on past occurrences.
- **Frequency/Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
 - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year
 - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less
 - ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years
 - ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change**—This section contains the effects of climate change (if applicable). The possible ramifications of climate change on each hazard are discussed.

Vulnerability Assessment

With Placer County’s hazards identified and profiled, a vulnerability assessment was conducted to describe the vulnerability and impact that each hazard would have on the County. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to identified hazards and estimates potential losses. This section focuses on the vulnerabilities of the Placer County Planning Area as a whole, as well as the unincorporated Placer County.

An estimate of the vulnerability of the Placer County Planning Area and unincorporated Placer County to each identified hazard is provided in each of the hazard-specific vulnerability sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of the Placer County Planning Area to that hazard.

The vulnerability assessment identified four hazards in the Planning Area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These four hazards are dam failure, earthquake, flood, and wildfire. The vulnerability of the flood, dam failure, (1%/0.2% annual chance), and wildfire hazards were analyzed using GIS and County parcel and assessor data.

FEMA’s loss estimation software, HAZUS-MH, was used to analyze the County’s vulnerability to earthquakes.

For dam failure, flood (1%/0.2% annual chance), and wildfire, the following elements were inventoried for each community, to the extent possible, to quantify vulnerability in identified hazard areas:

- General vulnerability and hazard-related impacts, including impacts to life, safety, and health
- Values at risk (i.e., types, numbers, and value of land and improvements)
- Population at risk
- Critical facilities at risk
- Overall community impact
- Future development/development trends within the identified hazard area

The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed in more general terms. These include:

- Agricultural Pests and Diseases
- Avalanche
- Climate Change
- Drought and Water Shortage
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flows
- Levee Failure
- Pandemic
- Seiche

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Winds and Tornadoes

The following sections provide the hazard profile and vulnerability assessments for each of the hazards identified in Section 4.1 Hazard Identification. *The severe weather hazards are discussed first to paint the picture of the County’s climate and hazard environment which often lead to other hazards such as flood and wildfire. The remainder of the hazards follow alphabetically.*

General Vulnerability Issues in Placer County

Existing State Routes (SRs) 267 and 89 are the only continuous roadways that connect the Lake Tahoe region and its communities of Placer County to the Interstate 80 corridor (4-lane roadway) to the north accessed through the Town of Truckee in Nevada County. The distance on SR 89 between Tahoe City and Truckee is approximately 12 miles, and similarly, the distance on SR 267 between Kings Beach and Truckee is approximately 12 miles. Both SR 267 and SR 89 are two-lane highways with discontinuous paved shoulders. In the event of a wildfire or other emergency requiring a large scale evacuation, the two highways could become congested and also impact emergency vehicle access. As part of enhancing and encouraging travel in the area using public transit, Placer County is planning to add a third travel lane to both highways for use by public transit and high occupancy vehicles only. Funding for this type of infrastructure will require several years to secure. The third lane could be used by emergency vehicles and/or evacuation purposes in the event of a large scale emergency. This type of infrastructure should be considered the highest priority to help become fully prepared in eastern Placer County for mitigating the potential impacts of a catastrophic event requiring evacuation to help prevent casualties.

Power Shortage/Failure

An additional impact of extreme heat is power outage or power failure. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. Electric power disruptions can be generally grouped into two categories: intentional and unintentional.

Intentional Disruptions

There are four types of intentional disruptions:

- **Planned:** Some disruptions are intentional and can be scheduled based maintenance or upgrading needs
- **Unscheduled:** Some intentional disruptions must be done "on the spot." in response to an emergency
- **Demand-Side Management:** Some customers (i.e., on the demand side) have entered into an agreement with their utility provider to curtail their demand for electricity during periods of peak system loads

- **Load Shedding:** When the power system is under extreme stress due to heavy demand and/or failure of critical components, it is sometimes necessary to intentionally interrupt the service to selected customers to prevent the entire system from collapsing, resulting in rolling blackouts

The California Independent System Operator (CAISO) is tasked with managing the power distribution grid that supplies most of California, except in areas served by municipal utilities. CAISO is thus the entity that coordinates statewide flow of electrical supply. CAISO uses a series of stage alerts to the media based on system conditions. The alerts are:

- Stage 1 – reserve margin falls below 7 percent
- Stage 2 – reserve margin falls below 5 percent
- Stage 3 – reserve margin falls below 1.5 percent

Rotating blackouts become a possibility when Stage 3 is reached. Rotating outages and/or blackouts such as those experienced in 2000/2001 and 2006 can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption.

On January 17, 2001, CAISO declared a Stage 3 Emergency and notified the then Governor's Office of Emergency Services (Cal OES) that PG&E was dropping firm load of 500 megawatts (MW) in Northern California leading to rolling black-outs. Cal OES, in turn, issued an Electrical Emergency Message to all Emergency Services Agencies to prepare for rolling blackouts. This scenario was repeated the following day, January 18, 2001, and again on March 19, 2001.

A July 2006 heat storm event affected the entire state as well as most of the West, producing record energy demand levels in California. The state was able to avoid rotating outages due to a combination of favorable factors that included no major transmission outages, lower than typical generator outages, significant customer response to pleas for energy conservation, high imports from the Pacific Northwest despite unusually high loads, outstanding cooperation among western control area operators, and prompt response to fires that potentially threatened major interties. However, the event brought to light the vulnerability of the electric distribution system, as over 3,500 distribution transformers failed, leaving over two million customers without power at various times over the ten-day event, many for several hours and a small minority for up to three days.

In 2020, the state battled both extreme heat and wildfires. As a result of extreme heat, the CAISO declared a Stage 3 emergency. PG&E initiated rotating outages in August at the request of California's grid operator. The outages, which impacted 220,000 customers, occurred during periods of high heat. These rolling blackouts lasted less than a week.

On June 17, 2021, PG&E has notified Placer OES that rolling blackouts may be declared by Cal ISO in parts of Northern California and could include portions of Placer County. Placer OES was in communications with PG&E and worked to obtain maps of potentially impacted locations. The projected timing is between 7pm and 9pm lasting between 1-2 hours. These are not Public Safety Power Shutoffs.

Unintentional Disruptions

Unintentional or unplanned disruptions are outages that come with essentially no advance notice. This type of disruption can be the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others
- Malfunction or equipment failure
- Equipment overload (utility company or customer)
- Reduced capability (equipment that cannot operate within its design criteria)
- Tree contact other than from storms
- Vandalism or intentional damage
- Weather, including lightning, wind, earthquake, flood, and broken tree limbs taking down power lines
- Wildfire that damages transmission lines

Climate Change and Energy Shortage

Changing climate is expected to bring more frequent and intense natural disasters. Key climate parameters are starting to move outside of historically observed variability at a rate that makes historical data a poor predictor of future climate. For example, the warmest years on record in California occurred in 2014, 2015, 2016, and 2019. 2020 is on pace to be a remarkably hot year as well. In addition, the 2016-2017 year broke the record as the wettest ever recorded in the northern Sierra Nevada Mountains.

Changes in temperatures, precipitation patterns, extreme events, and sea level rise have the potential to decrease the efficiency of thermal power plants and substations, decrease the capacity of transmission lines, render hydropower less reliable, spur an increase in electricity demand, and put energy infrastructure at risk of flooding.

With climate warming, higher costs from increased demand for cooling in the summer are expected to outweigh the decreases in heating costs in the cooler seasons. Hotter temperatures in California will mean more energy (typically measured in “cooling-degree days”) needed to cool homes and businesses both during heat waves and on a daily basis, during the daytime peak of the diurnal temperature cycle. During future heat waves, historically cooler coastal cities (e.g., San Francisco and Los Angeles) are projected to experience greater relative increases in temperature, such that areas that never before relied on air conditioning will experience new cooling demands.

Secondary impacts of energy shortages are most often felt by vulnerable populations. For example, those who rely on electric power for life-saving medical equipment, such as respirators, are extremely vulnerable to power outages. Also, during periods of extreme heat emergencies, the elderly and the very young are more vulnerable to the loss of cooling systems requiring power sources.

Additional impacts from a power disruption affect remote areas. This includes evacuation messaging and coordination difficulties, and a reduction in firefighting capabilities due to lack of water access in more remote areas (especially for those on wells).

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a Public Safety Power Shutoff (PSPS).

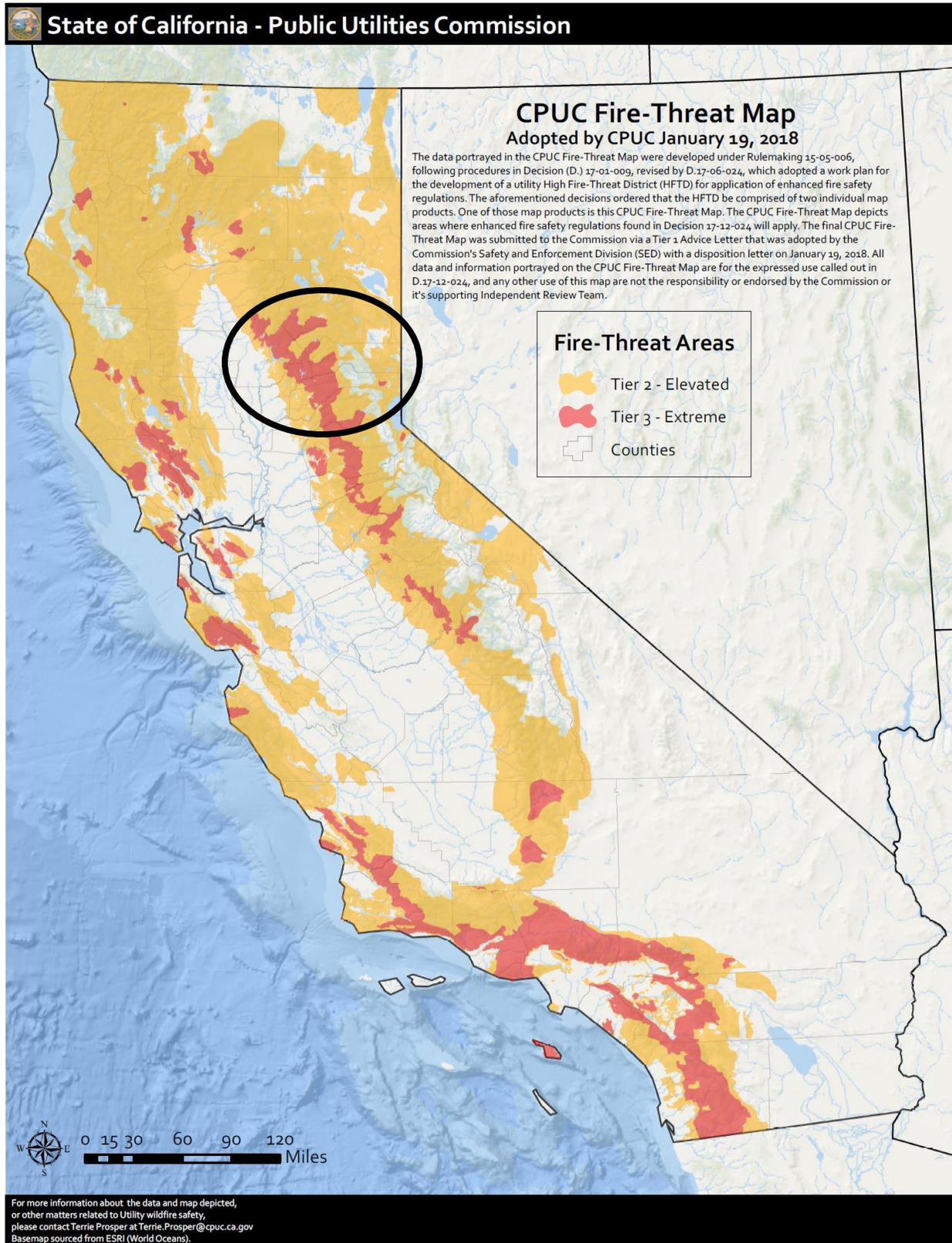
Public Safety Power Shutoff Criteria

The Wildfire Safety Operations Center (WSOC) monitors fire danger conditions across PG&E service areas and evaluates whether to turn off electric power lines in the interest of safety. While no single factor will drive a Public Safety Power Shutoff, some factors include:

- A Red Flag Warning declared by the National Weather Service
- Low humidity levels generally 20% and below
- Forecasted sustained winds generally above 25 mph and wind gusts in excess of approximately 45 mph, depending on location and site-specific conditions such as temperature, terrain and local climate
- Condition of dry fuel on the ground and live vegetation (moisture content)
- On-the-ground, real time observations from PG&E's WSOC and field observations from PG&E crews

The most likely electric lines to be considered for shutting off for safety will be those that pass through areas that have been designated by the CPUC as at elevated (Tier 2) or extreme (Tier 3) risk for wildfire (seen on Figure 4-13). This includes both distribution and transmission lines. The specific area and number of affected customers will depend on forecasted weather conditions and which circuits PG&E needs to turn off for public safety. Although a customer may not live or work in a high fire-threat area, their power may also be shut off if their community relies upon a line that passes through an area experiencing extreme fire danger conditions. This means that any customer who receives electric service from PG&E should be prepared for a possible PSPS.

Figure 4-13 State of California Tier 2 and 3 Areas



PG&E noted that extreme weather threats can change quickly. When possible, PG&E will provide customers with advance notice prior to turning off the power, as well as updates until power is restored. Timing of notifications (when possible) are:

- Approximately 48 hours before power is turned off
- Approximately 24 hours before power is turned off
- Just before power is turned off
- During the public safety outage
- Once power has been restored

The County noted it have been affected by PSPS on the following dates:

- 10/14/2018 – EOC activated at Level 3 (OES staff only). PSPS affected the areas of Colfax, Alta/Dutch Flat, and Todd Valley/Foresthill. Approximately 2200 customers affected in Foresthill and 900 customers in Alta/Dutch Flat.
- 11/8/2018 – EOC activated at Level 3 (OES staff only). Forecast for potential PSPS for Alta, Baxter, Cape Horn, Casa Loma, Dutch Flat, Eden Valley, Foresthill, Gold Run, Hughes Mill, Iowa Hill, Magra, Michigan Bluff, Monte Vista, Pinecroft, Shady Glen, Towle, Yankee Jims. Although forecasted, PG&E didn't initiated PSPS for the noted areas.
- 6/8 – 6/9/2019 – EOC activated at Level 3 (OES staff only). Forecast for potential PSPS: Lincoln, approx. 164 customers.
- 9/21 – 9/25/2019 – EOC activated at Level 3 (OES staff only). Approx 3,000 address points affected in Placer
- 10/9/21 – EOC activated at Level 3 (OES staff & select dept reps) – Approx 35,000 connection points/customers affected
- 10/23/2019 – EOC activated at Level 3 (OES staff only) - Approx 16,000 address points affected
- 10/26/2019 – EOC activated at Level 3 (OES staff only) – Approx 32,000 address points affected
- 10/29/2019 – EOC activated at Level 3 (OES staff only) – Approx 25,000 address points were scheduled to be affect affected, however PG&E did not initiated PSPS for Placer due to change in forecasted weather
- 11/20/2019 – EOC not activated; duty officer monitor status – Approx 12,000 address points were scheduled to be affected, however PG&E did not initiated PSPS for Placer due to change in forecasted weather
- 9/8/2020 – EOC activated at Level 3 (OES staff only) – Approx 6,000 address points affected
- 9/27/2020 – EOC activated at Level 3 (OES staff only) – Approx 4,000 address points affected
- 10/14/2020 – EOC activated at Level 3 (OES staff only) – Approx 389 address points were scheduled to be affect affected, however PG&E did not initiated PSPS for Placer due to change in forecasted weather
- 10/21/2020 - EOC activated at Level 3 (OES staff only) for monitoring only as forecast PSPS to potential impact Placer, however, did not materialized.
- 10/25/2020 – EOC activated at Level 3 (OES staff only) – Approx 17,000 address points affected
- 12/7/2020 - EOC activated at Level 3 (OES staff only) – Approx 6,400 address points were scheduled to be affect affected, however PG&E did not initiated PSPS for Placer due to change in forecasted weather

(NOTE- All customers affected are for Placer only, although total affected address point for each PSPS event is much larger)

Data Sources

In general, information provided by the County and HMPC members is integrated into this section with information from other data sources. The data sources listed below formed the basis for this Hazard Profiles and Vulnerability section of this Plan. Where data and information from these studies, plans, reports, and other data sources were used, the source is referenced as appropriate throughout this risk assessment.

- 2018 California State Hazard Mitigation Plan
- ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.
- Bureau of Land Management
- CA DWR Best Available Maps
- CAL FIRE GIS datasets
- Cal OES
- Cal-Adapt
- Cal-Adapt – Annual Average of Acres Burned
- Cal Adapt – Extended Drought Scenarios
- Cal-Adapt – Number of Extreme Heat Days by Year
- Cal-Adapt – Precipitation: Decadal Averages Map
- California Adaptation Planning Guide
- California Climate Adaptation Strategy (CAS) – 2014
- California Department of Water Resources
- California Department of Water Resources (CA DWR) Division of Safety of Dams
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Division of Mines and Geology
- California Geological Survey
- California Office of Emergency Services – Dam Inundation Data
- California’s Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.
- Climate Change and Health Profile Report – Placer County
- County staff
- Existing plans and studies
- FEMA
- FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes
- FEMA’s HAZUS-MH 4.2 GIS-based inventory data
- Integrated Regional Water Management Plan
- IPCC Fifth Assessment Synthesis Report (2014)
- Kenward, Alyson PhD, Adams-Smith, Dennis, and Raja, Urooj. Wildfires and Air Pollution – The Hidden Health Hazards of Climate Change. Climate Central. 2013.
- Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.
- Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. Climatic Change. 138: 655. doi:10.1007/s10584-016-1762-6. 2016.
- Multi-Hazard Identification and Risk Assessment, FEMA 1997
- National Drought Mitigation Center

- National Drought Mitigation Center – Drought Impact Reporter
- National Integrated Drought Information System
- National Levee Database
- National Oceanic and Atmospheric Administration’s National Climatic Data Center
- National Weather Service
- Natural Resource and Conservation Service
- NOAA Storm Prediction Center
- Pacific Gas and Electric Company
- Personal interviews with planning team members and staff from the County
- Placer County General Plan (2013)
- Placer County General Plan Background Report
- Placer County Housing Element (2013)
- Placer County Housing Element Background Report (2013)
- Placer County Resource Conservation District Long Range Strategic Plan (2011)
- Placer County Sustainability Plan (2020)
- Proceedings of the National Academy of Sciences
- Public Health Alliance of Southern California
- Public Policy Institute of California
- Science Magazine
- Statewide GIS datasets from other agencies such as Cal OES, FEMA, USGS, CGS, Cal Atlas, and others
- U.S. Census Bureau 2010 Household Population Estimates
- U.S. Fish and Wildlife Service
- U.S. Fish and Wildlife Service’s National Wetlands Inventory maps
- U.S. Forest Service GIS datasets
- U.S. Geological Survey
- U.S. Occupational Safety and Health Administration
- United States Geological Survey Open File Report 2015-3009
- University of California
- US Army Corps of Engineers
- US Department of Agriculture
- US Farm Service Agency
- US Fish and Wildlife Service
- USDA Forest Service Region 5
- USGS Bulletin 1847
- USGS National Earthquake Information Center
- USGS Publication 2014-3120
- Vaisala National Lightning Detection Network
- Western Regional Climate Center
- World Health Organization
- Written descriptions of inventory and risks provided by Placer County

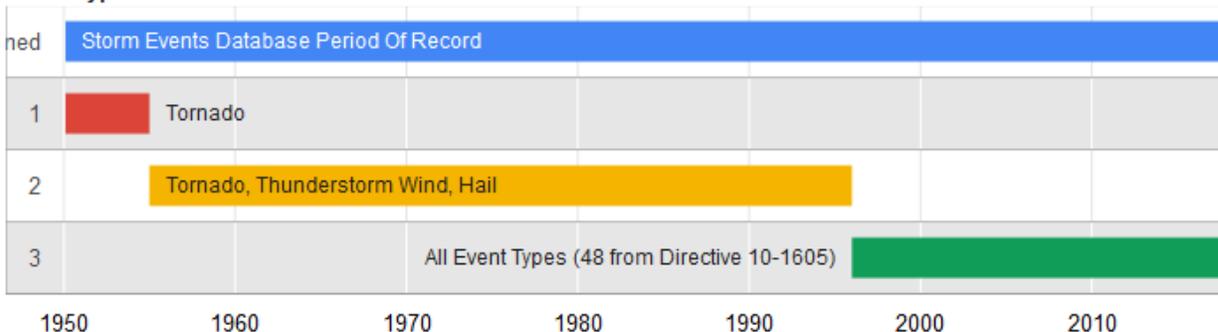
4.3.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the Placer County Planning Area as localized storms that bring heavy rains and floods; severe cold, snow, and winter weather;

extreme heat, and strong winds. The NOAA’s NCDC has been tracking severe weather since 1950. Their Storm Events Database contains data on the following events shown on Figure 4-14.

Figure 4-14 NCDC Storm Events Database Period of Record

Event Types Available:



Event Types Available:

Add more info about event types here. Link to collections page/tab when referencing data collection source.

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the [Unformatted Text Files](#).

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in [NWS Directive 10-1605](#).

Source: NCDC

The NCDC’s Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 1,349 severe weather events that occurred in Placer County between January 1, 1950, and July 31, 2020. Table 4-24 summarizes these events.

*Table 4-24 NCDC Severe Weather Events for Placer County 1950-7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Avalanche	15	6	12	\$0	\$0	0	0
Blizzard	4	0	0	\$30,000	\$0	0	1
Cold/Wind Chill	19	1	0	\$0	\$0	2	8
Debris Flows	6	0	0	\$8,000	\$0	0	0
Dense Fog	11	6	38	\$2,120,000	\$0	0	1
Dense Smoke	1	0	0	\$0	\$0	0	0
Drought	44	0	0	\$0	\$0	0	0
Excessive Heat	5	6	1	\$0	\$0	0	2

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Extreme Cold/Wind Chill	1	0	0	\$0	\$0	0	0
Flash Flood	6	0	0	\$150,000	\$0	0	0
Flood	33	2	1	\$12,370,000	\$7,800,000	0	0
Frost/Freeze	9	0	0	\$200,000	\$5,000,000	0	0
Funnel Cloud	2	0	0	\$0	\$0	0	0
Hail	9	0	0	\$1,000	\$0	0	0
Heat	27	0	3	\$0	\$0	1	1
Heavy Rain	59	2	0	\$10,000	\$0	0	0
Heavy Snow	633	2	6	\$1,675,000	\$0	1	3
High Surf	1	0	0	\$0	\$0	0	0
High Wind	150	0	1	\$12,371,000	\$48,000	0	0
Landslide	1	0	0	\$0	\$0	0	0
Strong Wind	34	1	2	\$2,599,600	\$0	0	0
Thunderstorm Wind	4	0	0	\$20,000	\$0	0	0
Tornado	5	0	0	\$252,530	\$0	0	0
Waterspout	1	0	0	\$0	\$0	0	0
Wildfire	22	3	22	\$500,525,000	\$0	21	0
Winter Storm	154	2	3	\$265,000	\$0	1	1
Winter Weather	93	4	0	\$10,000	\$0	0	2
Total	1,349	35	89	\$532,607,130	\$12,848,000	26	19

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

The NCDC table above summarize severe weather events that occurred in Placer County. Only a few of the events actually resulted in state and federal disaster declarations. It is further interesting to note that different data sources capture different events during the same time period, and often display different information specific to the same events. The value in this data is that it provides data depicting the County's "big picture" hazard environment.

As previously mentioned, many of Placer County's state and federal disaster declarations have been a result of severe weather. For this Plan, severe weather is discussed in the following subsections:

- Extreme Heat
- Freeze and Snow
- Heavy Rains and Storms
- High Winds and Tornadoes

Due to size of the County and changes in elevation (i.e., from approximately 100 feet to more than 9,000 feet above mean sea level (msl)) and climate, weather conditions can vary greatly across the County. For purposes of this hazard profile, the County will be divided into two distinct sections, as applicable: western

Placer County, which is predominantly below an elevation of 4,000 feet above msl, is generally below the snowfall line (although snow has fallen at lower elevations), and includes the community of Foresthill and all land to the west (including all incorporated cities and towns); and eastern Placer County, which is generally above 4,000 feet above msl, receives snowfall, and includes all of the County east of Foresthill. The profiles that follow provide information, where possible, from two Western Regional Climate Center (WRCC) weather stations located in these two different parts of the County: Auburn (elevation: 1,290 feet above msl) in west Placer County and Tahoe (elevation: 6,230 feet above msl), in east Placer County.

4.3.2. Severe Weather: Extreme Heat

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to information provided by FEMA and the National Weather Service (NWS), extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. Extreme heat conditions can also compound the effects of other hazards, such as drought and wildfire and can contribute to increases in tree mortality. Extreme heat can also affect agriculture in Placer County. During times of high heat, low humidity, and winds, PG&E can issue a Public Safety Power Shutdown (PSPS) for the County.

A key concern is the effect of extreme heat on people, especially vulnerable populations. Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds a level at which the body can remove it, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness may develop. Elderly persons, small children, chronic invalids, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions.

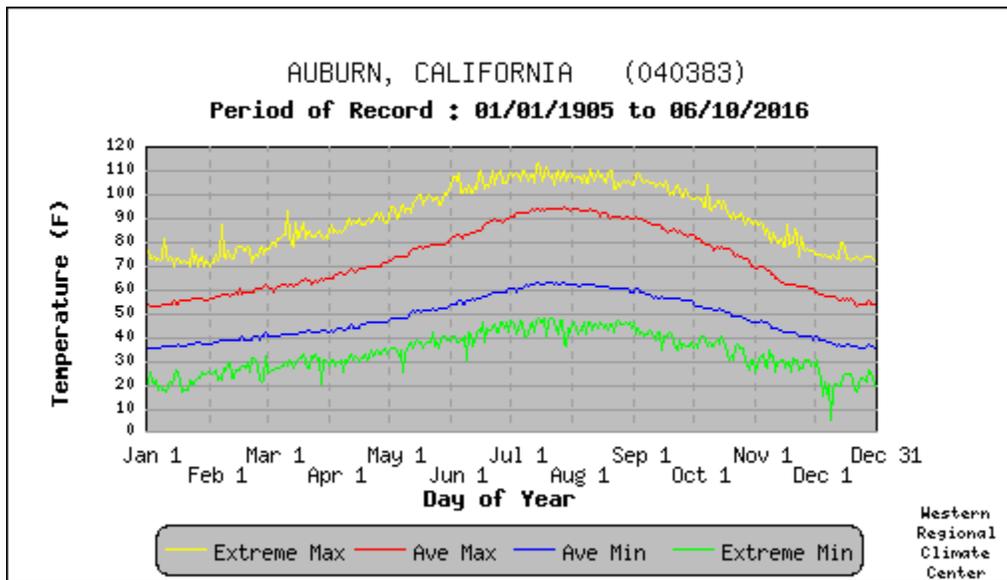
Location and Extent

Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the County, though it is more prevalent in the lower elevations in the western portions of the County. All portions of the County are at some risk to extreme heat. Extreme heat occurs throughout the Planning Area primarily during the summer months. The WRCC maintains data on weather normal and extremes in the western United States. Information from the representative weather stations introduced in Section 4.3.1 is summarized below.

Placer County – West (Auburn Weather Station, Period of Record 1905 to 2016 [Elevation of 1,360 feet above msl])

According to the WRCC, in western Placer County, monthly average maximum temperatures in the warmest months (May through October) range from the upper-70s to the low-90s. The highest recorded daily extreme was 113°F on July 15, 1972. In a typical year, maximum temperatures exceed 90°F on 67.7 days. Figure 4-15 shows the average daily high temperatures and extremes for the western County. Table 4-25 shows the record high temperatures by month for the western County.

Figure 4-15 Placer County – West Daily Temperature Averages and Extremes



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Table 4-25 Placer County – West Record High Temperatures 1905 to 2016

Month	Record High	Date	Month	Record High	Date
January	81°	1/9/1962	July	113°	7/15/1972
February	78°	2/20/1964	August	111°	8/10/1978
March	93°	3/11/1910	September	109°	9/3/1950
April	90°	4/25/1910	October	100°	10/6/1913
May	102°	5/31/1910	November	89°	11/1/1965
June	110°	6/16/1961	December	85°	12/6/1913

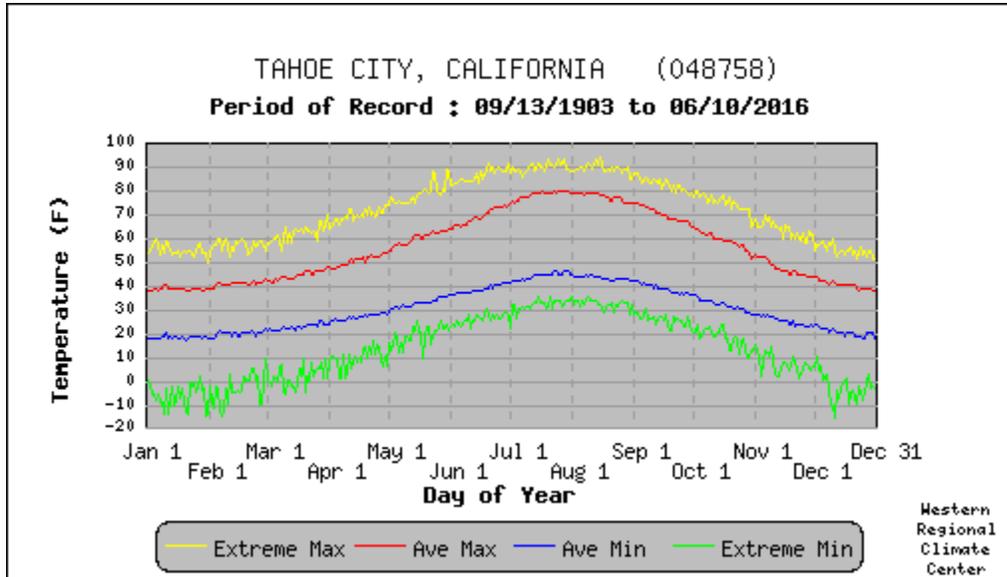
Source: Western Regional Climate Center

Placer County – East (Tahoe City Weather Station, Period of Record 1903 to 2016 [Elevation of 6,230 feet above msl])

According to the WRCC, in eastern Placer County, monthly average maximum temperatures in the warmest months (May through October) range from the upper-40s to the low-70s. The highest recorded daily extreme was 94°F on August 15, 1933. In a typical year, maximum temperatures exceed 90°F on 0.4 days.

Figure 4-16 shows the average daily high temperatures and extremes for the eastern County. Table 4-26 shows the record high temperatures by month for the eastern County.

Figure 4-16 Placer County – East Daily Temperature Averages and Extremes



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Table 4-26 Placer County – Eastern Record High Temperatures 1903 to 2016

Month	Record High	Date	Month	Record High	Date
January	59°	1/10/1990	July	93°	7/20/1931
February	60°	2/17/1985	August	94°	8/15/1933
March	67°	3/27/1988	September	87°	9/3/1931
April	74°	4/30/1981	October	80°	10/3/1933
May	89°	5/30/1910	November	70°	11/6/1988
June	90°	6/22/1961	December	60°	12/10/1990

Source: Western Regional Climate Center

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios. While heat waves are obviously less dramatic, they are potentially deadlier. According to the 2018 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The NWS has in place a system or scale to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color

(green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-27.

Table 4-27 National Weather Service HeatRisk Categories

Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Source: National Weather Service

The NWS office in Sacramento can issue the following heat-related advisory as conditions warrant.

- **Heat Advisories** are issued during events where the HeatRisk is on the Orange/Red threshold (Orange will not always trigger an advisory)
- **Excessive Heat Watches/Warnings** are issued during events where the HeatRisk is in the Red/Magenta output

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disasters related to extreme heat, as shown in Table 4-4. The County had five USDA disaster declarations since 2002 related to extreme heat, as shown on Table 4-28.

Table 4-28 Placer County – USDA Heat Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2003	N/A	N/A	Late Rain/Heat
2004	N/A	N/A	Unseasonable Early Heat
2005	N/A	N/A	Heat
2006	N/A	N/A	Heat
2007	N/A	N/A	Heat

Source: USDA

NCDC Events

The NCDC data showed 32 extreme heat incidents for Placer County since 1993. This can be seen in Table 4-29

*Table 4-29 NCDC Heat Events for Placer County 1950-7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Excessive Heat	5	6	1	\$0	\$0	0	2
Heat	27	0	3	\$0	\$0	1	1
Total	32	6	4	\$ 0	\$ 0	1	3

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

Hazard Mitigation Planning Committee Events

The HMPC identified the following events related to extreme temperatures in the Placer County Planning Area.

- June 13, 1961 – A heat event recorded in the SHELDUS database reported property damage of \$14,700.
- July 2006 – In response to extreme high temperature, the Governor’s Office of Emergency Service (now Cal OES) directed that the California Department of Food and Agriculture make each state-owned fairground a cooling center, which included the Placer County Gold Country Fairgrounds (PC GCF). PCOES and Health & Human Services served as lead in coordinating and staffing the cooling center located at the PC GCF.
- June-September 2007 – PCOES & County HHS coordinated contingency preparedness to activate cooling centers for general public and assistance to special population in response to very high temperatures occurring throughout the summer.
- June-September 2008 – PCOES & County HHS coordinated contingency preparedness to activate cooling centers for general public and assistance to special population in response to very high temperatures occurring throughout the summer.
- May 25 – June 22, 2020 – NWS forecast heat wave for the region, however, after assessment of the forecast high temperatures & discussion with County Public Health, determined the forecast temp did not meet threshold for activation of EOC or cooling centers/locations.
- Aug 14 – 19, 2020 – NWS forecast for prolonged extreme heat period (102- and 113-degrees Fahrenheit). Placer County opened a cooling center at the Auburn Library on Monday (8/17); City of Roseville and City of Rocklin each opened a cooling center.

It was noted that high temperatures and high winds occurred on the dates that PSPS events were issued for the County. Those dates were discussed at the beginning of Section 4.3.

Likelihood of Future Occurrence

Highly Likely—Temperature extremes are likely to continue to occur annually in the Placer County Planning Area. Temperatures at or above 90°F are common most summer days in the lower elevations of the County.

Climate Change and Extreme Heat

Climate change and its effect on extreme heat in the County is discussed utilizing four sources:

- Placer County Sustainability Plan – 2020
- Climate Change and Health Profile Report – Placer County
- California Climate Adaptation Strategy (CAS) – 2014
- Cal-Adapt

2020 Placer County Sustainability Plan

The warmer temperatures brought on by climate change are likely to cause an increase in extreme heat events in all parts of California, including the different areas of Placer County. Depending on emission levels, the number of extreme heat days is expected to rise from a historical average of 4 annually to between 22 and 32 by the middle of the century, and to between 33 and 62 by the end of the century, depending on the location and level of emissions. According to the state Cal Adapt database, cooler areas may see about as many extreme heat days as warmer areas. For example, even though the extreme heat threshold in Tahoe City is more than 20 degrees cooler than the threshold in Sheridan, both communities are projected to see a similar number of extreme heat days. Table 4-30 shows extreme heat thresholds and projections for the number of extreme heat days in different communities in the unincorporated area of Placer County.

Table 4-30 Placer County – Future Extreme Heat Days by Community

Community	Extreme Heat Threshold (°F)	Number of Historical Extreme Heat Days	Number of Extreme Heat Days (2040-2060)		Number of Extreme Heat Days (2070-2099)	
			Medium GHGS (RCP 4.5)	High FHGS (RCP 8.5)	Medium GHGS (RCP 4.5)	High GHGS (RCP 8.5)
Granite Bay	104.6	4.3	23	30	33	53
Penryn	104.1	4.3	24	32	35	56
Sheridan	105.0	4.3	25	32	37	59
Meadow Vista	100.8	4.3	22	31	35	58
Foresthill	99.3	4.3	22	30	34	58
Alta	94.3	4.2	23	30	35	62
Tahoe City	82.1	4.2	22	31	36	61
Kings Beach	82.7	4.3	23	31	36	60

Source: Placer County Sustainability Plan - 2020

In addition to the increases in extreme heat events, all of Placer County is also expected to see an increase in the average daily high temperatures. Although the temperature increases may appear modest, the projected high temperatures are substantially greater than historical norms. These increases also make it more likely that an above--average high temperature will cross the extreme heat threshold. average high temperature will cross the extreme heat threshold.

Climate Change and Health Profile Report – Placer County

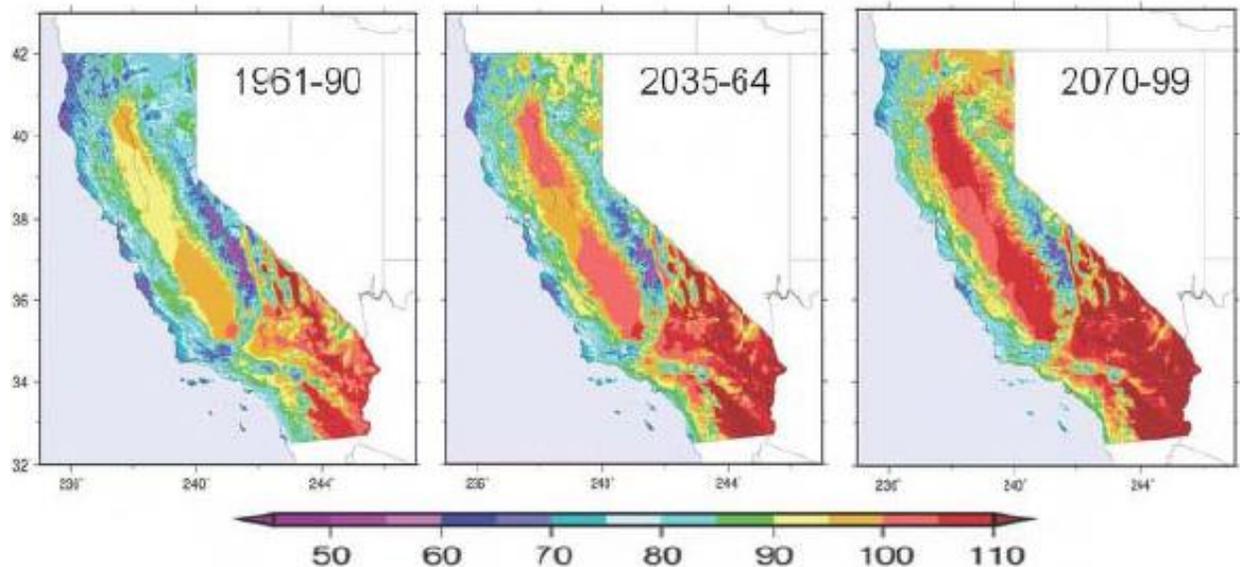
The 2017 Climate Change and Health Profile Report (CCHPR) noted for Placer County that increased temperatures manifested as heat waves and sustained high heat days directly harm human health through heat-related illnesses (mild heat stress to fatal heat stroke) and the exacerbation of pre-existing conditions

in the medically fragile, chronically ill, and vulnerable. Increased heat also intensifies the photochemical reactions that produce smog and ground level ozone and fine particulates (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and carbon dioxide enhance the growth of plants that produce pollen, which are associated with allergies. Increased temperatures also add to the heat load of buildings in urban areas and exacerbate existing urban heat islands adding to the risk of high ambient temperatures.

Climate Adaptation Strategy

The 2014 CAS, citing a California Energy Commission study, states that “over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined.” This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves as shown in Figure 4-17.

Figure 4-17 California Historical and Projected Temperature Increases – 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and Placer County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2014 CAS report and the 2018 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in mortality related to extreme heat in Placer County.

Cal-Adapt

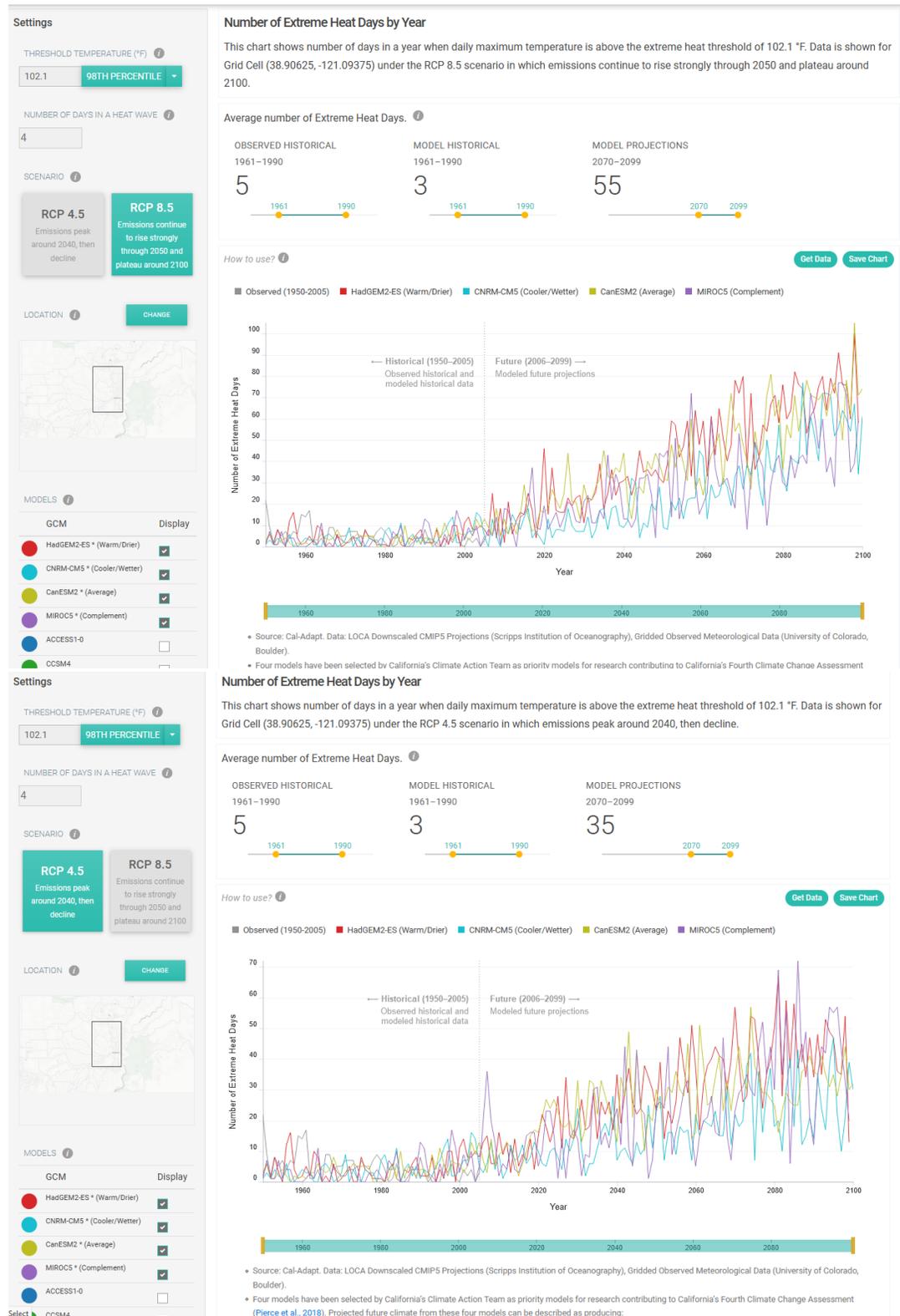
Cal Adapt also noted that overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the

temperature increases projected in the higher emissions scenario (Representative Concentration Pathways (RCP) 8.5) are approximately twice as high as those projected in the lower emissions scenario (RCP 4.5).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt for the Placer County Planning (using the quad that contains the Auburn) are shown in Figure 4-18. It shows the following:

- The upper chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0°F. Data is shown for Placer County under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0 °F. Data is shown for Placer County under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-18 Placer County – Future Temperature Estimates in Low and High Emission Scenarios



Source: Cal-Adapt – Number of Extreme Heat Days by Year, Retrieved 12/7/2020

Vulnerability Assessment

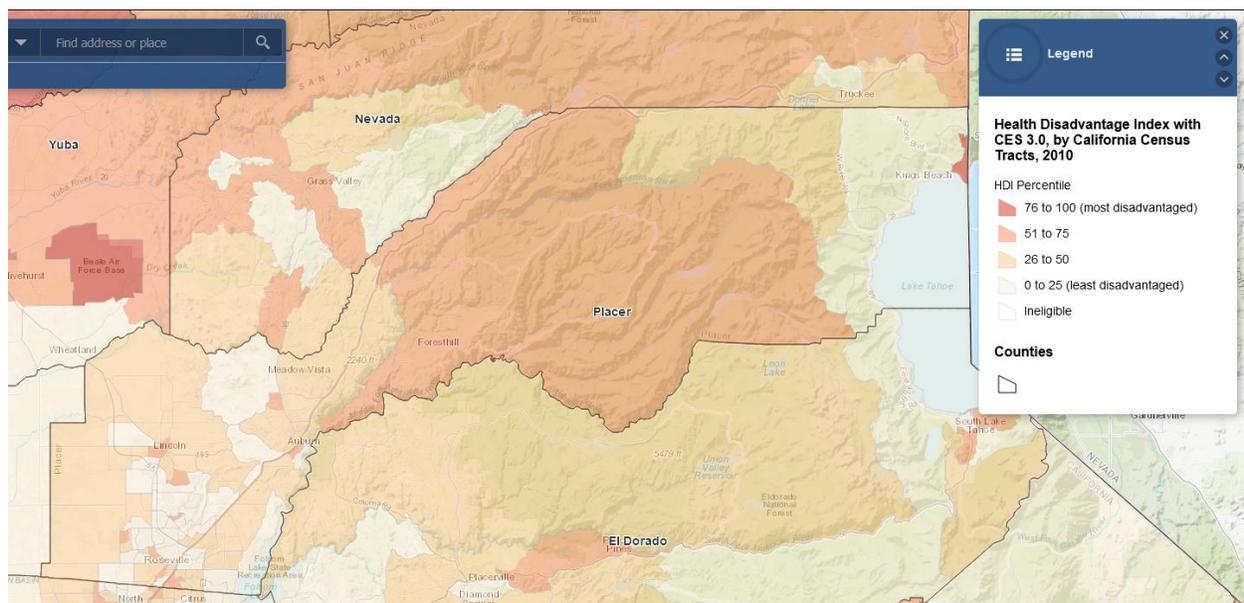
Vulnerability—Medium

Extreme heat happens in Placer County each year, especially in the lower elevations in the Valley area of western Placer County. Extreme heat rarely affects buildings in the County, but affects the population inside the County as well as the County’s agricultural industry.

Impacts from Extreme Heat

Vulnerable populations are at the greatest risk to the effects of extreme heat. The Public Health Alliance has developed a composite index to identify cumulative health disadvantage in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat. This is shown on Figure 4-19.

Figure 4-19 Health Disadvantage Index by California Census Tract



Source: Public Health Alliance of Southern California, retrieved 12/7/2020

Vulnerable populations to extreme heat include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

In addition to vulnerable populations, heat can cause stress to agricultural crops and livestock in the County. Extreme heat dries out vegetation in the County, creating greater risks from wildfires. Hot weather and

extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock. Extreme heat dries out vegetation in the County, creating greater risks from wildfires, which is discussed in Section 4.3.17.

Future Development

As the County shifts in demographics, more residents will become senior citizens. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary. Future development may also need to consider changes to both the length of wildfire season and the increasing hazards of wildfire (discussed in more detail in 4.3.17).

4.3.3. Severe Weather: Freeze and Snow

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

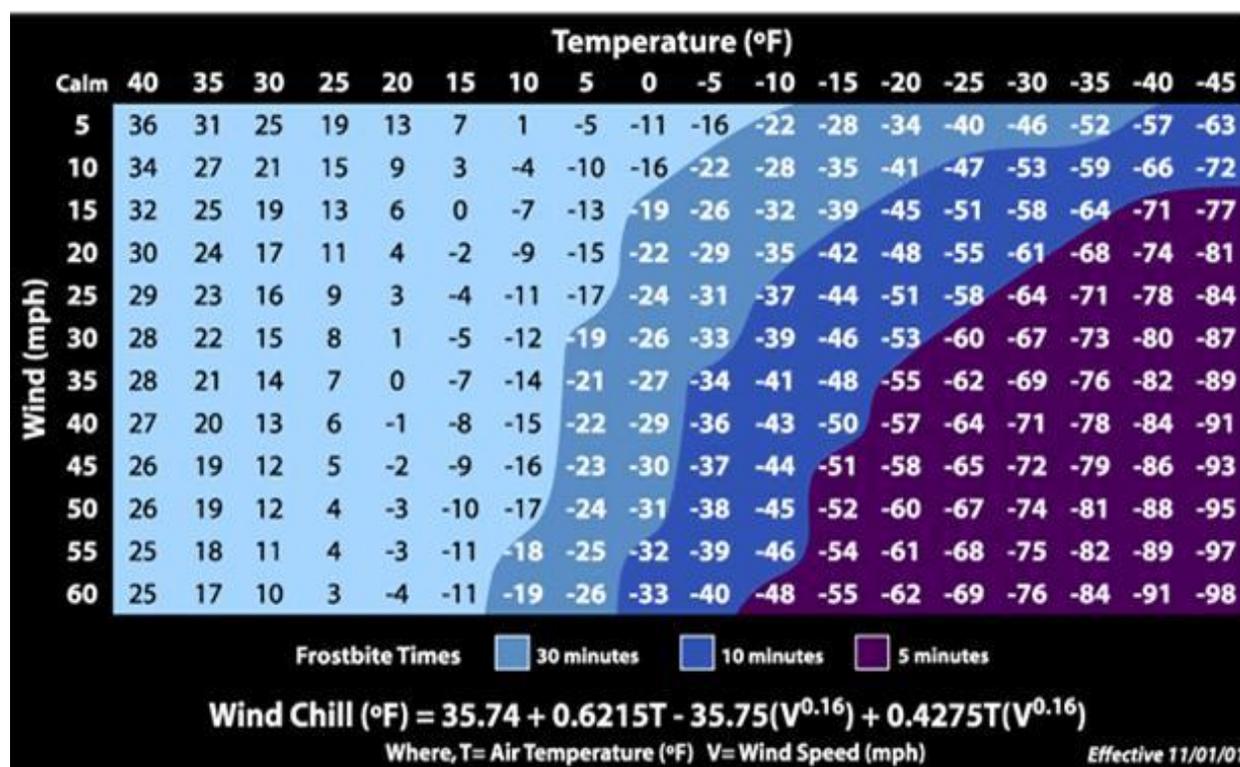
According to the NWS and the WRCC, winter snow storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Location and Extent

Freeze and snow events occur on a regional basis. Extreme cold can occur in any location of the County. Snowfall can occur in any location of the County, but is much more prevalent in the upper elevations of the County. Freeze has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-20), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-20 Wind Chill Temperature Chart

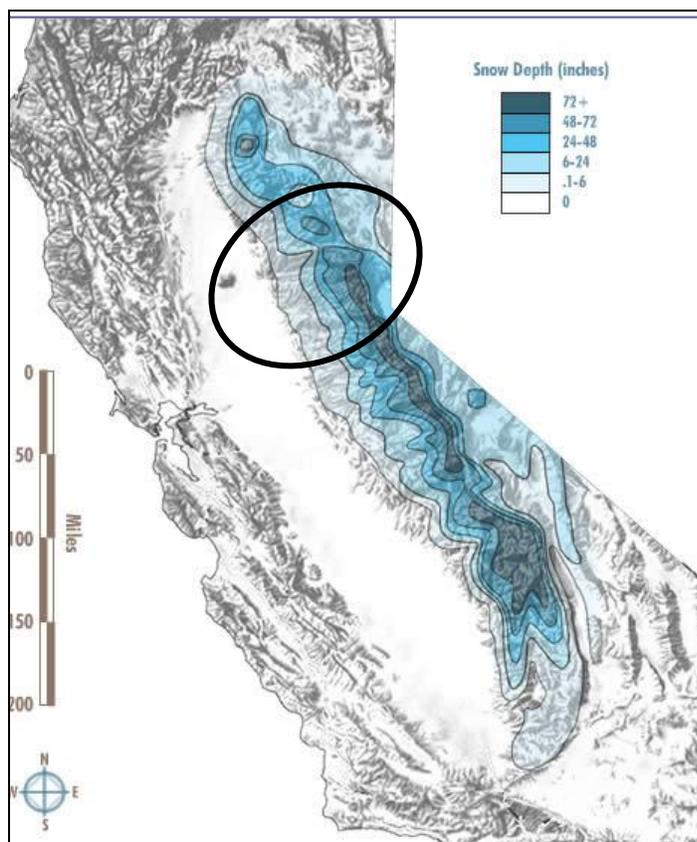


Source: National Weather Service

Snowfall has a short speed on onset, and can stay on the ground for months in the County. The western portion of the Placer County Planning Area does not experience snowfall on a regular seasonal basis; however, the northern and eastern portions of the County receive an abundance of snow, mostly between the months of November through March. Winter snow storms in this part of the County, including strong winds and blizzard conditions can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is also an increase in the number and severity of traffic accidents. People can become isolated in their homes and vehicles and are unable to receive essential services. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can lead to flooding or landslides during the spring if the area snowpack melts too quickly and also create numerous challenges for emergency responders. In the higher elevations at Lake Tahoe, snowfall will bury fire hydrants and street signs. It can often take the district weeks to dig out the approximately 2,500 fire hydrants. This is exacerbated by County snow plows/blowers re-burying the hydrants in subsequent plowing efforts. Inaccessible hydrants and/or delayed responses can impact life and property.

Snowfall in the Sierras increases with elevation. The lower foothills rarely receive any measurable snow. Middle elevations receive a mix of snow and rain during the winter. Above about 6,000 ft., the majority of precipitation falls as snow. It is not unusual, in some locations, to have ten feet of snow on the ground for extended periods. Figure 4-21 shows the average maximum measured snow depth in the Sierra Nevada for the month of March (the month of greatest average snow depths).

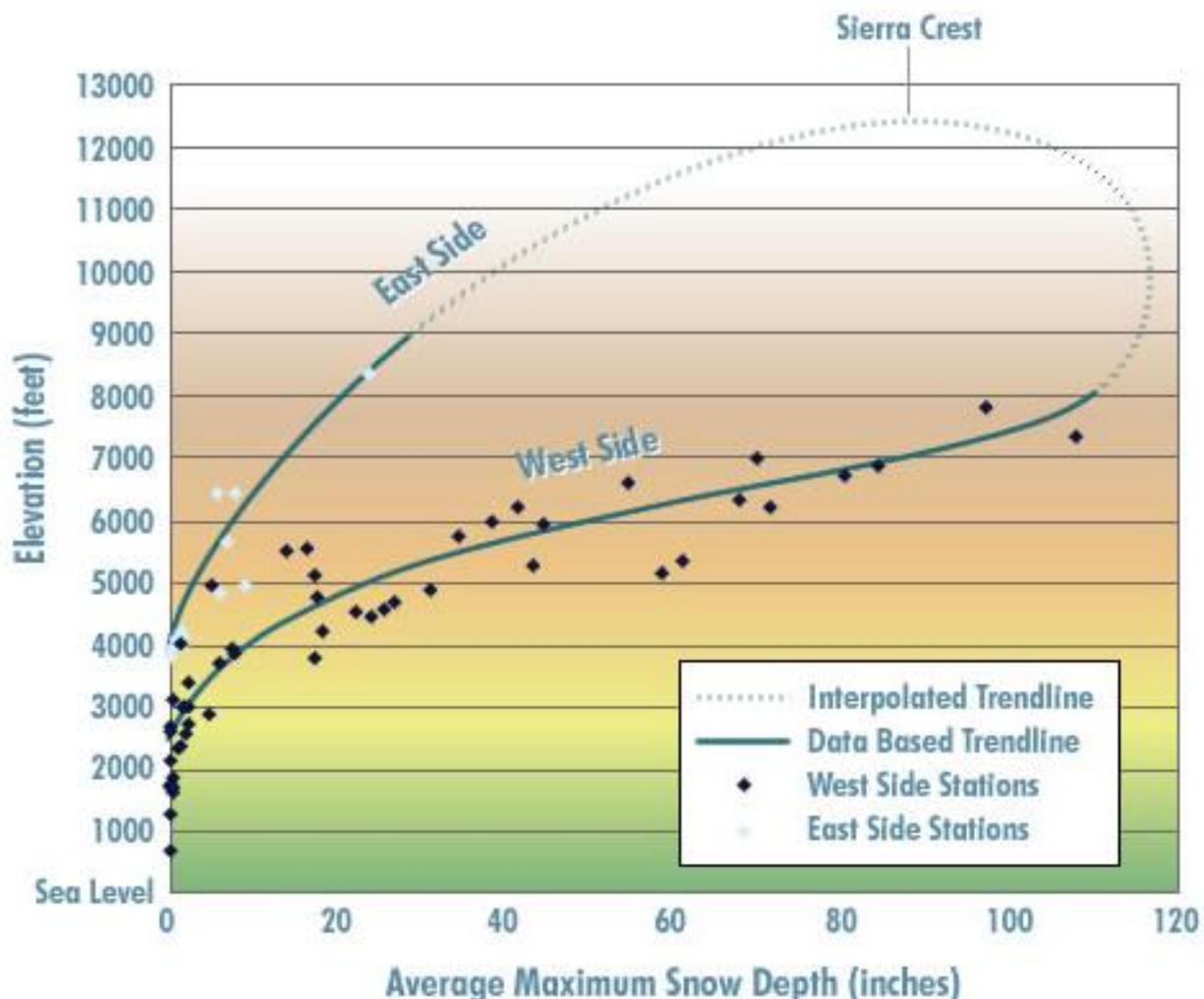
Figure 4-21 Average Maximum Snow Depths of Sierra Nevada Mountains in March



Source: http://www.sierranavadaphotos.com/geography/snow_depth.asp. Retrieved in 2016.

Snow accumulation does not directly follow precipitation in the Sierra Nevada. While the greatest total precipitation occurs in the northern part of the range, the greatest snow accumulation occurs in the central and high southern parts of the range, due to higher elevations and colder temperatures which inhibit snow melt. The western slope of the Sierra Nevada acts as trap for winter storms, wringing out the moisture before it can get to the east side. Weather stations located on the west side begin registering measurable snow between 2,500 and 3,000 feet elevation. On the east side, measurable snow accumulation doesn't begin until about 4,000 feet and increases more slowly with altitude. Snow depths drop dramatically on the east side of the range due to the rain shadow effect as illustrated in the comparative east side/west side snow depth chart shown on Figure 4-22.

Figure 4-22 Snow Accumulation with Directional Variations



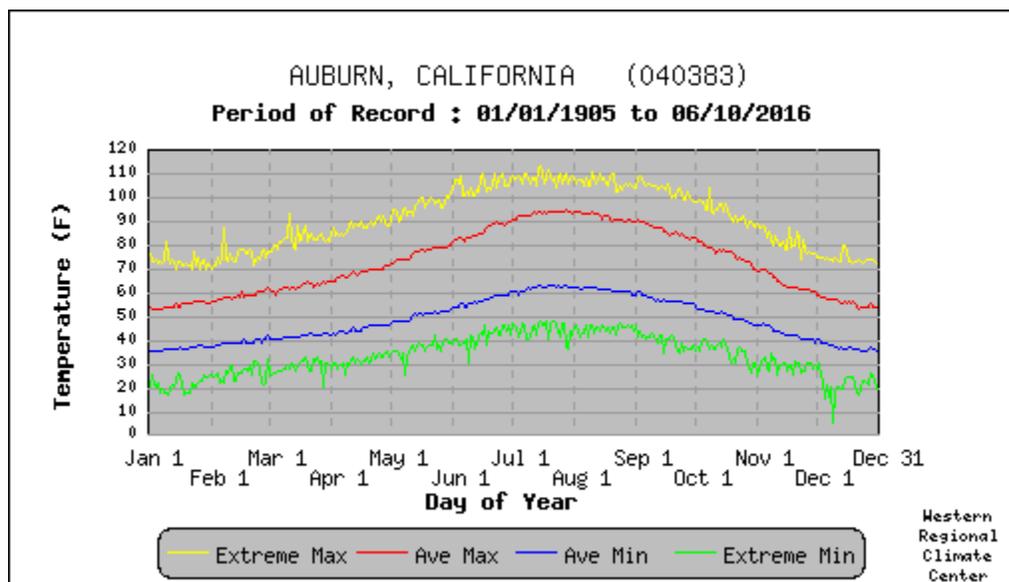
Source: http://www.sierranevadaphotos.com/geography/east_west_snow_depth.html. Retrieved in 2016.

Information on extreme cold and freeze from the WRCC coop stations introduced in Section 4.3.1 for the County are shown below.

Placer County – West (Auburn Weather Station, Period of Record 1905 to 2016 [Elevation of 1,360 feet above msl])

According to the WRCC, in western Placer County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 16°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F. Table 4-31 shows the record low temperatures by month for Placer County. Average daily temperatures for western Placer County are shown in Figure 4-23.

Figure 4-23 Placer County – West Daily Temperature Averages and Extremes



Source: Western Regional Climate Center

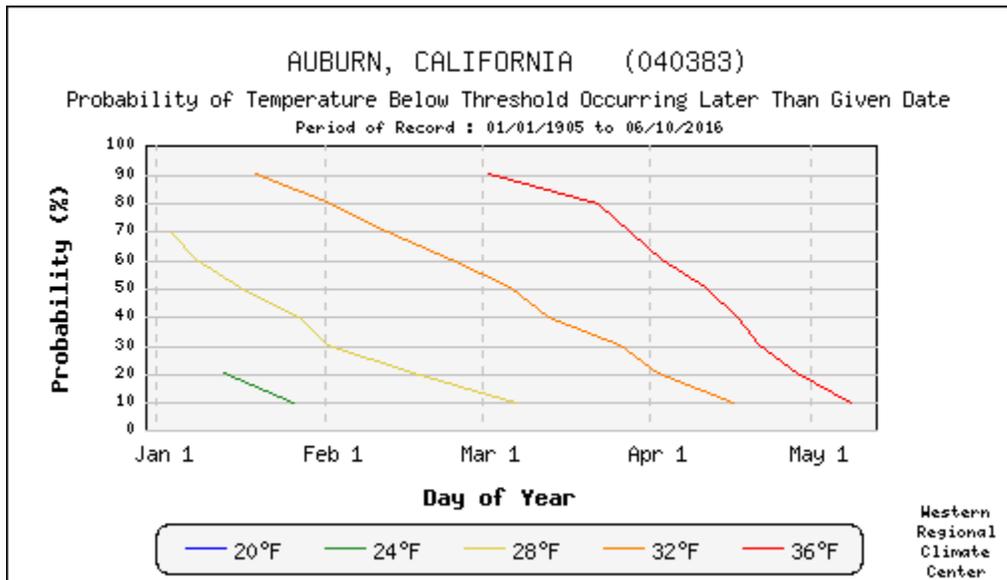
Table 4-31 Placer County – West Record Low Temperatures 1905 to 2016

Month	Record Low	Date	Month	Record Low	Date
January	20°	1/6/1913	July	41°	7/4/1948
February	21°	2/27/1962	August	35°	8/25/2004
March	25°	3/1/1971	September	34°	9/15/1906
April	30°	4/20/1912	October	30°	10/19/1949
May	32°	5/6/1912	November	24°	11/24/2010
June	30°	6/26/1905	December	16°	12/9/1972

Source: Western Regional Climate Center

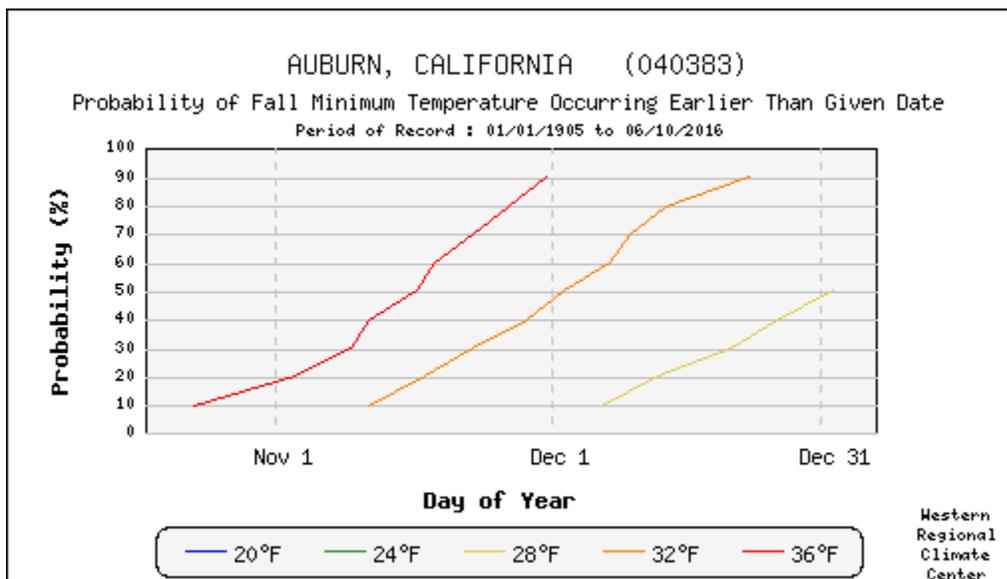
Figure 4-24 and Figure 4-25 show the probabilities of freeze for both spring and fall in western Placer County.

Figure 4-24 Placer County – West Spring Freeze Probabilities



Source: Western Regional Climate Center

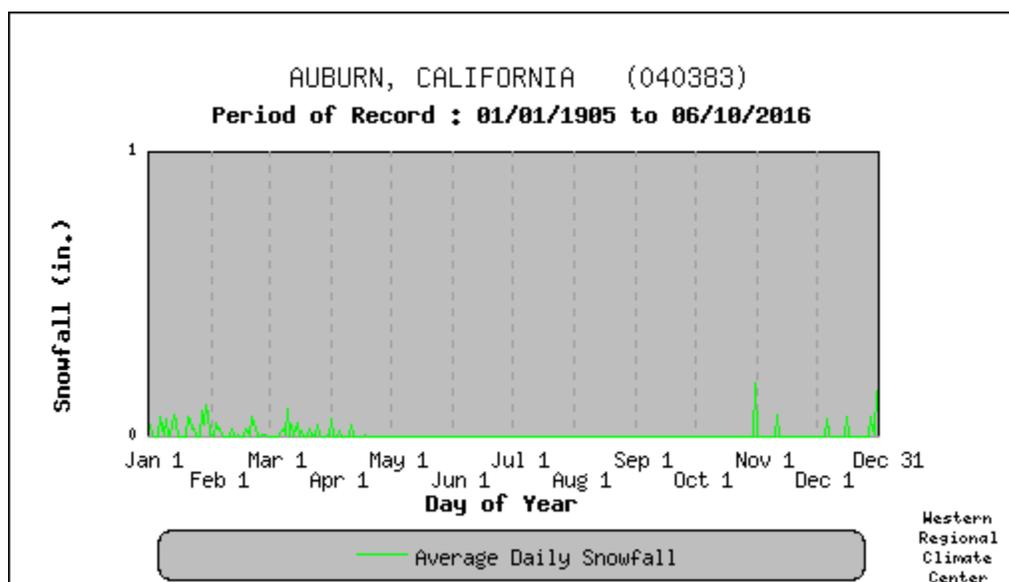
Figure 4-25 Placer County – West Fall Freeze Probabilities



Source: Western Regional Climate Center

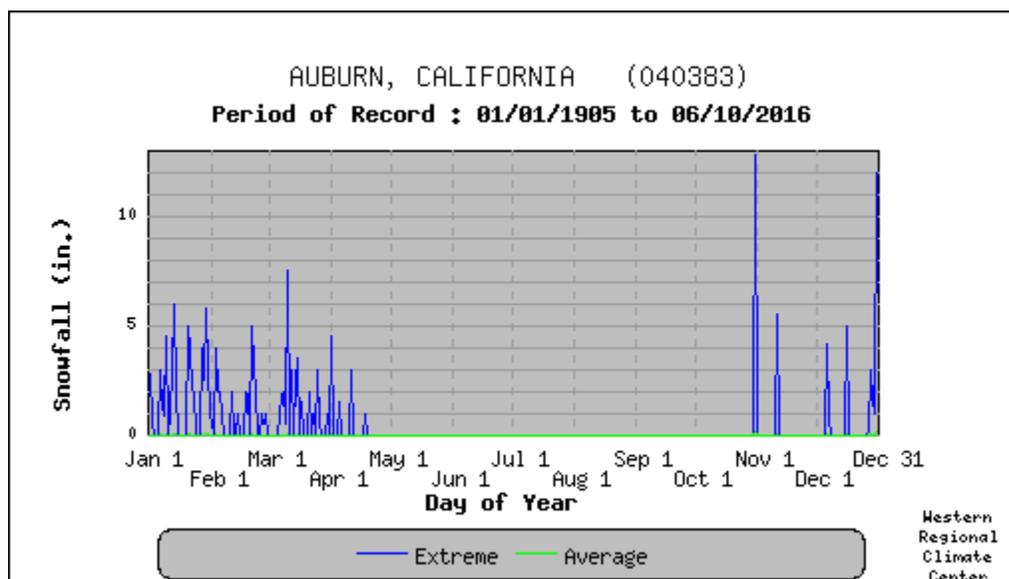
According to the WRCC, average snowfall on the western side of the County is 1.4 inches, as shown in Figure 4-26. The highest annual snowfall fell in 1972, when 10.7 inches fell. Highest monthly snowfall accumulation came in January of 1972, when 6.5 inches fell. Average snowfall in January through March are minimal. This can be seen in Figure 4-27.

Figure 4-26 Placer County – West Snowfall Average Daily Snowfall



Source: Western Regional Climate Center

Figure 4-27 Placer County – West Snowfall Averages and Extremes

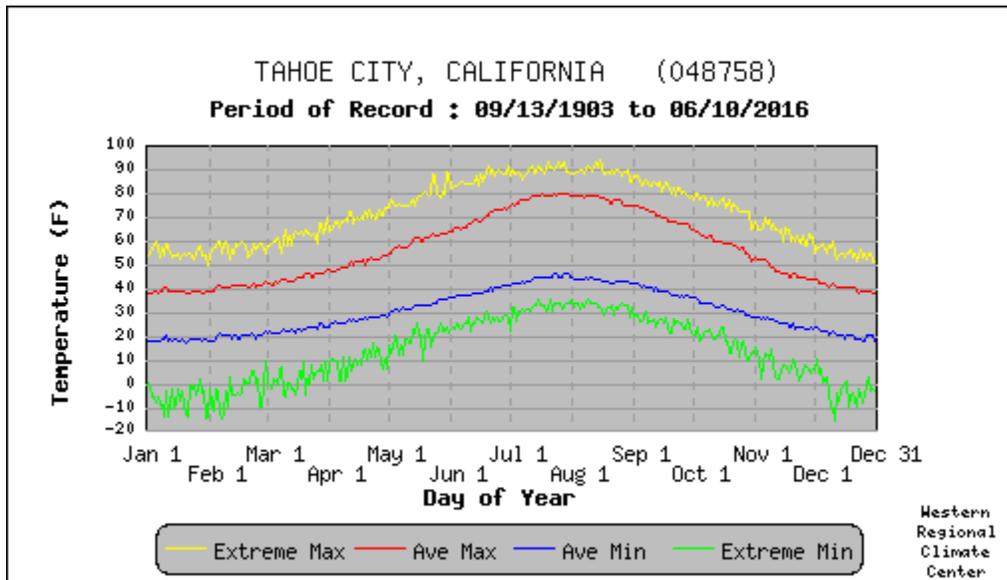


Source: Western Regional Climate Center

Placer County – East (Tahoe City Weather Station, Period of Record 1903 to 2016 [Elevation of 6,230 feet above msl])

According to the WRCC, in eastern Placer County monthly average minimum temperatures from November through April range from the upper-10s to upper-30s. The lowest recorded daily extreme was -16°F on December 11, 1972. In a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F. Table 4-32 shows the record low temperatures by month for eastern Placer County. Average daily temperatures for eastern Placer County are shown in Figure 4-28.

Figure 4-28 Placer County – East Daily Temperature Averages and Extremes



Source: Western Regional Climate Center

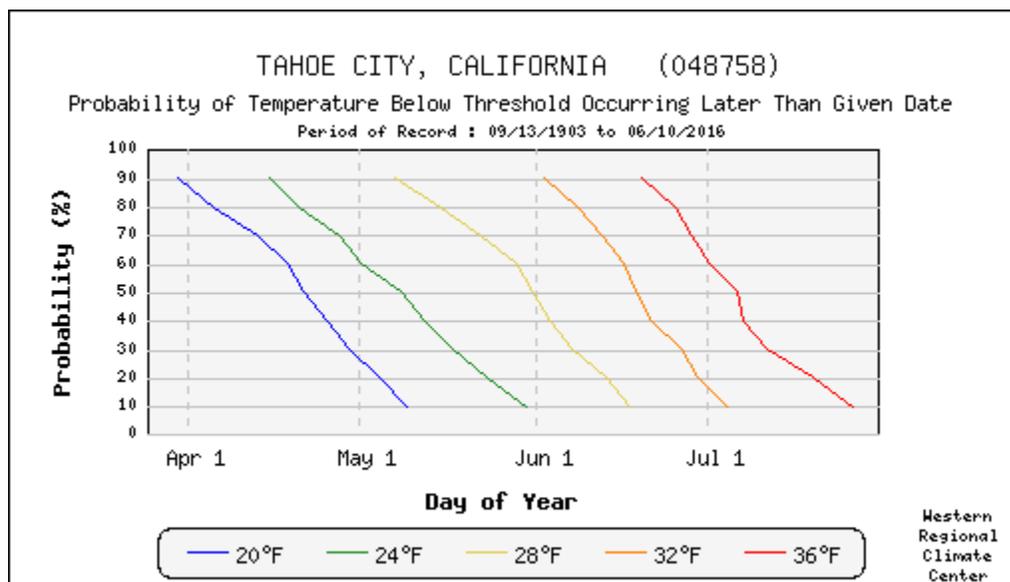
Table 4-32 Placer County – East Record Low Temperatures 1903 to 2016

Month	Record Low	Date	Month	Record Low	Date
January	-14°	1/9/1937	July	22°	7/1/1975
February	-15°	2/7/1989	August	28°	8/30/1912
March	-6°	3/10/1935	September	21°	9/30/1950
April	5°	4/12/1911	October	9°	10/28/1971
May	9°	5/18/1974	November	-1°	11/23/1931
June	24°	6/1/1955	December	-16°	12/11/1972

Source: Western Regional Climate Center

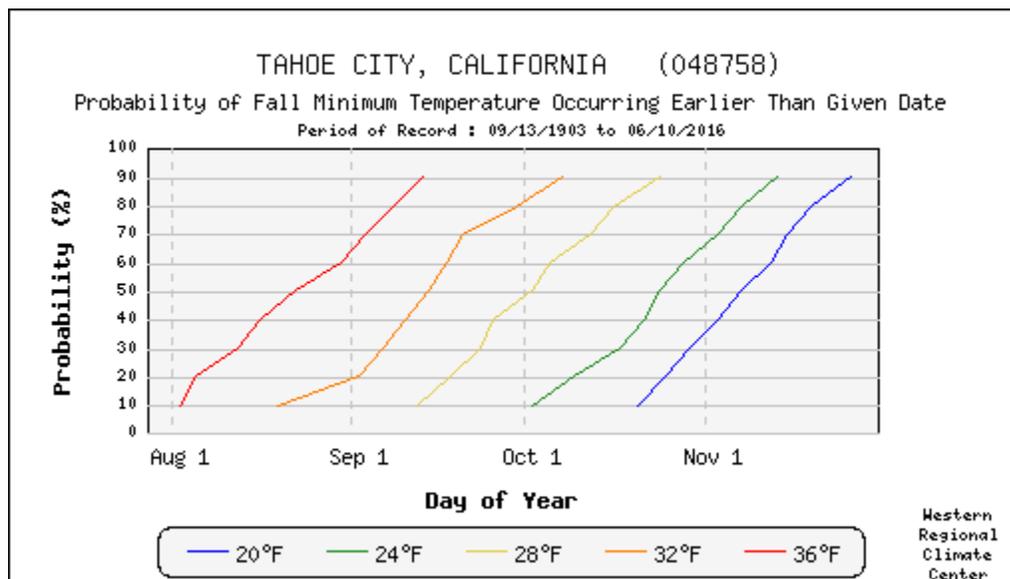
Figure 4-29 and Figure 4-30 show the probabilities of freeze for both spring and fall in eastern Placer County.

Figure 4-29 Placer County – East Spring Freeze Probabilities



Source: Western Regional Climate Center

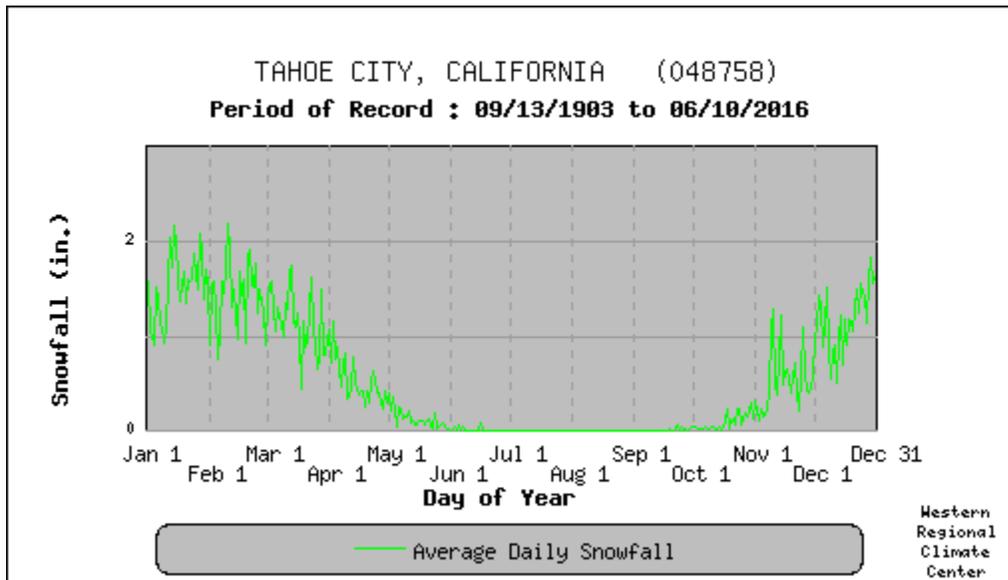
Figure 4-30 Placer County – East Fall Freeze Probabilities



Source: Western Regional Climate Center

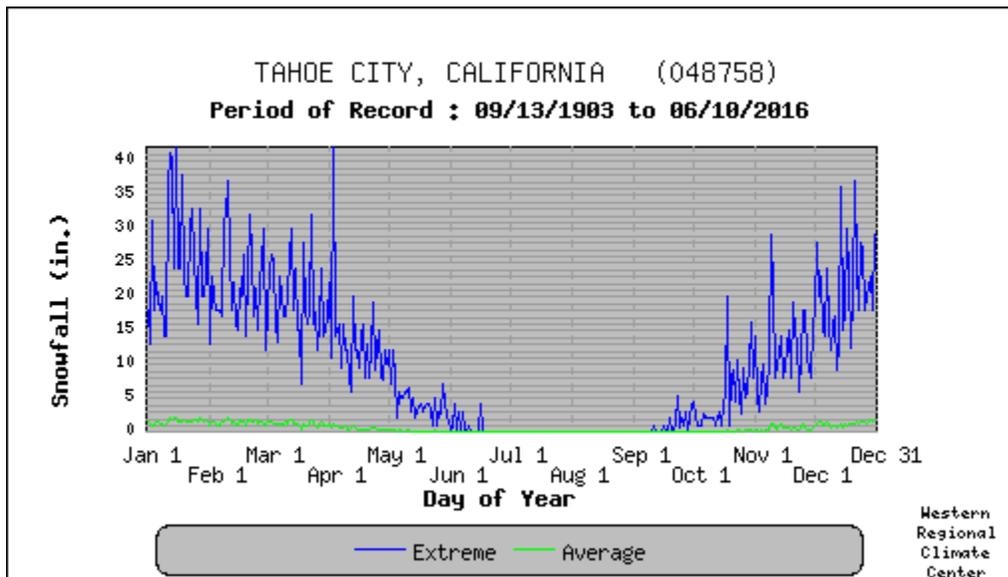
According to the WRCC, average snowfall on the eastern side of the County is 190.7 inches, as shown in Figure 4-26. The highest annual snowfall fell in 1952, when 499.3 inches fell. Highest monthly snowfall accumulation came in January of 1911, when 229.0 inches fell. Average snowfall in January through March range from 10" to 40". This can be seen in Figure 4-27.

Figure 4-31 Placer County – East Average Daily Snowfall



Source: Western Regional Climate Center

Figure 4-32 Placer County – East Snowfall Averages and Extremes



Source: Western Regional Climate Center

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for freeze and snow, as shown on Table 4-33.

Table 4-33 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

Another database of disaster declarations comes from the USDA. This database was searched from 2002 to 2020, which showed four freeze disaster declarations for Placer County. This is shown on Table 4-34.

Table 4-34 Placer County – USDA Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2003	N/A	N/A	Hail and Freeze
2005	N/A	N/A	Freeze
2007	N/A	N/A	Freeze
2008	N/A	N/A	Freeze

Source: USDA

NCDC Events

The NCDC reports 913 events of past extreme cold and freeze for Placer County since 1996 as shown on Table 4-35.

*Table 4-35 NCDC Freeze and Snow Events for Placer County 1996 – 7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Blizzard	4	0	0	\$30,000	\$0	0	1
Cold/Wind Chill	19	1	0	\$0	\$0	2	8
Extreme Cold/Wind Chill	1	0	0	\$0	\$0	0	0
Frost/Freeze	9	0	0	\$200,000	\$5,000,000	0	0
Heavy Snow	633	2	6	\$1,675,000	\$0	1	3
Winter Storm	154	2	3	\$265,000	\$0	1	1
Winter Weather	93	4	0	\$10,000	\$0	0	2
Total	913	9	9	\$2,180,000	\$5,000,000	4	15

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

Hazard Mitigation Planning Committee Events

The HMPC identified the following events related to extreme temperatures in the Placer County Planning Area.

- **April 17, 1972** – State declaration for freeze and severe weather conditions.
- **December 1990** – Freezing temperatures cause the fire sprinkler pipes to burst in the main office of the Placer County Office of Education causing \$107,487 in damages.
- **December 17, 1992** – Heavy snow on a roof caused damages to a building located in the Foresthill Union School District causing \$3,371 in damages.
- **March 23, 1995** – Excessive snow closed the school in Colfax; damages unknown.
- **January 26, 1999** – Excessive snow closed the school in Colfax; damages unknown.
- **1999** – A severe freeze caused broken pipes at three schools in the Eureka Union School District (Oakhills, Ridgeview, Cavitt) in southern Placer County. Total damage to carpet, drinking fountains, and miscellaneous supplies was \$10,281 (\$1,000 deductible, remainder insurance).
- **February 2003** – A severe snowstorm caused a variety of damage to schools located in the areas of Tahoe City, West Shore, and Polaris Road. The snowstorm caused an underground propane leak at one school, a district-wide power outage, and damages resulting from roof snow loading and removal. School closures ranged from two days to two weeks.
- **December 2006/January 2007** – Placer County, as well as the State, declared a local disaster proclamation declared as result of an extreme low temperature event for the entire state. Placer County OES & Health and Human Services (HHS) coordinated with the Salvation Army in the City of Roseville, and local church organizations to open warming centers at the fairgrounds in Auburn and in church affiliated facilities in the Auburn and Roseville area.
- **In March, April, and May 2011** the Serene Lakes community was hit by a continuous stream of storms that dumped record setting amounts of snow on the area. Approximately 700 of the structures in Serene Lakes are served by propane and the high snow levels led to one home explosion, 43 identified propane leaks, a voluntary evacuation order, a protective sheriff’s patrol and a very anxious community. No lives were lost and there were no major injuries, but it was just luck that the community avoided human catastrophe. None of the installations that leaked met current code requirements. The principal reason for propane leaks was failure of piping in all areas.
- **January 2016** – A winter storm event occurred in the Tahoe area of the County. During this event, a tree fell on the Tahoe Engineering Building at 7717 N Lake Blvd, Tahoe Vista, CA. Damages of \$124,312.59 were reported for clean up and roof repair.

Likelihood of Future Occurrence

Highly Likely— Freeze and snow are likely to continue to occur annually in the Placer County Planning Area. This is especially true for the eastern portion of the County where elevations are higher.

Climate Change and Freeze and Snow

Climate change and its effect on freeze and snow in the County has been discussed by three sources:

- 2020 Placer County Sustainability Plan
- CAS – 2014
- Cal-Adapt – 2021

Placer County Sustainability Plan

According to the Placer County Sustainability Plan, severe winter weather includes heavy snowfall, ice storms, extreme cold, and similar events. In Placer County these events are usually limited to the Sierra

Nevada region, although in rare cases severe winter weather can occur at lower elevations, such as the communities of Colfax or Foresthill. Overall, climate change is expected to increase average temperatures, so the total number of days with cooler temperatures is expected to drop. However, climate change may increase the number of severe storms affecting Placer County. These intense storm systems could create severe winter weather conditions in the Sierra Nevada and more severe winter weather events in the area.

CAS

According to the CAS, freezing spells are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

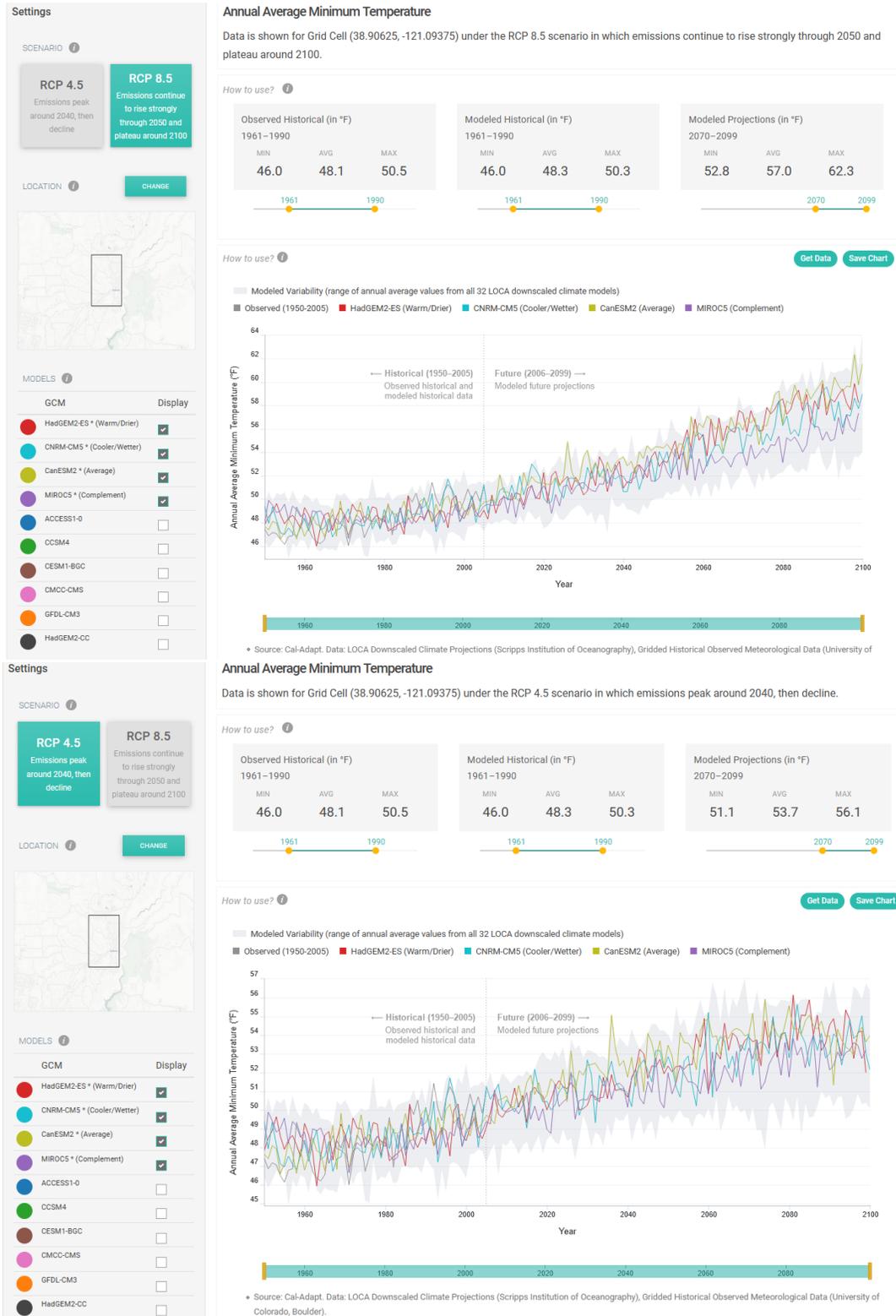
Cal Adapt

Cal Adapt also noted that overall temperatures are expected to rise substantially throughout this century, reducing the number of days of freeze and possibly turning snow into rain in certain areas of the State and County. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (Representative Concentration Pathways (RCP) 8.5) are approximately twice as high as those projected in the lower emissions scenario (RCP 4.5).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt for the Placer County Planning (using the quad that contains the Auburn) are shown in Figure 4-33. It shows the following:

- The upper chart shows projections for annual average minimum temperatures in the County. Data is shown for Placer County under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows projections for annual average minimum temperatures in the County. Data is shown for Placer County under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-33 Placer County – Future Minimum Temperature Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map. Retrieved 12/9/2020

Vulnerability Assessment

Vulnerability—Medium

Freeze and snow events occur in Placer County each year. It can impact structures, critical facilities and infrastructure, and populations in Placer County, especially in the upper elevations in the eastern County.

Impacts

Freeze and snow events happen in Placer County each year. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. The ability for the County to continue to operate during periods of winter storm and freeze is paramount. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

Of significant concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and freeze. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

P{potential impacts were noted on the closed landfill gas flare system at the Eastern Regional Landfill (ERL) in Truckee at the end of Cabin Creek Road. The flare system (extraction wells and piping underground below the closed landfill and a flare system) pulls gas from under the landfill cap. If the gas is not removed for long periods of time, it may migrate downward toward ground water. If in contact with groundwater, it has the potential to partition into groundwater and cause contamination. Excessive snow

loads can build up and cause breaks in operation of the flare system on the order of a couple days. Multiple back-to-back extreme events that may cause a long service disruption exceeding multiple weeks could create a potential hazard to groundwater. Snow removal is present onsite and the likelihood of an inability to access the flare system to restart it is low.

The varying elevations in the County, in part, determine the extent to which a given area is affected by freeze and snow. The agricultural industry is especially vulnerable to extreme temperatures. Freezing temperatures can cause significant loss to crops, and excessive heat can cause high levels of mortality among livestock as well as damage to crops.

Impacts to the County as a result of extreme cold and freeze include damage to infrastructure, utility outages, road closures, traffic accidents, and interruption in business and school activities. Delays in emergency response services can be of significant concern. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures and ice can cause accidents and road closures and can cause significant damage to the agricultural industry. Extreme cold can affect agricultural products and cattle in the County. Freeze damages reduce the values of agricultural crops.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Backup power should be considered for any new critical facility. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the County shifts resulting in a larger number of senior citizens in the Planning Area.

4.3.4. Severe Weather: Heavy Rains and Storms

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Storms in the Placer County Planning Area are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. In the upper elevations, these storms can drop large amounts of snow (discussed in Section 4.3.3). Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Placer County area falls mainly in the fall, winter, and spring months.

This severe weather hazard is broken down in the following sections into:

➤ Heavy Rain and Storms

- Hail
- Lightning

Heavy Rain and Storms

The NWS reports that storms and thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. As storms continue to increase in intensity, the limited drainage infrastructure has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees and cause power outages.

Cloudburst storms can be expected in the spring, summer, and fall. Cloudburst storms, sometimes lasting as long as 6 hours, are high intensity storms that can produce floods characterized by high peak flows, short-duration flood flows, and small runoff volume.

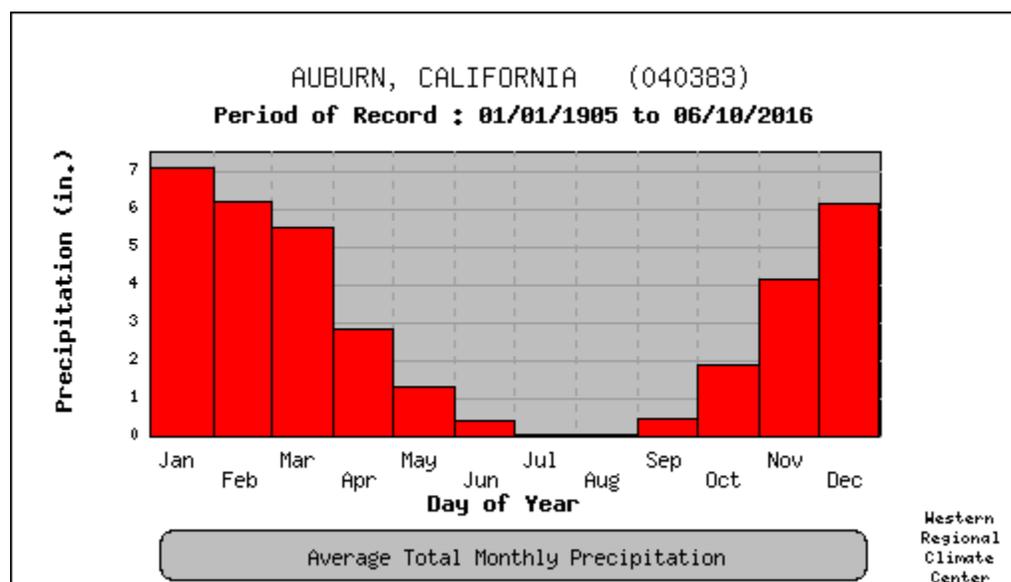
Location and Extent

Heavy rains in Placer County vary by season and location. There is no scale by which heavy rains are measured – usually it is measured in terms of rainfall amounts. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. Information from the WRCC weather station in Placer County previously discussed in Section 4.3.1 is summarized below.

Placer County – West (Auburn Weather Station, Period of Record 1905 to 2016 [Elevation of 1,360 feet above msl])

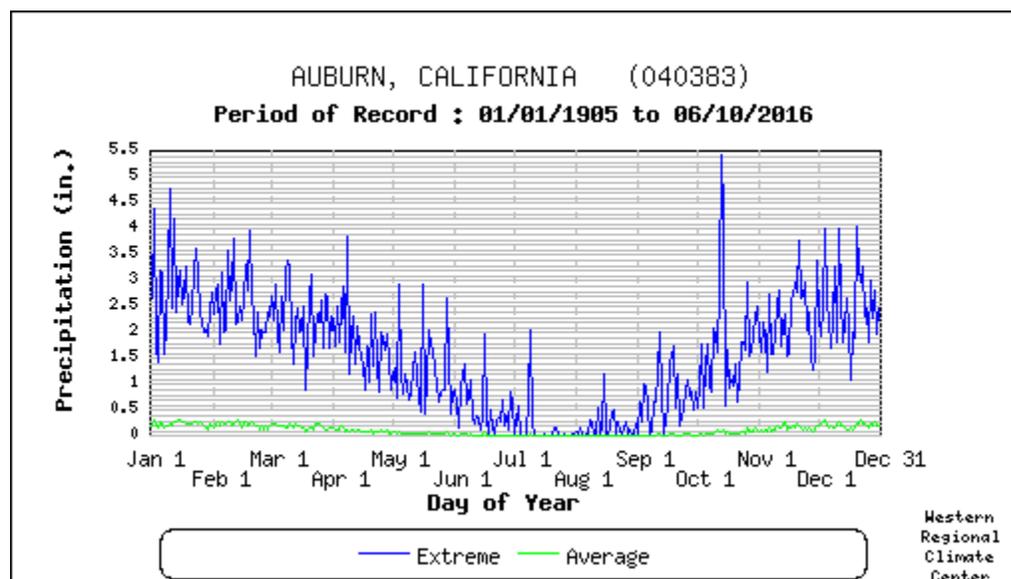
According to the WRCC, average annual precipitation in western Placer County is 34.39 inches per year. The highest recorded annual precipitation is 64.87 inches in 1983; the highest recorded precipitation for a 24-hour period is 5.41 inches on October 13, 1962. The lowest recorded annual precipitation was 11.76 inches in 1976. Average monthly precipitation for western Placer County is shown in Figure 4-34. Daily average and extreme precipitations are shown in Figure 4-35.

Figure 4-34 Placer County – West Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-35 Placer County – West Daily Average and Extreme Precipitation

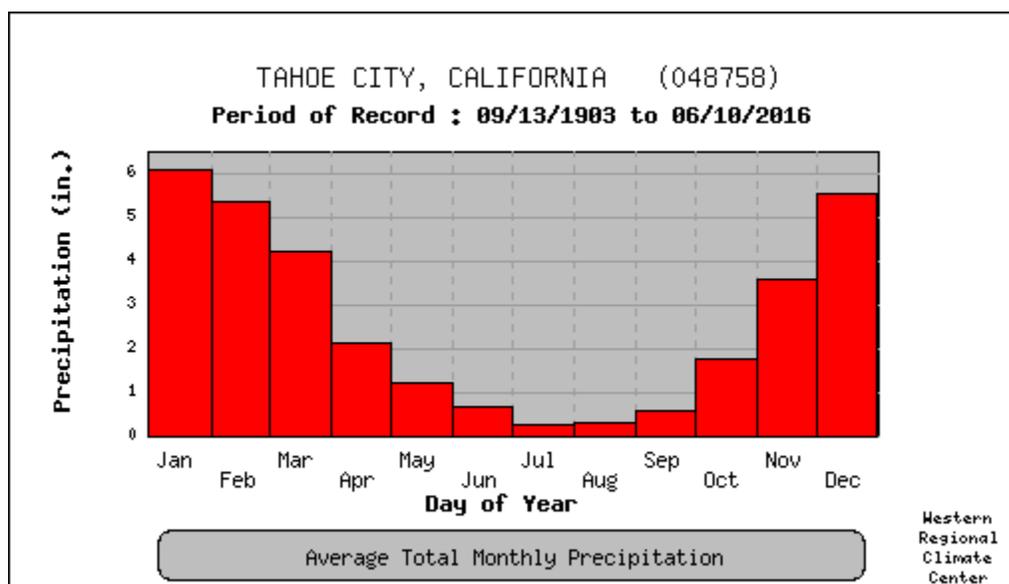


Source: Western Regional Climate Center, www.wrcc.dri.edu/

Placer County – East (Tahoe City Weather Station, Period of Record 1903 to 2016 [Elevation of 6,230 feet above msl])

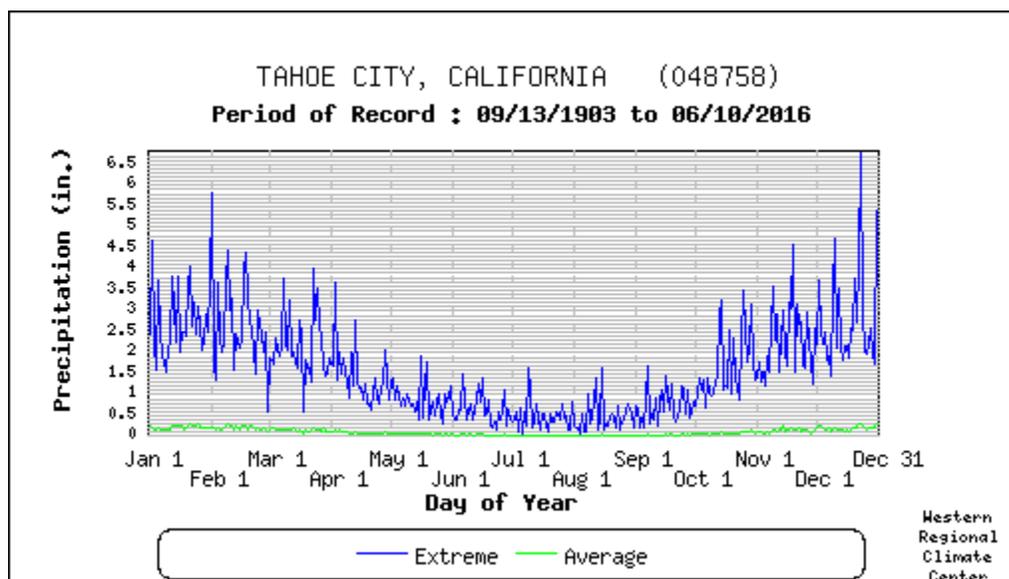
According to the WRCC, average annual precipitation in eastern Placer County is 31.46 inches per year. The highest recorded annual precipitation is 66.41 inches in 1996; the highest recorded precipitation for a 24-hour period is 7.0 inches on November 4, 1903. The lowest recorded annual precipitation was 9.34 inches in 1976. Average monthly precipitation for eastern Placer County is shown in Figure 4-36. Daily average and extreme precipitations are shown in Figure 4-37.

Figure 4-36 Placer County – East Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

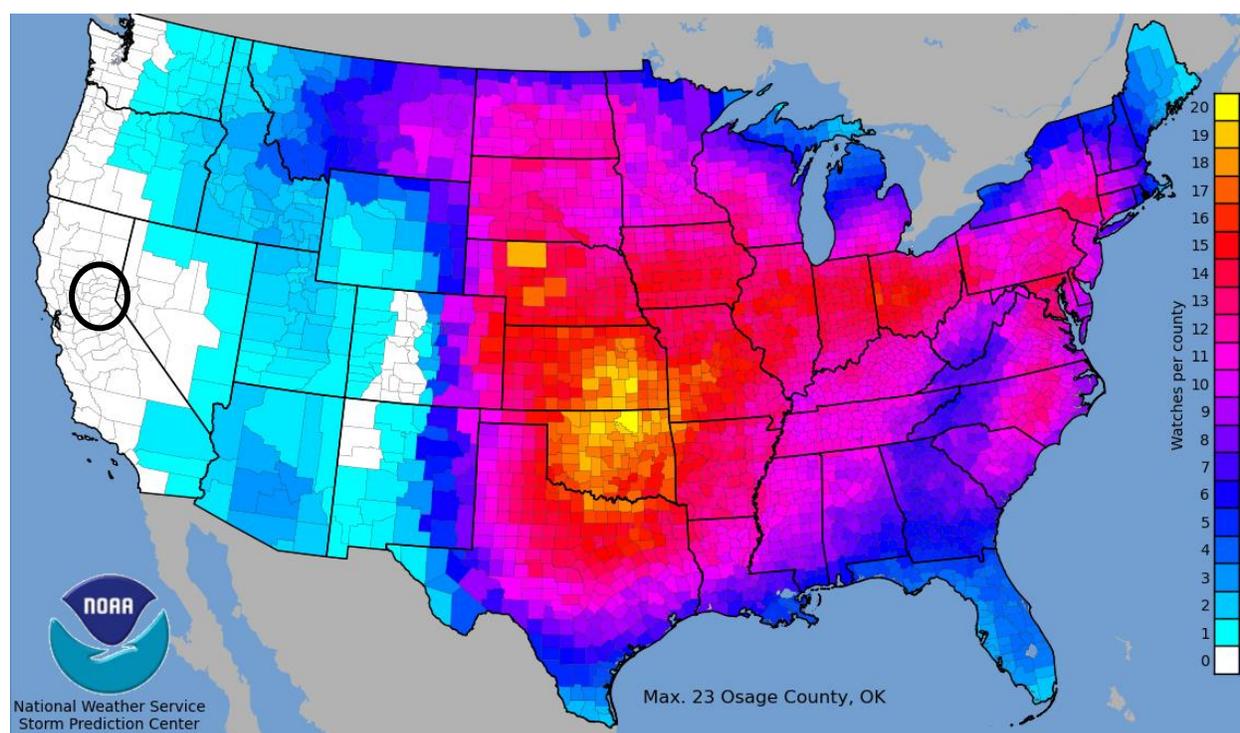
Figure 4-37 Placer County – East Daily Average and Extreme Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

The NOAA Storm Prediction Center tracks thunderstorm watches on a county basis. Figure 4-38 shows thunderstorm watches in Placer County and the United States for a 20-year period between 1993 and 2012, the most recent map available.

Figure 4-38 Placer County – Average Thunderstorm Watches per Year (1993 to 2012)



Source: NOAA Storm Prediction Center, map retrieved 12/14/2020

Hail

Hail can occur throughout the Placer County Planning Area during storm events, though it is rare. Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the Placer County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-36 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-36 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter

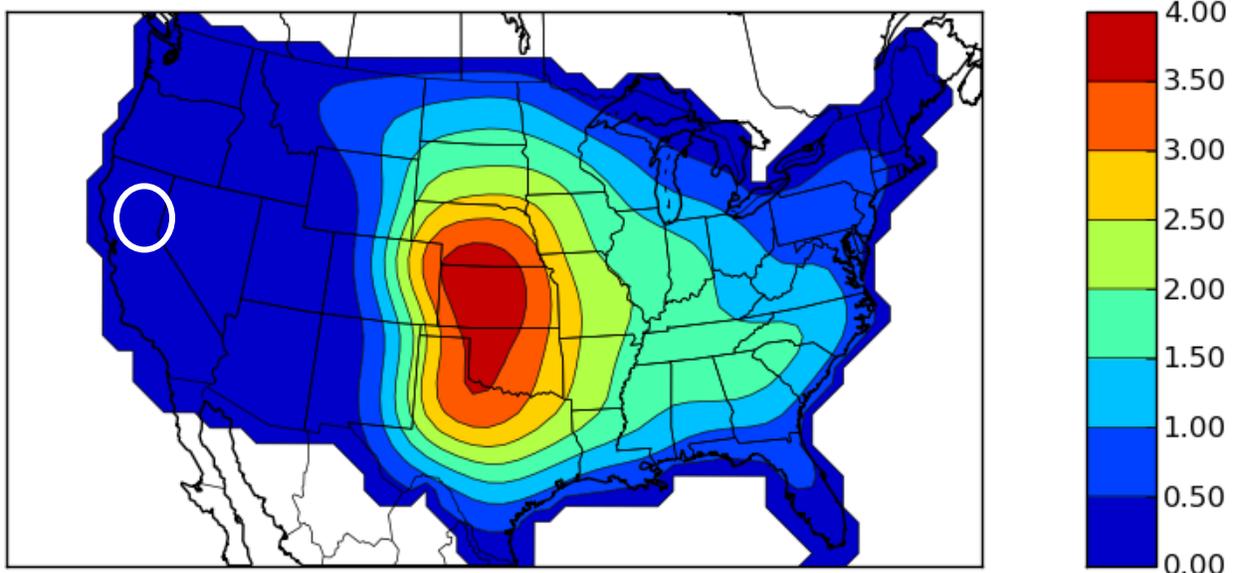
Average Diameter	Corresponding Household Object
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Location and Extent

Hail events can occur in any location of the County. All portions of the County are at risk to hail. There is no scale in which to measure hail, other than hail stone size as detailed above. The speed of onset of hail can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms that can cause hail in California is often short, ranging from minutes to hours. Hail events last shorter than the duration of the total thunderstorm. The National Weather Service tracks hail events. Figure 4-39 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1990 to 2009, the most recent map available.

Figure 4-39 Placer County – Average Hail Days per Year (1990 to 2009)



Source: National Weather Service, map retrieved 12/14/2020

Lightning

Lightning can occur throughout the County both during and outside of storm events. Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms.

Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

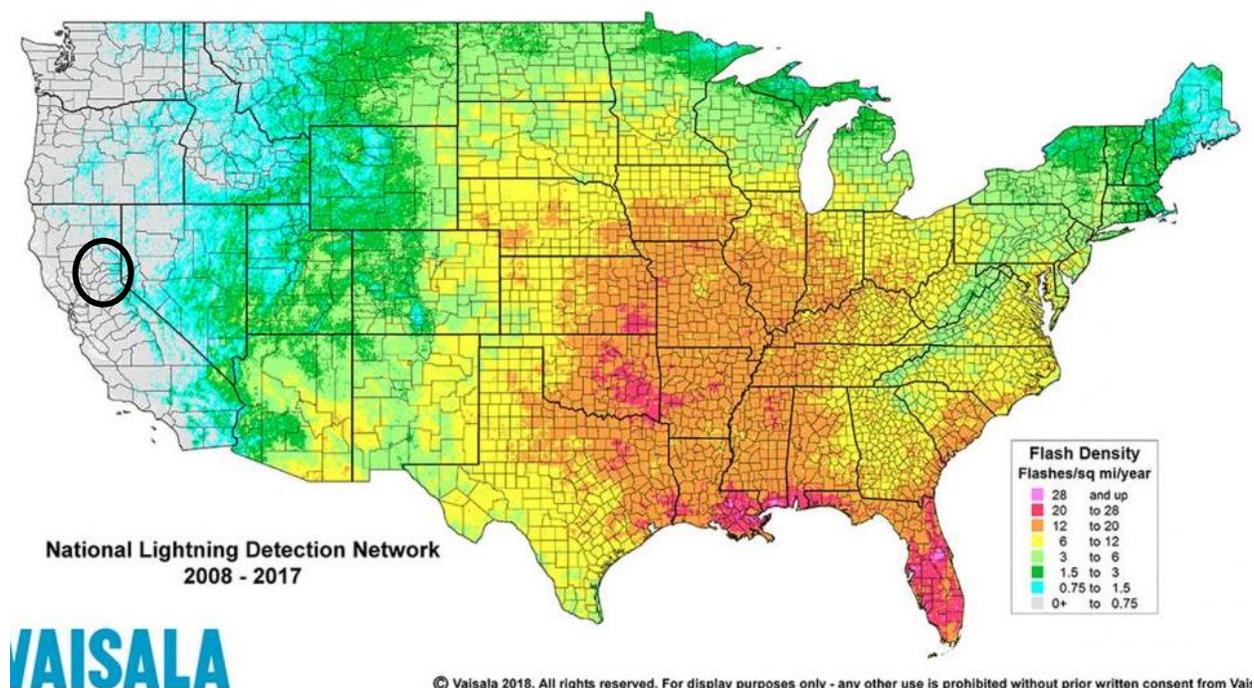
Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually, it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat. Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage. Lightning in the County is also a concern due to the number of fires that are started by lightning strikes. Wildfire is discussed in more detail in Section 4.3.17.

Location and Extent

Lightning events can occur in any location of the County and are often associated with thunderstorms. All portions of the County are at risk to lightning. Lightning tends to be rare in the County, as discussed in the extent section below. Lightning in the County can occur both during and outside of thunderstorms; the latter often referred to as dry lightning events. The speed of onset of thunderstorms that can cause lightning can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. Vaisala maintains the National Lightning Detection Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-40 shows lightning incidences in the County and the rest of the United States from 2008 to 2017, the most recent map date available.

Figure 4-40 Placer County – Lightning Incidence Map 2008 to 2017



Source: Vaisala National Lightning Detection Network, map retrieved 12/14/2020

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. Heavy rains and storms have caused flooding in the County. Events where flooding resulted in a state or federal disaster declaration are shown in Table 4-37.

Table 4-37 Placer County – Disaster Declarations from Heavy Rain and Storms (and Floods) 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: FEMA, Cal OES

Another database of disaster declarations comes from the USDA. This database was searched from 2002 to 2020, which showed nine disaster declarations for Placer County, related to heavy rains and storms, including hail and lightning. This is shown on Table 4-38.

Table 4-38 Placer County – USDA Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2002	N/A	N/A	Rain and Wind
2003	N/A	N/A	Hail and Freeze
2003	N/A	N/A	Excessive Rain/Late Rain
2003	N/A	N/A	Late Rain/Heat
2005	N/A	N/A	Unseasonable Late Rain
2006	N/A	N/A	Rain/Hail Event
2016	S4164	Contiguous	Severe weather including excessive rainfall and high winds
2016	S4170	Contiguous	Severe weather including excessive rainfall and high winds
2019	S4565	Contiguous	Excessive rain

Source: USDA

NCDC Events

The NCDC data recorded 68 hail, heavy rain, and lightning incidents for Placer County since 1950. A summary of these events is shown in Table 4-39. Additional events of heavy rain and storms are also discussed in the NCDC table in the flood profile in Section 4.3.12.

*Table 4-39 NCDC Hail, Heavy Rain, Lightning, and Wind Events in Placer County 1950–7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Hail	9	0	0	\$1,000	\$0	0	0
Heavy Rain	59	2	0	\$10,000	\$0	0	0
Total	68	2	0	\$11,000	\$ 0	0	0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

Hazard Mitigation Planning Committee Events

The HMPC also noted the following events:

- **February 1, 1990** – A rainstorm caused water damage to a floor in the Foresthill Union School District causing \$4,680 in damages.
- **February 20/21, 1990** – Excessive rain and wind closed the schools in Colfax and Iowa Hill; damages unknown.
- **January 10/11, 1995**- Excessive rain and wind closed the school in Colfax; damages unknown.
- **1995 Winter Storms** – The roof drains of the Placer Union High School gymnasium became clogged, damaging the roof and flooding the gymnasium. Damages were incurred and FEMA paid out disaster monies in the amount of \$7,108.33.

- **1996** – Heavy rain clogged storm drains causing flooding in the Cavitt School gymnasium in southern Placer County. Total damage was \$85,976 covered by Emergency Services under a disaster declaration.
- **December 16, 2002** – Excessive rain and wind closed the school in Colfax; damages unknown.
- **October 31, 2003** - Winds associated with heavy storms caused a power outage and closure of Truckee Elementary School. The area affected Donner Pass Road in the city of Truckee. Costs associated with the closure were paid for by the State insurance program.
- **December 2005/January 2006** – Flooding occurred in the County as a result of heavy rains and stormwater runoff caused by severe winter storms. Storms impacted transit on public roads and caused some business closures.
- **March/April 2006** – Spring storm resulted in local disaster proclamation from extended rain and windstorm. Placer County roadways in unincorporated areas, particularly Foresthill Road and Ophir Road, were significantly damaged due to rain and mudslides. Costs to public agencies were in excess of \$1 million.
- **January 2008** –Severe winter storms brought massive snow, rain, and near record winds to Northern California over the first weekend in January, 2008 beginning on Friday January 4, 2008. It resulted in the temporary loss of power to some 2.5 million Pacific Gas & Electric (PG&E) customers throughout Northern California; approximately 45,000 in Placer County alone. In some cases, power outages lasted up to six days; and, in addition to the power outages, extensive physical damage was recorded in the foothill area between Alta/Dutch Flat and Foresthill due primarily to falling trees or large tree limbs. Numerous other houses and businesses throughout the foothills and western portions of the County were damaged by falling trees, flying debris, water or wind. As a result, Placer County declared a local emergency. The initial damage assessment provided to the State Office of Emergency Services indicated damages of over \$410,000 in the public sector, and an estimated \$600,000 of private, residential damage. Businesses losses were much smaller and initial estimates were in the range of only \$205,000 total for five businesses.
- **January 2016** – Flash flood warnings were issued for burn zone areas in the Sierra foothills, as heavy rains pummeled the area. Drivers were also urged not to use area roadways in the area because of the possibility of debris flows and mudslides on hillsides that might be unstable because of the fires.

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 68 heavy rain and storm incidents over a 71-year period (1950-2020) equates to a severe storm event every year. As noted, this database doesn't likely capture all heavy rain, hail, and lightning events. Severe weather is a well-documented seasonal occurrence that will continue to occur often in the Placer County Planning Area.

Climate Change and Heavy Rains and Storms

Climate change and its effect on rain and storms in the County has been discussed by three sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014
- Cal-Adapt – 2021

Placer County Sustainability Plan

In Placer County, according to their Sustainability Plan, most severe weather is linked to high winds. Climate change is expected to cause an increase in intense rainfall, which is usually associated with strong storm systems. This means that Placer County could see more intense storms in the coming years and decades. Such an increase may not affect all forms of severe weather and may not always be apparent.

CAS

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in the County. The amount of lightning is not projected to change.

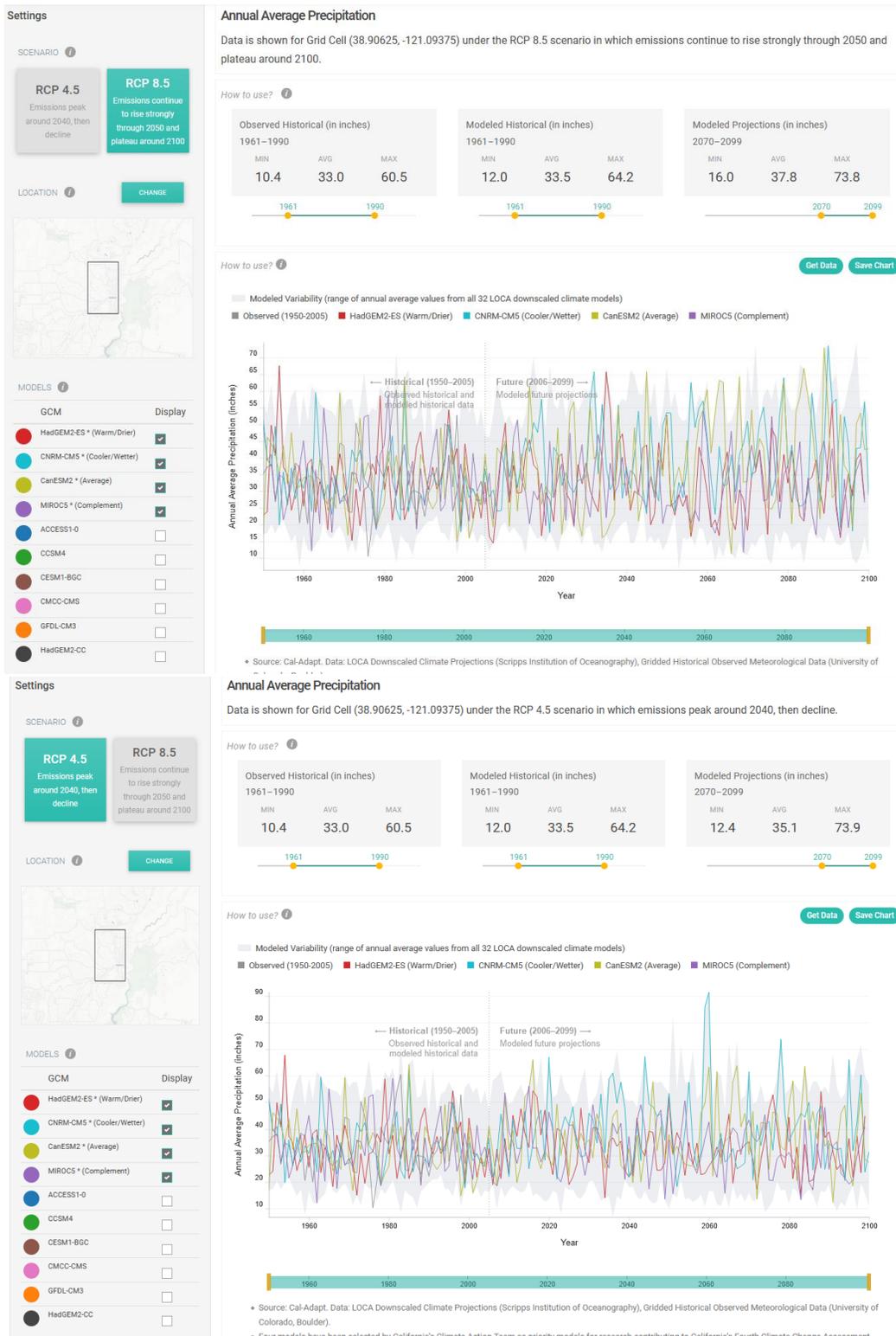
Cal Adapt

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized.

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future precipitation estimates from Cal-Adapt for the Placer County Planning (using the quad that contains Auburn) are shown in Figure 4-41.. It shows the following:

- The upper chart shows annual averages of observed and projected precipitation values for the selected area on map under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.
- The lower chart shows annual averages of observed and projected Precipitation values for the selected area on map under the RCP 4.5 scenario in which emissions peak around 2040, then decline. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.

Figure 4-41 Placer County – Future Precipitation Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map, Retrieved 12/8/2020

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data, heavy rains and storms are an annual occurrence in Placer County. Lightning occurs less frequently and can occur both with and without storm events. Hail tends to occur less frequently in the County. Impacts can be felt by both the population of the County as well as the structures that have been built in the County.

Impacts

Impacts from heavy rains and storms include damages to property and infrastructure. This includes: downed trees; damaged utility structures and infrastructures; power outages; road damages and blockages; hail damage to crops, buildings, and automobiles; and lightning damages to homes, critical infrastructure, and people. However, actual damage associated with the primary effects of severe weather have been somewhat limited. It is the secondary hazards caused by severe weather, such as floods, fire, and agricultural losses that have had the greatest impact on the County. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this plan (Section 4.3.12 Flood: 1%/0.2% Annual Chance, Section 0 Flood: Localized Stormwater, Section 4.3.9 Dam Failure, Section 4.3.14 Levee Failure, and Section 4.3.17 Wildfire).

Heavy Rains and Storms and Power Shortage/PSPS

During periods of heavy rains and storms, power outages can occur. These power outages can affect critical facilities and infrastructure, including pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found at the beginning of Section 4.3.

Future Development

Homes built in the County are built to existing building codes that generally withstand heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand lightning, hail and thunderstorm winds. Backup power sources for critical facilities should be incorporated into all new facilities. Properly located, designed, and constructed, future losses to new development should be minimal.

4.3.5. Severe Weather: High Winds and Tornadoes

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

High Winds

High winds, often accompanying severe storms and thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Location and Extent

The entire Placer County Planning Area is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort wind force scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Figure 4-42 shows the Beaufort wind scale.

Figure 4-42 Beaufort Wind Force Scale

Beaufort Number	Wind Speed (miles/hour)	Wind Speed (km/hour)	Wind Speed (knots)	Description	Wind Effects on Land
0	<1	<1	<1	Calm	Calm. Smoke rises vertically.
1	1-3	1-5	1-3	Light Air	Wind motion visible in smoke.
2	4-7	6-11	4-6	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	12-19	7-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	20-28	11-16	Moderate Breeze	Dust and loose paper are raised. Small branches begin to move.
5	19-24	29-38	17-21	Fresh Breeze	Small trees begin to sway.
6	25-31	39-49	22-27	Strong Breeze	Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult.
7	32-38	50-61	28-33	Near Gale	Whole trees in motion. Some difficulty experienced walking into the wind.
8	39-46	62-74	34-40	Gale	Twigs and small branches break from trees. Cars veer on road.
9	47-54	75-88	41-47	Strong Gale	Larger branches break from trees. Light structural damage.
10	55-63	89-102	48-55	Storm	Trees broken and uprooted. Considerable structural damage.
11	64-72	103-117	56-63	Violent Storm	Widespread damage to structures and vegetation.
12	> 73	> 117	> 64	Hurricane	Considerable and widespread damage to structures and vegetation. Violence.

Source: National Weather Service

Figure 4-43 depicts wind zones for the United States. The map denotes that Placer County falls into Zone I, which is characterized by high winds of up to 130 mph. Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. This is discussed in greater detail in the wildfire profile in Section 4.3.18.

Figure 4-43 Wind Zones in the United States



Source: FEMA

Tornadoes

Tornadoes and funnel clouds can also occur during severe storms. Tornadoes are another severe weather hazard that, though rare, can affect anywhere within the Placer County Planning Area, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300-mile-wide hurricanes. Figure 4-44 illustrates the potential impact and damage from a tornado. Tornadoes can cause damage to property and loss of life.

Figure 4-44 Potential Impact and Damage from a Tornado

Figure 2-2 Potential impact of a tornado

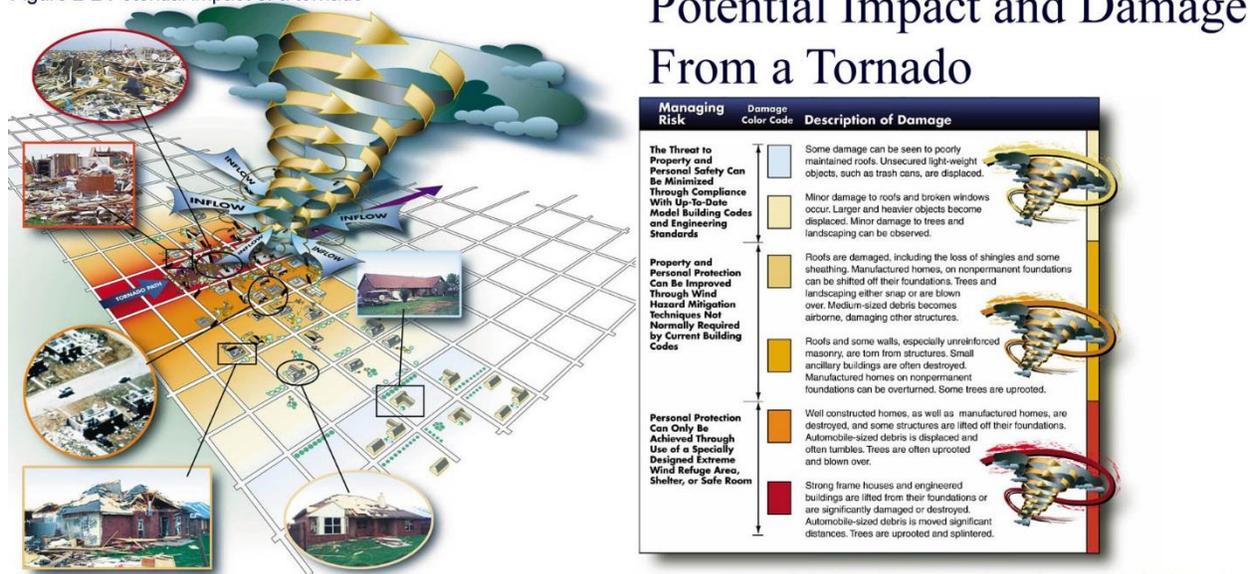


Figure 2-2 Potential damage table for impact of a tornado

Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Location and Extent

Tornadoes, while rare, can occur at locations in the lower elevations County. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. Table 4-40 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-41 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-40 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 4-41 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

It is difficult to predict a tornado or the conditions that preclude a tornado far in advance. Tornadoes can strike quickly with very little warning. In California it is rare for tornadoes to exceed EF3 magnitude. Most tornadoes that touch down are not long lived.

Past Occurrences

Disaster Declaration History

There have been no past federal or state disaster declarations due to high winds or tornadoes, according to Table 4-4. There have been four past USDA Secretarial Disaster Declarations due to high winds (and rainfall). This is shown in Table 4-42.

Table 4-42 Placer County – USDA Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2002	N/A	N/A	Rain and Wind
2008	N/A	N/A	Wind Event
2016	S4164	Contiguous	Severe weather including excessive rainfall and high winds

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2016	S4170	Contiguous	Severe weather including excessive rainfall and high winds

Source: USDA

NCDC Events

The NCDC data recorded 195 high wind and tornado incidents for Placer County since 1955. A summary of these events is shown in Table 4-43.

*Table 4-43 NCDC High Wind and Tornado Events in Placer County 1955-7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Funnel Cloud	2	0	0	\$0	\$0	0	0
High Wind	150	0	1	\$12,371,000	\$48,000	0	0
Strong Wind	34	1	2	\$2,599,600	\$0	0	0
Thunderstorm Wind	4	0	0	\$20,000	\$0	0	0
Tornado	5	0	0	\$252,530	\$0	0	0
Total	195	1	3	\$15,243,130	\$48,000	0	0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

HMPC Events

The HMPC noted the following wind and tornado events:

- **March 4, 1991** – High winds caused a roof to blow off a building in the Foresthill Union School District causing \$10,629 in damages.
- **December 12, 1995** – High winds caused a power outage resulting in the closure of Franklin Elementary, Placer Elementary, and Loomis Grammar School (Loomis Union School District).
- **December 20, 2002** – High winds caused a power outage resulting in the Franklin Elementary School closure (Loomis Union School District).
- **October 31, 2003** - Winds associated with heavy storms caused a power outage and closure of Truckee Elementary School. The area affected Donner Pass Road in the city of Truckee. Costs associated with the closure were paid for by the State insurance program.
- **March/April 2006** – Spring storm resulted in local disaster proclamation from extended rain and wind storm. Placer County roadways in unincorporated areas, particularly Foresthill Road and Ophir Road, were significantly damaged due to rain and mudslides. Costs to public agencies were in excess of \$1 million.
- **January 2008** –Severe winter storms brought massive snow, rain, and near record winds to Northern California over the first weekend in January, 2008 beginning on Friday January 4, 2008. It resulted in the temporary loss of power to some 2.5 million Pacific Gas & Electric (PG&E) customers throughout Northern California; approximately 45,000 in Placer County alone. In some cases, power outages lasted up to six days; and, in addition to the power outages, extensive physical damage was recorded in the foothill area between Alta/Dutch Flat and Foresthill due primarily to falling trees or large tree limbs.

Numerous other houses and businesses throughout the foothills and western portions of the County were damaged by falling trees, flying debris, water or wind. As a result, Placer County declared a local emergency. The initial damage assessment provided to the State Office of Emergency Services indicated damages of over \$410,000 in the public sector, and an estimated \$600,000 of private, residential damage. Businesses losses were much smaller and initial estimates were in the range of only \$205,000 total for five businesses.

- **2018** – During a weather event in the Tahoe region, a large Pine tree fell on the roof of the Tahoe Engineering Building (TED) 7717 N Lake Blvd, Tahoe Vista, CA. The event caused holes in the roof and structural damage to the rafters. The primary damage was over a file room in the building and the incident occurred while employees were not present in the building.

Likelihood of Future Occurrence

Highly Likely/Occasional – Based on NCDC data and HMPC input, 195 wind and tornado incidents over a 66-year period (1955-2020) equates to a severe wind/tornado event every year. High winds are a well-documented seasonal occurrence that will continue to occur annually in the Placer County Planning Area. Tornadoes tend to be rare in the County and warrant a likelihood of future occurrence rating of occasional.

Climate Change and High Winds

Climate change and its effect on high winds and tornadoes in the County has been discussed by two sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014

Placer County Sustainability Plan

In Placer County, most severe weather is linked to high winds. Climate change is expected to cause an increase in intense rainfall, which is usually associated with strong storm systems. This means that Placer County could see more intense storms in the coming years and decades. Such an increase may not affect all forms of severe weather and may not always be apparent. The Placer County Sustainability Plan does not discuss non-thunderstorm winds or tornadoes.

CAS

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability Assessment

Vulnerability—Medium

Placer County is subject to potentially destructive straight-line winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe

storm event. Tornadoes are less common and tend to occur mostly in the lower elevations in the western portion of the County.

Impacts from High Winds and Tornadoes

Straight line and tornadoes winds are primarily a public safety and economic concern. Windstorms and tornadoes can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind or tornado events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

Impacts from straight line winds and tornadoes include:

- Increased wildfire risk
- Erosion (soil loss)
- Dry land farming seed loss
- Windblown weeds
- Downed trees
- Power line impacts and economic losses from power outages
- Occasional building damage, primarily to roofs

Campers, mobile homes, barns, and sheds and their occupants are particularly vulnerable as windstorm events in the region can be sufficient in magnitude to overturn these lighter structures. Livestock that may be contained in these structures may be injured or killed, causing economic harm to the rancher who owns both the structure and the livestock. Overhead power lines are vulnerable and account for the majority of historical damages. State highways can be vulnerable to high winds and dust storms, where high profile vehicles may be overturned by winds and lowered visibility can lead to multi-car accidents. The greatest threat to Placer County from wind is not from damage from the winds themselves, but from the spread of wildfires during windy days, and now from the periodic PSPS events.

High Winds and Power Shortage/PSPS

During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found at the beginning of Section 4.3.

Future Development

Future development projects should consider windstorm and tornado hazards at the planning, engineering, and architectural design stage with the goal of reducing vulnerability. Utilities at risk to high winds should be undergrounded as new facilities are improved or added. Whether high winds and tornadoes will occur, where, when, and of what intensity are all factors that evolve over the days and hours before they form and after they do. Improved weather forecasts coupled with new information technologies, including social media, has resulted in an increasingly large volume of risk information that is available to people when tornadoes and high winds threaten. Development trends in the County are not expected to increase vulnerability to this hazard.

4.3.6. Agricultural Hazards

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Before its rapid population growth in the 1970s and 1980s, Placer County was known as an agricultural and timber-producing county. Agriculture and timber production are still important sectors of the County's economy; however, manufacturing, recreation, and service industries have increased in economic importance. Agricultural lands continue to be at risk to development based on population growth projections for the County. In western Placer County, land traditionally used for agricultural purposes lies near existing cities and is expected to accommodate much of this population increase. While its agricultural land is threatened, Placer County retains a significant amount of agricultural land where the economy is intact and where farmers are a real presence in the community.

According to the HMPC, agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. The 2018 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

In addition to severe weather, invasive species can affect the agricultural industry in the County. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard addresses the issues related to invasive pests including that pose a significant threat to the agricultural industry and are therefore a concern in the Placer County Planning Area. This hazard does not address pests and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

According to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMPP), as of 2016 the County has approximately 7,431 acres of prime farmland, 4,097 acres of farmland of statewide importance, 18,784 acres of farmland of local importance, and 30,267 acres of grazing land. These numbers have been reduced quite considerably since 1996 due to increased development in the County. (see Table 4-44).

Table 4-44 Placer County Farmland Inventory – 1996, 2006, and 2016

Soil Category	1996 Acres	2006 Acres	2016 Acres
Prime Farmland	9,867	8,524	7,431
Farmland of Statewide Importance	5,546	5,021	4,097
Unique Farmland	23,301	22,793	18,784

Soil Category	1996 Acres	2006 Acres	2016 Acres
Farmland of Local Importance	114,270	101,846	94,732
Grazing Land	33,694	28,692	30,267
Urban and Built-Up Land	35,002	55,770	61,214
Water	184,804	183,874	189,929
Other Land	5,047	5,011	5,012
Total Area Inventoried	411,531	411,531	411,466

Source: State of California Department of Conservation Farmland Mapping and Monitoring Program, www.conservation.ca.gov/

According to the 2019 Placer County Crop Report, Placer County’s total gross value of agricultural crops and products for 2019 was \$86,707,959. This represents an increase of \$14,005,069, or 17% above 2018’s value of \$72,702,890. This report reflects the gross value of agricultural crops and products and not the net income producers receive. Rice retained its spot as Placer County’s top grossing crop with a value of \$25,766,652, which represented a \$5 million increase due to strong prices and an increase in planted acreage. Although down significantly from 2018, beef cattle remained second in overall value, with a total value of \$12,925,000. Walnuts took over the third position at \$11,777,842 with a significant increase in value of more than \$6 million due to much of the recently planted new acreage coming into production. Nursery stock and timber rounded out the top five with respective values of \$7,048,500 and \$6,026,000. A summation of crop production values, sourced from the Placer County Agricultural Commissioner’s Annual Crop Reports, from 2015-2019 for Placer County is shown in Table 4-45.

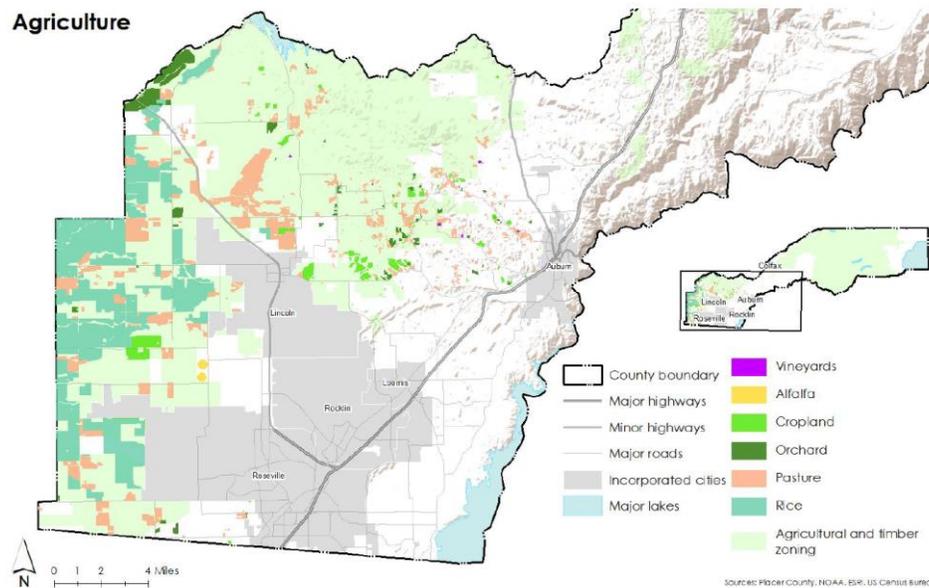
Table 4-45 Placer County – Value of Agricultural Production 2015-2019

Crop	2015	2016	2017	2018	2019
Fruit & Nut	\$20,761,473	\$11,348,890	\$9,818,000	\$9,779,000	\$9,047,000
Field Crops	\$32,484,236	\$27,140,000	\$16,565,000	\$19,122,000	\$22,385,000
Vegetable Crops	\$1,710,000	\$2,000,000	\$1,850,000	\$1,750,000	\$1,750,000
Livestock/Poultry	\$16,263,000	\$17,839,000	\$13,298,000	\$20,580,000	\$15,177,000
Livestock/Poultry Products	\$1,860,000	\$1,904,000	\$1,929,000	\$1,500,000	\$1,716,000
Nursery Products	\$7,048,500	\$7,558,000	\$8,442,000	\$8,154,000	\$8,208,000
Apiary Products	\$278,750	\$75,000	\$73,000	\$62,000	\$113,000
Subtotals	\$80,405,959	\$67,864,890	\$51,975,000	\$60,947,000	\$58,396,000
Gross Timber Harvest/ Christmas Trees	\$6,302,000	\$4,838,000	\$6,084,000	\$4,259,000	\$5,918,000
Grand Totals	\$86,707,959	\$72,702,890	\$58,059,000	\$65,206,000	\$64,314,000

Source: Placer County Agricultural Commissioner

These agricultural products are grown in various areas of the County. These areas are shown on Figure 4-45.

Figure 4-45 Placer County – Agricultural Areas



Source: 2020 Placer County Sustainability Plan

Natural Disasters and Severe Weather

According to the USDA, every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature.

Location and Extent of Severe Weather

Severe weather events that can affect agriculture are often regional events (droughts, wind, freeze, heavy rains, and extreme heat). The entirety of the agriculture producing areas of the County are at risk to these severe weather events. The speed of onset varies. Winds, freeze, extreme heat, and heavy rains can have short onset speeds, the onset of drought is much longer. Duration of events varies as well, with longer durations possible for drought and extreme temperatures and shorter durations for winds and heavy rains.

Insect Pests

Placer County is threatened by a number of insects that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. Insects of concern to plants and crops include the melon fruit fly, Oriental fruit fly, Mediterranean fruit fly, gypsy moth, light brown apple moth, Japanese beetle, European grapevine moth, Asian citrus psyllid, and glassy-winged sharpshooter. The

Placer County Department of Agriculture traps and monitors all of these agricultural pests. Pest detection is a proactive program that seeks to identify exotic, invasive insects. These pests have a wide host ranges and are difficult and costly to manage once established. Early detection is essential for quick and efficient eradication. Public participation is critical to the success of this program, since staff relies on the goodwill of property owners who allow traps to be placed on their properties. The Agriculture Department deploys over 1,700 traps annually between spring and fall.

Location and Extent of Insect Pests

Insect pests can affect the whole of the County. The speed of onset can be short, while the duration of the infestation varies, but can be long. Insect pests affecting crop production result in economic disasters. These hazards can have a major economic impact on farmers, farm workers, packers, and shippers of agricultural products. They can also cause significant increases in food prices to the consumer due to shortages. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

Weeds

Noxious weeds, defined as any plant that is or is liable to be troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, are also of concern. Noxious weeds within the Planning Area include those listed on Table 4-24.

Table 4-46 Placer County Weeds of Concern

Species of Concern				
Barb Goatgrass	Giant Reed	Red Brome	Downy Brome	Spotted Knapweed
Yellow Starthistle	Jubatagrass	Pampasgrass	Scotch Broom	Water Hyacinth
French Bloom	English Ivy	Hydrilla	Perennial Pepperweed	Uruguay Water Primrose
Creeping Water Primrose	Purple Loosestrife	Parrotfeather	Eurasian watermilfoil	Scotch Thistle
Himalayan Blackberry	Red Sesbania	Spanish Broom	Medusahead	Smallflower Tamarisk
Tamarisk				

Source: California Invasive Plant Council Weed Mapper – Containment Opportunities (high) retrieve on 12/2/2020

Roadways serve as conduits for the movement of invasive plants into and throughout Placer County. Vehicles traveling on interstate and regional highways as well as local roads can unintentionally move and introduce invasive plants to new locales. The most significant and threatening travel thoroughfare in the area is the I-80 corridor which directly links northern California to other western states that are infested with invasive plants that are not established in California, or are present in limited numbers. Likewise, weeds like yellow starthistle and stinkwort, which are prevalent on the western slope of the Sierras, are poised to move eastward along roadways into the mountains absent intervention and management.

To counter these threats, the Placer County Agriculture Department cooperates with Caltrans to conduct annual surveys and treatments along I-80 between Colfax and Donner Summit. During the summer months when weeds are actively growing and readily visible, agriculture department inspectors scour the interstate shoulders and medians looking for new occurrences of troublesome weeds like spotted knapweed, musk thistle and perennial pepperweed. These annual efforts allow inspectors to identify, treat and eradicate infestations before they become established and spread outside of the travel way into forest, riparian and other environments including agricultural lands in western Placer County. In 2019, over 579 noxious weed sites were treated.

Location and Extent of Weeds

Agricultural hazards occur throughout the County where lands are used for farming and grazing. The County has large swaths of agricultural lands. These were shown for the County on Figure 4-3 in Section 4.2 above. Areas not as greatly affected by severe weather, insects, and pests are the incorporated jurisdictions in the County, as well as the forest lands in the eastern portion of the County which all contain fewer agricultural acres. However, while the cities may not be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: insects, weeds, severe weather, as well as downturns in commodity prices. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Insects and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

The agricultural lands of Placer County have historically been affected by weather related events such as freeze, heavy rain, and drought. The severe weather events can have devastating effects leading to losses in yield and affecting quality. The US Farm Services Agency provided information on disaster declarations from 2012 through 2020 (the length of data available on their website). These are shown in Table 4-47.

*Table 4-47 Placer County – USDA Disaster Declarations 2012 to 2020**

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2002	N/A	N/A	Drought
2002	N/A	N/A	Rain and Wind
2003	N/A	N/A	Hail and Freeze
2003	N/A	N/A	Excessive Rain/Late Rain
2003	N/A	N/A	Drought
2003	N/A	N/A	Late Rain/Heat
2004	N/A	N/A	Drought
2004	N/A	N/A	Unseasonable Early Heat

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2004	N/A	N/A	Fire
2005	N/A	N/A	Freeze
2005	N/A	N/A	Unseasonable Late Rain
2005	N/A	N/A	Heat
2006	N/A	N/A	Heat
2006	N/A	N/A	Rain/Hail Event
2007	N/A	N/A	Heat
2007	N/A	N/A	Freeze
2007	N/A	N/A	Drought
2008	N/A	N/A	Drought Event
2008	N/A	N/A	Freeze Event
2008	N/A	N/A	Wind Event
2009	N/A	N/A	Drought Event
2012	S3283	Contiguous	Drought-FAST TRACK
2012	S3379	Primary	Drought
2012	S3440	Contiguous	Drought-FAST TRACK
2013	S3462	Contiguous	Drought-FAST TRACK
2013	S3495	Primary	Drought-FAST TRACK
2013	S3569	Primary	Drought-FAST TRACK
2014	S3638	Contiguous	Drought-FAST TRACK
2014	S3626	Primary	Drought-FAST TRACK
2014	S3631	Contiguous	Drought
2014	S3637	Primary	Drought-FAST TRACK
2014	S3797	Primary	Drought
2015	S3784	Primary	Drought-FAST TRACK
2015	S3789	Contiguous	Drought-FAST TRACK
2015	S3963	Contiguous	Drought
2016	S3952	Primary	Drought-FAST TRACK
2016	S3953	Contiguous	Drought-FAST TRACK
2016	S4164	Contiguous	Severe weather including excessive rainfall and high winds
2016	S4170	Contiguous	Severe weather including excessive rainfall and high winds
2017	S4163	Contiguous	Drought-FAST TRACK
2018	S4427	Contiguous	Drought-FAST TRACK
2019	S4565	Contiguous	Excessive rain
2020	S4697	Primary	Drought-FAST TRACK
2020	S4765	Contiguous	Drought-FAST TRACK

Source: Placer County Agricultural Commissioner, US Farm Service Agency

* Disaster declarations for 2019 were released, but no disasters have yet been declared for the County in the 2019 agricultural year

NCDC Events

The NCDC does not track agriculture events.

Hazard Mitigation Planning Committee Events

The HMPC noted that agriculture events occur yearly, though with varying levels of damages to a variety of crops. Severe weather, insect pests, and noxious weeds occur yearly.

Likelihood of Future Occurrence

Highly Likely—As long as severe weather events, insects, and weeds continue to be an ongoing concern to the Placer County Planning Area, the potential for agricultural losses remains.

Climate Change and Agricultural Hazards

Climate change and its effect on the agriculture industry in the County has been discussed by two sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014

Placer County Sustainability Plan

The forests, farms, and ranches of Placer County all face risk from assorted pests and diseases that may affect crop plants, trees, and livestock. One of the most direct effects of climate change is that average temperatures will increase, and this has a bearing on many pests and diseases. Many pests and organisms that carry diseases are most active during warmer months, so the threat of infection or infestation can be higher during this time of year. Temperatures are expected to get warmer earlier in the year and remain warmer until later in the year due to climate change, creating a wider window for pests and diseases to be active and spread. While there are treatment options for a number of agriculture and forestry diseases, some have no cure.

Many crop plants, trees, and livestock may also be harmed and consequently weakened by warmer temperatures and changes in precipitation. The weaker plants and animals may not be able to fend off infestations or infections as well as stronger plants or animals, causing pests and diseases to affect more of the population. These pests and diseases can cause plants and animals to grow slower, damage them so their products are less appealing and harder to sell, or even kill them.

CAS

According to the CAS, addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

Vulnerability Assessment

Vulnerability—Medium

Given the importance of agriculture to Placer County, agricultural hazards continue to be an ongoing concern. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and extreme heat; insect/pest infestations; and noxious weeds. According to the County, agricultural losses occur on an annual basis throughout the County and are usually associated with these types of events.

Impacts

According to the USDA, every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. Specific impacts by hazard are listed below:

- Drought's most severe effects on agriculture include water quality and quantity issues. Other impacts include decreased crop yields, impact to feed and forage, altered plant populations and tree mortality.
- Earthquakes, though rare in Placer County, can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on agricultural production and the environment. These impacts could include loss of harvest or livestock and destruction of irrigation systems and other agricultural infrastructure.
- Extreme cold may result in loss of livestock, increased deicing, downed power lines, and increased use of generators. Deicing can impact agriculture by damaging local ecosystems and contaminating water bodies. Downed power lines cause people to run generators more often, which can release harmful air pollutants.
- Hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.
- Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.
- Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.
- Landslides and debris flow occur in all 50 states and commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. Some of the threats from landslides and debris flow include rapidly moving water and debris that can cause trauma; broken electrical, water, gas, and sewage lines; and disrupted roadways and railways. This can lead to

agricultural impacts including contamination of water, change in vegetation, and harvest and livestock losses.

In addition to threats to agriculture from weather and other natural hazard events, agriculture in the County is at risk from insects, pests, and noxious weeds. Establishment of an invasive species would be detrimental to the agricultural industry of Placer County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem. In addition, invasive plants:

- Increase wildfire potential
- Reduce water resources
- Accelerate erosion and flooding
- Threaten wildlife
- Degrade rangeland, cropland, and timberland
- Diminish outdoor recreation opportunities.

Invasive plants cost California \$82 million every year (2008 California Invasive Plan Council). Estimates on exact yearly losses in Placer County varies and was not available for the County. Due to the high economic value of crops in the County, invasive species have the ability to cause immense financial harm.

Future Development

Future development in the County is not likely to have an impact on agricultural hazards in Placer County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing. However, the HMPC did note that with additional development in the County, there may be additional competition for water resources thus possibly impacting the agricultural industry and the Placer County Planning Area.

4.3.7. Avalanche

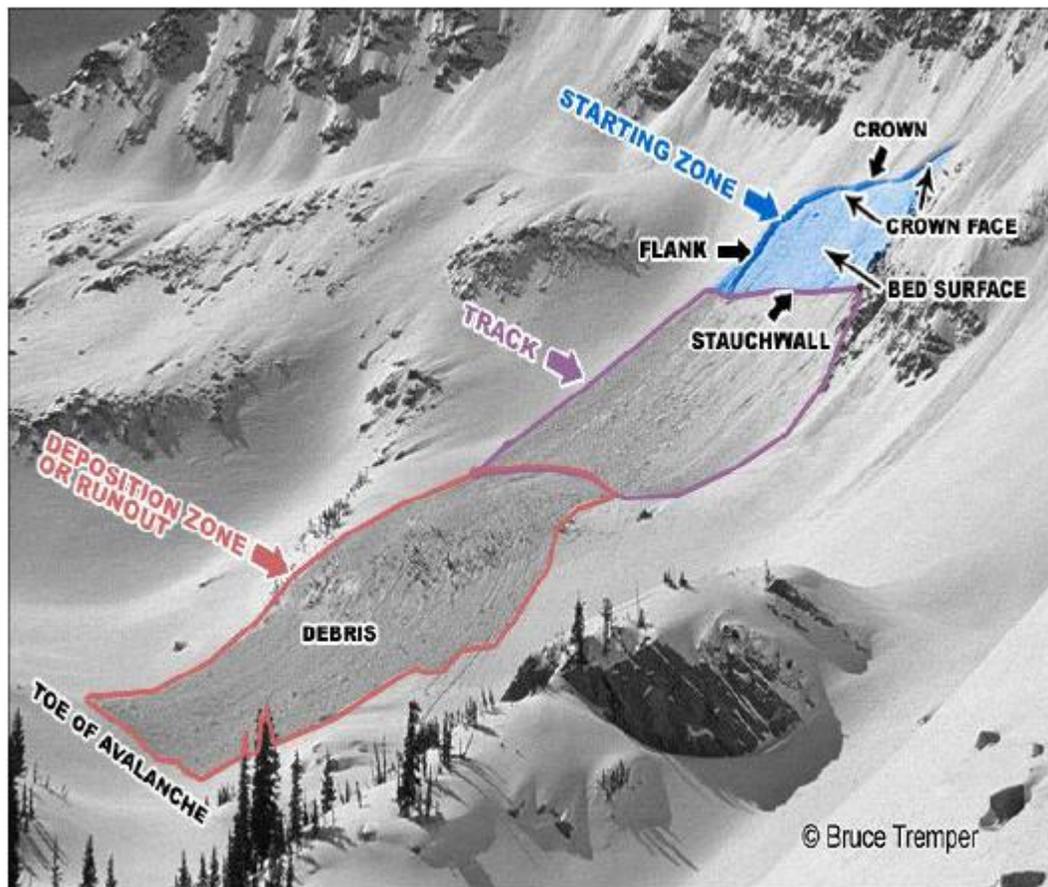
Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited. This can be seen in Figure 4-46.

Figure 4-46 Avalanche Zones



Source: Sierra Avalanche Center

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This can be found in Table 4-48.

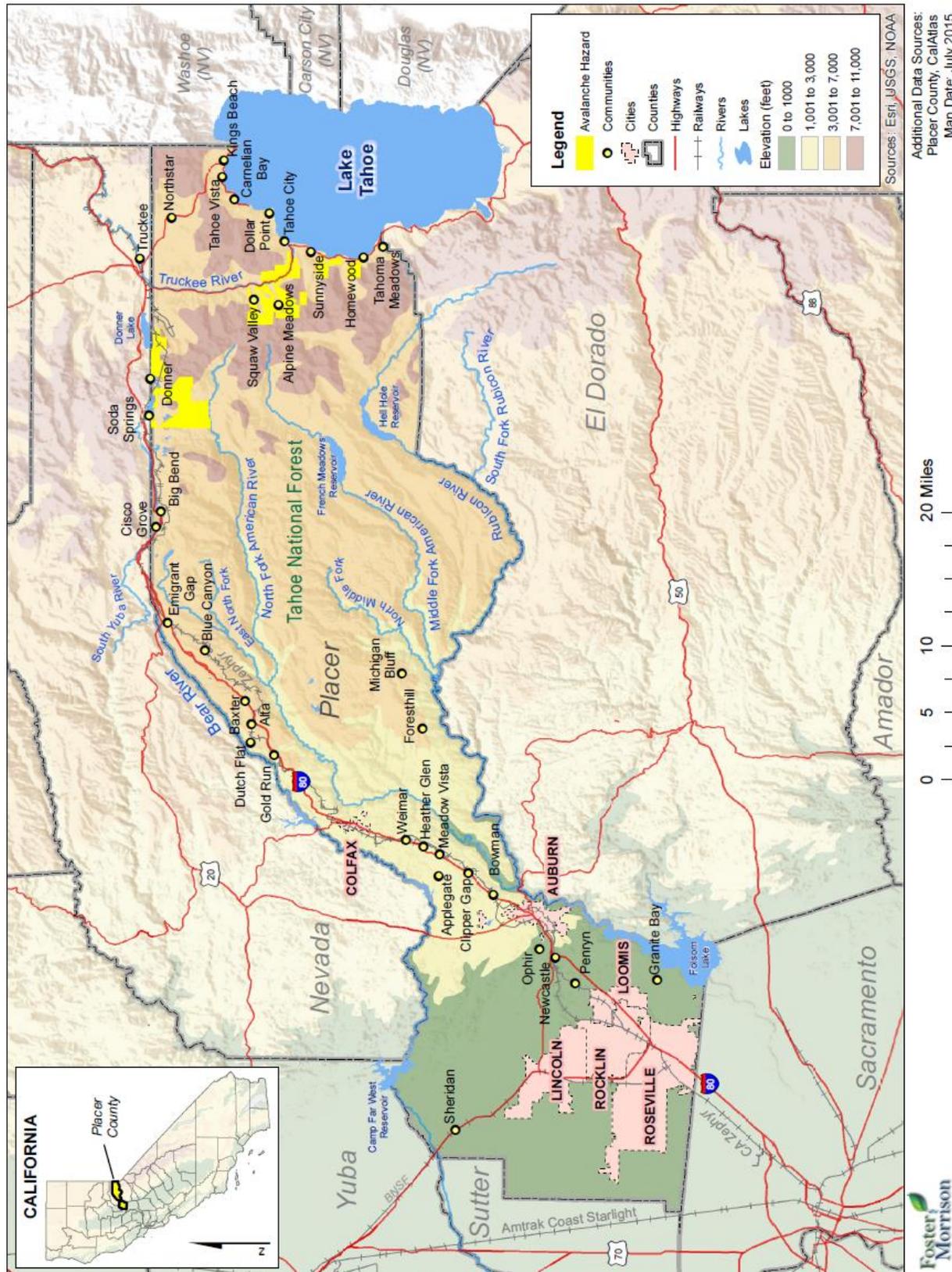
Table 4-48 North American Public Avalanche Danger Scale

Danger Level	Travel Advice	Likelihood of Avalanche	Avalanche Size or Distribution.
5 – Extreme	Avoid all avalanche terrain	Natural and human-triggered avalanches certain	Large to very large avalanches in many areas
4 – High	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended	Natural avalanches likely; human-triggered avalanches very likely	Large avalanches in many areas; or very large avalanches in specific areas
3 – Considerable	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision making essential	Natural avalanches possible; human-triggered avalanches likely	Small avalanches in many areas; or large avalanches in specific areas; or very large avalanches in isolated areas
2 – Moderate	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern	Natural avalanches unlikely; human-triggered avalanches possible	Small avalanches in specific areas; or large avalanches in isolated areas
1 – Low	Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features	Natural and human-triggered avalanches unlikely	Small avalanches in isolated areas or extreme terrain

Source: National Avalanche Center

Areas prone to avalanche hazards include hard to access areas deep in the backcountry. Avalanche hazards exist in eastern Placer County where combinations of the above criteria occur. This is shown on Figure 4-47.

Figure 4-47 Placer County – Avalanche Hazard Areas



Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations related to avalanche in Placer County, as shown in Table 4-4.

NCDC Events

The NCDC database shows 15 avalanche events in Placer County since 1996, as shown in Table 4-49.

*Table 4-49 NCDC Avalanche Events for Placer County 1950-7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Avalanche	15	6	12	\$0	\$0	0	0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

HMPC Events

Historically, avalanches occur within the County between the months of December and March, following snowstorms. Although avalanches have occurred on slopes of many angles, they most often occur on slopes ranging between 30 degrees and 45 degrees. Therefore ski resorts, residences, roads, businesses, and other structures and activities in these areas are vulnerable. Areas where the potential for avalanches to exist are zoned as moderate or high avalanche hazard zones and have been identified. Moderate hazard zones are usually on shallow slopes and located immediately downhill of high zones. These high and moderate zones are located near the Nevada County line, south of Donner Lake and Lake Van Norden, east of Tahoe City, near Twin Peaks and McKinney Bay, and in areas near Squaw Valley, Alpine Meadows, and Sugar Bowl. According to the 2004 Placer Operational Area, Emergency Operations Plan, areas of particular concern include:

- Alpine Meadows, Bear Creek drainage;
- West shore of Donner Lake;
- Donner Summit/Norden Area;
- West shore of Lake Tahoe (Homewood & Ward Creek tract);
- Serene Lakes, Onion Creek drainage;
- Squaw Valley;
- Sugar Bowl Ski Resort and Onion Creek;
- Truckee River Corridor/Highway 89 Corridor; and
- Northstar Ski Resort.

The following avalanche incidents have resulted in 19 fatalities within Placer County since 1982:

- **March 31, 1982** – At Alpine Meadows, a 30-foot high wall of snow plowed through a ski lodge and other buildings at 80 mph, killing seven people. SHELDUS estimated the cost of the damages at \$5 million.

- **February 11, 1998** – Donner Summit backcountry, one fatality - snowboarder.
- **February 6, 1999** – Donner Summit, one fatality.
- **February 21, 2001** – Squaw Valley, two fatalities, Class II Avalanche. A storm resulted in 20 inches of snow and winds out of the SSW were in the 40-50 mile per hour range with gusts up to 60-70 miles per hour.
- **March 8, 2002** – Sugarbowl Resort, one fatality. A storm hit with 34 inches of snow and winds were up to 100 miles per hour.
- **January 1, 2004** – Donner Summit near Castle Peak, one fatality.
- **December 25, 2008** – The Sacramento Bee newspaper reported that a 21-year-old skier died in an avalanche in the Sierra on Christmas morning. The newspaper reported that the skier's body was found buried following an avalanche in the Red Dog area at Squaw Valley Ski Resort. The victim was a resident of Tahoe City.
- **March 3, 2009** – A ski patrolman was partially buried in an avalanche at Squaw Valley Ski Resort while he was working avalanche controls. He was dug out of the avalanche by another member of the ski patrol. He was transferred to Renown Regional Medical Center in Reno but later died from his injuries.
- **March 1, 2012** – A Sierra Avalanche Center report indicated that three skiers were skiing in the backcountry near Alpine Meadows when one of the skiers triggered an avalanche about 300 ft wide by 500 feet long and one foot deep. The skier was buried under 3 feet of snow. The other two skiers found the victim within several minutes. However, the victim sustained severe injuries due to impact with trees and debris and died in the hospital that night.
- **December 24, 2012** – One fatality occurred when a male snowboarder, age 49, was caught in an avalanche at Donner Ski Ranch. The man's body was found under 2-3 feet of snow at the base of the avalanche. The wind had blown snow to depths of 7 ft or more where the man was snowboarding.
- **December 24, 2012** – Avalanche control activities (explosives) at the Alpine Meadows Ski resort resulted in the death of an experienced ski patroller. The avalanche broke much wider and higher than expected based on past experience. The man was found and uncovered within 8 minutes of the avalanche. He was airlifted via CareFlight helicopter to Renown Medical Center in Reno where he died.
- **February 4, 2019** – Between 4pm and midnight, the meter at the bottom of Roundhouse (~6950 elevation) recorded 21.6 new inches of snow, a snowfall rate of ~2.5 inches per hour. Natural slides were observed around 9:50 pm on 2/4/19 at depths about 3 feet near Alpine Meadows Road between Juniper Mountain and Deer Park roads. North Tahoe Fire, PCSO, and DPW responded and managed the scene until the road was reopened. No injuries or damages recorded.
- **On January 18, 2020**, one man was killed and another man was seriously injured by an avalanche near the Subway ski run at Alpine Meadows.

Likelihood of Future Occurrence

Likely—Injuries and loss of life from an avalanche are usually due to people recreating in remote areas at the wrong time. Given the topography and amount of snow falling on an annual basis in eastern Placer County, avalanches and resulting damages, including injuries and loss of life, will continue to occur.

Climate Change and Avalanche

Climate change and its effect on avalanche in the County has been discussed by two sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014

Placer County Sustainability Report

Climate change is likely to cause more intense winter storms, and warmer temperatures are likely to cause a greater percent of precipitation to fall as rain instead of snow. Warmer conditions can cause more rapid melting of snow, which may destabilize snow on hillsides, causing more avalanches in Placer County.

CAS

According to the CAS, climate change may exacerbate the avalanche hazard in the County. Avalanches stemming from a weather pattern of heavy snowfalls followed by thawing may increase – a dangerous combination that can be expected with climate change.

Vulnerability Assessment

Vulnerability—Low

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. The combination of steep slopes, abundant snow, weather, snowpack, and a trigger to cause movement create avalanches. In Placer County, there is not significant development in these areas. A primary concern are areas in and around the ski areas, where avalanche risk and vulnerability is continuously evaluated and mitigated as needed to protect property, residents and visitors. The other primary concern of the County to avalanche is associated with possible impact to major roads which can cause road closures and in some instances bury cars.

Impacts

Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

Future Development

The County noted that future development occurs infrequently in avalanche prone areas.

4.3.8. Climate Change

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Climate change is the distinct change in measures of weather patterns over a long period of time, ranging from decades to millions of years. More specifically, it may be a change in average weather conditions such as temperature, rainfall, snow, ocean and atmospheric circulation, or in the distribution of weather around the average. While the Earth's climate has cycled over its 4.5-billion-year age, these natural cycles have taken place gradually over millennia, and the Holocene, the most recent epoch in which human civilization developed, has been characterized by a highly stable climate – until recently. Climate change is caused by an increase in levels of greenhouse gases (GHGs) in the atmosphere. Common GHGs include carbon dioxide, methane, and nitrous oxide, which trap heat and increase Earth's average temperature, causing changes in the planet's climate system and altering conditions across the globe.

This LHMP Update is concerned with human-induced climate change that has been rapidly warming the Earth at rates unprecedented in the last 1,000 years. Since industrialization began in the 19th century, the burning of fossil fuels (coal, oil, and natural gas) at escalating quantities has released vast amounts of carbon dioxide and other greenhouse gases responsible for trapping heat in the atmosphere, increasing the average temperature of the Earth. Secondary impacts include changes in precipitation patterns, the global water cycle, melting glaciers and ice caps, and rising sea levels. According to the Intergovernmental Panel on Climate Change (IPCC), climate change will “increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems” if unchecked.

Through changes to oceanic and atmospheric circulation cycles and increasing heat, climate change affects weather systems around the world. Climate change increases the likelihood and exacerbates the severity of extreme weather – more frequent or intense storms, floods, droughts, and heat waves. Consequences for human society include loss of life and injury, damaged infrastructure, long-term health effects, loss of agricultural crops, disrupted transport and freight, and more. Climate change is not a discrete event but a long-term hazard, the effects of which communities are already experiencing.

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Similarly, as noted in California's Fourth Climate Change Assessments, projections show that average temperatures will continue to rise across California, drought will increase in length and frequency, and sea levels will rise in coastal communities. Drought and temperature increases are likely to create secondary hazards that can include a decline in overall snowpack, changes in frequency and intensity of precipitation events, and an increase in wildfire activity. Climate change hazards can impact water availability, agricultural production, public health systems, essential transportation corridors, and disadvantaged communities in both rural and urban areas across California.

California’s Adaptation Planning Guide (APG): Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. California’s Adaptation Planning Guide: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. California’s Adaptation Planning Guide: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors, and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. Table 4-50 provides a summary of Cal-Adapt Climate Projections for the North Sierra Region.

Table 4-50 North Sierra Region and Placer County – Cal Adapt Climate Projections

Effect	Ranges
Temperature Change, 1990-2100	January increase in average temperatures: 2.5 °F to 4°F by 2050 and 6°F to 7°F by 2100. The largest changes are observed in the southern part of the region. July increase in average temperatures: 4 °F to 5°F by 2050 and 10°F by the end of the century, with the greatest change in the northern part of the region. (Modeled average temperatures; high emissions scenario)
Precipitation	Precipitation decline is projected throughout the region. The amount of decrease varies from 3 to 5 inches by 2050 and 6 inches to more than 10 inches by 2100, with the larger rainfall reductions projected for the southern portions of the region. (CCSM3 climate model; high carbon emissions scenario)
Heat wave	Heat waves are defined as five consecutive days over 83 °F to 97°F depending on location. By 2050, the number of heat waves per year is expected to increase by two. A dramatic increase in annual heat waves is expected by 2100, eight to 10 more per year.
Snowpack	Snowpack levels are projected to decline dramatically in many portions of the region. In southern portions of the region, a decline of nearly 15 inches in snowpack levels - a more than 60 percent drop - is projected by 2090. (CCSM3 climate model; high carbon emissions scenario)
Wildfire	Wildfire risk is projected to increase in a range of 1.1 to 10.5 times throughout the region, with the highest risks expected in the northern and southern parts of the region. (GFDL climate model; high carbon emissions scenario)

Source: Cal-Adapt

In Placer County, climate change will be more localized in the form of specific hazards (or exposures) that will occur through changes in existing conditions or new natural hazards. These exposures are analyzed in the vulnerability assessment and include agriculture and forestry pests and diseases, avalanche, drought, extreme heat, flooding, pandemic hazards, landslides, severe weather, severe winter weather, and wildfire. Some hazards, such as wildfire and drought, relate directly to the occurrence of other hazards, such as agriculture and forestry pests and diseases, landslides, and flooding. Placer County is currently experiencing some of these changes, but others may not occur or be apparent for several years or decades.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the County. There is no scale to measure the extent of climate change. Climate change exacerbates other hazard, such as drought, extreme

heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters, as shown in Table 4-4. The County had no USDA disaster declarations since 2002 related to climate change, as shown on Table 4-6.

NCDC Events

The NCDC does not track climate change events.

Hazard Mitigation Planning Committee Events

While the HMPC noted that climate change is of concern, no specific impacts of climate change could be recalled. HMPC members noted that the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. The HMPC also noted that the winter rains of 2017 and 2019 were more intense.

Likelihood of Future Occurrence

Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2017 and 2019 were two of the hottest years on record. Without significant global action to reduce greenhouse gas (GHG) emissions, the IPCC concludes in its Fifth Assessment Synthesis Report (2014) that average global temperatures are likely to exceed 1.5°C by the end of the 21st century, with consequences for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges.

Climate Scenarios

The United Nations IPCC developed several GHG emissions scenarios based on differing sets of assumptions about future economic growth, population growth, fossil fuel use, and other factors. The emissions scenarios range from “business-as-usual” (i.e., minimal change in the current emissions trends) to more progressive (i.e., international leaders implement aggressive emissions reductions policies). Each of these scenarios leads to a corresponding GHG concentration, which is then used in climate models to examine how the climate may react to varying levels of GHGs. Climate researchers use many global climate models to assess the potential changes in climate due to increased GHGs.

Key Uncertainties Associated with Climate Projections

- Climate projections and impacts, like other types of research about future conditions, are characterized by uncertainty. Climate projection uncertainties include but are not limited to:
 - ✓ Levels of future greenhouse gas concentrations and other radiatively important gases and aerosols,

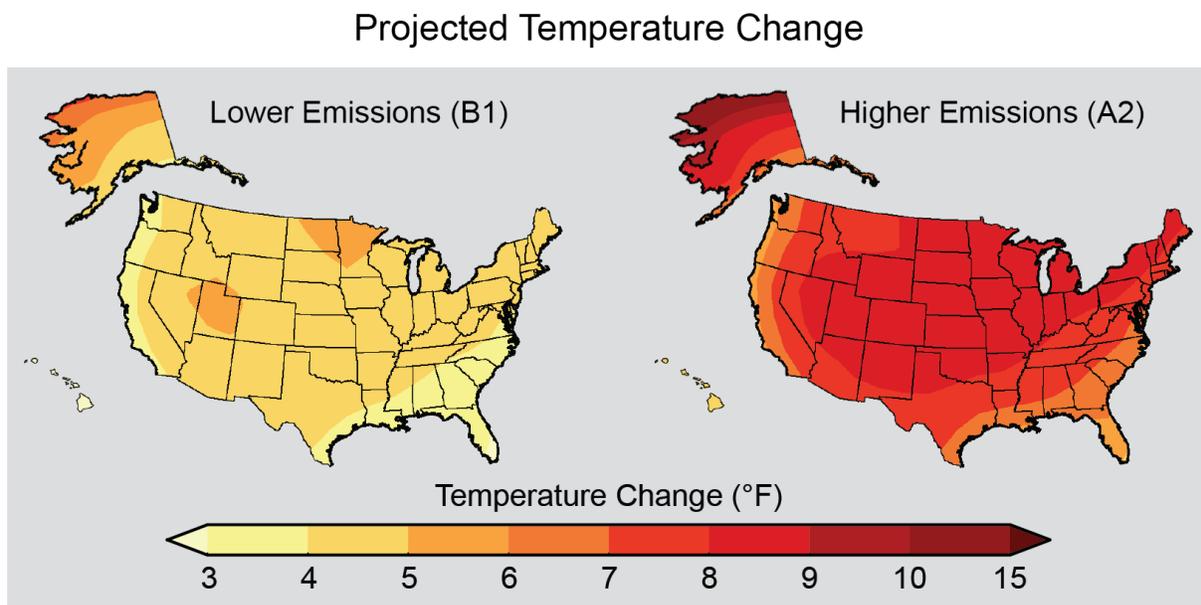
- ✓ Sensitivity of the climate system to greenhouse gas concentrations and other radiatively important gases and aerosols,
- ✓ Inherent climate variability, and
- ✓ Changes in local physical processes (such as afternoon sea breezes) that are not captured by global climate models.

Even though precise quantitative climate projections at the local scale are characterized by uncertainties, the information provided can help identify the potential risks associated with climate variability/climate change and support long term mitigation and adaptation planning.

National Climate Assessment

Maps show projected change in average surface air temperature in the later part of this century (2071-2099) relative to the later part of the last century (1970-1999) under a scenario that assumes substantial reductions in heat trapping gases and a higher emissions scenario that assumes continued increases in global emissions. These are shown in Figure 4-48.

Figure 4-48 Projected Temperature Change – Lower and Higher Emissions Scenario



Source: National Climate Assessment 2014

CAS – 2014

According to the California Natural Resource Agency (CNRA), climate change is already affecting California and is projected to continue to do so well into the foreseeable future. Current and projected changes include increased temperatures, sea level rise, a reduced winter snowpack altered precipitation patterns, and more frequent storm events. Over the long term, reducing greenhouse gases can help make these changes less severe, but the changes cannot be avoided entirely. Unavoidable climate impacts can

result in a variety of secondary consequences including detrimental impacts on human health and safety, economic continuity, ecosystem integrity and provision of basic services.

The CNRA's 2014 CAS delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, and drought:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Placer County and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes may increase the probability of floods and levee and dam failures, along with creating issues related to saltwater intrusion.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

Vulnerability Assessment

Vulnerability—Medium

Climate change is the distinct change in measures of weather patterns over a long period of time, ranging from decades to millions of years. More specifically, it may be a change in average weather conditions such as temperature, rainfall, snow, ocean and atmospheric circulation, or in the distribution of weather around the average. While climate change on its own is a hazard, its effects on exacerbating other hazards is also a concern.

Placer County Climate Change Impacts

The Placer County HMPC noted that hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock. This section sources multiple documents that focus on Placer County's climate change vulnerability:

- Placer County Sustainability Plan - 2020
- California Adaptation Planning Guide - 2012
- Proceedings of the National Academy of Sciences - 2014

Placer County Sustainability Plan

When putting the Placer County Sustainability Plan together, Placer County took an inventory of impacts to the County. Placer County relied on local plans and reports, scholarly research, spatial data, and other scientific and government studies to assess the damage these hazards can cause and the capacity of people and assets to resist this damage and adapt to it. As part of this analysis, a measure of vulnerability is assigned to each population and asset type for each applicable hazard condition. This assessment measures vulnerability (V) on a scale of 1 to 5, with V1 being the least vulnerable and V5 being the most vulnerable. Of the 58 populations and assets in this analysis, 31 have a high level of vulnerability (scoring V4 or V5) for at least one of the eleven hazards. Additionally, ten of the eleven hazards created a high level of vulnerability for at least one population or asset. The one exception is fog, which did not result in a score higher than V3. Key findings of this vulnerability assessment include the following.

- Most of the vulnerable people in Placer County are those who have socioeconomic challenges (e. g. people in poverty) and persons who are more likely to have physical or behavioral limitations that can impede their ability to respond to emergency conditions.
- Vulnerable infrastructure systems include various parts of the local transportation network and systems that help provide electrical and communication services.
- The most vulnerable buildings and facilities are in more rural areas, where they are more likely to be exposed to harmful events such as wildfires or landslides.
- The economic drivers most at risk from climate change range widely, although the agricultural and recreational industries are among the most susceptible.
- Placer County’s conifer forests, already harmed by events such as bark beetles and wildfires, are among the most vulnerable ecosystems, along with grasslands and mountain meadow/scrubland.
- Among key services, the communication and energy delivery services are the most vulnerable.

Additionally, the County looked at impacts from climate change to 11 different natural hazards: avalanche, droughts, extreme heat, flooding, fog, human health hazards, landslides, pests and diseases in agriculture and forestry, severe weather, severe winter weather, and wildfire. 9 of these hazards are contained in this LHMP Update, and the affects of climate change on those hazards is dealt with in their respective sections of this LHMP Update. The 2 hazards not discussed in this LHMP Update and their associated impacts are below.

- **Fog** is a low cloud—typically low enough to touch the ground—that forms when the air near the surface reaches the right temperature for water vapor in the air to condense into a cloud. In Placer County, fog usually forms in the valley regions, although it sometimes appears in the Tahoe Basin. Although the impacts of climate change on fog are less clear, there have been significantly fewer days with fog in California’s Central Valley in recent years than in the past, close to a 50 percent reduction since the early 1980s. Scientists believe that the warmer temperatures created by climate change make it harder for the air to become cool enough to create fog, and that warmer temperatures are more likely to evaporate any fog that does form. However, scientists have also found that fog formation may be linked to levels of air pollution, because particles of pollutants in the air help water vapor to condense, and so

a reduction in pollution can make it harder for fog to form. The most recent science suggests that both warmer temperatures and a decline in air pollution may be responsible for the decrease in fog, although more research is needed.

- **Human Health Hazards** – There are several diseases that are linked to climate change that have the potential to affect Placer County. Examples include hantavirus pulmonary syndrome, Lyme disease, West Nile fever, and influenza. Many of these diseases are carried by animals such as mice and rats or insects such as ticks and mosquitos, all of which are usually seen as pests even if they do not cause disease. Climate change can increase the rates of various diseases because many of the creatures that carry diseases are more active during warmer weather. Warmer temperatures in both winter and spring can cause them to be active for longer periods, increasing the time that these diseases can be transmitted. Warmer temperatures may also cause some mosquito-carried illnesses not currently present in California, such as Zika. West Nile virus appears to be more active during drought periods, and periods of intense precipitation can increase populations of rodents and ticks. Although some of these diseases may not be serious for most people, others can be debilitating or even fatal.

California Adaptation Planning Guide

The APG prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. The APG: Defining Local and Regional Impacts focuses on understanding the ways in which climate change can affect a community. According to this APG, climate change impacts (temperature, precipitation, sea level rise, ocean acidification, and wind) affect a wide range of community structures, functions and populations. These impacts further defined by regional and local characteristics are discussed by secondary impacts and seven sectors found in local communities: Public Health, Socioeconomic, and equity impacts; Ocean and Coastal Resources; Water Management; Forest and Rangeland; Biodiversity and Habitat; Agriculture; and Infrastructure.

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

California's APG: Understanding Regional Characteristics provides input on adaptation considerations for the North Sierra Region. As detailed in this guide, climate change has the potential to disrupt many features that characterize the region, including ecosystems health, snowpack, and the tourist economy. Specific regional impacts include the following:

Ecosystems and Biodiversity. Exacerbated by new development in the region, climate change can cause habitats to shift, creating conditions that stress ecosystems and endemic species. Timber practices, also compounded by climate change, has resulted in forests with trees of similar age, lacking snags and

underbrush, further reducing the diversity of the habitat. The Sierra's aquatic and riparian systems are one of the most altered habitats in the region through past development and water diversion activities. Continued changes in hydrologic flow regimes and increased temperatures will further stress these systems regional habitats supporting many special-status species.

Snowpack and Flooding. Climate-related decrease in snowpack can have significant consequences on the areas that depend on this water. In addition, a decrease in snowpack can increase impacts from flooding, landslide, and loss of economic base related to a drop in tourism. Recreation and tourism are likely to suffer due to lower water levels in waterways and reservoirs and declining snowpack. This can result in fewer ski days and impacts to hotels, restaurants, and second home development. Increases in flood events can further stress the region and increase flood related impacts and damages.

Wildfire. The North Sierra Region is already challenged through past fire suppression combined with the large number of structures that have been built throughout the WUI areas. Climate change is projected to result in large increases in wildfire frequency and size which will further compound the wildfire problem. In addition, potential impacts following fires, such as heavy rains causing landslide and erosion in post-burn areas can have significant consequences on waterways and entire watersheds.

Public Health, Socioeconomic, and Equity Impact. The foothills of the North Sierra Region show higher ozone levels and increased temperatures causing vulnerable populations to be at greater risk to these issues. In addition to the elderly population found in this region, people who work and play outdoors are also vulnerable.

Proceedings of the National Academy of Sciences

In addition to the APG, a report from the Proceedings of the National Academy of Sciences (PNAS) states that some of the recent fire impacts may have been attributed to climate change. The PNAS report posits that climate influences wildfire potential primarily by modulating fuel abundance in fuel-limited environments, and by modulating fuel aridity in flammability-limited environments. Increased forest fire activity across the western United States in recent decades has contributed to widespread forest mortality, carbon emissions, periods of degraded air quality, and substantial fire suppression expenditures. Those most vulnerable to high levels of ozone and particulate matter include people who work or spend a lot of time outdoors, such as residents of this region who are employees of the tourist industry. Households eligible for energy utility financial assistance programs are an indicator of potential impacts. These households may be more at risk of not using cooling appliances, such as air conditioning, due to associated energy costs.

Future Development

Placer County in general could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations could be expected to impact demand for housing and other development. For example, sea level rise may disrupt economic activity and housing in coastal communities, resulting in migration to inland urban areas. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact

the Placer County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Climate change, coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. Compact, mixed-use and infill developments that can help residents avoid long commutes and vulnerabilities associated with the transportation system will likely continue to grow in popularity. The value of open space and pressure to preserve it will likely increase, due in part to its restorative, recreational, environmental and habitat benefits but also for its ability to sequester carbon, help mitigate the accumulation of greenhouse gas in the atmosphere and slow down the global warming trend. Higher flood risks, especially if coupled with increased federal flood insurance rates, may decrease market demand for housing and other types of development in floodplains, while increased risk of wildfires may do the same for new developments in the urban-wildland interface. Flood risks may also inspire new development and building codes that elevate structures while maintaining streetscapes and neighborhood characteristics.

Climate change will stress water resources. Water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue in many U.S. regions, especially in the West. Floods, water quality problems, and impacts on aquatic ecosystems and species are likely to be amplified by climate change. Declines in mountain snowpack are important in Placer County the Sierra Nevada Mountains and across the state, where snowpack provides vital natural water storage and supply. The ability to secure and provide water for new development requires on-going monitoring and assurances. It is recommended that the ability to provide a reliable water supply from the appropriate water purveyor, continue to be in the conditions for project approval, and such assurances shall be verified and in place prior to issuing building permits.

Similarly, protecting and enhancing water supply will also need to be addressed. California's Sustainable Groundwater Management Act (SGMA) will contribute to addressing groundwater and aquifer recharge needs. Good groundwater management will provide a buffer against drought and climate change, and contribute to reliable water supplies regardless of weather patterns. California depends on groundwater for a major portion of its annual water supply, and sustainable groundwater management is essential to a reliable and resilient water system. Protection of critical recharge areas should be addressed across the County in the respective Groundwater Management Plans. Further, these plans should include provisions that guide development or curtail development in areas that would harm or compromise recharge areas.

Climate change will affect transportation. The transportation network is vital to the County and the region's economy, safety, and quality of life. While it is widely recognized that emissions from transportation have impacts on climate change, climate will also likely have significant impacts on transportation infrastructure and operations. Examples of specific types of impacts include softening of asphalt roads and warping of railroad rails; damage to roads; flooding of roadways, rail routes, and airports from extreme events; and interruptions to flight plans due to severe weather. Climate change impacts considered in the plan include: extreme temperatures; increased precipitation, runoff and flooding; increased wildfires; and landslides. Although landslides are not a direct result of climate change, these

events are expected to increase in frequency due to increased rainfall, runoff, and wildfire. These events have the potential to cause injuries or fatalities, environmental damage, property damage, infrastructure damage, and interruption of operations. During flood events, these trails serve as secondary transportation facilities when roadways are blocked or otherwise impassible. During Hurricane Sandy, bicycles were one of the primary modes used to deliver food and water to residents stranded in their homes due to flood. Including dual or multi-purpose facilities and amenities as part of all new development provides not just desirable community amenities but critical infrastructure for climate resiliency.

Climate change will affect land uses and planning. Climate change coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. Compact, mixed-use and infill developments that can help residents avoid long commutes and vulnerabilities associated with the transportation system will likely continue to grow in popularity. The value of open space, urban greening, green infrastructure, tree canopy expansion and pressure to preserve it will likely increase, due in part to its restorative, recreational, environmental, and habitat, and physical and mental health benefits but also for its ability to sequester carbon and cool the surrounding environment.

Climate change will affect Utilities. California is already experiencing impacts from climate change such as an increased number of wildfires, sea level rise and severe drought. Utility efforts to deal with these impacts range from emergency and risk management protocols to new standards for infrastructure design and new resource management techniques. Utilities are just beginning to build additional resilience and redundancy into their infrastructure investments from a climate adaptation perspective, but have been doing so from an overall safety and reliability perspective for decades. Significant efforts are also being made in those areas that overlap with climate change mitigation such as diversification of resources, specifically the addition of more renewables to the portfolio mix, as well as implementation of demand response efforts to curb peak demand. Efforts are also under way to upgrade the distribution grid infrastructure, which should add significant resilience to the grid as well. Next, they will issue a guidance document that expands upon the vulnerability assessments phase and includes plans for resilience solutions including cost/benefit analysis methodologies. The outcomes of this work will help to inform next steps on how infrastructure, the grid and other related operations will be modified to address climate change. New development will have to adapt and incorporate these new approaches as they evolve. Existing and new development will be affected from impacts that includes not only diminished capacity from all of the utility assets from generation to transmission and distribution, but also the cost consequences resulting from prevention, replacement, outage, and energy loss. These have the potential for greatly impacting not just residential development but commercial and industrial and all utility users.

4.3.9. Dam Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake;
- Inadequate spillway capacity resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity;
- Improper design;
- Improper maintenance;
- Negligent operation; and/or
- Failure of upstream dams on the same waterway.

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Dams and reservoirs have been built throughout California to supply water for agriculture and domestic use, to allow for flood control, as a source of hydroelectric power, and to serve as recreational facilities. The storage capacities of these reservoirs range from a few thousand acre-feet to five million acre-feet. The water from these reservoirs eventually makes its way to the Pacific Ocean by way of several river systems.

The California Department of Water Resources (CA DWR) Division of Safety of Dams (DSOD) has jurisdiction over impoundments that meet certain capacity and height criteria. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet are non-jurisdictional. Additionally, dams that are less than 25 feet high can impound up to 50 acre-feet without being jurisdictional. CA DWR, DOSD assigns hazard ratings to large dams within the State. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property:

- **Extremely High Hazard** – Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more
- **High Hazard** – Expected to cause loss of at least one human life.
- **Significant Hazard** – No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.

- **Low Hazard** – No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner’s property.

Location and Extent

According to data provided by Placer County, CA DWR, and Cal OES, there are 47 dams in the County. Of these, there are 3 extremely high hazard dams, 11 high hazard dams, 9 significant hazard dams, and 12 low hazard dams in Placer County that falls under the jurisdiction of the DSOD (jurisdictional dams described above). 12 dams in Placer County lie outside the jurisdiction of the DSOD and do not have a hazard classification. All mapped dams that lie in the County are shown on Figure 4-49. Table 4-51 gives information on the dams in the County.

Figure 4-50 shows and Table 4-52 identifies the dams outside of Placer County that could affect areas inside Placer County should they fail. The HMPC noted that the Lakewood Dam (which is privately owned) was categorized by DSOD as being deficient as of the writing of the Plan Update in mid-2021.

Figure 4-49 Placer County Dam Inventory – Inside County

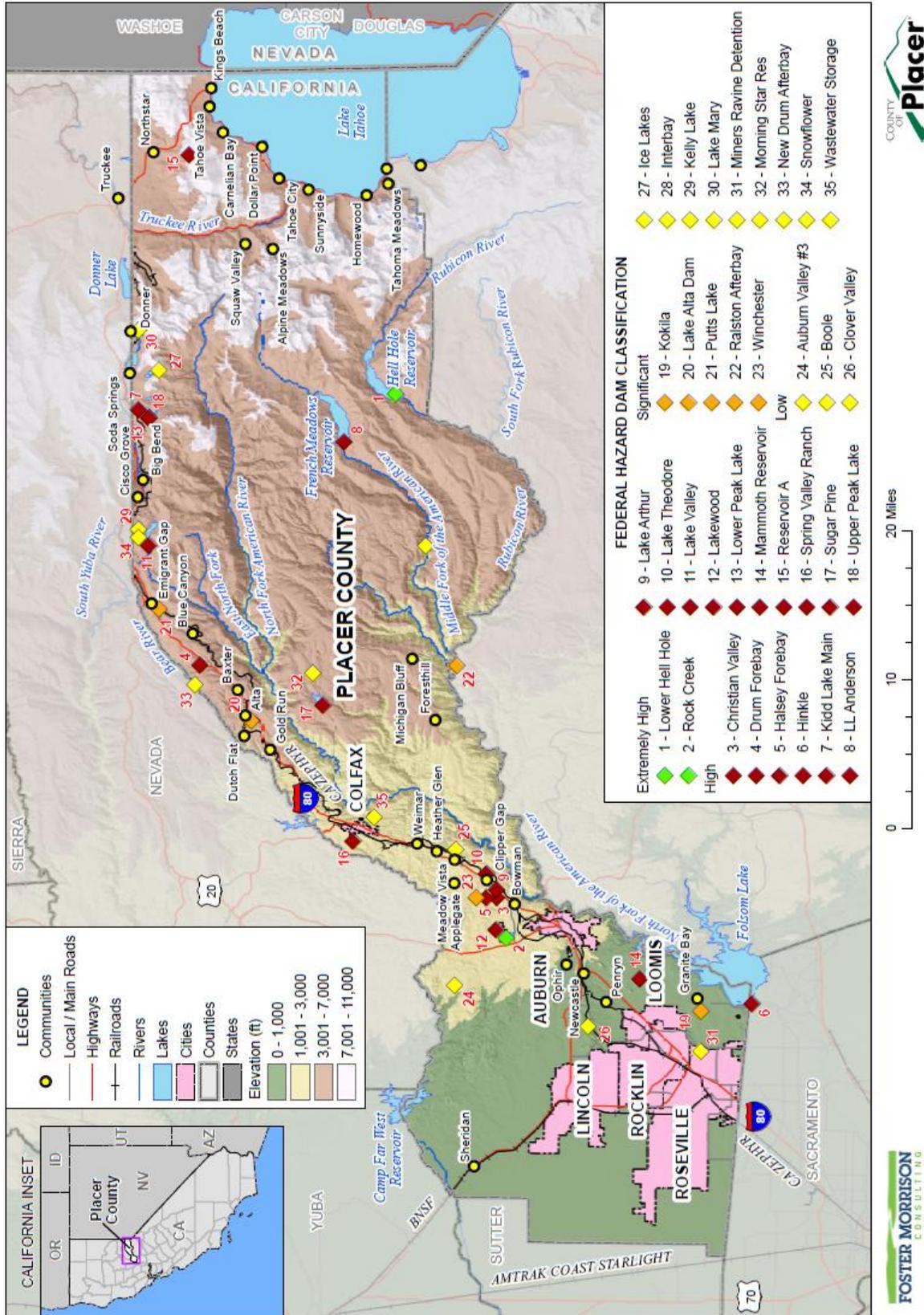


Table 4-51 Placer County – Inventory of Dams under DSOD Jurisdiction

Name	Hazard Classification	Owner	River	Nearest City/ Distance (mi)	Mapped	Year Built	Structural Height (ft)	Maximum Storage (acre-ft)*
Auburn Dam**	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Auburn Valley #3	Low	Golf Resources of Auburn	Tributary of the Bear River	Auburn 4	Y	1959	39	200
Auburn Valley #2**	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
Baldwin**	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
Boole	Low	Our Lady of the Oaks	Tributary of American River	Applegate 1	Y	1951	25	65
Christian Valley	High	Pac Gas and Electric	South Fork of Dry Creek	Bowman 0	Y	1916	33	110
City Of Lincoln # 2**	N/A	City of Lincoln	Tributary of Markham Ravine	Lincoln 1	Y	–	21	301
City Of Lincoln # 4**	N/A	City of Lincoln	Offstream	–	Y	–	18	301
City Of Lincoln WWTP**	N/A	City of Lincoln	Tributary of Markham Ravine	Lincoln 2	Y	–	33	454
Clover Valley	Low	Placer County Water Agency	Tributary of Antelope Creek	Rocklin 5	Y	1909	35	29
Columbian**	N/A	Private	Tributary of Auburn Ravine	Lincoln 5	N	–	44	132
Drum Forebay	Significant	Pacific Gas and Electric	Drum Canal	Baxter 3	Y	1913	65	564
Halsey Forebay	High	Pacific Gas and Electric	Dry Creek	Auburn 1	Y	1916	42	220
Hinkle	High	San Juan Suburban Water Dist.	Tributary of American River	Orangevale 2	Y	1980	20	200

Name	Hazard Classification	Owner	River	Nearest City/ Distance (mi)	Mapped	Year Built	Structural Height (ft)	Maximum Storage (acre-ft)*
Ice Lakes	Low	Sierra Lakes Co Water Dist.	Serena Creek	Soda Springs 2	Y	1942	12	220
Interbay	Low	Placer County Water Agency	Middle Fork Interbay	Auburn 30	Y	1966	70	178
Kelly Lake	Low	Pacific Gas and Electric	North Fork American River	Washington 8	Y	1928	21	290
Kidd Lake Main	High	Pacific Gas and Electric	South Yuba River - Tributary	Washington	25	1855	40	1,930
Kokila	Significant	Private	Tributary of Miners Ravine	Roseville 6	Y	1951	18	54
LL Anderson	Extremely High	Placer County Water Agency	Middle Fork American River	N/A	Y	1965	231	155,000
Lake Alta Dam	Significant	Placer County Water Agency	Tributary of the North Fork of the American River	Dutch Flat 1	Y	1862	22	270
Lake Arthur	Significant	Placer County Water Agency	South Fork of Dry Creek	Auburn 3	Y	1909	44	87
Lake Mary	Low	Sugar Bowl Corporation	Tributary of the South Fork of Yuba River	Soda Springs 3	Y	1926	22	172
Lake Tahoe**	N/A	Department of the Interior	Truckee River	Truckee 17	Y	-	18	840,000
Lake Theodore	Significant	Placer County Water Agency	South Fork of Dry Creek	Bowman 4	Y	1896	40	207
Lake Valley	High	Pacific Gas & Electric	North Fork of American River	Washington 25	Y	1911	74	8,127

Name	Hazard Classification	Owner	River	Nearest City/ Distance (mi)	Mapped	Year Built	Structural Height (ft)	Maximum Storage (acre-ft)*
Lakewood	High	Private	Dry Creek	Auburn 2	Y	1959	33	152
Lower Hell Hole	Extremely High	Placer County Water Agency	Rubicon River	N/A	Y	1969	410	208,400
Lower Peak Lake	High	Pacific Gas & Electric	Tributary of South Yuba River	Washington 25	Y	1860	33	494
Mammoth Res	High	Placer County Water Agency	Offstream	Hidden Valley 4	Y	1851	23	103
Miners Ravine Detention	Low	Placer County Flood Control District	Miners Ravine	N/A	Y	2007	23	120
Morning Star Res	Low	De Anza Placer Gold Mining	North Forbes Cr	Auburn 30	Y	1870	44	1,405
North Fork Dam**	N/A	Cespk	North Fork American River	Folsom 22	Y	N/A	155	14,700
Patterson Sec 29	Low	Private	Tributary of Bear River	Wheatland 5	Y	1962	22	92
Putts Lake	Significant	Private	Blue Canyon Creek	Blue Canyon 2	Y	1916	19	249
Quail Lake**	N/A	Tahoe City PUD	Tributary of Lake Tahoe	Tahoma 2	Y	N/A	14	160
Ralston Afterbay	Significant	Placer County Water Agency	Rubicon River	Auburn 20	Y	1966	85	2,800
Reservoir A	Significant	Northstar Comm Svc, Dist.	West Martis Creek	Truckee	5	1973	93	180
Rock Creek	Extremely High	Pacific Gas & Electric	Rock Creek	Auburn 1	Y	1916	35	410
Sewer Stab Pond #3**	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A

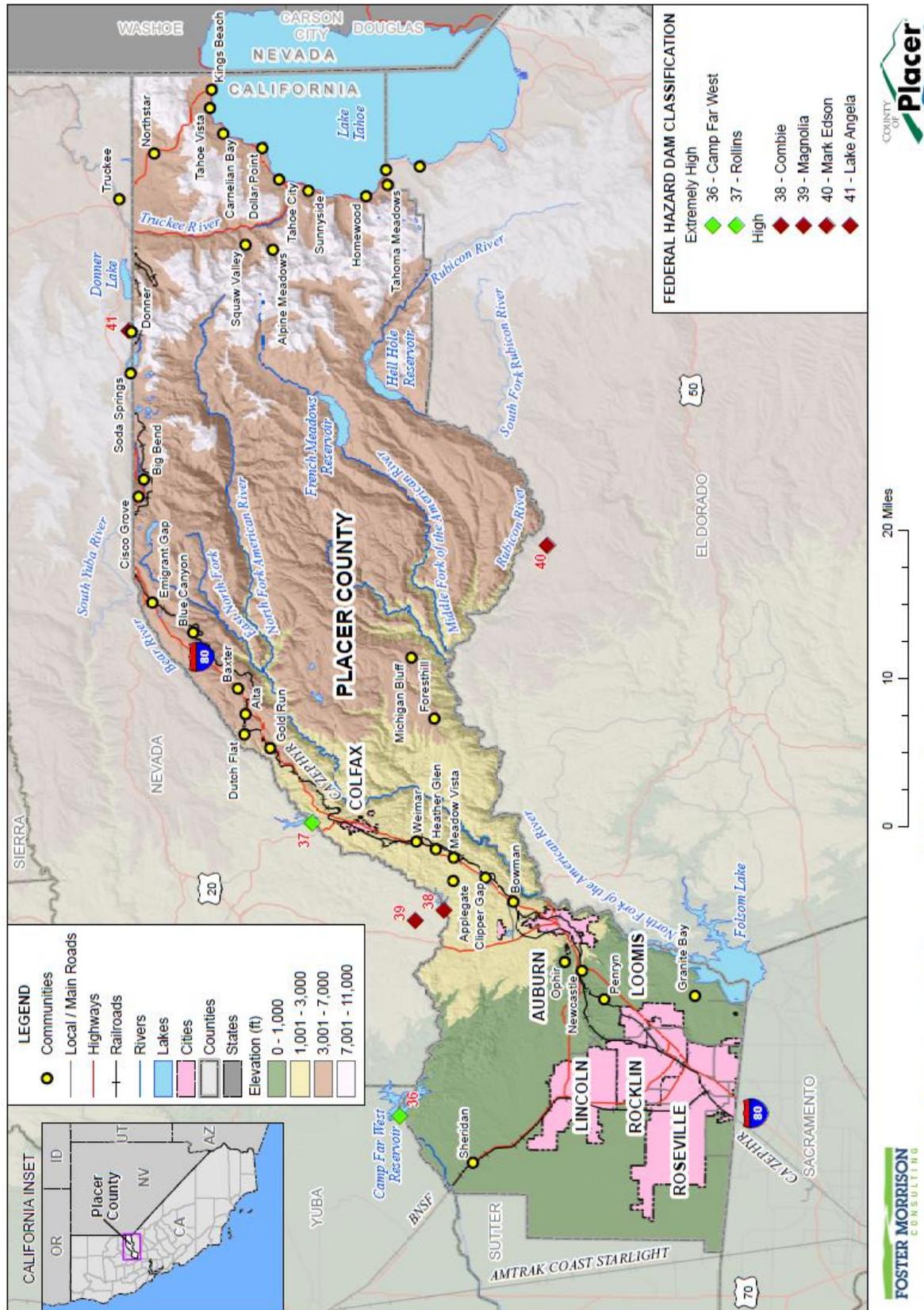
Name	Hazard Classification	Owner	River	Nearest City/ Distance (mi)	Mapped	Year Built	Structural Height (ft)	Maximum Storage (acre-ft)*
Sewer Stab Pond #5**	N/A	N/A	N/A	N/A	Y	N/A	N/A	N/A
Snowflower	Low	Naco West of California	Kelly Creek	Auburn 42	Y	1964	28	165
Spring Valley Ranch	High	Private	Tributary of Campbell Creek	Pineroft 2	Y	1958	39	60
Sugar Pine	High	Department of the Interior	North Shirttail Creek	None	Y	1981	251	6,916
Upper Peak Lake	High	Pacific Gas and Electric	South Yuba River	Washington 25	Y	1850	37	2,112
Wastewater Storage	Low	City of Colfax	Tributary of Smuthers Ravine	Illinois Town 1	Y	1978	75	212
Winchester	Significant	Private	Tributary of Orr Creek	N/A	Y	1999	39	58

Source: Cal OES, DSOD, and the National Performance of Dams Program

*One Acre Foot=326,000 gallons

**Dam location and information provided by Placer County. These dams do not fall under the jurisdiction of the DSOD.

Figure 4-50 Placer County – Dams of Concern Outside the County



Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table 4-52 Dams of Concern Outside Placer County

Name (County)	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
Camp Far West (Yuba)	Bear River	Extremely High	South Sutter Water District	Earth and Rock	104,500	185	1963
Rollins (Nevada)	Bear River	Extremely High	Nevada Irrigation District	Earth and Rock	66,000	242	1911
Combie (Nevada)	Bear River	High	Nevada Irrigation District	Variable Radius Arch	5,555	80	1928
Magnolia (Nevada)	Tributary of Bear River	High	Lake of the Pines Association	Earth and Rock	4,150	58	1967
Mark Edson (El Dorado)	Pilot Creek	High	Georgetown Divide PUD	Earth and Rock	20,000	162	1962
Lake Angela (Nevada)	Tributary of Yuba River	High	Donner Summit PUD	Rockfill	310	28	1924

Source: Cal OES and the National Performance of Dams Program

*One Acre Foot=326,000 gallons

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, dam failure would most probably happen in consequence of the natural disaster triggering the event. However, DOSD assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail: Low, Significant, High, and Extremely High. There is no scale with which to measure dam failure. While a dam may fill slowly with runoff from winter storms, a dam break can have a very quick speed of onset. The duration of dam failure is not long – only as long as it takes to empty the reservoir of water the dam held back. Dam inundation flood geographic extents are discussed in Table 4-61 (for extremely high hazard dams) and Table 4-62 (for high hazard dams) in the flooded acres analysis in the vulnerability assessment of this section.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declaration related to dam failure affecting Placer County, as shown in Table 4-4. The County had no USDA disaster declarations since 2002 related to dam failure, as shown on Table 4-6.

NCDC Events

There have been no NCDC dam failure events in Placer County.

National Performance of Dams Program Events

The National Performance of Dams Program at Stanford University tracks dam failures. A search of the National Performance of Dams Program database showed no past dam failure events in Placer County.

Hazard Mitigation Planning Committee Events

According to the HMPC, there have been five dam failure type events:

- **Hell Hole Dam** - In **1964** construction of the Hell Hole dam was underway and the contractor had stopped operations for the winter. A major storm event (rains) occurred during December 1964 causing the Hell Hole Reservoir to fill and since the dam was not completed, it failed sending a considerable amount of water towards Auburn. 30,000 acre-feet of water washed out a bridge on Highway 49 over the American River at the confluence of the North and Middle Forks and flooded a quarry. Due to the way the construction contract was worded, the contractor had to rebuild the dam at his own expense. As a result, Placer County incurred no costs related to this event. No claims for damages were filed against PCWA by either the quarry owner or the state.
- **1986 Auburn Coffey Dam** – As a result of area flooding, the Coffey Dam at Auburn breached and partially washed away. The U.S. Bureau of Reclamation had designed the Coffey Dam for a controlled failure by building a soft earthen plug into the dam for this purpose. It appears the dam failed as designed.
- **August 2004 Ralston Dam Release Gate Break** – A broken release gate on Ralston Dam in the Middle Fork of the American River prompted the National Weather Service to issue a flash flood warning in Placer County. According to the PCWA, the gate near the Ralston Powerhouse malfunctioned at 6 a.m. The sudden release of water from Ralston Reservoir south of Auburn sent a “wall of water three to four-feet high” down the river. About 800 to 1,000 acre-feet of water were released, with flows peaking between 10-11 a.m. It was expected to reach Folsom Dam by 12 noon. Sheriff’s deputies and California Highway Patrol officers alerted campers in the Auburn State Recreation Area to move to higher ground. The CHP was monitoring the muddy water as it approached Highway 49. There were no immediate reports of injuries or damage along the river, which is popular with rafters, kayakers and residents fleeing the summer heat.
- **August 2009 Cottonwood Dam** – a privately owned and constructed dam on Miners Ravine located within the Hidden Valley Estates subdivision (Auburn Folsom Rd and Twin Rocks Rd area of Granite Bay), failed and leached flows and sediment into Miners Ravine. NOAA/NMFS quickly became involved because of the impacts to critical fish species. A temporary fix (notch) in the concrete portion of the dam was approved and made while the HOA and interested agencies determined next steps. A dam removal project with creek restoration is now being proposed.
- **February 12, 2017** – The Oroville Spillway in Butte County was at threat of collapse. A Level 3/OES & Public Health staffs only was declared and the EOC was opened. Evacuation & mutual aid support to Butte Co and other affected nearby counties was supplied by Placer County. No damages were sustained in the County.

Likelihood of Future Occurrence

Occasional—The County remains at risk to dam breaches/failures from numerous dams under a variety of ownership and control and of varying ages and conditions. Given the number and types of dams in the

County and the history of past uncontrolled releases to dams, the potential exists for future dam issues in the Placer County Planning Area.

Climate Change and Dam Failure

Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Placer County.

Vulnerability Assessment

Vulnerability—High

Dam failure flooding can occur as the result of a partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. An earthquake event can also contribute to a dam failure. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions. Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding.

Impacts

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Electric generating facilities and transmission lines could also be damaged and affect life support systems in communities outside the immediate hazard area. Associated water supply, water quality and health concerns could also be an issue. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

A major dam failure could have a devastating impact on the Placer County Planning Area. Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline critical utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

Flooding, including that from dam failure, causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.

Dams of Concern and Mapped Dams

As detailed in Table 4-51, the County is vulnerable to a large number of extremely high, high, and significant hazard dams. The mapped dams analyzed for this Plan Update are:

Dams inside Placer County

- Rock Creek (extremely high hazard dam)
- Christian Valley (high hazard dam)
- Drum Forebay (high hazard dam)
- Halsey Forebay (high hazard dam)
- Hinkle (high hazard dam)
- Kidd Lake Main (high hazard dam)
- Lake Arthur (high hazard dam)
- Lake Theodore (high hazard dam)
- Lake Valley (high hazard dam)
- LL Anderson (high hazard dam)
- Lower Peak Lake (high hazard dam)
- Mammoth Reservoir (high hazard dam)
- Reservoir A (high hazard dam)
- Spring Valley Ranch (high hazard dam)
- Sugar Pine (high hazard dam)
- Upper Peak Lake (high hazard dam)

Dams outside Placer County

- Camp Far West (extremely high hazard dam)
- Rollins (extremely high hazard dam)
- Combie (high hazard dam)
- Lake Angela (high hazard dam)
- Magnolia (high hazard dam)
- Mark Edson (high hazard dam)

Values at Risk

Dam inundation areas were available for the dams of concern, as obtained from CA DWR, DSOD, and Cal OES, were used as the basis of this dam inundation analysis. Dams were grouped by hazard rating in order to perform analysis. The depth of flooding due to the failure of these dams is unknown.

Methodology and Results

The same methodology was used for both the Inside the County and Outside the County dam analysis. Placer County's 2020 Parcel/Assessor Data, obtained from Placer County, were used for the County inventory of parcels and values. GIS was used to for analysis on the parcel layer. The dam inundation areas, obtained from Cal OES and DSOD, were then overlaid on the parcel layer. A modified methodology was used for both the Inside the County and Outside the County dam analysis. Placer County's 2020 Parcel/Assessor Data, obtained from Placer County, were used for the County inventory of parcels and values. GIS was used to perform analysis on the parcel layer. The dam inundation areas, obtained from Cal OES and DSOD, were then overlaid on the polygon parcel layer unlike the assets at risk analysis which was performed by centroid analysis. For the purposes of this analysis, if the dam inundation layer intersected any part of the polygon parcel, the entire parcel was considered to be in the dam inundation

area. The parcels were segregated and analyzed in this fashion for the entirety of Placer County. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the dam inundation areas due primarily to Proposition 13 and to a lesser extent, properties falling under the Williamson Act.

Dams Inside Placer County

Dam inundation analysis was performed for the 1 extremely high and 15 high hazard dams located inside the County. Figure 4-51 shows the dam inundation areas of both the mapped extremely high and high hazard dams located inside County. The depth of flooding due to the failure of a dam is unknown. Analysis was performed in the following manner:

- Extremely High Hazard Dam
 - ✓ Table 4-53 the total parcel counts, improved parcel counts, their improved structure and land values in the extremely high hazard dam inundation areas in the Planning Area. Table 4-54 shows the property uses affected by each dam inundation area in unincorporated County. Tables showing the property uses affected by each dam inundation area for each jurisdiction in the County are shown in their respective annexes to this Plan Update.
- High Hazard Dams
 - ✓ Table 4-55 the total parcel counts, improved parcel counts, their improved structure and land values in the high hazard dam inundation areas in the Planning Area. Table 4-56 shows the property uses affected by each dam inundation area in unincorporated County. Tables showing the property uses affected by each dam inundation area for each jurisdiction in the County are shown in their respective annexes to this Plan Update.

Figure 4-51 Placer County – Extremely High and High Hazard Dam Inundation Areas inside County

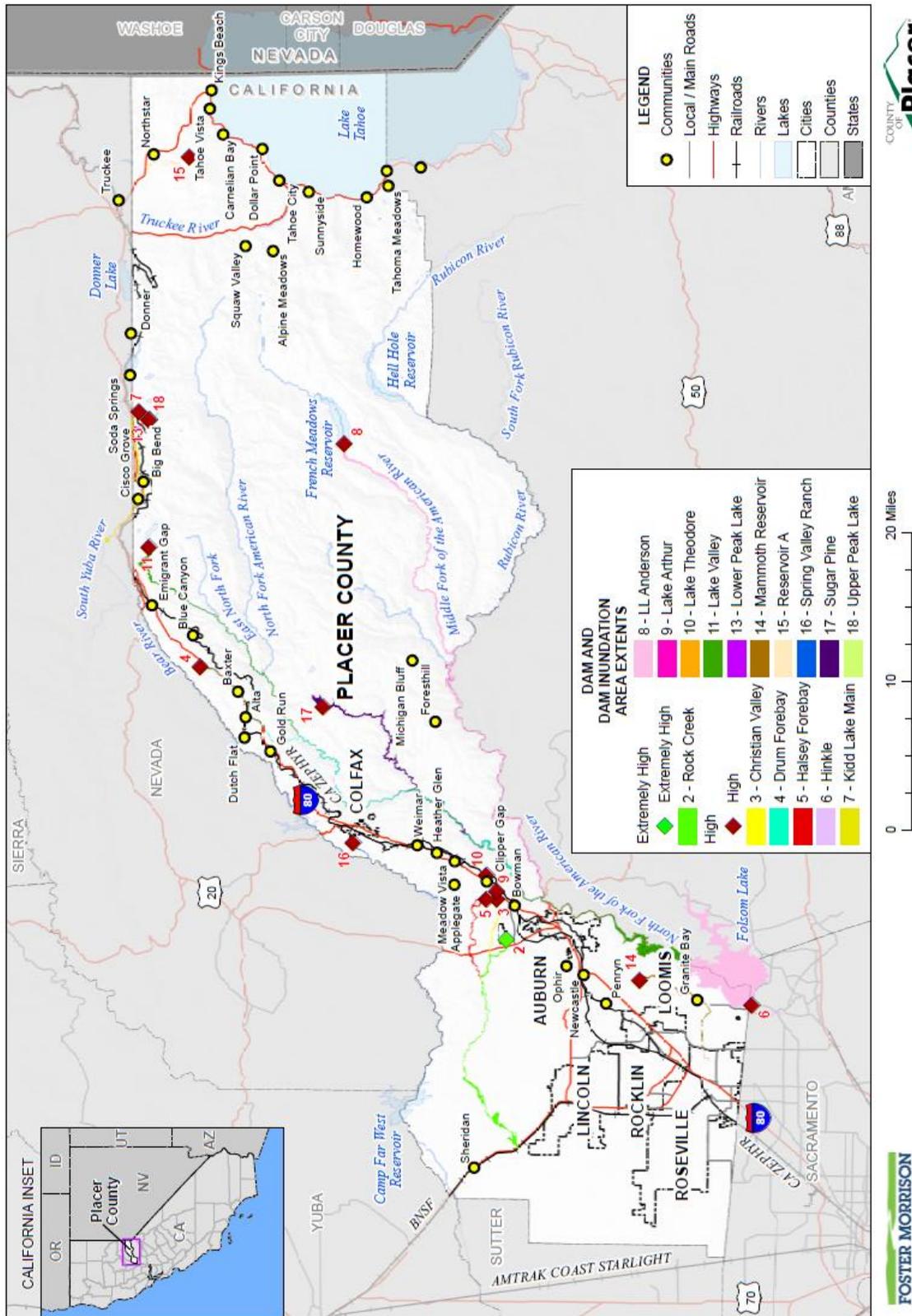


Table 4-53 Placer County Planning Area – Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas from Dams Inside the County

Dam	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Rock Creek	208	131	\$39,415,718	\$57,675,695	\$43,813,872	\$140,905,285

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-54 Unincorporated Placer County – Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas by Property Use from Dams Inside the County

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Rock Creek Dam						
Agricultural	35	9	\$13,595,084	\$1,374,521	\$1,374,521	\$16,344,126
Commercial	7	4	\$1,818,195	\$4,702,846	\$4,702,846	\$11,223,887
Industrial	4	3	\$1,185,430	\$6,984,409	\$10,476,614	\$18,646,453
Institutional	2	1	\$289,493	\$7,625,696	\$7,625,696	\$15,540,885
Miscellaneous	31	1	\$2,502,431	\$15,688	\$15,688	\$2,533,807
Natural / Open Space	16	5	\$2,364,960	\$2,264,480	\$2,264,480	\$6,893,920
Residential	113	108	\$17,660,125	\$34,708,055	\$17,354,027	\$69,722,207
Total	208	131	\$39,415,718	\$57,675,695	\$43,813,872	\$140,905,285

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-55 Placer County Planning Area – Count and Value of Parcels in the High Hazard Dam Inundation Areas from Dams Inside the County

Dam	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Christian Valley	214	129	\$35,244,536	\$40,569,595	\$21,839,466	\$97,653,597
Drum Forebay	231	20	\$7,977,364	\$3,894,239	\$2,237,232	\$14,108,835
Halsey Forebay	260	176	\$40,959,305	\$59,347,685	\$32,043,094	\$132,350,084
Hinkle	5	0	\$0	\$0	\$0	\$0
Kidd Lake Main	128	62	\$5,208,563	\$7,930,246	\$4,504,492	\$17,643,301

Dam	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Lake Arthur	165	97	\$20,202,247	\$33,240,967	\$17,502,220	\$70,945,434
Lake Theodore	192	112	\$21,832,216	\$35,207,590	\$18,758,185	\$75,797,991
Lake Valley	312	25	\$7,603,078	\$2,697,033	\$1,353,568	\$11,653,679
LL Anderson	188	4	\$1,553,188	\$1,993,099	\$996,550	\$4,542,837
Lower Peak Lake	87	34	\$4,252,881	\$5,137,469	\$3,729,941	\$13,120,291
Mammoth Reservoir	323	263	\$67,937,801	\$118,997,377	\$59,498,690	\$246,433,868
Reservoir A	79	49	\$13,109,762	\$21,469,965	\$11,490,576	\$46,070,303
Spring Valley Ranch	25	18	\$2,655,983	\$5,748,000	\$2,874,000	\$11,277,983
Sugar Pine	273	10	\$6,850,047	\$1,667,927	\$906,399	\$9,424,373
Upper Peak Lake	126	55	\$5,694,899	\$7,939,209	\$5,130,812	\$18,764,920

Source: Placer County 2020 Parcel/ Assessor's Data, Cal OES, DSOD

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-56 Unincorporated Placer County – Count and Value of Parcels in the High Hazard Dam Inundation Areas by Property Use from Dams Inside the County

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Christian Valley Dam						
Agricultural	32	8	\$12,337,499	\$1,071,260	\$1,071,260	\$14,480,019
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	48	1	\$3,739,626	\$15,688	\$15,688	\$3,771,002
Natural / Open Space	10	4	\$908,899	\$2,022,396	\$2,022,396	\$4,953,691
Residential	123	116	\$18,258,512	\$37,460,251	\$18,730,122	\$74,448,885
Total	214	129	\$35,244,536	\$40,569,595	\$21,839,466	\$97,653,597
Drum Forebay Dam						
Agricultural	5	0	\$35,474	\$0	\$0	\$35,474
Commercial	3	1	\$375,839	\$200,000	\$200,000	\$775,839
Industrial	8	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	193	2	\$4,955,099	\$10,200	\$10,200	\$4,975,499

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Natural / Open Space	6	1	\$463,235	\$370,026	\$370,026	\$1,203,287
Residential	16	16	\$2,147,717	\$3,314,013	\$1,657,006	\$7,118,736
Total	231	20	\$7,977,364	\$3,894,239	\$2,237,232	\$14,108,835
Halsey Forebay Dam						
Agricultural	30	8	\$12,200,346	\$1,071,260	\$1,071,260	\$14,342,866
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	2	1	\$358,362	\$374,846	\$562,269	\$1,295,477
Institutional	5	0	\$0	\$0	\$0	\$0
Miscellaneous	35	1	\$2,607,856	\$15,688	\$15,688	\$2,639,232
Natural / Open Space	24	7	\$1,557,701	\$2,901,870	\$2,901,870	\$7,361,441
Residential	164	159	\$24,235,040	\$54,984,021	\$27,492,007	\$106,711,068
Total	260	176	\$40,959,305	\$59,347,685	\$32,043,094	\$132,350,084
Hinkle Dam						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	5	0	\$0	\$0	\$0	\$0
Natural / Open Space	0	0	\$0	\$0	\$0	\$0
Residential	0	0	\$0	\$0	\$0	\$0
Total	5	0	\$0	\$0	\$0	\$0
Kidd Lake Dam						
Agricultural	6	0	\$109,531	\$0	\$0	\$109,531
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	3	1	\$242,870	\$1,028,309	\$1,028,309	\$2,299,488
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	48	1	\$1,511,603	\$50,428	\$50,428	\$1,612,459
Natural / Open Space	7	0	\$102,000	\$0	\$0	\$102,000
Residential	63	60	\$3,242,559	\$6,851,509	\$3,425,755	\$13,519,823
Total	128	62	\$5,208,563	\$7,930,246	\$4,504,492	\$17,643,301
Lake Arthur Dam						
Agricultural	15	2	\$1,148,062	\$278,700	\$278,700	\$1,705,462
Commercial	0	0	\$0	\$0	\$0	\$0

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Industrial	2	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	43	0	\$3,461,881	\$0	\$0	\$3,461,881
Natural / Open Space	3	1	\$475,309	\$1,484,779	\$1,484,779	\$3,444,867
Residential	102	94	\$15,116,995	\$31,477,488	\$15,738,741	\$62,333,224
Total	165	97	\$20,202,247	\$33,240,967	\$17,502,220	\$70,945,434
Lake Theodore Dam						
Agricultural	15	2	\$1,148,062	\$278,700	\$278,700	\$1,705,462
Commercial	2	1	\$46,847	\$52,350	\$52,350	\$151,547
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	4	0	\$0	\$0	\$0	\$0
Miscellaneous	55	2	\$3,777,787	\$492,953	\$492,953	\$4,763,693
Natural / Open Space	3	1	\$475,309	\$1,484,779	\$1,484,779	\$3,444,867
Residential	113	106	\$16,384,211	\$32,898,808	\$16,449,403	\$65,732,422
Total	192	112	\$21,832,216	\$35,207,590	\$18,758,185	\$75,797,991
Lake Valley Dam						
Agricultural	8	0	\$231,406	\$0	\$0	\$231,406
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	16	0	\$0	\$0	\$0	\$0
Miscellaneous	255	2	\$4,985,808	\$10,100	\$10,100	\$5,006,008
Natural / Open Space	9	0	\$88,025	\$0	\$0	\$88,025
Residential	23	23	\$2,297,839	\$2,686,933	\$1,343,468	\$6,328,240
Total	311	25	\$7,603,078	\$2,697,033	\$1,353,568	\$11,653,679
LL Anderson Dam						
Agricultural	14	0	\$161,129	\$0	\$0	\$161,129
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	3	0	\$0	\$0	\$0	\$0
Miscellaneous	157	0	\$378,104	\$0	\$0	\$378,104
Natural / Open Space	5	0	\$0	\$0	\$0	\$0
Residential	5	3	\$724,791	\$886,535	\$443,268	\$2,054,594
Total	184	3	\$1,264,024	\$886,535	\$443,268	\$2,593,827

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Lower Peak Lake Dam						
Agricultural	6	0	\$109,841	\$0	\$0	\$109,841
Commercial	5	3	\$1,234,485	\$2,265,022	\$2,265,022	\$5,764,529
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	39	2	\$1,066,386	\$57,392	\$57,392	\$1,181,170
Natural / Open Space	5	0	\$102,000	\$0	\$0	\$102,000
Residential	31	29	\$1,740,169	\$2,815,055	\$1,407,527	\$5,962,751
Total	87	34	\$4,252,881	\$5,137,469	\$3,729,941	\$13,120,291
Mammoth Reservoir Dam						
Agricultural	4	0	\$15,075,318	\$0	\$0	\$15,075,318
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	38	0	\$1,794,766	\$0	\$0	\$1,794,766
Natural / Open Space	13	0	\$0	\$0	\$0	\$0
Residential	267	263	\$51,067,717	\$118,997,377	\$59,498,690	\$229,563,784
Total	323	263	\$67,937,801	\$118,997,377	\$59,498,690	\$246,433,868
Reservoir A Dam						
Agricultural	4	0	\$64,136	\$0	\$0	\$64,136
Commercial	2	1	\$64,481	\$585,733	\$585,733	\$1,235,947
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	5	0	\$0	\$0	\$0	\$0
Miscellaneous	7	0	\$4,080	\$0	\$0	\$4,080
Natural / Open Space	17	4	\$2,645,343	\$925,451	\$925,451	\$4,496,245
Residential	44	44	\$10,331,722	\$19,958,781	\$9,979,392	\$40,269,895
Total	79	49	\$13,109,762	\$21,469,965	\$11,490,576	\$46,070,303
Spring Valley Ranch Dam						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	7	0	\$433,921	\$0	\$0	\$433,921

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Natural / Open Space	0	0	\$0	\$0	\$0	\$0
Residential	18	18	\$2,222,062	\$5,748,000	\$2,874,000	\$10,844,062
Total	25	18	\$2,655,983	\$5,748,000	\$2,874,000	\$11,277,983
Sugar Pine Dam						
Agricultural	19	0	\$162,178	\$0	\$0	\$162,178
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	15	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	224	3	\$5,617,249	\$144,870	\$144,870	\$5,906,989
Natural / Open Space	6	0	\$100,974	\$0	\$0	\$100,974
Residential	8	7	\$969,646	\$1,523,057	\$761,529	\$3,254,232
Total	272	10	\$6,850,047	\$1,667,927	\$906,399	\$9,424,373
Upper Peak Lake Dam						
Agricultural	8	0	\$130,593	\$0	\$0	\$130,593
Commercial	5	3	\$1,234,485	\$2,265,022	\$2,265,022	\$5,764,529
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	53	2	\$1,505,326	\$57,392	\$57,392	\$1,620,110
Natural / Open Space	7	0	\$102,000	\$0	\$0	\$102,000
Residential	52	50	\$2,722,495	\$5,616,795	\$2,808,398	\$11,147,688
Total	126	55	\$5,694,899	\$7,939,209	\$5,130,812	\$18,764,920

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

Dams Outside of Placer County

Dam inundation analysis was performed for the 2 extremely high and 15 high hazard dams located outside to the County. Figure 4-52 shows the dam inundation areas of both the mapped extremely high and high hazard dams located outside County that have inundation areas inside the County. The depth of flooding due to the failure of a dam is unknown. Analysis was performed in the following manner:

➤ Extremely High Hazard Dams

- ✓ Table 4-57 the total parcel counts, improved parcel counts, their improved structure and land values in the extremely high hazard dam inundation areas in the Planning Area.
- ✓ Table 4-58 shows the property uses affected by each dam inundation area in unincorporated County. Tables showing the property uses affected by each dam inundation area for each jurisdiction in the County are shown in their respective annexes to this Plan Update.

➤ High Hazard Dams

- ✓ Table 4-59 the total parcel counts, improved parcel counts, their improved structure and land values in the high hazard dam inundation areas in the Planning Area. Table 4-60 shows the property uses affected by each dam inundation area in unincorporated County. Tables showing the property uses affected by each dam inundation area for each jurisdiction in the County are shown in their respective annexes to this Plan Update.

Figure 4-52 Placer County – Extremely High and High Hazard Dam Inundation Areas Outside County

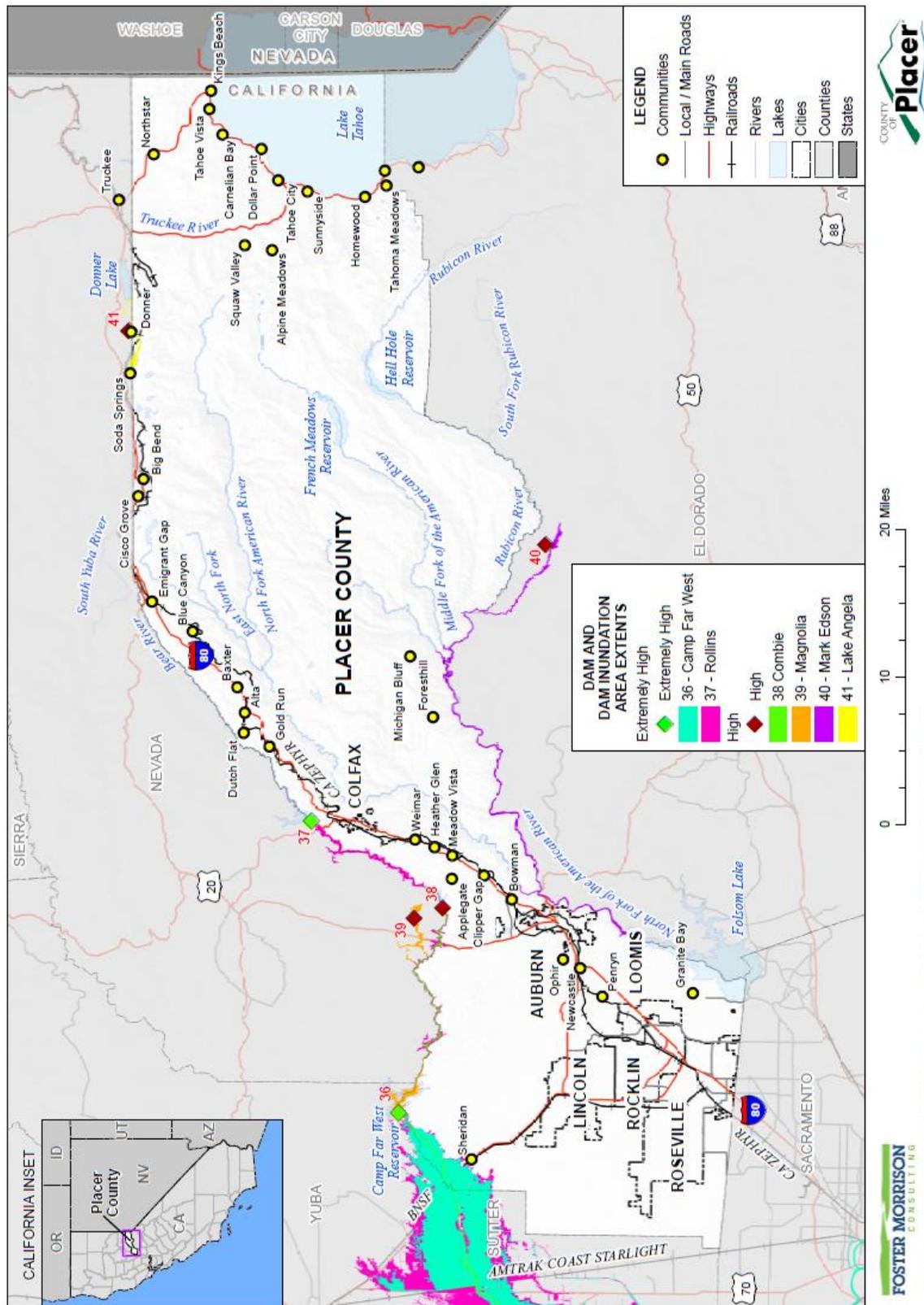


Table 4-57 Placer County Planning Area – Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas from Dams Outside the County

Dam	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Camp Far West	157	44	\$32,843,478	\$8,321,974	\$6,310,190	\$47,475,642
Rollins	361	147	\$64,627,630	\$40,366,068	\$22,645,038	\$127,638,736

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-58 Unincorporated Placer County – Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas from Dams Outside the County

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Camp Far West Dam						
Agricultural	44	10	\$13,050,063	\$1,166,429	\$1,166,429	\$15,382,921
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	59	1	\$3,526,211	\$549,403	\$549,403	\$4,625,017
Natural / Open Space	35	16	\$7,818,247	\$2,582,571	\$2,582,571	\$12,983,389
Residential	19	17	\$8,448,957	\$4,023,571	\$2,011,787	\$14,484,315
Total	157	44	\$32,843,478	\$8,321,974	\$6,310,190	\$47,475,642
Rollins Dam						
Agricultural	63	15	\$19,014,317	\$1,694,202	\$1,694,202	\$22,402,721
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	139	3	\$12,576,210	\$559,605	\$559,605	\$13,695,420
Natural / Open Space	40	16	\$7,719,168	\$2,670,193	\$2,670,193	\$13,059,554
Residential	119	113	\$25,317,935	\$35,442,068	\$17,721,038	\$78,481,041
Total	361	147	\$64,627,630	\$40,366,068	\$22,645,038	\$127,638,736

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

Table 4-59 Placer County Planning Area – Count and Value of Parcels in the High Hazard Dam Inundation Areas from Dams Outside the County

Dam	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Combie	101	33	\$22,416,636	\$15,074,339	\$7,988,466	\$45,479,441
Lake Angela	35	6	\$2,312,218	\$4,801,250	\$3,183,440	\$10,296,908
Magnolia	57	12	\$13,429,895	\$9,341,895	\$4,690,508	\$27,462,298
Mark Edson	121	2	\$978,340	\$835,448	\$417,724	\$2,231,512

Source: Placer County 2020 Parcel/ Assessor's Data, Cal OES, DSOD

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-60 Unincorporated Placer County – Count and Value of Parcels in the High Hazard Dam Inundation Areas by Property Use from Dams Outside the County

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Combie Dam						
Agricultural	25	3	\$7,223,316	\$175,362	\$175,362	\$7,574,040
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	43	1	\$7,162,858	\$549,403	\$549,403	\$8,261,664
Natural / Open Space	7	3	\$929,549	\$177,825	\$177,825	\$1,285,199
Residential	26	26	\$7,100,913	\$14,171,749	\$7,085,876	\$28,358,538
Total	101	33	\$22,416,636	\$15,074,339	\$7,988,466	\$45,479,441
Lake Angela Dam						
Agricultural	1	0	\$324	\$0	\$0	\$324
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	23	0	\$1,026,756	\$0	\$0	\$1,026,756
Natural / Open Space	5	3	\$495,499	\$1,565,630	\$1,565,630	\$3,626,759
Residential	6	3	\$789,639	\$3,235,620	\$1,617,810	\$5,643,069
Total	35	6	\$2,312,218	\$4,801,250	\$3,183,440	\$10,296,908
Magnolia Dam						
Agricultural	11	2	\$5,071,367	\$28,423	\$28,423	\$5,128,213
Commercial	0	0	\$0	\$0	\$0	\$0

Dam/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	29	2	\$4,278,024	\$10,694	\$10,694	\$4,299,412
Natural / Open Space	9	0	\$135,067	\$0	\$0	\$135,067
Residential	8	8	\$3,945,437	\$9,302,778	\$4,651,391	\$17,899,606
Total	57	12	\$13,429,895	\$9,341,895	\$4,690,508	\$27,462,298
Mark Edson Dam						
Agricultural	3	0	\$29,270	\$0	\$0	\$29,270
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	109	0	\$370,274	\$0	\$0	\$370,274
Natural / Open Space	2	0	\$0	\$0	\$0	\$0
Residential	5	2	\$578,796	\$835,448	\$417,724	\$1,831,968
Total	120	2	\$978,340	\$835,448	\$417,724	\$2,231,512

Source: Placer County 2020 Parcel/Assessor's Data, Cal OES, DSOD

Dam Inundation – Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and values at risk to the dam failure hazard, analysis was performed to obtain total acres and flooded acres by dam inundation area. The following is an analysis of inundated or flooded acres associated with dam failures and inundation areas in the County.

Methodology

GIS was used to calculate acres flooded by each Cal OES and DWR DSOD dam inundation area. The parcel layer was intersected with the dam inundation area data to obtain the acres inundated by dam. The Placer County parcel layer and inundation areas were intersected, and each segment divided by the intersection of inundation area, and was affected areas were calculated for acres.

Limitations

One limitation created by this type of analysis is that with respect to the improved acres analysis, improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall within the inundated portion of a parcel; thus, areas of improvements inundated, calculated through this method, may be higher or lower than those actually seen in a similar real-world event.

Analysis Results

The following tables represent a summary analysis of total acres for each dam inundation area in the Planning Area. Table 4-61 shows the flooded acres of the Placer County Planning Area in the inundation areas of each extremely high and high hazard dam located inside the County. Table 4-62 shows the flooded acres of the Placer County Planning Area in the inundation areas of each extremely high and high hazard dam located outside the County.

Table 4-61 Placer County – Flooded Acres from Extremely High and High Hazard Dams Inside of the County

Dam Inundation Areas	Jurisdiction	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Extremely High Hazard Dams							
Rock Creek	Unincorporated Placer County	946.52	0.1053%	447.20	0.25%	499.33	0.0694%
High Hazard Dams							
Christian Valley	Unincorporated Placer County	363.28	0.0404%	174.53	0.0969%	188.75	0.0262%
Drum Forebay	Unincorporated Placer County	823.69	0.0916%	39.43	0.0219%	784.26	0.1091%
Halsey Forebay	Unincorporated Placer County	587.59	0.0653%	308.63	0.1714%	278.96	0.0388%
Hinkle	Unincorporated Placer County	6.88	0.0008%			6.88	0.0010%
Kidd Lake Main	Unincorporated Placer County	332.93	0.0370%	39.67	0.0220%	293.26	0.0408%
Lake Arthur	Unincorporated Placer County	110.34	0.0123%	29.90	0.0166%	80.45	0.0112%
Lake Theodore	Unincorporated Placer County	150.37	0.0167%	40.71	0.0226%	109.66	0.0152%
Lake Valley	Auburn	0.92	0.0001%	0.36	0.0002%	0.92	0.0001%
LakeValley	Unincorporated Placer County	1,734.23	0.1929%	20.12	0.0112%	1,688.03	0.2347%
LL Anderson	Auburn	11.14	0.0012%	0.36	0.0002%	10.78	0.0015%
LL Anderson	Unincorporated Placer County	3,391.86	0.3772%	20.12	0.0112%	3,371.75	0.4689%
Lower Peak Lake	Unincorporated Placer County	214.25	0.0238%	26.99	0.0150%	187.26	0.0260%
Mammoth Reservoir	Unincorporated Placer County	321.66	0.0358%	239.82	0.1332%	81.83	0.0114%
Reservoir A	Unincorporated Placer County	143.00	0.0159%	41.72	0.0232%	101.28	0.0141%

Dam Inundation Areas	Jurisdiction	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Spring Valley Ranch	Unincorporated Placer County	40.17	0.0045%	24.52	0.0136%	15.65	0.0022%
Sugar Pine	Auburn	1.64	0.0002%			1.64	0.0002%
Sugar Pine	Unincorporated Placer County	2,011.65	0.2237%	142.67	0.0792%	1,868.98	0.2599%
Upper Peak Lake	Unincorporated Placer County	377.80	0.0420%	45.64	0.0253%	332.15	0.0462%

Source: Cal OES, DSOD

Table 4-62 Placer County – Flooded Acres from Extremely High and High Hazard Dams Outside of the County

Dam Inundation Areas	Jurisdiction	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Extremely High Hazard Dams							
Camp Far West	Unincorporated Placer County	4,807.40	0.5347%	2,082.63	1.16%	2,724.77	0.3789%
Rollins	Unincorporated Placer County	6,583.24	0.7322%	2,666.17	1.48%	3,917.06	0.5447%
High Hazard Dams							
Combie	Unincorporated Placer County	401.80	0.0447%	109.35	0.06%	292.46	0.0407%
Lake Angela	Unincorporated Placer County	203.43	0.0226%	12.33	0.01%	191.10	0.0266%
Magnolia	Unincorporated Placer County	587.84	0.0654%	39.24	0.02%	548.60	0.0763%
Mark Edson	Unincorporated Placer County	203.43	0.0226%	12.33	0.01%	191.10	0.0266%

Source: Cal OES, DSOD

Population at Risk

A separate analysis was performed to determine population in dam inundation areas for identified dams of concern. Using GIS, the dam inundation area dataset was overlaid on the improved residential parcel data. Those parcel centroids that intersect an inundation area were counted and multiplied by the Census Bureau average household size for Placer County and its jurisdictions. The following tables were created:

- Table 4-63 shows the populations at risk to dam failure flooding for extremely high and high hazard dams located inside the County.
- Table 4-64 shows the populations at risk to dam failure flooding for high hazard dams located inside the County.

It is unlikely that all dams that could affect Placer County would fail at the same time. The unincorporated County is the only jurisdiction with residential populations in dam inundation zones. While Auburn has some inundation areas, there are no affected residential parcels.

Table 4-63 Placer County Planning Area – Residential Population at Risk in Extremely High and High Hazard Dam Inundation Area from Dams Inside the County

Dam	City of Auburn		City of Colfax		City of Lincoln		Town of Loomis		City of Rocklin		Unincorporated County	
	Impr. Res. Parcels	Pop.	Impr. Res. Parcels	Pop.								
Extremely High Hazard Dams												
Rock Creek	0	0	0	0	0	0	0	0	0	0	108	279
High Hazard Dams												
Christian Valley	0	0	0	0	0	0	0	0	0	0	116	299
Drum Forebay	0	0	0	0	0	0	0	0	0	0	16	41
Halsey Forebay	0	0	0	0	0	0	0	0	0	0	159	410
Hinkle	0	0	0	0	0	0	0	0	0	0	0	0
Kidd Lake Main	0	0	0	0	0	0	0	0	0	0	60	155
Lake Arthur	0	0	0	0	0	0	0	0	0	0	94	242
Lake Theodore	0	0	0	0	0	0	0	0	0	0	106	273
Lake Valley	0	0	0	0	0	0	0	0	0	0	23	59
LL Anderson	1	2	0	0	0	0	0	0	0	0	3	8
Lower Peak Lake	0	0	0	0	0	0	0	0	0	0	29	75
Mammoth Reservoir	0	0	0	0	0	0	0	0	0	0	263	679
Reservoir A	0	0	0	0	0	0	0	0	0	0	44	114
Spring Valley Ranch	0	0	0	0	0	0	0	0	0	0	18	46
Sugar Pine	0	0	0	0	0	0	0	0	0	0	7	18
Upper Peak Lake	0	0	0	0	0	0	0	0	0	0	50	129

Source: Cal OES Dam Inundation Data, US Census Bureau Average Household Sizes: Auburn (2.19); Colfax (2.30); Lincoln (2.57); Loomis (2.60), Rocklin (2.68); and unincorporated Placer County (2.58)
 The City of Roseville is not included in the calculations of populations at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-64 Placer County Planning Area – Residential Population at Risk in Extremely High and High Hazard Dam Inundation Area from Dams Outside the County

Dam	City of Auburn		City of Colfax		City of Lincoln		Town of Loomis		City of Rocklin		Unincorporated County	
	Impr. Res. Parcels	Pop.	Impr. Res. Parcels	Pop.								
Extremely High Hazard Dams												
Camp Far West	0	0	0	0	0	0	0	0	0	0	17	44
Rollins	0	0	0	0	0	0	0	0	0	0	113	292
High Hazard Dams												
Combie	0	0	0	0	0	0	0	0	0	0	26	67
Lake Angela	0	0	0	0	0	0	0	0	0	0	3	8
Magnolia	0	0	0	0	0	0	0	0	0	0	8	21
Mark Edson	0	0	0	0	0	0	0	0	0	0	2	5

Source: Cal OES Dam Inundation Data, US Census Bureau Average Household Sizes: Auburn (2.19); Colfax (2.30); Lincoln (2.57); Loomis (2.60), Rocklin (2.68); and unincorporated Placer County (2.58)
 The City of Roseville is not included in the calculations of populations at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Placer County to determine critical facilities that fall in mapped dam inundation areas. Using GIS, the Cal OES and DSOD dam inundation layers were overlaid on the critical facility GIS layer. Figure 4-53 shows critical facilities that fall inside of dam inundation areas from dams originating inside of Placer County. Table 4-65 details the critical facilities that fall inside dam inundation areas from dams originating inside of Placer County. Table 4-65 Placer County Planning Area – Critical Facilities in Dam Inundation Areas from Dams Inside the County

Jurisdiction	Critical Facility Class	Critical Facility Type / Critical Facility Name	Facility Count
Rock Creek Dam			
Unincorporated Placer County	Class 3	Hazardous Materials Facility	
		NID/Locksley	1
		Placer County DPW	2

		Water Treatment Plant	
		NID North Auburn Water Treatment Plant	1
Unincorporated Placer County Total			4
Kidd Lake Main			
Unincorporated Placer County	Class 2	Fire Station	
		USFS FS #34- Soda Springs	1
Unincorporated Placer County Total			1
Upper Peak Lake			
Unincorporated Placer County	Class 2	Fire Station	
		USFS FS #34- Soda Springs	1
Unincorporated Placer County Total			1

Source: Cal OES, DSOD, Placer County GIS

Figure 4-54 shows critical facilities that fall inside of dam inundation areas from dams originating outside of Placer County. No critical facilities fall in dam inundation areas from dams that originate outside of the County. As such, no tabular analysis was performed.

Figure 4-53 Placer County Planning Area – Critical Facilities in Dam Inundation Areas from Dams Inside the County

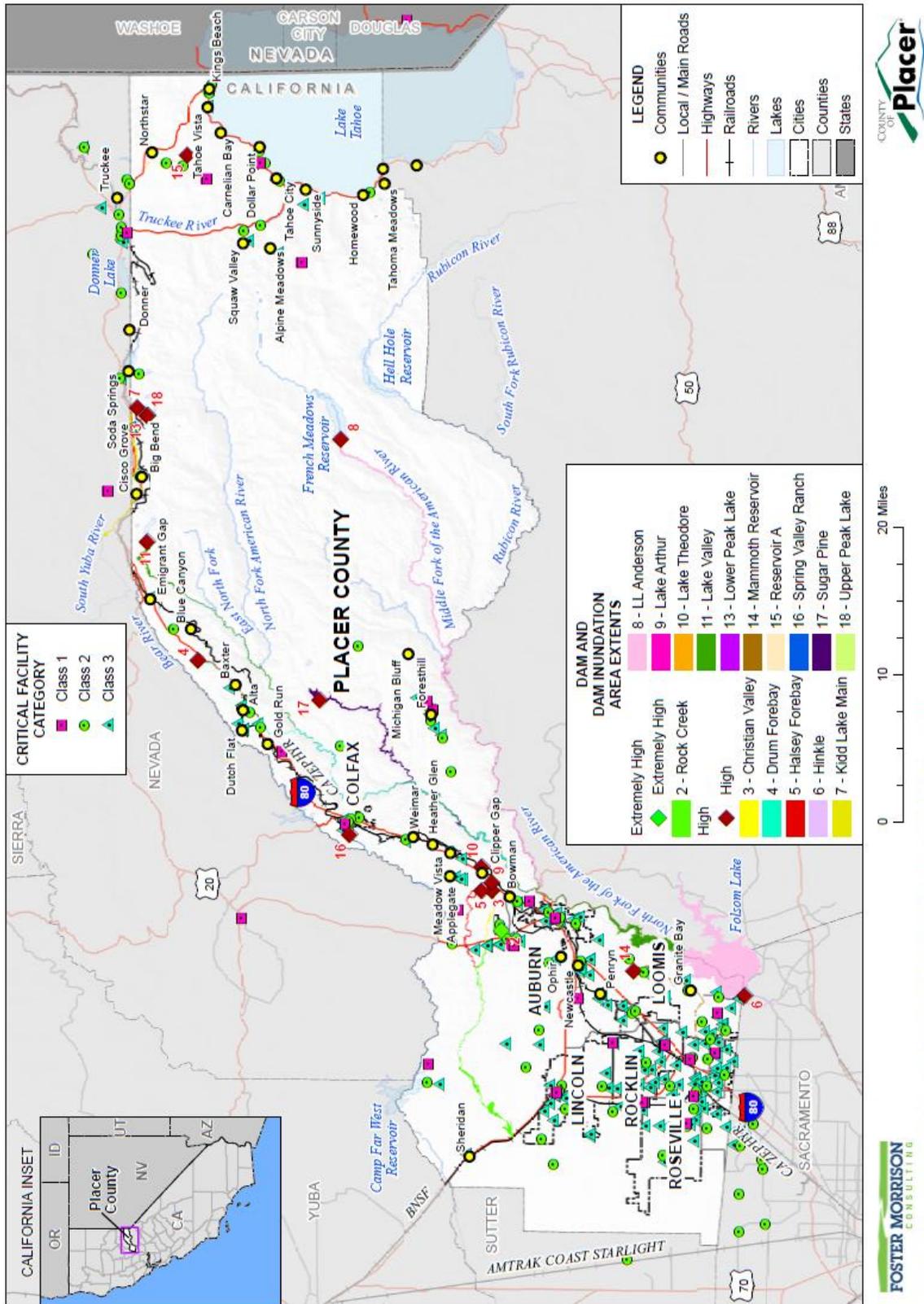
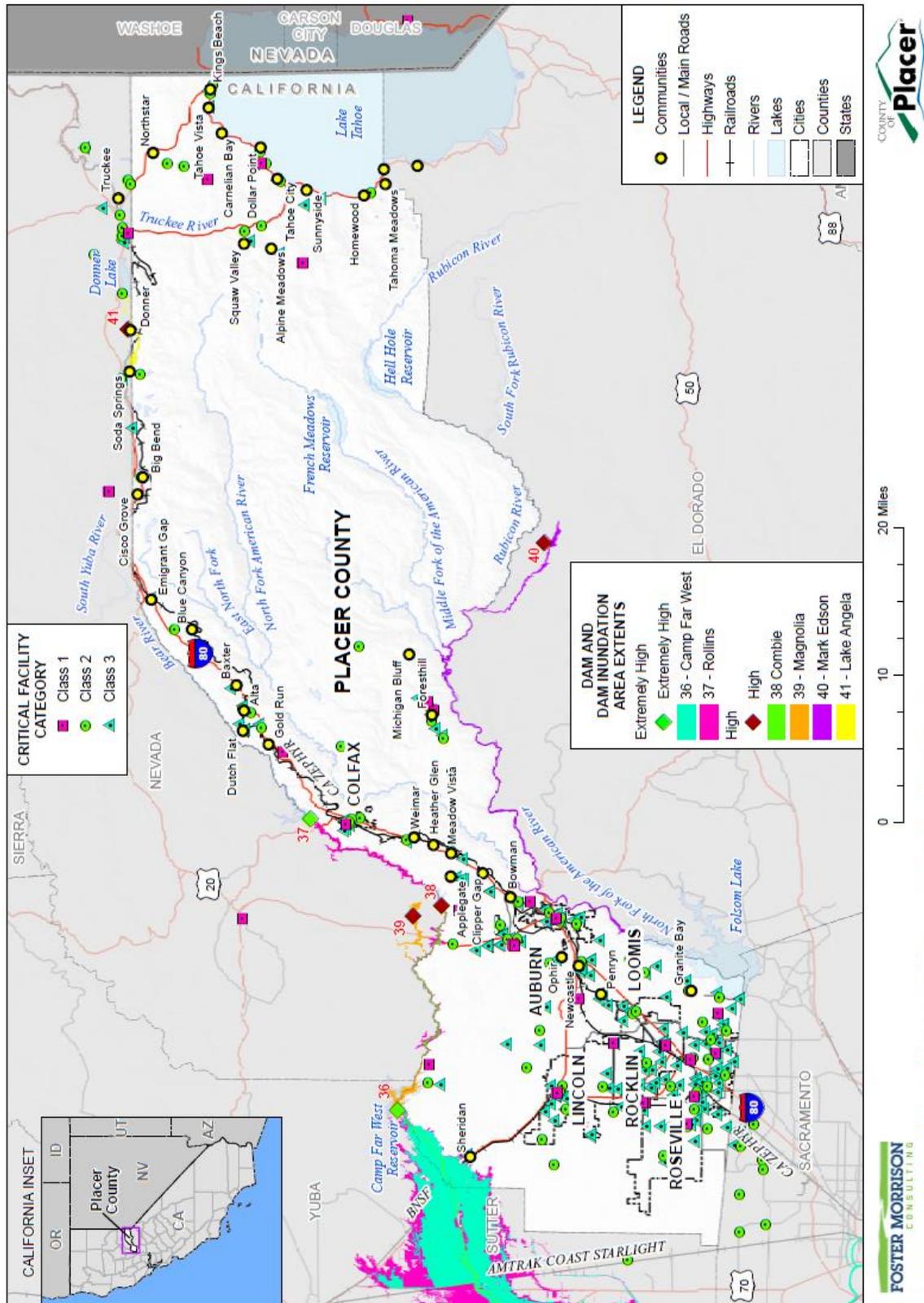


Table 4-65 Placer County Planning Area – Critical Facilities in Dam Inundation Areas from Dams Inside the County

Jurisdiction	Critical Facility Class	Critical Facility Type / Critical Facility Name	Facility Count
Rock Creek Dam			
Unincorporated Placer County	Class 3	Hazardous Materials Facility	
		NID/Locksley	1
		Placer County DPW	2
		Water Treatment Plant	
		NID North Auburn Water Treatment Plant	1
Unincorporated Placer County Total			4
Kidd Lake Main			
Unincorporated Placer County	Class 2	Fire Station	
		USFS FS #34- Soda Springs	1
Unincorporated Placer County Total			1
Upper Peak Lake			
Unincorporated Placer County	Class 2	Fire Station	
		USFS FS #34- Soda Springs	1
Unincorporated Placer County Total			1

Source: Cal OES, DSOD, Placer County GIS

Figure 4-54 Placer County Planning Area – Critical Facilities in Dam Inundation Areas from Dams Outside the County



Overall Community Impact

Dam failure floods and their impacts vary by location and severity of any given dam failure event and will likely only directly affect certain areas of the Placer County Planning Area during specific times. Based on the risk assessment, it is evident that dam failure floods have the potential for devastating life safety, property, environmental, and economic impacts to certain areas of the County. Impacts that are not always quantified, but can be anticipated in a large dam failure event, include:

- Injury and loss of life;
- Impacts to agricultural lands and industry;
- Commercial and residential structural and property damage;
- Disruption of and damage to critical infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors may fall in the areas flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

Future Development GIS Analysis

In order to ascertain if future development areas fall in dam inundation areas, a GIS analysis was performed. Using GIS, the following methodology was used in determining parcel counts and values associated with future development in the unincorporated Placer County Planning Area. Placer County's 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. Using the GIS parcel spatial file and the APNs, the 2 types and 37 future development projects were mapped, and overlaid on the Cal OES and DSOD dam inundation areas. This can be seen on Figure 4-55 and detailed in Table 4-66 for dam inundation areas from dams inside the County. This can be seen on Figure 4-56 and detailed in Table 4-67 for dam inundation areas from dams inside the County. Maps of future development and dam inundation areas in each City in the County are presented in their respective annexes to this Plan Update.

Figure 4-55 Unincorporated Placer County – Future Development in Dam Inundation Areas from Dams Inside the County

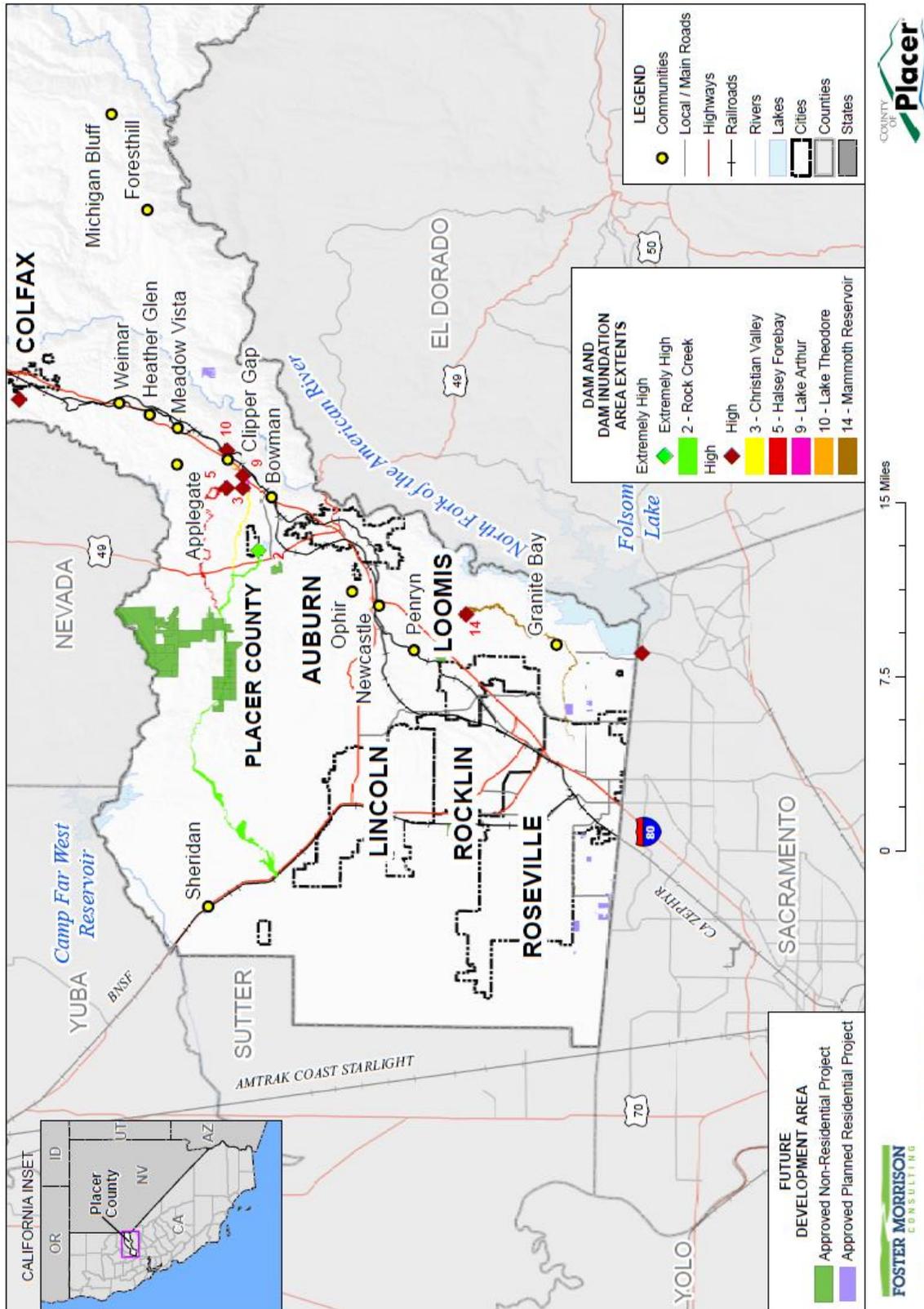


Table 4-66 Unincorporated Placer County – Future Development in Dam Inundation Areas from Dams Inside the County

Dam Inundation Area / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Christian Valley (High Hazard Dam Inundation Area)			
Approved Planned Residential Project			
Rancho Del Oro	1	0	117.5
Approved Planned Residential Project Total	1	0	117.5
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	16	1	1,049.2
Approved Non-Residential Project Total	16	1	1,049.2
Grand Total	17	1	1,166.7
Halsey Forebay (High Hazard Dam Inundation Area)			
Approved Planned Residential Project			
Rancho Del Oro	1	0	117.5
Approved Planned Residential Project Total	1	0	117.5
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	16	1	1,049.2
Approved Non-Residential Project Total	16	1	1,049.2
Grand Total	17	1	1,166.7
Lake Arthur (High Hazard Dam Inundation Area)			
Approved Planned Residential Project			
Rancho Del Oro	1	0	117.5
Approved Planned Residential Project Total	1	0	117.5
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	16	1	1,049.2
Approved Non-Residential Project Total	16	1	1,049.2
Grand Total	17	1	1,166.7
Lake Theodore (High Hazard Dam Inundation Area)			
Approved Planned Residential Project			
Rancho Del Oro	1	0	117.5

Dam Inundation Area / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Approved Planned Residential Project Total	1	0	117.5
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	16	1	1,049.2
Approved Non-Residential Project Total	16	1	1,049.2
Grand Total	17	1	1,166.7
Mammoth Reservoir (High Hazard Dam Inundation Area)			
Approved Planned Residential Project			
Rancho Del Oro	1	0	117.5
Approved Planned Residential Project Total	1	0	117.5
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	16	1	1,049.2
Approved Non-Residential Project Total	16	1	1,049.2
Grand Total	17	1	1,166.7

Source: Placer County GIS, Cal OES, DSOD

Figure 4-56 Unincorporated Placer County – Future Development in Dam Inundation Areas from Dams Outside the County

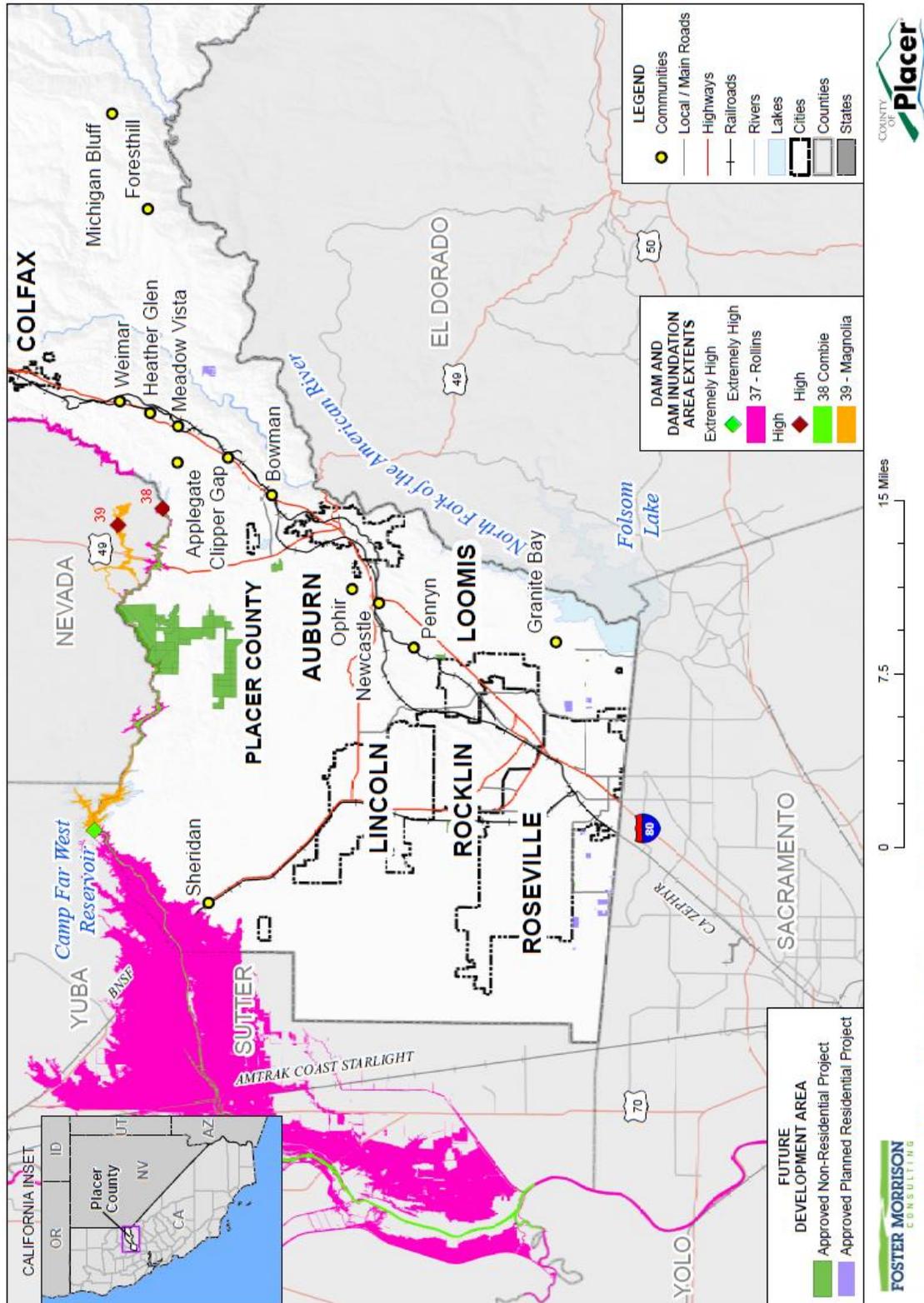


Table 4-67 Unincorporated Placer County – Future Development in Dam Inundation Areas from Dams Outside the County

Dam Inundation Area / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Combie (High Hazard Dam Inundation Area)			
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	5	0	1,052.4
Approved Non-Residential Project Total	5	0	1,052.4
Grand Total	5	0	1,052.4
Magnolia (High Hazard Dam Inundation Area)			
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	5	0	1,052.4
Approved Non-Residential Project Total	5	0	1,052.4
Grand Total	5	0	1,052.4

Source: Placer County GIS, Cal OES, DSOD

4.3.10. Drought and Water Shortage

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

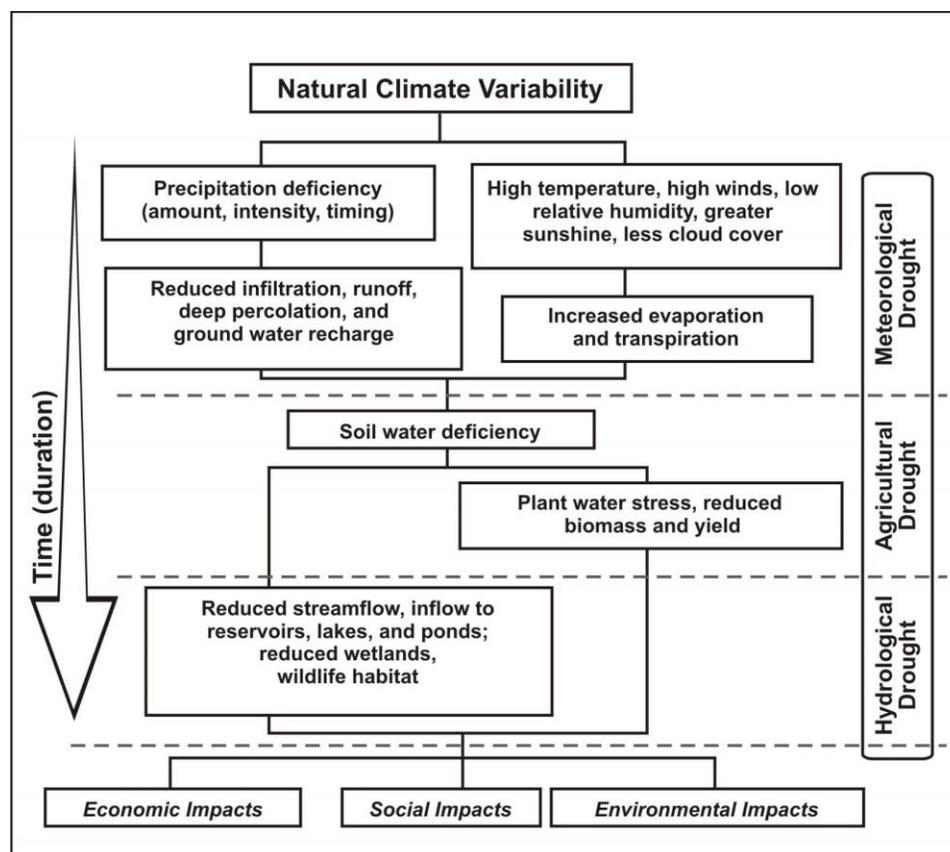
Drought

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement projects to mitigate the effects of a drought and water supply shortage.

Drought is a complex issue involving (see Figure 4-57) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

Figure 4-57 Causes and Impact of Drought



Source: National Drought Mitigation Center (NDMC)

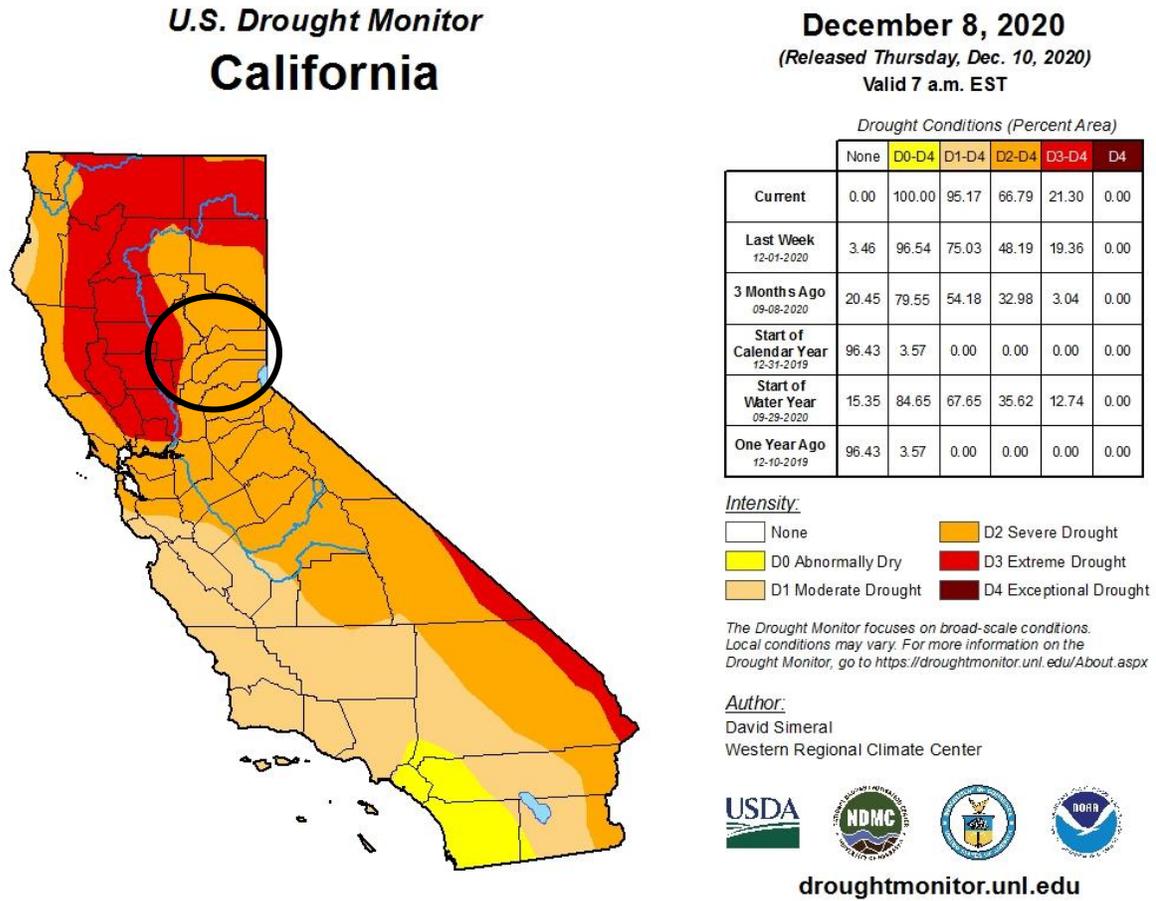
The HMPC noted that drought can cause increased wildfire risk, discussed in Section 4.3.17. During periods of drought, subsidence can also occur.

Location and Extent

Since drought is a regional phenomenon, it affects the whole of the County. Speed of onset of drought is slow, while the duration varies from short (months) to long (years) Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of

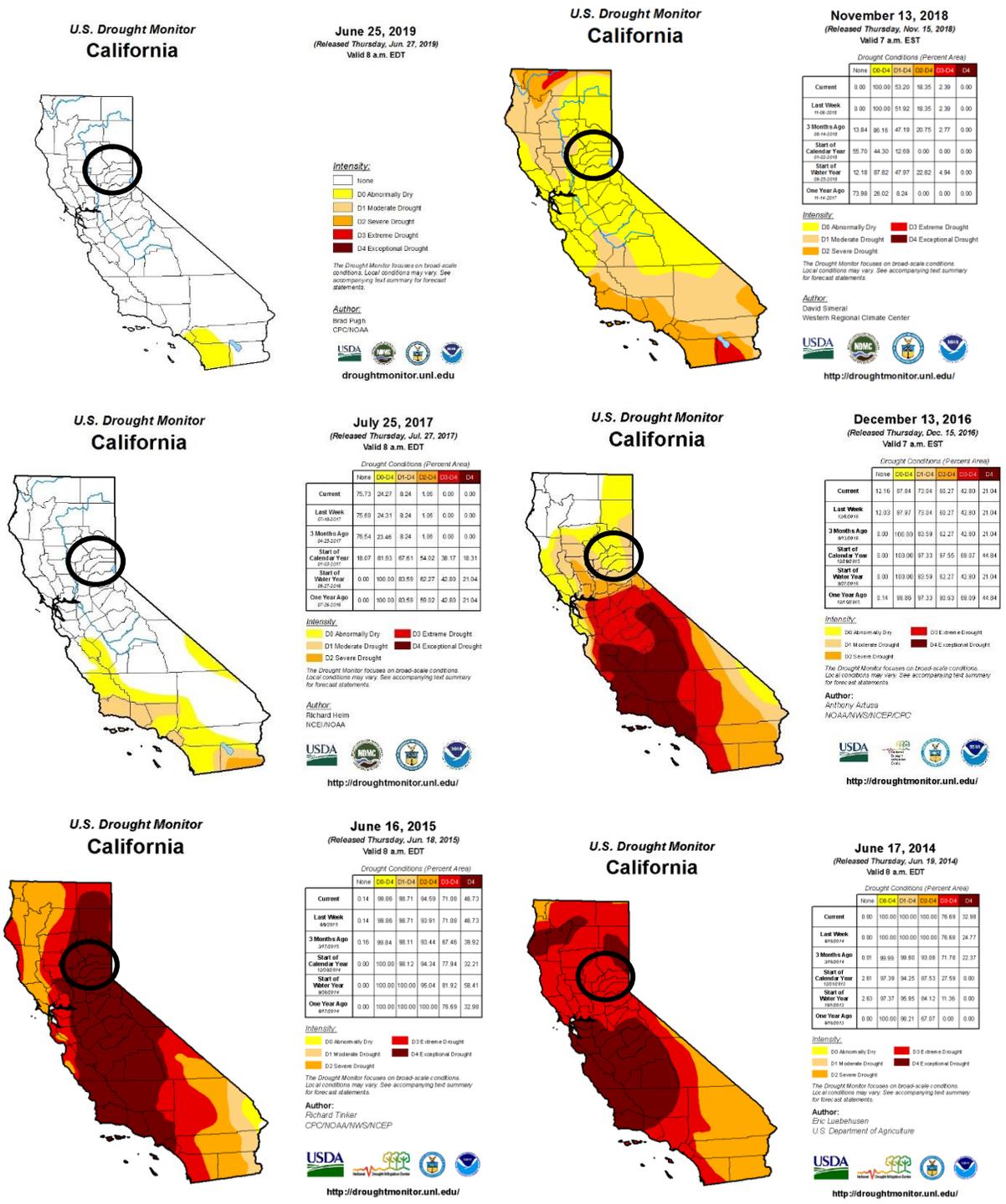
federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the drought conditions in California and Placer County (2020) can be found in Figure 4-58. Snapshots from 2014 through 2019 is shown in Figure 4-59.

Figure 4-58 Placer County – Current Drought Status



Source: US Drought Monitor

Figure 4-59 Previous Drought Status in Placer County



Source: US Drought Monitor

CA DWR says the following about drought:

One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between farming and federally protected fish habitats in California contributes to this issue.

As shown on the previous figures, drought is tracked by the US Drought Monitor. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Water Shortage

Northern Sacramento Valley counties, including Placer County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. Water supply has not been significant issues in Placer County in years past due to the extensive surface and groundwater supplies in the region.

Location and Extent

Since water shortage happens on a regional scale, the entirety of the County is at risk. There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of the drought that accompanies it.

Past Occurrences

Disaster Declaration History

There has been one federal disaster related to drought and water shortage in Placer County issued in 1977. There has been one state disaster related to drought and water shortage in Placer County issued in 2014. This can be seen in Table 4-68.

Table 4-68 Placer County – Disaster Declarations from Drought 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: FEMA, Cal OES

Another database of disaster declarations comes from the USDA. This database shows agricultural disasters that result from natural hazards like drought. This database was searched from 2002 to 2020, and the results for drought for Placer County are shown on Table 4-70.

Table 4-69 Placer County – USDA Disaster Declarations 2002-2020

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2002	N/A	N/A	Drought
2003	N/A	N/A	Drought
2004	N/A	N/A	Drought
2007	N/A	N/A	Drought
2008	N/A	N/A	Drought Event
2009	N/A	N/A	Drought Event
2012	S3283	Contiguous	Drought-FAST TRACK
2012	S3379	Primary	Drought
2012	S3440	Contiguous	Drought-FAST TRACK
2013	S3462	Contiguous	Drought-FAST TRACK
2013	S3495	Primary	Drought-FAST TRACK
2013	S3569	Primary	Drought-FAST TRACK
2014	S3638	Contiguous	Drought-FAST TRACK
2014	S3626	Primary	Drought-FAST TRACK
2014	S3631	Contiguous	Drought
2014	S3637	Primary	Drought-FAST TRACK
2014	S3797	Primary	Drought
2015	S3784	Primary	Drought-FAST TRACK
2015	S3789	Contiguous	Drought-FAST TRACK
2015	S3963	Contiguous	Drought

Year	Declaration Number	Primary or Contiguous County	Disaster Type
2016	S3952	Primary	Drought-FAST TRACK
2016	S3953	Contiguous	Drought-FAST TRACK
2017	S4163	Contiguous	Drought-FAST TRACK
2018	S4427	Contiguous	Drought-FAST TRACK
2020	S4697	Primary	Drought-FAST TRACK
2020	S4765	Contiguous	Drought-FAST TRACK

Source: USDA, Placer County Agricultural Commissioner

NCDC Events

There have been 44 NCDC drought events in Placer County, related to events in the 2014 to 2016 drought. No deaths, injuries, or property damages were reported to the NCDC from these events.

*Table 4-70 NCDC Drought Events for Placer County 1996-7/31/2020**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Drought	44	0	0	\$0	\$0	0	0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Placer County

CA DWR and Hazard Mitigation Planning Committee Events

Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 4-71 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. Figure 4-60 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

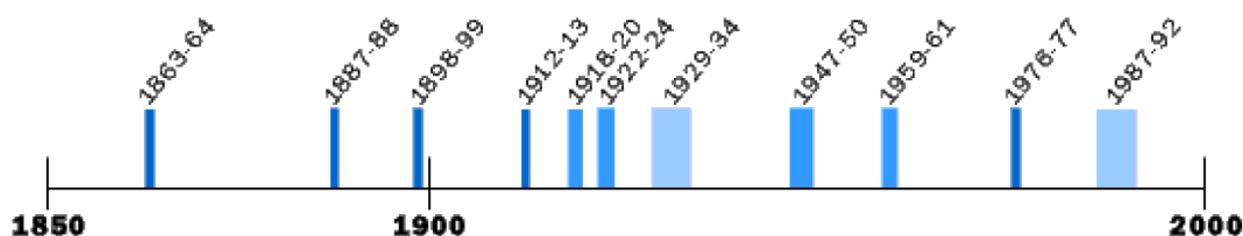
Table 4-71 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

Drought Period	Sacramento Valley Runoff		San Joaquin Valley Runoff	
	(maf*/yr)	(percent Average 1901-96)	(maf*/yr)	(percent Average 1906-96)
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47
2007-09	11.2	64	3.7	61

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.

*maf=million acre feet

Figure 4-60 California's Multi-Year Historical Dry Periods, 1850-2000

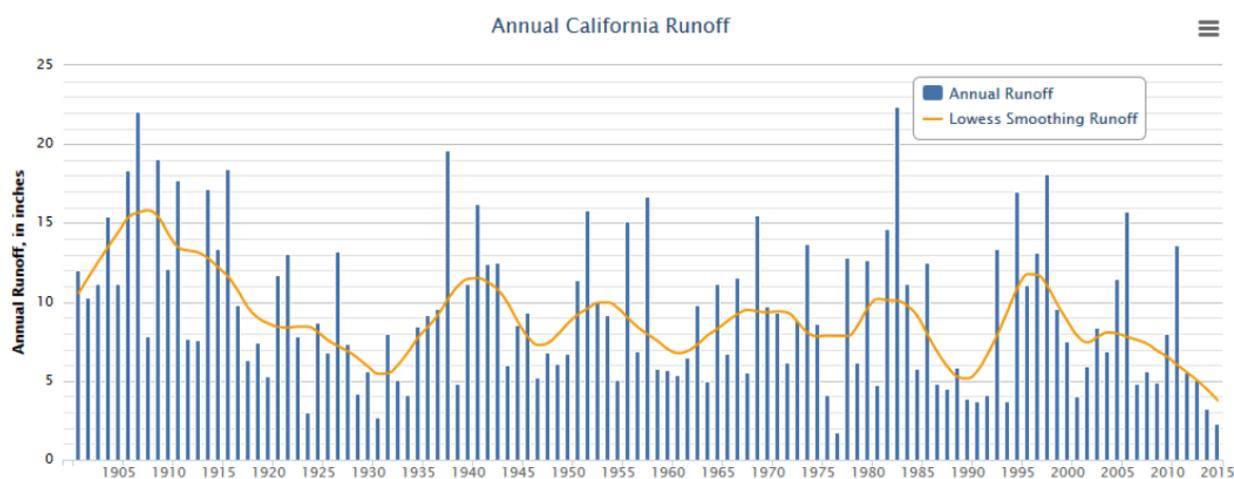


Source: California Department of Water Resources, www.water.ca.gov/

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-61 depicts runoff for the State from 1900 to 2015. This gives a historical context for the 2014-2015 drought to compare against past droughts.

Figure 4-61 Annual California Runoff –1900 to 2015



Source: California DWR

The 2018 California State Hazard Mitigation Plan fleshed out the major droughts from 1900 to 2017. This discussion below appends to the tables and figures above.

The 1975-1977 Drought

From November 1975 through November 1977, California experienced one of its most severe droughts. Although people in many areas of the state are accustomed to very little precipitation during the growing season (April to October), they expect it in the winter. In 1976 and 1977, the winters brought only one-half and one-third of normal precipitation, respectively. Most surface storage reservoirs were substantially drained in 1976, leading to widespread water shortages when 1977 turned out to be even drier. 31 counties were affected, resulting in \$2.67 billion in crop damages.

The 1987-1992 Drought

From 1987 to 1992, California again experienced a serious drought due to low precipitation and run-off levels. The hardest-hit region was the Central Coast, roughly from San Jose to Ventura. In 1988, 45

California counties experienced water shortages that adversely affected about 30 percent of the state's population, much of the dry-farmed agriculture, and over 40 percent of the irrigated agriculture. Fish and wildlife resources suffered, recreational use of lakes and rivers decreased, forestry losses and fires increased, and hydroelectric power production decreased. In February 1991, DWR and Cal OES surveyed drought conditions in all 58 California counties and found five main problems: extremely dry rangeland, irrigated agriculture with severe surface water shortages and falling groundwater levels, widespread rural areas where individual and community supplies were going dry, urban area water rationing at 25 to 50 percent of normal usage, and environmental impacts.

Storage in major reservoirs had dropped to 54 percent of average, the lowest since 1977. The shortages led to stringent water rationing and severe cutbacks in agricultural production, including threats to survival of permanent crops such as trees and vines. Fish and wildlife resources were in critical shape as well. Not since the 1928-1934 drought had there been such a prolonged dry period. In response to those conditions, the Governor established the Drought Action Team. This team almost immediately created an emergency drought water bank to develop a supply for four critical needs: municipal and industrial uses, agricultural uses, protection of fish and wildlife, and carryover storage for 1992. The large-scale transfer program, which involved over 800,000 acre-feet of water, was implemented in less than 100 days with the help and commitment of the entire water community and established important links between state agencies, local water interests, and local governments for future programs.

The 2007-2009 Drought

Water years 2007-2009 were collectively the 15th driest three-year period for DWR's eight-station precipitation index, which is a rough indicator of potential water supply availability to the State Water Project (SWP) and Central Valley Project (CVP). Water year 2007 was the driest single year of that drought, and fell within the top 20 percent of dry years based on computed statewide runoff. In June 2008, a state emergency proclamation was issued due to water shortage in selected Central Valley counties. In February 2009, for the first time in its history, the State of California proclaimed a statewide drought. The state placed unprecedented restrictions on CVP and SWP diversions from the Delta to protect listed fish species, a regulatory circumstance that exacerbated the impacts of the drought for water users.

The greatest impacts of the 2007–2009 drought were observed in the CVP service area on the west side of the San Joaquin Valley, where hydrologic conditions combined with reduced CVP exports resulted in substantially reduced water supplies (50 percent supplies in 2007, 40 percent in 2008, and 10 percent in 2009) for CVP south-of-Delta agricultural contractors. Small communities on the west side highly dependent on agricultural employment were especially affected by land fallowing due to lack of irrigation supplies, as well as by factors associated with current economic recession. The coupling of the drought and economic recession necessitated emergency response actions related to social services, such as food banks and unemployment assistance.

The 2012-2017 Drought

The statewide drought of 2012-2017 will be remembered as one of the most severe and costliest droughts of record in California. The drought that spanned water years 2012 through 2017 included the driest four-year statewide precipitation on record (2012-2015) and the smallest Sierra-Cascades snowpack on record

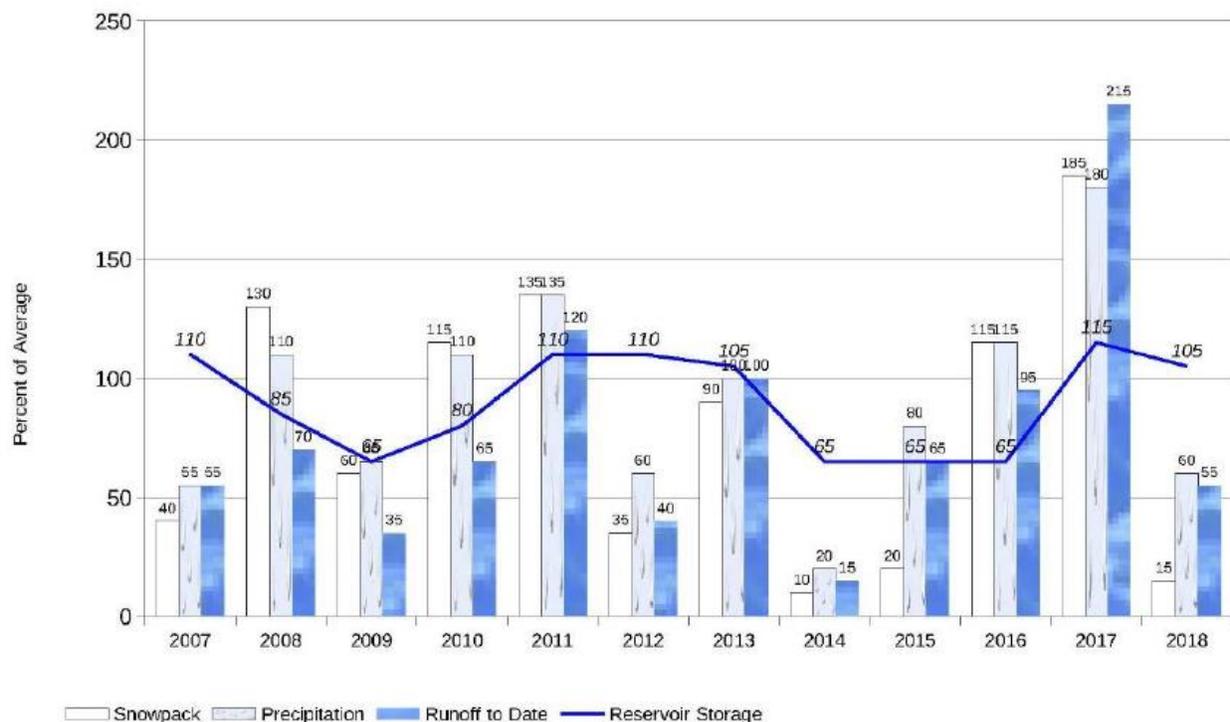
(2015, with 5 percent of average). It was marked by extraordinary heat: 2014, 2015, and 2016 were (at the time) California's first, second, and third warmest years in terms of statewide average temperatures. By the time the drought was declared officially over in April 2017, the state had expended \$6.6 billion in drought response and mitigation programs, and had been declared a federal disaster area. The immediate cause of California's 2014 drought can be traced to the altered route of atmospheric water vapor, which is necessary for strong winter precipitation in the state. Ordinarily, water evaporates from the ocean in the warm Tropical Pacific Ocean and winds carry that water vapor to the U.S. west coast. However, in 2014 the water vapor transport split into two branches and ended up going either north or south of California. In March of 2015, Yuba City noted that there was a possibility that water demand may exceed supply. The City's Public Works Director spelled out the City's options to the Yuba City City Council and recommended the City continue to implement mandatory water use restrictions for the rest of the year. At that time, the worst case scenario showed that demand could exceed supply by an estimated 1,000 acre-feet. Conservation measures were put into place in the City and the County which reduced use by 28 to 35 percent.

According to the HMPC, during this drought significant shortages were occurring on the west side and some residential areas (the largest City in the County – Roseville) were almost put on rations as Folsom reservoir was near the point of being below the intake pumping capability (this is predicted to occur 2 out of every 10 years due to the State tunnel system, a drought would increase that during every year of a drought). Surface water for agriculture was cutback significantly and one year not available. On the east side cutbacks were enacted but they fared better as there are fewer people/business to support.

Water Shortage

Figure 4-62 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2007 and 2018. The chart illustrates the cyclical nature of weather patterns in California.

Figure 4-62 Water Supply Conditions, 2007 to 2018



Source: 2018 State of California Hazard Mitigation Plan

Beginning in 2012, snowpack levels in California dropped dramatically. 2015 estimates placed snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close to 2015’s severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In “normal” years, the snowpack supplies about 30 percent of California’s water needs, according to the California Department of Water Resources. Snowpack levels began to increase in 2016, and in 2017 snowpack increased to the largest in 22 years, according to the State Department of Water Resources. In late 2017 and early 2018, drought conditions began to return to California but were dampened by periods of above average rainfall in the first part of 2019. Placer County has been in and out of drought conditions since 2019.

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Placer County Planning Area and region indicate there have been 5 significant droughts in the last 85 years. This equates to a drought every 17 years on average or a 5.9 percent chance of a drought in any given year. However, based on this data and given the multi-year length and cyclical nature of droughts, the HMPC determined that future drought occurrences in the Planning Area are likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that Placer County may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the County in the future during extreme drought conditions. Water supply has not been significant issues in Placer County in years past due to the extensive surface and groundwater supplies in the region; the County’s senior water rights; and their ability to maximize water resources through conjunctive use.

Climate Change and Drought and Water Shortage

Climate change and its effect on avalanche in the County has been discussed by three sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014
- Cal-Adapt – 2021

Placer County Sustainability Plan

Although droughts are a regular feature of California’s climate, scientists expect that climate change will lead to more frequent and more intense droughts statewide. Overall, precipitation levels are expected to stay similar, and may even increase in some places. However, the State’s current data says that there will be more years with extreme levels of precipitation, both high and low, which is expected to cause more droughts that last longer and are more intense, compared to historical norms.

Drought conditions will likely be made worse by changes to Placer County’s snowpack, which is the level of accumulated snow that builds up in the Sierra Nevada. Usually this snow melts slowly over the year, helping to provide a regular supply of water during dry months. However, because of climate change, less precipitation is expected to fall as snow and instead will fall as rain due to warmer temperatures, leading to a smaller snowpack. This may make water levels particularly low in late summer and early autumn, which are also often the hottest parts of the year.

CAS

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state’s water storage, distribution, management, conservation, and use policies. The 2014 CAS stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California’s future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

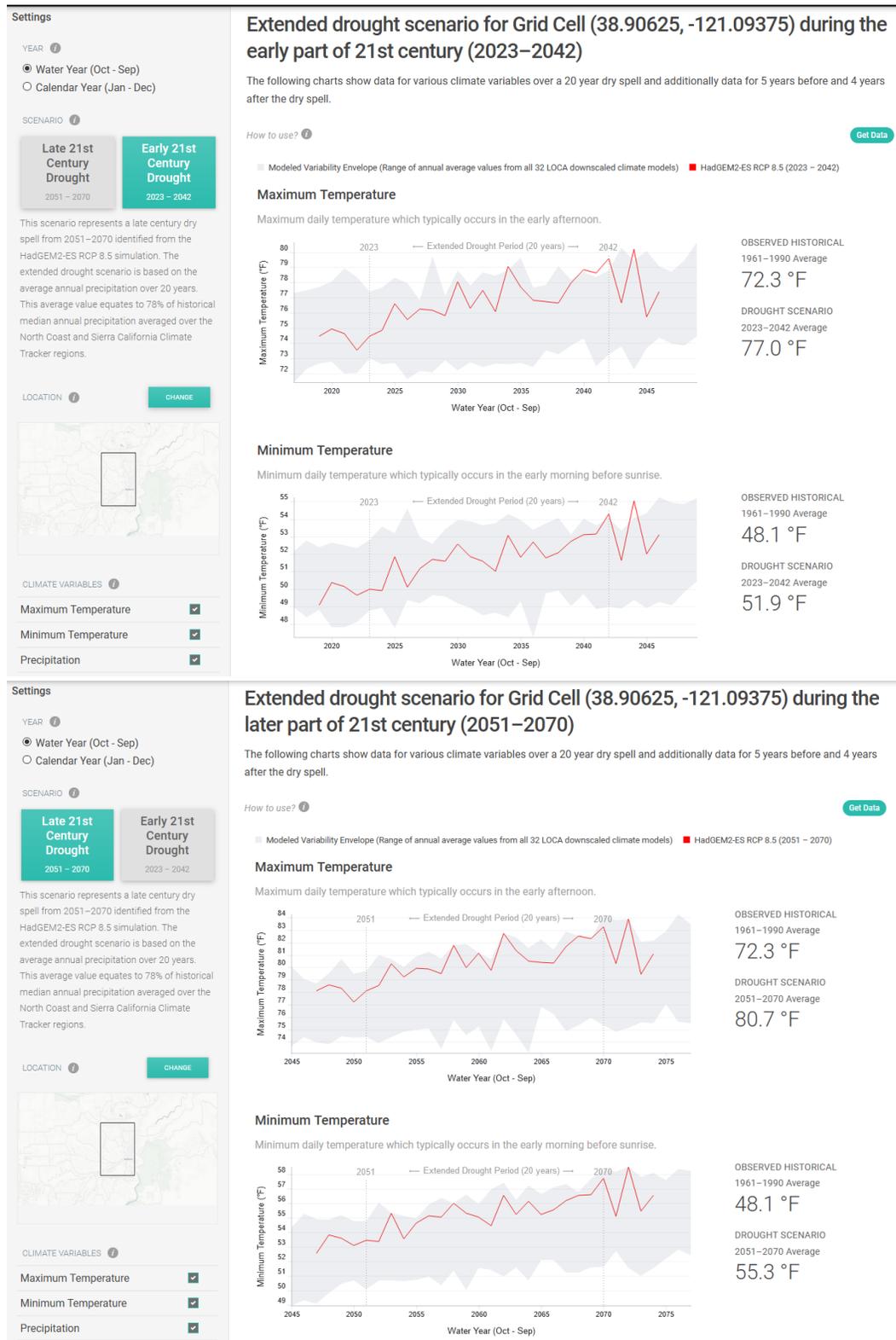
A report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal-Adapt

Cal-Adapt has modeled future risk of drought. Recent research suggests that extended drought occurrence (“mega-drought”) could become more pervasive in future decades. This tool explores data for two 20-year drought scenarios (using the quad that contains the City of Auburn) derived from LOCA downscaled meteorological and hydrological simulations (Figure 4-63) – one for the earlier part of the 21st century, and one for the latter part:

- The upper chart represents a mid-century dry spell from 2023-2042 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.
- The lower chart represents a late century dry spell from 2051–2070 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.

Figure 4-63 Placer County – Future Extended Drought Scenarios



Source: Cal Adapt – Extended Drought Scenarios. Retrieved 12/13/2020

Vulnerability Assessment

Vulnerability—High

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water. In the populated areas of the County, community service districts provide water and sewer services. In the rural areas, wells and septic systems can be prevalent.

According to the HMPC, the risk of drought on the west side of the County is significant as the storage capability is limited by few and small reservoirs with state mandates to allow most of the water to flow into the Sacramento delta to support habitat and sea water intrusion. The groundwater basin suffered after three straight years of drought but has bounced back during the past three years of above normal and normal water years. In the east side cutbacks were enacted but the fared better as there are fewer people. Any future drought will result in cutbacks and likely rationing with significant loss of business revenue as well via agricultural and restaurant/hotel industry.

Most surface water on the west side of the county (where a significant majority of the population resides) is provided by Placer County Water Agency (PCWA) which has two main sources; 1) Water from the Middle Fork & North Fork of the American River (some comes from the Rubicon River) which flows into Folsom Reservoir and 2) Water from the PG&E Yuba/Bear river system by contract. In addition, the Nevada Irrigation District (NID) also supplies some water from the Yuba Bear river system. Groundwater is also used in the west side from a variety of agricultural, municipal, and individual pumps and the groundwater basin is very healthy. The east side of the county has multiple small surface water systems servicing most of the Lake Tahoe Basin and groundwater is utilized to serve most of the Martis valley and the groundwater basin is very healthy.

Impacts

Based on historical information, the occurrence of drought in California, including Placer County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of Placer County to drought is countywide, but impacts may vary and may include reduction in water supply, agricultural losses, and an increase in dry fuels.

The most significant qualitative impacts associated with drought in the Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With a reduction in water, water supply issues based on water rights becomes more evident. Some agricultural uses are severely impacted through limited water supply, especially those with livestock. Other impacts include decreased crop yields, impact to feed and forage, altered plant populations and tree mortality. Drought and water supply issues will continue to be a concern to the Planning Area. The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Land subsidence can also occur when the groundwater table is depleted.

In addition, the County noted that drought leads to accelerated root intrusion into the sewers which leads to blockages.

Drought Impact Monitor

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-72 show drought impacts for the Placer County Planning Area from 1850 to December 2020. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Table 4-72 Placer County Drought Impacts

Category	Number of Impacts
Agriculture	39
Business and Industry	24
Energy	7
Fire	20
Plants & Wildlife	49
Relief, Response, and Restrictions	75
Society and Public Health	57
Tourism and Recreation	35
Water Supply and Quality	87

Source: National Drought Mitigation Center, 1/1/1850-12/1/2020

CA DWR Impacts

Recently, a 2020 report by CA DWR (titled Small Water Suppliers and Rural Communities at Risk of Drought and Water Shortage Vulnerability and Recommendations and Guidance to Address the Planning Needs of these Communities), sought to quantify the drought and water shortage vulnerability to rural counties, like Placer County, in the State of California. Included in the draft report is the methodology for developing relative risk assessment scores that show where small water systems rank on an index of drought and water shortage vulnerability and recommendations on drought and water shortage vulnerability for

small water systems. It is important to note that the primary benefit of this scoring exercise is to offer local and regionally-specific information to assist with drought and water shortage planning.

DWR developed a tool to rate drought and water shortage risk by water provider. To develop the tool, DWR used statewide datasets to estimate risk of drought and water shortage for small water suppliers and rural communities. DWR was only able to calculate relative risk scores for small water systems that had a digital service area boundary, with data available from the Water Board. DWR is working with the Water Board to create a process to obtain service areas boundaries for the remaining small water systems. Table 4-73 was extracted from the Excel table from the report, and shows the systems in Placer County that were reviewed and their risk score for drought and water shortage.

Table 4-73 Placer County – Drought and Water Shortage Risk Factors for Small Water Suppliers

System Name	Risk Score
Camp Winthers	94
Emigrant Gap Mutual Water Co.	86
Meadow Vista CWD	85
Shady Glen Community Water System	83
Sierra Meadows Apartment	82
Alpine Meadows Property Owners Association	77
Auburn Mobile Home Village	77
Auburn Ridge Woods	73
Gold Hill Mobile Home Park	71
Weimar Water Company	66
Heather Glen Community Services District	59
Dutch Flat Mutual	56
Folsom Lake Mutual Water Co	55
North Eden Valley	53
Rosecrest Mutual	52
Madden Creek Water Company	50
Agate Bay Water Company	48
Sierra Lakes County Water District	39
Auburn Valley CSD	39
Baker Ranch Water Company	37
Midway Heights CWD	36
Talmon Resort Improvement District	36
McKinney Water District	34
Castle City MHP	29
Tahoe Cedars Water Company	27
Christian Valley Park CSD	26

System Name	Risk Score
Placer CSA – Sheridan	26
Alpine Springs County Water District	24
Ward Well Water Company	23
Tahoe City PUD – Timberland	19
Lakeview Hills Community Association	19
Fulton Water Company	17

Source: CDAG Report

Note: It is important to note that the primary benefit of this scoring exercise is to offer local and regionally specific information to assist with drought and water shortage planning.

0 is the lowest risk and 100 is highest risk, compared to other small water suppliers

Drought and Power Shortage/PSPS

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause PSPS events to be declared in the County. More information on power shortage and failure can be found at the beginning of Section 4.3.

Future Development

According to the 2015 Urban Water Management Plan and input from the HMPC, Placer County has access to large quantities of water through surface water and water supplies purchased under an agreement with PG&E. However, population growth in the County will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. Population in the County in the future is expected to increase (see Table 4-22), which increases pressure on water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity to replace aging systems and accommodate additional users.

4.3.11. Earthquake

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends

on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Ground shaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by ground shaking is among the most serious seismic hazards. Damage to structures from this vibration, or ground shaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion.

Actual ground breakage generally affects only those buildings directly over or near the fault. Ground shaking generally has a much greater impact over a greater geographical area than ground breakage. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry buildings [URM]) and soft story buildings are generally the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low-rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction, which can occur in earthquakes with strong ground shaking, is mostly found in areas with sandy soil or fill and a high water table located 50 feet or less below the ground surface. Liquefaction can cause damage to property with the ground below structures liquefying making the structure unstable causing

sinking or other major structural damage. Evidence of liquefaction may be observed in "sand boils," which are expulsions of sand and water from below the surface due to increased pressure below the surface.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Other Hazards

Earthquakes can also cause seiches, landslides, and dam and levee failures. A seiche is a periodic oscillation of a body of water resulting from seismic shaking or other factors that could cause flooding. Earthquakes may cause landslides (discussed in Section 4.3.14), particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail (see Section 4.3.9 Dam Failure).

Location and Extent

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Faults

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant. This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. For example, the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active. Potentially active faults are those that have shown displacement within the last 1.6 million years (Quaternary). An inactive fault shows no evidence of movement in historic (last 200 years) or geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or

two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam (which was never built). Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills fault, which is situated approximately 36 miles northwest of Auburn. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

Further analysis using FEMA's HAZUS-MH (nationally applicable loss estimation software) shows that there are several potentially active faults east of the Placer County line in Nevada. The closest faults and estimated maximum earthquakes are the North Tahoe Fault (6.5 estimated maximum magnitude), Incline Village Fault (6.5 estimated maximum magnitude), and the East Tahoe Fault (7.0 estimated maximum magnitude).

Additionally, western Placer County may experience ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas Fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906, including the State Capitol, the full extent of which was not discovered until the mid-1970s) and the closer Hayward fault have the potential for experiencing major to great events. The US Geological Survey recently (February 2004) estimated that there is a 62 percent probability of at least one 6.7 or greater magnitude earthquake occurring that could cause widespread damage in the greater San Francisco Bay area before 2032.

Figure 4-64 shows the faults in and near Placer County.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake’s magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-74). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-74 Modified Mercalli Intensity (MMI) Scale

MMI	Felt Intensity
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III	Felt noticeably indoors. Standing automobiles may rock slightly.
IV	Felt by many people indoors; by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, and great in poorly built structures. Heavy furniture is overturned.
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

Past Occurrences

Disaster Declaration History

There have been no disaster declarations in the County related to earthquakes, as shown on Table 4-4. The County had no USDA disaster declarations since 2002 related to earthquake, as shown on Table 4-6.

NCDC Events

Earthquake events are not tracked by the NCDC database.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in the Placer County area. Table 4-75 shows the approximate distances earthquakes can be felt away from the epicenter. According to the USGS data, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Auburn in western Placer County and Lake Tahoe in eastern Placer County. There are 51 events that are detailed in Table 4-76, and 66 events in Table 4-77.

Table 4-75 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity*	Distance Felt (miles)
2.0 - 2.9	I – II	0
3.0 - 3.9	II – III	10
4.0 - 4.9	IV – V	50
5.0 - 5.9	VI – VII	90
6.0 - 6.9	VII – VIII	135
7.0 - 7.9	IX – X	240
8.0 - 8.9	XI – XII	365

*Modified Mercalli Intensity Scale.

Source: United State Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-76 Magnitude 5.0 Earthquakes or greater within 90 Miles of Western Placer County**

Date	Richter Magnitude	Location
8/24/2014	6.02	South Napa
5/24/2013	5.69	10km WNW of Greenville, California
4/26/2008	5.1	1km NW of Mogul, Nevada
8/10/2001	5.2	Northern California
9/12/1994	5.1	Northern California
9/12/1994	5.7	11km SE of Gardnerville Ranchos, Nevada
11/28/1980	5.1	Northern California
1/27/1980	5.4	San Francisco Bay area, California
1/24/1980	5.1	San Francisco Bay area, California
1/24/1980	5.8	San Francisco Bay area, California
2/22/1979	5.3	Northern California
8/2/1975	5.2	Northern California
8/2/1975	5.1	Northern California
8/1/1975	5.7	0km WSW of Palermo, California
10/2/1969	5.1	Northern California
4/29/1968	5	Northern California
9/12/1966	5.91	Northern California

Date	Richter Magnitude	Location
4/1/1959	5.6	Northern California
10/24/1955	5.4	San Francisco Bay area, California
9/26/1953	5.3	Nevada
3/22/1953	5	Northern California
5/9/1952	5.1	Nevada
12/29/1948	6	Northern California
3/30/1943	5.3	Northern California
12/17/1942	5.1	Northern California
2/8/1940	5.7	Northern California
4/5/1915	5	Central California
4/24/1914	6.4	Nevada
2/18/1914	6	Nevada
6/23/1909	5.7	Northern California
3/3/1909	5	Northern California
5/19/1902	5.4	Northern California
3/31/1898	6.2	San Francisco Bay area, California
8/9/1893	5.1	Northern California
4/30/1892	5.5	Northern California
4/21/1892	6.2	Northern California
4/19/1892	6.4	Northern California
10/12/1891	5.5	Northern California
5/1/1889	6	San Francisco Bay area, California
4/29/1888	5.9	Northern California
6/3/1887	6.3	Nevada
1/7/1881	5.6	Near Red Bluff, California
7/10/1887	5.5	Lake Tahoe area, California-Nevada border
1/24/1875	6.2	South of Janesville, California
12/27/1869	6.2	Near Carson City, Nevada
12/27/1869	6.4	Northwest of Virginia City, Nevada
9/17/1868	5.6	Near Markleeville, California
5/30/1868	6	Near Virginia City, Nevada
7/15/1866	6	Southwest of Stockton, California
7/4/1861	5.8	San Francisco Bay area, California
9/3/1857	6	California-Nevada Border east of Truckee

Source: USGS

*Search dates 1/1/1850 – 12/20/2020

*Table 4-77 Magnitude 5.0 Earthquakes or greater within 90 Miles of Eastern Placer County**

Date	Richter Magnitude	Location
12/28/2016	5.5	28km SW of Hawthorne, Nevada
12/28/2016	5.6	26km SW of Hawthorne, Nevada
12/28/2016	5.6	27km SW of Hawthorne, Nevada
4/26/2008	5.1	1km NW of Mogul, Nevada
8/10/2001	5.2	Northern California
9/12/1994	5.1	Northern California
9/12/1994	5.7	11km SE of Gardnerville Ranchos, Nevada
10/24/1990	5.8	Central California
1/24/1985	5.2	Central California
11/28/1980	5.1	Northern California
10/7/1979	5	Central California
2/22/1979	5.3	Northern California
8/2/1975	5.2	Northern California
8/2/1975	5.1	Northern California
8/1/1975	5.7	0km WSW of Palermo, California
9/12/1966	5.91	Northern California
4/13/1962	5.1	Central California
6/23/1959	5.5	Nevada
6/23/1959	5.6	Nevada
4/1/1959	5.6	Northern California
12/31/1956	5.1	Central California
12/31/1956	5	Central California
7/26/1956	5.1	Nevada
8/8/1955	5.2	Nevada
6/19/1955	5	Nevada
9/1/1954	5.5	Nevada
8/31/1954	5.8	Nevada
8/24/1954	5.2	Nevada
8/24/1954	6.56	Nevada
8/2/1954	5.4	Nevada
7/30/1954	5.1	Nevada
7/8/1954	5.3	Nevada
7/6/1954	6.23	Nevada
7/6/1954	5.2	Nevada
7/6/1954	5.7	Nevada
7/6/1954	5.5	Nevada
7/6/1954	6.8	Nevada

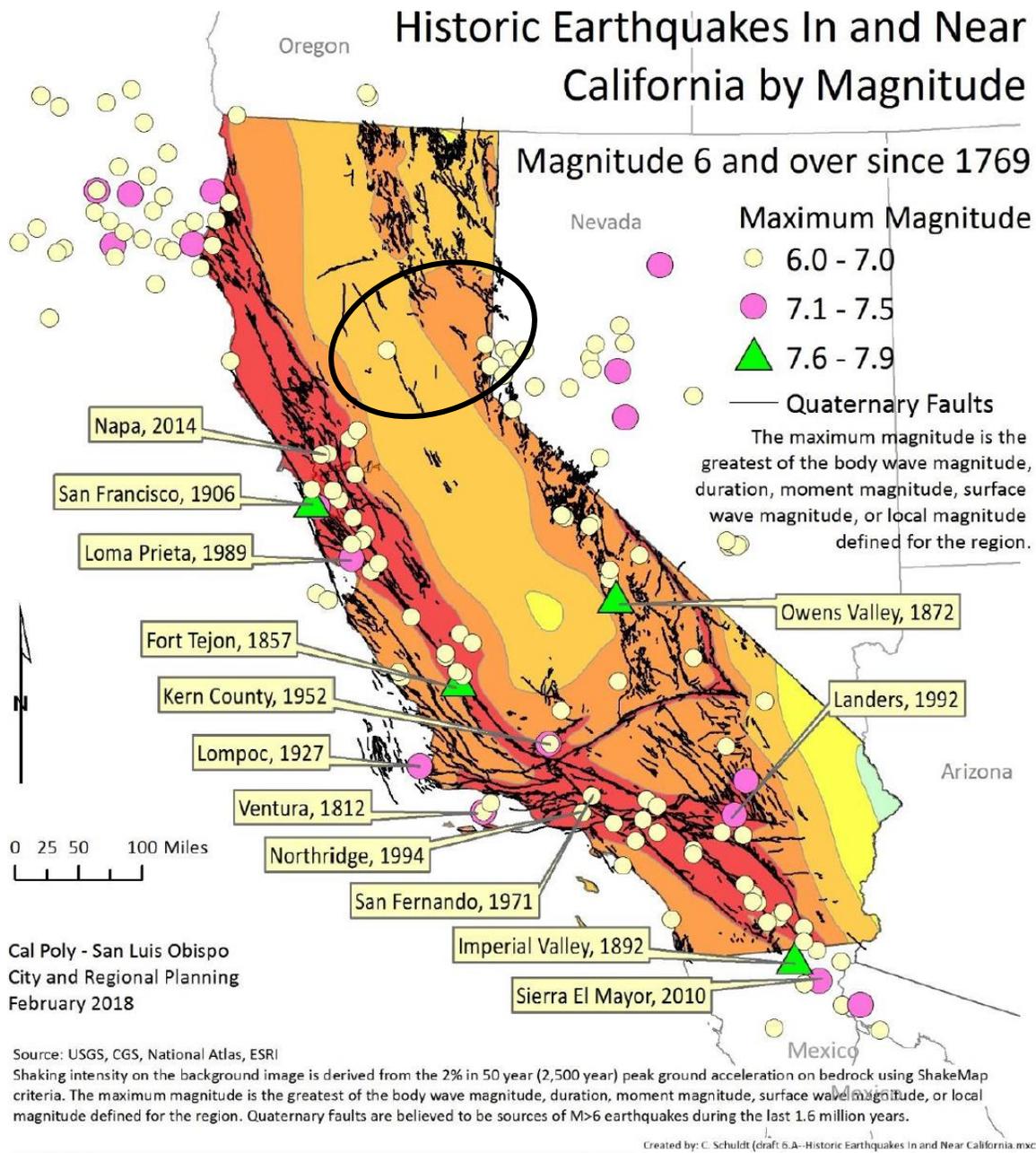
Date	Richter Magnitude	Location
9/26/1953	5.3	Nevada
3/22/1953	5	Northern California
5/9/1952	5.1	Nevada
12/14/1950	5.6	Northern California
12/29/1948	6	Northern California
3/30/1943	5.3	Northern California
12/17/1942	5.1	Northern California
12/3/1942	5.5	Nevada
8/18/1942	5	Nevada
7/18/1941	5	Nevada
1/11/1939	5.5	Nevada
6/25/1933	6.1	Nevada
12/19/1919	5.2	Central California
4/5/1915	5	Central California
4/24/1914	6.4	Nevada
2/18/1914	6	Nevada
6/23/1909	5.7	Northern California
3/3/1909	5	Northern California
4/29/1888	5.9	Northern California
6/3/1887	6.3	Nevada
7/10/1877	5.5	Lake Tahoe area, California-Nevada border
1/24/1875	6.2	South of Janesville, California
12/27/1869	6.2	Near Carson City, Nevada
12/27/1869	6.4	Northwest of Virginia City, Nevada
9/17/1868	5.6	Near Markleeville, California
5/30/1868	6	Near Virginia City, Nevada
3/15/1860	6.5	East of Reno, Nevada
9/3/1857	6	California-Nevada Border east of Truckee
1/25/1855	5.5	Sierra County, California

Source: USGS

*Search dates 1/1/1850 – 12/20/2020

Figure 4-65 shows major historical earthquakes in California from 1769 to 2017.

Figure 4-65 Historic Earthquakes in California 1769 to 2017



Cal Poly - San Luis Obispo
City and Regional Planning
February 2018

MMI	Damage	Effects
X	Very Heavy	Some well-built, wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
IX	Heavy	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
VIII	Moderate to Heavy	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
VII	Moderate	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly-built or badly designed structures; some chimneys broken.
VI	Light	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
V	Very Light	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

Source: 2018 State of California Multi-Hazard Mitigation Plan

Hazard Mitigation Planning Committee Events

Historically, major earthquakes have not been an issue for Placer County. However, minor earthquakes have occurred in the County in the past. The HMPC has identified several earthquakes that were felt by area residents and/or caused damaging shaking in Placer County. Details on some of these events follow.

- **1892** – The Midland Fault Zone, the source of an 1892 earthquake centered between the cities of Vacaville and Winters, caused minor damage in the City of Lincoln.
- **1908** – An estimated 4.0+ Richter magnitude earthquake occurred between Auburn and Folsom with an epicenter possibly associated with the Bear Mountain fault.
- **1975** – The Cleveland Hills fault was the source of the Oroville earthquake (Richter Magnitude: 5.7), which was felt strongly in Placer County and neighboring areas.
- **2003/2004** – Volcanic magma (molten rock) migrating about 20 miles below the surface of the Sierra Nevada mountains caused a swarm of about 1,600 small earthquakes in late 2003 and early 2004. The 20 mile depth is about twice as deep as earthquakes caused by normal faulting in the region measured during the last 30 years. Placer County did not report any damages associated with these small earthquakes.
- **2008, 2013, 2014** – There were earthquakes in the Placer County vicinity in these years. No significant issues were reported in the County. Groundshaking was the primary concern.

The County noted that there are many small earthquakes in the Tahoe area. All have been small since 2016.

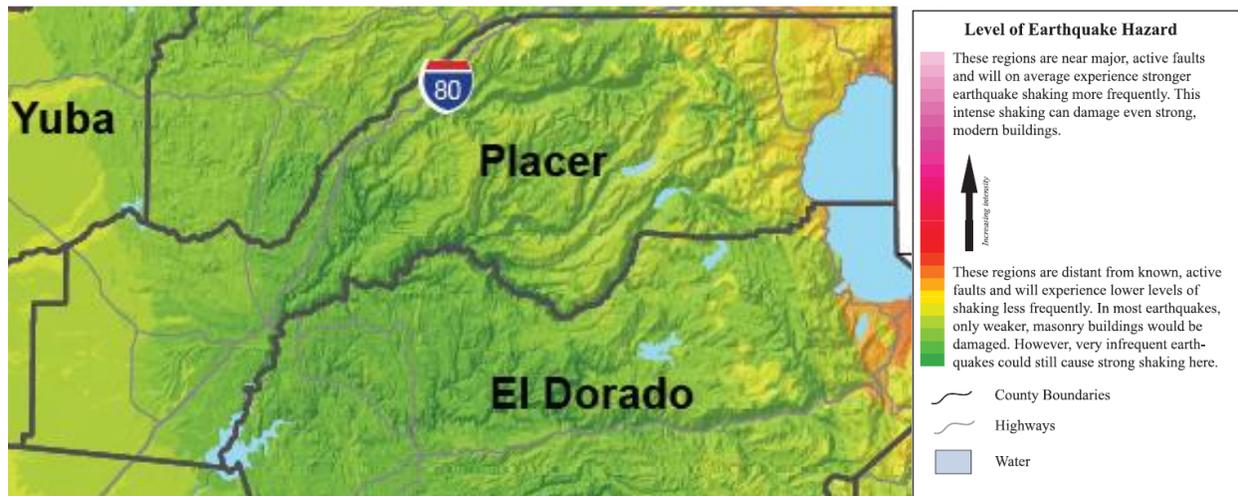
Likelihood of Future Occurrence

Occasional— No major earthquakes have been recorded within the County; although the County has felt ground shaking from earthquakes with epicenters located elsewhere. Based on historical data and the location of the Placer County Planning Area relative to active and potentially active faults, the Planning Area will likely experience a significantly damaging earthquake occasionally.

Mapping of Future Occurrences

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-66, prepared by the California Division of Mines and Geology, shows the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2,500-year average repeat time. This data shows that Placer County falls within an area of mostly low to moderate seismic risk.

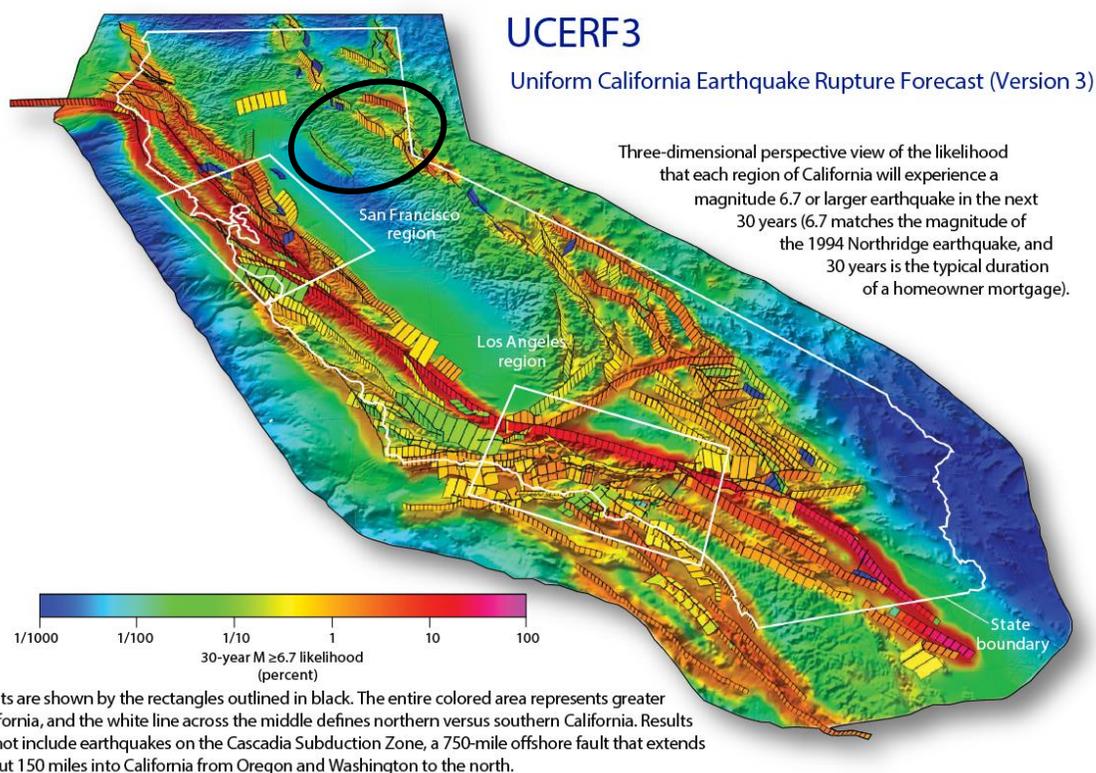
Figure 4-66 Maximum Expectable Earthquake Intensity – 2% Chance in 50 Years



Source: California Division of Mines and Geology

In 2014, the USGS and the California Geological Survey (CGS) released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-67 and indicates that Placer County has a low to moderate risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional.

Figure 4-67 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



Source: United States Geological Survey Open File Report 2015-3009

Climate Change and Earthquake

Climate changes is unlikely to increase earthquake frequency or strength.

Vulnerability Assessment

Vulnerability—Medium

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are within and near the County, seismic hazard mapping indicates that the County has low to moderate seismic hazard potential. Additionally, the County is not located within a delineated Alquist-Priolo Earthquake Fault Zone. The risks associated with earthquakes, such as surface fault rupture, within the County are considered low.

Seismic events can have particularly negative effects on older buildings constructed of URM, including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Placer County is within the less hazardous Zone 3.

Impacts

Impacts to the County would include damages to infrastructure (roads, bridges, railroad tracks, etc.), damages and loss of services to utilities and critical infrastructure, damages to residential and commercial buildings, and possible loss of life and injuries. Earthquakes, though rare in Placer County, can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment, on agricultural production, and the environment.

Estimating Potential Losses

Earthquake losses will vary across the Placer County Planning Area depending on the source and magnitude of the event. To further evaluate potential losses associated with earthquake activity in the Planning Area, one HAZUS-MH earthquake scenarios were run for this 2021 LHMP Update:

- A probabilistic 6.9 earthquake event in the eastern portion of the County
- A probabilistic 5.7 earthquake event in the western portion of the County

These events were chosen from data gathered from the General Plan Safety Element. It should be noted that the deterministic events are chosen based on actual events that have occurred. The fault's distance to the County is taken into account when analyzing earthquake shake hazards on the County. The probabilistic event is a "worst case" event, and assumes an earthquake takes place on an unknown fault that lies inside the County.

2021 Earthquake Scenarios

Probabilistic 6.9 Earthquake Event for Eastern Placer County

HAZUS-MH 4.2 was utilized to model earthquake losses for the County. Specifically, the probabilistic magnitude used for Placer County utilized a 6.9 magnitude earthquake for the eastern portion of the County. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis. The represents a "worst case" scenario.

The methodology for running the probabilistic earthquake scenario used seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2002 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the

various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas and is more of a worst-case scenario.

The results of the probabilistic scenario are captured in Table 4-78 and shown on Figure 4-68. Key losses for the eastern portion of the County included the following:

- Total economic loss estimated for the earthquake was \$1,650.45 million, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$1,128.12 million.
- 5,523 buildings in the eastern County were at least moderately damaged. 305 buildings were completely destroyed.
- Over 75 percent of the building- and income-related losses were residential structures.
- 15 percent of the estimated losses were related to business interruptions.
- The mid-day earthquake had the highest number of casualties at 9.
- 2,030 households experienced a loss of potable water the first day after the earthquake.
- 4,567 households experienced a loss of electricity the first day after the earthquake.

Table 4-78 HAZUS-MH Earthquake Loss Estimation Probabilistic 2,500-Year Scenario Results for Eastern Placer County

Type of Impact	Impacts to County from 6.9 Probabilistic Earthquake	
Total Buildings Damaged (based on 24,000 buildings)	Slight: 8,660 Moderate: 5,523 Extensive: 1,029 Complete: 305	
Building and Income Related Losses	\$1,128,120,000	
Total Economic Losses (Includes building, income and lifeline losses)	\$1,650,450,000	
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 55 Requiring hospitalization: 10 Life threatening: 1 Fatalities: 1	
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 132 Requiring hospitalization: 33 Life threatening: 5 Fatalities: 9	
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 96 Requiring hospitalization: 23 Life threatening: 4 Fatalities: 6	
Damage to Transportation Systems	No infrastructure with at least moderate damage	
Damage to Essential Facilities	7 schools and 2 fire stations with at least moderate damage	
Damage to Utility Systems	6 facilities with at least moderate damage 275 potable water line breaks, 138 wastewater line breaks, and 1 natural gas line break	
Households without Power/Water Service	Power loss, Day 1: 4,567	Water loss, Day 1: 2,030

Type of Impact	Impacts to County from 6.9 Probabilistic Earthquake	
(Based on 13,475 total households)	Power loss, Day 3: 3,131 Power loss, Day 7: 1,508 Power loss, Day 30: 344 Power loss, Day 90: 6	Power loss, Day 3: 1,314 Power loss, Day 7: 236 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	288 displaced households	
Shelter Requirements	162 persons	
Debris Generation	149,000 tons	

Source: HAZUS-MH 4.2, 2021

Probabilistic 5.7 Earthquake Event for Western Placer County

HAZUS-MH 4.2 was utilized to model earthquake losses for the County. Specifically, the probabilistic magnitude used for Placer County utilized a 5.7 magnitude earthquake for the western portion of the County. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis. The represents a “worst case” scenario.

The methodology for running the probabilistic earthquake scenario used seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2002 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas and is more of a worst-case scenario.

The results of the probabilistic scenario are captured in Table 4-79 and shown on Figure 4-69. Key losses for the western portion of the County included the following:

- Total economic loss estimated for the earthquake was \$3,322.78 million, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$2,488.07 million.
- 12,054 buildings in the County were at least moderately damaged. 385 buildings were completely destroyed.
- Over 68 percent of the building- and income-related losses were residential structures.
- 13 percent of the estimated losses were related to business interruptions.
- The mid-day earthquake had the highest number of casualties at 40.
- 28,954 households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

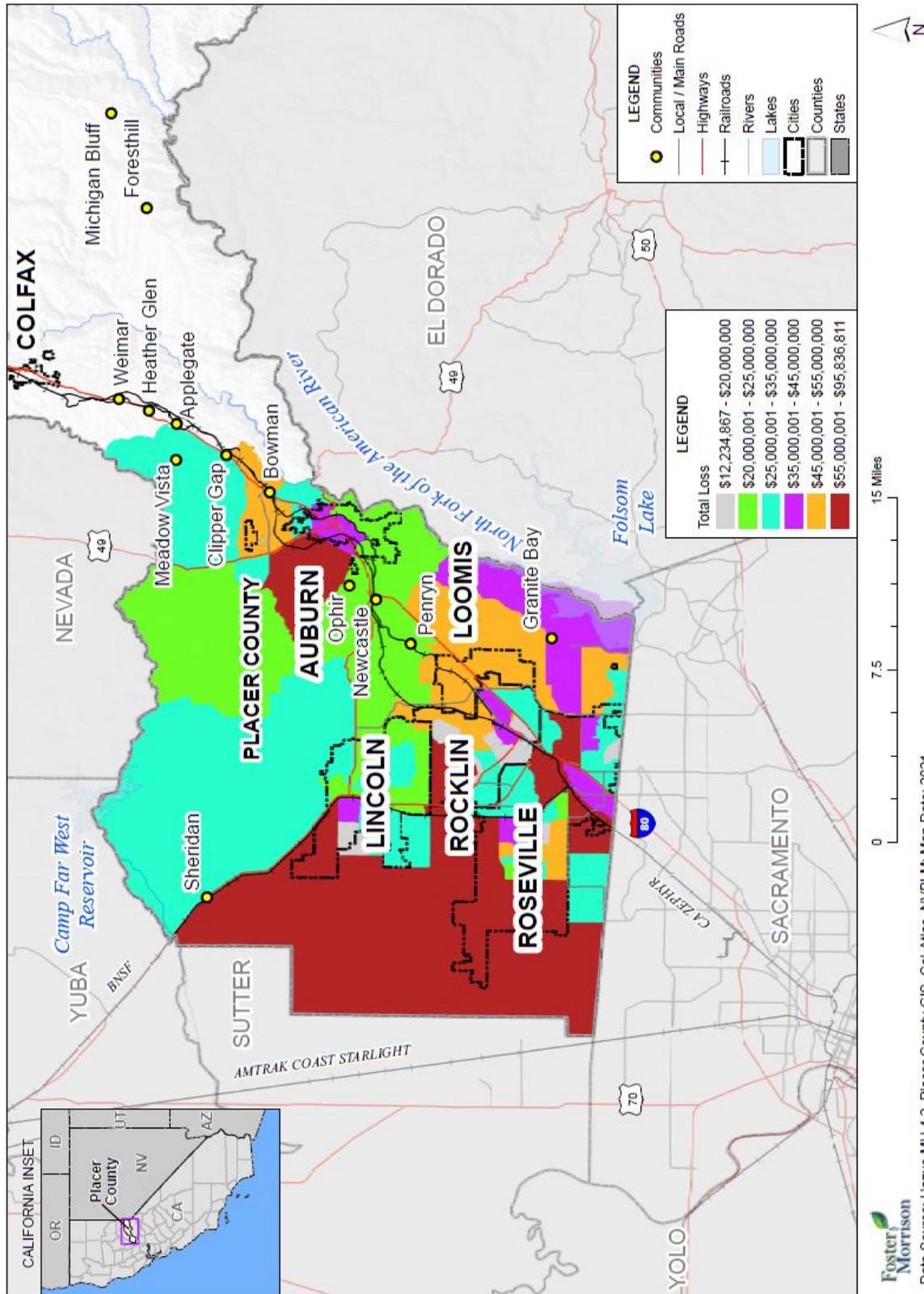
Table 4-79 HAZUS-MH Earthquake Loss Estimation Probabilistic 2,500-Year Scenario Results for Western Placer County

Type of Impact	Impacts to County from 5.7 Probabilistic Earthquake
Total Buildings Damaged (based on 115,000 buildings)	Slight: 33,952 Moderate: 12,054 Extensive: 1,649 Complete: 385
Building and Income Related Losses	\$2,448,070,000
Total Economic Losses (Includes building, income and lifeline losses)	\$3,322,780,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 214 Requiring hospitalization: 31 Life threatening: 2 Fatalities: 4

Type of Impact	Impacts to County from 5.7 Probabilistic Earthquake	
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 625 Requiring hospitalization: 143 Life threatening: 21 Fatalities: 40	
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 416 Requiring hospitalization:96 Life threatening:24 Fatalities: 25	
Damage to Transportation Systems	1 bridge with at least moderate damage	
Damage to Essential Facilities	None with at least moderate damage	
Damage to Utility Systems	1 facility with at least moderate damage 347 potable water line breaks, 174 wastewater line breaks, and 1 natural gas line break	
Households without Power/Water Service (Based on 119,152 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 28,954 Power loss, Day 3: 22,083 Power loss, Day 7: 9,025 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	951 displaced households	
Shelter Requirements	538 persons	
Debris Generation	344,000 tons	

Source: HAZUS-MH 4.2, 2021

Figure 4-69 Placer County – Total Loss Map from 5.7 Magnitude Probabilistic Hazus Earthquake Scenario for Western Placer County



Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake areas will continue to occur.

4.3.12. Flood: 1%/0.5%/0.2% Annual Chance

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the primary natural hazards impacting Placer County. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. The Placer County Planning Area is susceptible to various types of flood events as described below.

- **Riverine flooding** – Riverine flooding, defined as when a watercourse exceeds its “bank-full” capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the Placer County Planning Area, riverine flooding is largely caused by heavy and continued rains, sometimes combined with snowmelt, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- **Flash flooding** – Flash flooding describes localized floods of great volume and short duration. This type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour and thus early threat identification and warning is critical for saving lives.
- **Localized/Stormwater flooding** – Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems. More on localized flooding can be found in Section 4.3.12.
- **Dam failure flooding** – Flooding from failure of one or more upstream dams is also a concern to the Placer County Planning Area. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Residents could be displaced for an extended period of time. Impacts to life safety will depend on the warning time and the resources available to

notify and evacuate the public. Major loss of life could result, and there could be injuries and associated health concerns. Dam failure is further addressed in Section 4.3.9 Dam Failure.

Streambank Erosion

In addition to the damages to people and property from the above flooding issues, there can be issues along Placer County's waterways related to streambank erosion. Stream bank erosion is a natural process, but acceleration of this natural process, such as during high water or flood events, leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both of these components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse, and also provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. Stream bank aggradation or degradation is often a response to stream channel instability. Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. Numerous studies have demonstrated that stream bank erosion contributes a large portion of the annual sediment yield.

Determining the cause of accelerated streambank erosion is the first step in solving the problem. When a stream is straightened or widened, streambank erosion increases. Accelerated streambank erosion is part of the process as the stream seeks to re-establish a stable size and pattern. Damaging or removing streamside vegetation to the point where it no longer provides for bank stability can cause a dramatic increase in bank erosion. A degrading streambed results in higher and often unstable, eroding banks. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Addressing the problem of streambank erosion requires an understanding of both stream dynamics and the management of streamside vegetation.

Erosion and deposition are occurring continually at varying rates over the Planning Area. Swiftly moving floodwaters cause rapid local erosion as the water carries away earth materials. Severe erosion removes the earth from beneath bridges, roads and foundations of structures adjacent to streams. By undercutting it can lead to increased rockfall and landslide hazard. The deposition of material can block culverts, aggravate flooding, destroy crops and lawns by burying them, and reduce the capacity of water reservoirs as the deposited materials displace water.

Streambank erosion increases the sediment that a stream must carry, results in the loss of fertile bottomland and causes a decline in the quality of habitat on land and in the stream. High velocity flows can erode material from the streambank. Erosion can occur at once or over time as a function of the storm cycle and the scale of the peak storms.

Erosion may also occur on the outboard or waterside of the few levees (see Section 4.2.13) in the Planning Area, which may lead to instability and failure. The Bear River is highly incised so it takes a large flow to actually erode the levees in Placer County. Yuba County is completing a setback levee on the bear which will help with future flood events. As with any levee, there is always a potential for failure.

Location and Extent

Placer County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in Placer County occur primarily in the developed areas of the County extending westward from Colfax to Sacramento and Sutter Counties. Flood flows generally follow defined stream channels, drainages, and watersheds. Because flows within many of the creeks and rivers within Placer County can vary substantially from one another, the estimate for the average depth of the 100-year floodplain also varies and ranges anywhere from 1 foot to as high as 15 to 20 feet depending on numerous criteria.

Various flood protection measures are either in place or planned to protect Placer County from future flood events. Existing flood protection measures include a comprehensive system of dams, levees, overflow weirs, pumping plants, channel improvements, floodway bypasses, detention and retention structures, and other improvements. In addition, both the Placer County Flood Control and Water Conservation District and the City of Roseville maintain a system of ALERT Flood Warning gages, including multiple precipitation gages and stream level gages located throughout western Placer County that provide real time monitoring information on current flood conditions.

Historically, the Placer County Planning Area has always been at risk to flooding because of its high annual percentage of rainfall, the watercourses that bound the County, and the location of development adjacent to flood-prone areas. Drainage and stormwater runoff, in addition to natural and manmade waterways, all contribute to potential flooding in the Placer County Planning Area.

Major Sources of Flooding

California has 10 hydrologic regions. Placer County sits in the Sacramento River hydrologic region. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine and Amador counties are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. The Sacramento metropolitan area and surrounding communities form the major population center of the region. With the exception of Redding, cities and towns to the north, while steadily increasing in size, are more rural than urban in nature, being based in major agricultural areas.

A map of the California's hydrological regions is provided in Figure 4-70.

Figure 4-70 California Hydrologic Regions



Source: 2018 State of California Hazard Mitigation Plan

The Placer County Waterway System

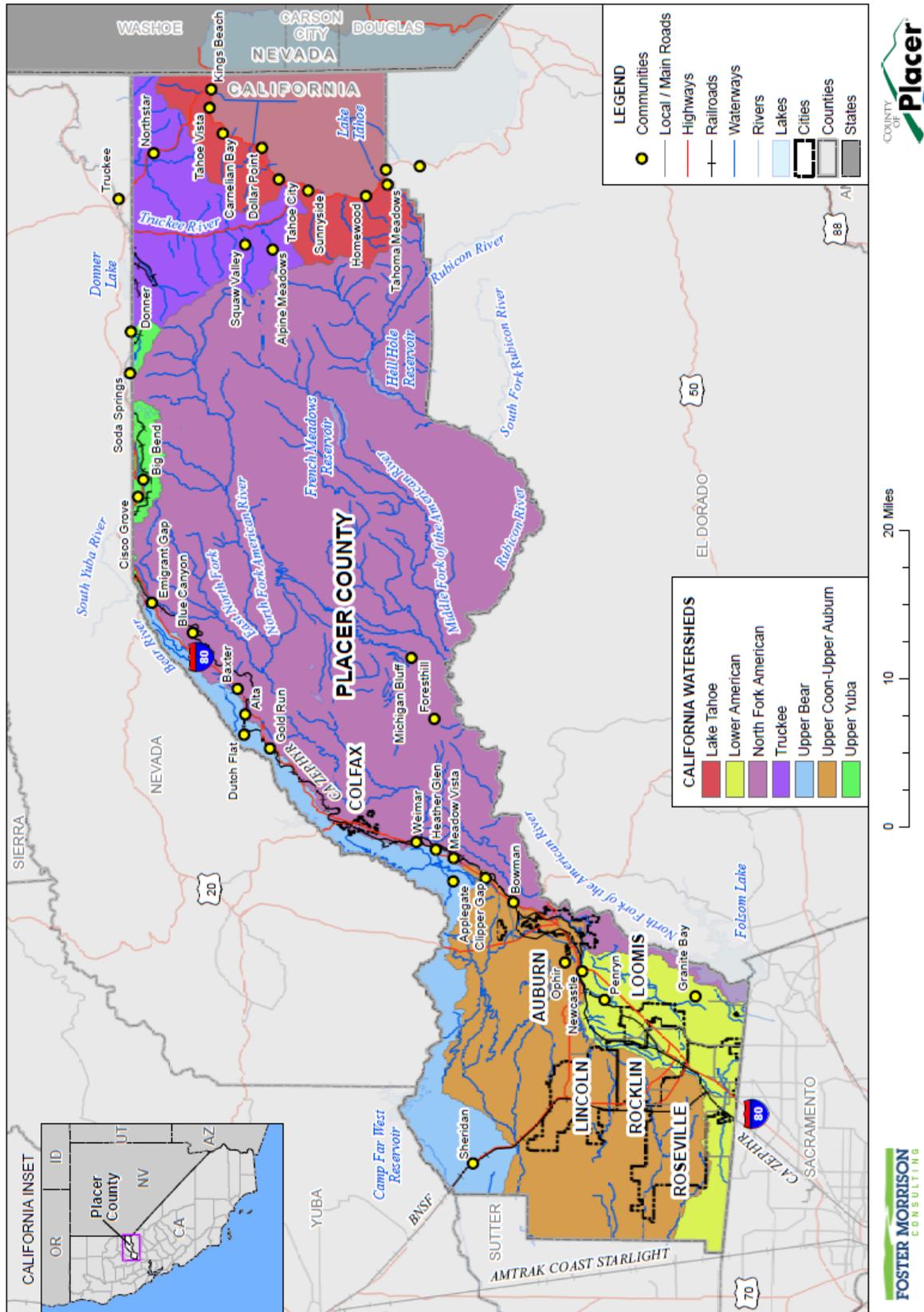
Placer County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in Placer County occur primarily in the developed areas of the county. Flood flows generally follow defined stream channels, drainages, and watersheds.

Placer County crosses 14 watersheds. The watersheds of Placer County include a combined drainage area of approximately 1,515 square miles. Of the 14 watersheds, there are four main watersheds or areas that are the primary source of flooding within the County. These include the following watersheds as further described in the following paragraphs:

- Dry Creek Watershed
- Cross Canal Watershed
- Auburn/Bowman Area
- Truckee River Watershed

Figure 4-71 illustrates the primary watersheds of Placer County, as well as the primary waterways in the County.

Figure 4-71 Primary Watersheds and Waterways of Placer County



Dry Creek Watershed. Dry Creek watershed encompasses approximately 116 square miles in Placer and Sacramento Counties. In Placer County the watershed is located in the southwestern portion of the County, and includes the cities of Rocklin and Roseville, and Town of Loomis. The headwaters of Dry Creek are located in the upper portions of the Loomis Basin, in the vicinity of Penryn and Newcastle, in unincorporated Placer County, in the Granite Bay area near Folsom Lake, and in Orangevale in Sacramento County. The headwaters are located in the Sierra Nevada foothills at elevations of 900-1200 feet above msl. The mouth of Dry Creek, at its confluence with the Natomas East Main Drainage Canal, is at an elevation of about 30 feet above msl. Major tributaries to Dry Creek include Antelope Creek, Clover Valley Creek, Secret Ravine, Sucker Ravine, Miners Ravine, Strap Ravine Creek, Linda Creek, and Cirby Creek. Dry Creek drains to Steelhead Creek. Land use in the Dry Creek watershed varies widely, from agricultural to residential to commercial. The watershed is located in an area of rapid urbanization and population growth.

Incidences of flooding along Dry Creek and its tributaries are well documented. Floods in the Dry Creek watershed occur from October through April. The major flooding problems within this drainage basin occur where the north and south branches of Dry Creek converge. Flooding occurs when heavy rains and saturated soils cause streams to overflow their banks, flooding property and structures located adjacent to the streams. Streams also back up at culverts and bridges, blocking roads or making them unsafe. Continued development in both the upper and lower reaches of the watershed will likely make flooding problems worse.

According to the 1992 Dry Creek Watershed Flood Control Plan, substantial flood damages will continue to occur under existing conditions. Areas with the most extensive and frequent damages include areas along Miners Ravine in the vicinity of Joe Rodgers Road and upstream of Sierra College Boulevard; Paragon Court near Antelope Creek in Rocklin; and areas along Cirby, Linda and Dry Creeks in Roseville. Some of these same areas are susceptible to flooding from storms as frequent as the 10-year storm. Many of the bridges and culverts in the watershed are inadequate to pass the 100-year event (70 percent). Nearly 50 percent of the stream crossings are inadequate for even the 25-year flood. Based on 1989 land use, structures that will be impacted by the 100-year flood are essentially those that were flooded by the February 1986 flood and again in 1995.

Floods generally caused by a combination of prolonged rainfall leading to saturated soils and a short period of intense precipitation occur from October through April. Dry Creek and its tributaries have an extensive record of historic flood, especially in the Roseville area. According to the 1992 report, damaging floods occurred in December 1955, April 1958, October 1962, December 1964, March 1983, February 1986, March 1995, and January 2017. The 1955, 1983, 1986, and 1995 floods were the largest and most damaging on record.

Cross Canal Watershed (Auburn Ravine/Raccoon Creek/Pleasant Grove Creek/Markham Ravine/Curry Creek). This watershed encompasses approximately 69,919 acres, and includes 6 dams. Auburn Ravine, Markham Ravine, Raccoon Creek, Pleasant Grove Creek, Curry Creek, and their tributaries drain approximately 292 square miles of northwestern and southeastern Sutter County (88 percent in Placer County and 12 percent in Sutter County) and are referred to as the Cross Canal Watershed. The Cross Canal, at the western portion of the watershed, carries the combined flow of the creeks to the Sacramento River. The watershed slopes from east to west with elevations ranging from 2,500 feet to 25 feet. The eastern portion of the watershed is located in the foothills of the Sierra Nevada. Stream channels in this area have

slopes of several hundred feet per mile. The eastern portion of the watershed is typified by the much flatter land of the Central Valley. Stream channels in this area have slopes of a few feet per mile. The City of Lincoln and portions of the Cities of Auburn, Rocklin, and Roseville are located within the watershed.

An extensive area upstream of the Cross Canal, in eastern Sutter County and western Placer County, is subject to periodic flooding. Major flooding in the watershed occurs as ponding and overland flow over many square miles of land east of the Cross Canal. Flooding also occurs adjacent to tributary streams where channel capacities are exceeded. Inadequately sized road crossings, land leveling, and channelization within the lower portion of the watershed have likely contributed to the frequency and degree of flooding. Future development in the watershed may also contribute to the flooding issue. The affected flooding area appears to be between 10,000 to 30,000 acres including the tributary streams. The Sutter-Placer Watershed Area Study by the Soil Conservation Service estimated approximately 31,000 acres of the watershed would be inundated during a 100-year frequency flood event. Approximately 95 percent of the potentially flooded area is west of Highway 65, in the flatter portion of the watershed. During major flooding, inundation along the individual streams combines upstream of the Cross Canal to form a continuous body of water approximately 10 miles by 3 miles. Several roads in the western portion of the watershed flood once or more each year on the average (Placer County Water Agency 2001). Several elements contribute to major flooding in the watershed including limited channel capacity, undersized bridges and culverts, high river stages in the Sacramento River, and historical land leveling and channel modifications.

Auburn/Bowman Area. The Auburn/Bowman area is a largely rural area located in the Sierra foothills in Placer County. The area covers approximately 41.5 square miles and is contained in portions of six different drainage basins (or watersheds): Bear River – 2.1 square miles, Orr Creek – 9.3 square miles, Dry Creek – 15.5 square miles (including Rock Creek – 4.3 square miles), Auburn Ravine – 10.8 square miles (including North Ravine – 4.6 square miles), Mormon Ravine – 1.4 square miles, Dutch Ravine – 1.0 square miles, the American River (North Fork) – 9.8 square miles, and Deadman’s Canyon – 1.0 square miles. This area is characterized by relatively steep slopes and moderate relief. Elevations in the area range from approximately 800 feet above msl in the southern portion of the study area to over 2000 feet above msl in upper Dry Creek and Orr Creek watersheds. Overall, most of the Auburn/Bowman area has elevations ranging from 1000 to 1500 feet above msl.

Flooding occurs when heavy rains cause streams to overflow their banks, flooding property and structures located adjacent to the stream. Streams also back up at culverts and bridges, blocking roads or otherwise making them unsafe. Emergency services can also be restricted by the flooded roads. In addition, there are numerous open canals in the study area which can intercept sheet runoff from one area and spill it into another. Excessive spills from these canals may also increase the potential for downstream flooding. According to the 1992 Auburn/Bowman Community Plan Hydrology Study, approximately 70 percent of the bridges and culverts in the watershed are inadequate to pass the 100-year flows for both existing and future conditions, and flooding will occur with the 100-year flood under existing conditions along Dry Creek Road. Specifically, flooding of up to two to three feet has been known to occur on Dry Creek Road between Dry Creek Road Bridge and Twin Pines Trail Bridge during a major storm event (e.g., March 1986). The flood of 1986 caused the most severe flooding damage to date in the Auburn/Bowman area. In addition to the overtopping of bridges and culverts, at several locations, flooding of structures occurred in the floodplains. Over 60 percent of the stream crossings are inadequate for even the 25-year flood.

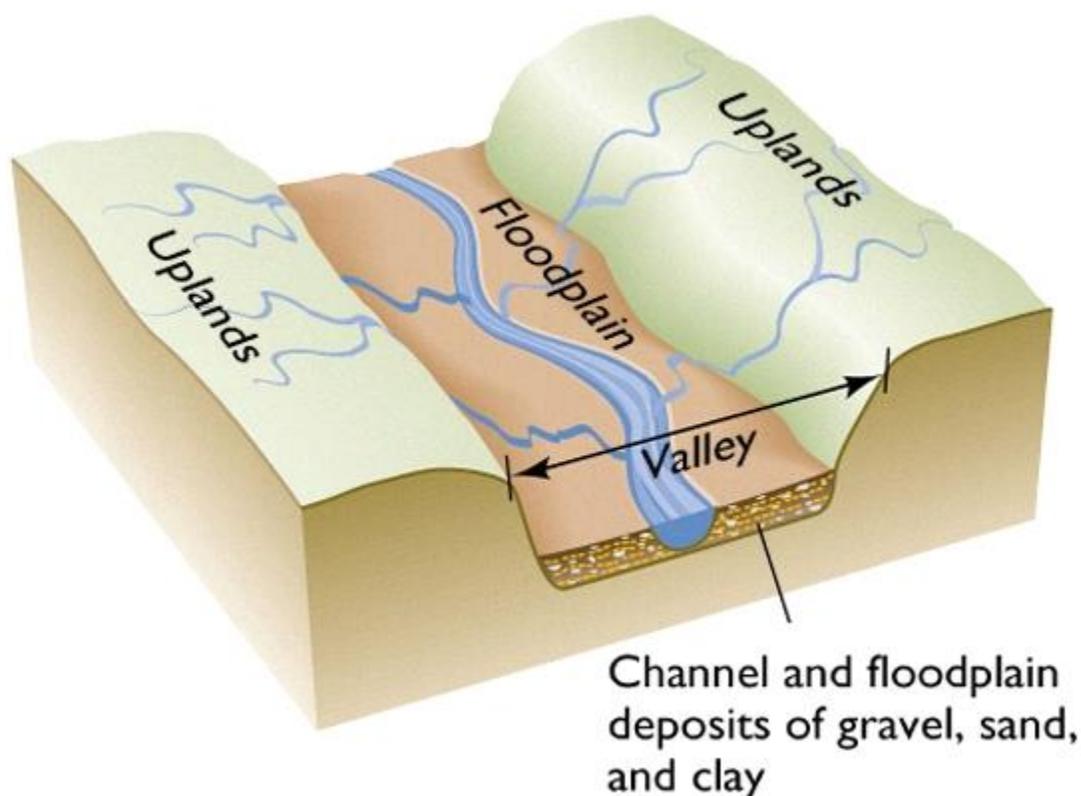
Truckee River Watershed. The Truckee River watershed, with an area of approximately 2,720 square miles, encompasses the entire Lake Tahoe, Truckee River, and Pyramid Lake systems. The major tributaries to the Truckee River in California include Bear Creek, Squaw Creek, Cabin Creek, Pole Creek, Donner Creek, Trout Creek, Prosser Creek, the Little Truckee River, Gray Creek, and Bronco Creek. Roughly the middle third of the Truckee River watershed is located within Placer County, in eastern Sierra Nevada, north of Lake Tahoe. A significant portion of the watershed is above 6,000 ft.

The overflowing and diversion of Squaw Creek (upper Truckee River Basin), is responsible for major flooding events, such as the January floods of 1997, in eastern Placer County. In the more urbanized areas, flood problems are intensified by the increased volume of water that must be carried away by streams. The volume is increased because rooftops of new homes and other structures, as well as new streets, driveways, parking lots, and other paved areas all decrease the amount of open land available to absorb rainfall and runoff. New design criteria is changing this type of runoff in new construction.

Floodplains

The area adjacent to a channel is the floodplain (see Figure 4-72). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 1% annual chance (or 100-year) flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 1% annual chance flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The 200-year flood is the flood that has a 0.5% chance of being equaled or exceeded in any given year. The 500-year flood is the flood that has a 0.2% chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-72 Floodplain Schematic



Source: FEMA

According to the 2018 Flood Insurance Study for Placer County, general rain floods can occur in the study area anytime during the period from November through April. This type of flood results from prolonged heavy rainfall and is characterized by high peak flows of moderate duration and by a large volume of runoff. Flooding is more severe when antecedent rainfall has resulted in saturated ground conditions. The severity of flooding on all the streams studied is intensified by backwater conditions between stream systems. Floodwater elevations are increased in the lower portions of tributary streams due to the backwater effect from main streams reducing hydraulic gradients and flow-storage areas. During this time there will be a high degree of coincidental 1-percent-annual-chance floodflows on all the study area waterways.

Placer County Flood Mapping

As part of the County's ongoing efforts to identify and manage their flood prone areas, Placer County relies on a variety of different mapping efforts. What follows is a brief description of FEMA and DWR mapping efforts covering the Placer County Planning Area.

FEMA Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and

regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. The FEMA floodplain are lands subject to the 1% annual chance (100-year) flood. FEMA mapping also includes areas subject to the .02% annual chance (500-year) flood. The State Senate Bill 5 (SB5) required all communities to map their communities. SB5 requires levee protection in urban areas to a 200-year (or 0.5% annual chance flood. A general overview of floodplain mapping is provided in the following paragraphs.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current Placer County FIS is dated November 2, 2018. This study covers both the unincorporated and incorporated areas of the County.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 1% and 0.2% annual chancer floodplains, floodways, and the locations of selected cross sections used in the hydraulic analysis and local floodplain regulation. The County FIRMs, for the south western portion of the County, have been replaced by digital flood insurance rate maps (DFIRMs) as part of FEMA’s Map Modernization program, which is discussed further below.

Letter of Map Revision (LOMR) and Map Amendment (LOMA)

LOMRs and LOMAs represent separate floodplain studies dealing with individual properties or limited stream segments that update the FIS and FIRM data between periodic FEMA publications of the FIS and FIRM.

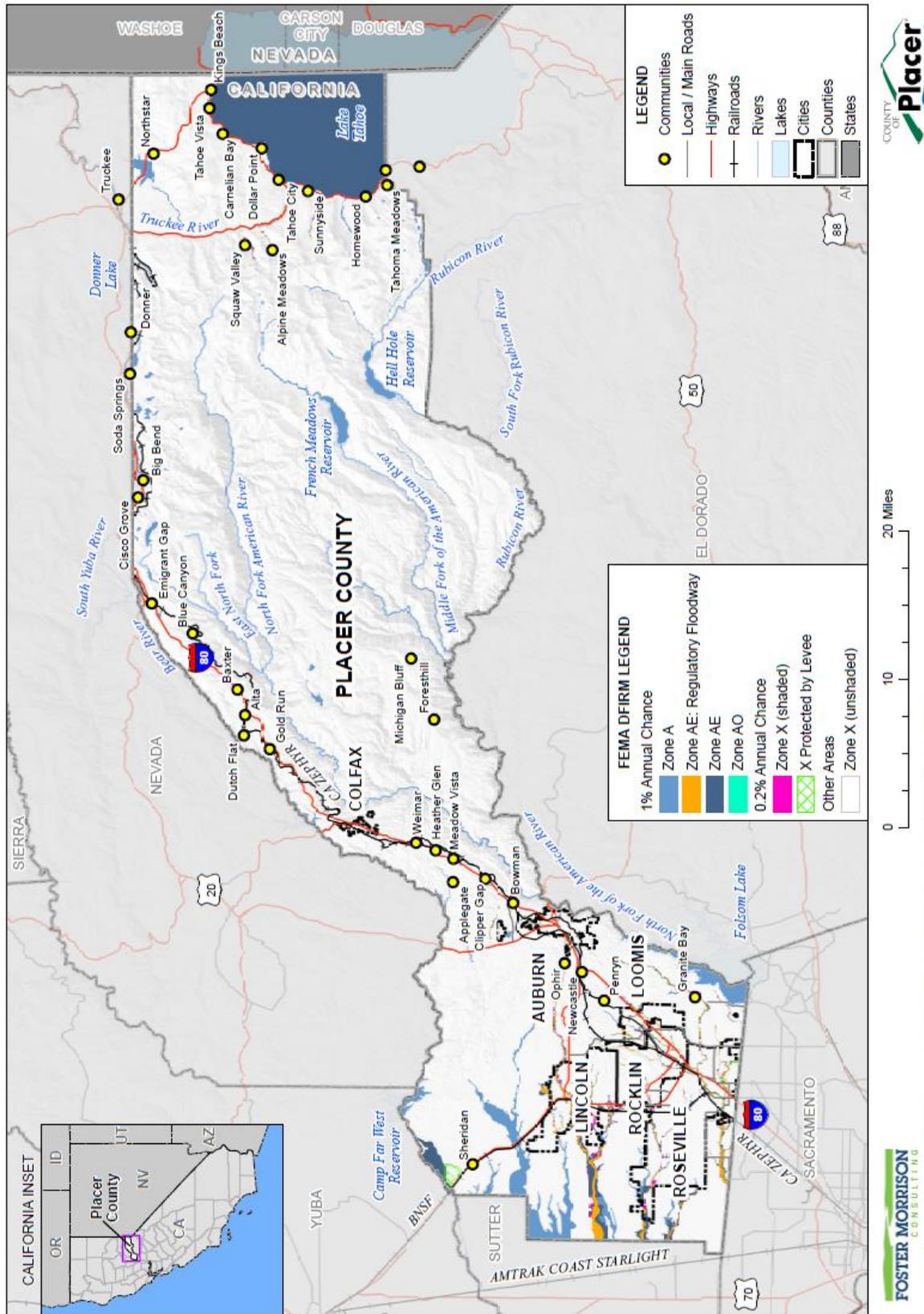
Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA is converting paper FIRMS to digital FIRMs, DFIRMS. These digital maps:

- Incorporate the latest updates (LOMRs and LOMAs);
- Utilize community supplied data;
- Verify the currency of the floodplains and refit them to community supplied basemaps;
- Incorporate levee accreditation status in accordance with FEMA requirements at 44 CFR 65.10;
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications; and
- Solicit community participation.

The 2018 DFIRMs are being used for the flood analysis for this LHMP Update, and are shown on Figure 4-73.

Figure 4-73 Placer County – DFIRM Flood Zones



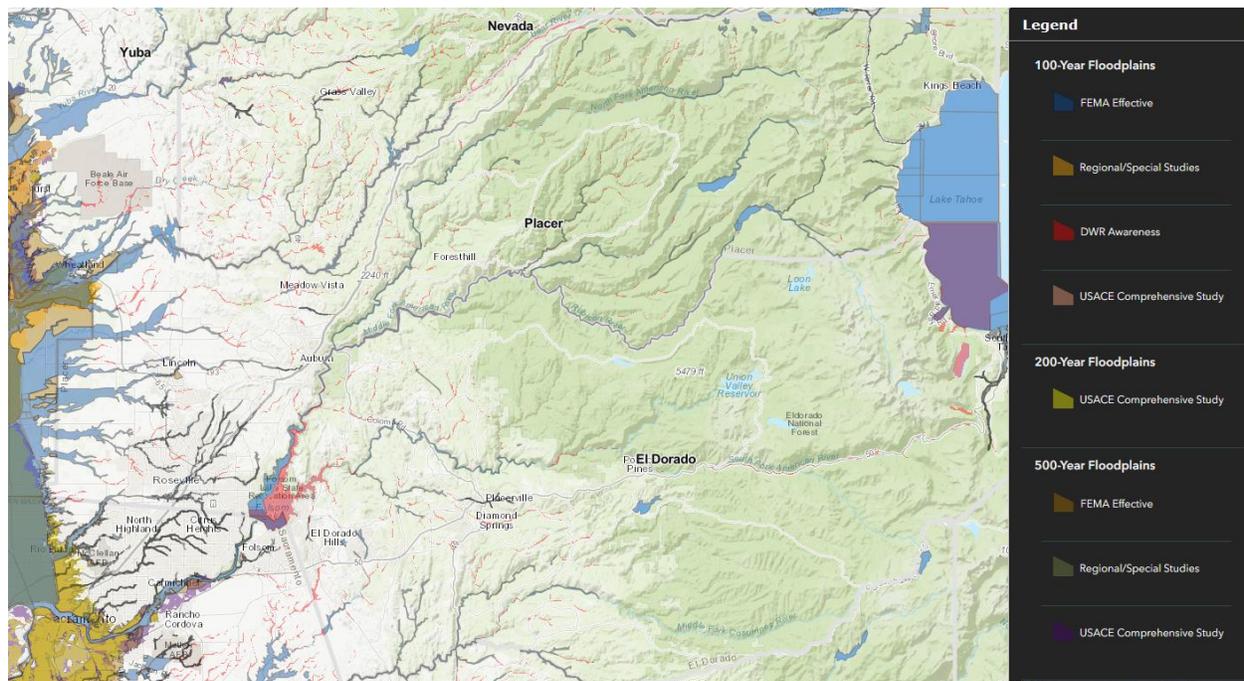
California Floodplain Mapping

Also to be considered when evaluating the flood risks in Placer County are various floodplain maps developed by the California DWR for various areas throughout California, and in the Sacramento-San Joaquin Valley cities and counties. The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5) enacted in 2007, authorized Cal-DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance flood zones.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and generally reflect only the 1% and 0.2% annual chance flood risks, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance flood zones. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the County than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance flood zone, it also supports identification of the need and requirement for flood insurance. Figure 4-74 shows the BAM for the Placer County Planning Area.

Figure 4-74 Placer County– Flood Awareness (Best Available) Map



Source: California DWR, Retrieved 8/18/2020

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study).

Flood extents are usually measured in depths of flooding, geographical extent of the floodplain, as well as flood zones that a location falls in (i.e. 1% or 0.2% annual chance flood). Expected flood depths in the County vary and are not well defined. Flood durations in the County tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Geographical flood extent from the FEMA DFIRMs are shown later on Figure 4-75 and below in Table 4-80.

Table 4-80 Placer County Planning Area– Geographical Flood Hazard Extents in FEMA DFIRM Flood Zones

Flood Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
1% Annual Chance	36,091	4.01%	10,914	6.06%	25,176	3.50%
0.2% Annual Chance	1,296	0.14%	636	0.35%	661	0.09%
Other Areas	861,777	95.84%	168,520	93.59%	693,257	96.41%
Total	899,164	100.00%	180,070	100.00%	719,094	100.00%

Source: 11/2/2018 DFIRM

Stream bank erosion occurs on rivers, streams, and other moving waterways, including leveed areas, in the County Planning Area. The speed of onset of this erosion is slow, as the erosion takes place over periods of years. Duration of erosion is extended. Greater erosion occurs during periods of high stream flow and during storm and wind events when wave action contributes to the extent and speed of streambank erosion.

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Placer County from flooding, (including heavy rains and storms) is shown on Table 4-81. The County had no USDA disaster declarations since 2002 related to flood, as shown on Table 4-6. No disasters were related to streambank erosion.

Table 4-81 Placer County – State and Federal Disaster Declaration from Flood 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Table 4-82 shows events in Placer County since 1993. Other heavy rain and storm events can be found in the Past Occurrences of the Severe Weather: Heavy Rains and Storms in Section 4.3.3. More information from the NCDC on some of the flooding is woven into the discussion of HMPC events below. The NCDC does not track streambank erosion.

*Table 4-82 NCDC Flood Events in Placer County 1993 to 7/31/2020**

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Flash Flood	6	0	0	\$150,000	\$0	0	0
Flood	33	2	1	\$12,370,000	\$7,800,000	0	0
Heavy Rain	59	2	0	\$10,000	\$0	0	0
Total	98	4	1	\$12,530,000	\$7,800,000	0	0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, much of which fell outside of Placer County

FIS Events

The FIS contained the following past occurrences of flood.

- Auburn Ravine - The February 1986 flood caused the most severe flooding on the study reach of Auburn Ravine of any event in the historic record. The only flood problem identified during the study that confirmed historic records, however, was overtopping of the roadway at Stonehouse Road, Forgotten Road, Highway 65 and Highway 193.
- Dry Creek – Floods occur in the Dry Creek watershed as a result of short, intense rainfall in the period from fall through spring. Historic flood events occurred in December 1955, April 1958, October 1962, December 1964, March 1983, and February 1986. The February 1986 flood is the historic flood of record, and has been estimated in this watershed as a 1-to-2-percent flow exceedance event, depending on the specific location. According to the Dry Creek Watershed Flood Control Plan, the February 1986 flood caused widespread damage throughout the watershed (Montgomery 1992b). Most bridges and culverts were overtopped, the crossing at Rocky Ridge was washed out, and 30 sustained embankment damage, including Cook Riolo Road. Many major streets were closed. Several homes along Dry Creek were flooded downstream of Roseville.
- Markham Ravine – Flooding of Gladding Road at Markham Ravine occurs even with frequent floods. No other history of flood hazards for Markham Ravine was available.
- Miners Ravine – Miners Ravine has headwater characteristics of steep gradient and high confining terrain along its upper reaches. Boulders and rock outcroppings limit most flooding to near the channel. Miners Ravine contributes to Dry Creek at Roseville. Sixteen homes were reportedly flooded near Joe Rodgers Road, during the February 1986 historic flood of record (Montgomery 1992b). The event has been estimated in this watershed as a 1-to-2-percent flow exceedance event, depending on the specific location. The most recent significant flooding occurred in 1997 and the area mostly affected was a residential area near the intersection of Douglas Boulevard and Auburn-Folsom Road. For about ½ mile, the stream banks are low with wide overbanks. Flooding is generally characterized by shallow depths.

Hazard Mitigation Planning Committee Events

Historically, portions of Placer County have always been at risk to flooding because of its high annual percentage of rainfall, heavy snowfall in the winter, and the number of watercourses that traverse the County. Flooding events have caused severe damage in the very eastern and very western portions of the County, but are less of a threat within the center of the County. However, western Placer County is more likely to experience severe flooding than in other areas. With the exception of Colfax, portions of all other incorporated cities in western Placer are at least partially located within the 100-year floodplain. Existing watershed reports confirm that under existing conditions, flooding will continue to occur. As previously noted, localized stormwater flooding also continues to be a problem throughout the Planning Area.

The HMPC provided additional information on the following historical flood events in the County.

- **1852** – This was the first big flood to be noted in western Placer. Mining camps were just beginning to spring up in the Lincoln area, so hardly any structures were built which could be affected.
- **1860** – Rains began during the first week of October and culminated in a big storm March 23-28. Major damage was reported from farms and mines along Coon Creek, Auburn Ravine, and Bear River. Main roads remained impassable for weeks.
- **1861-62** – Lincoln had just been founded as a railroad and stagecoach center. The Lincoln-Folsom railroad was closed. The Auburn Ravine Turnpike was severely damaged and closed. Mining debris caused Bear River to change its channel to the south of its original course.

- **1875** – Floods occurred along Bear River and destroyed the bridge to Grass Valley from Sheridan.
- **1880** – Levees were finally being constructed along Bear River.
- **1955** – Listed on NOAA’s website as one of the “top 15 weather/water/climate events, “significant and extended heavy rain and wind resulted in flooding throughout coastal and inland regions of northern California. Extensive flooding from overflowing small streams occurred in Placer County suburbs. Calculated damages for all areas affected within the State were 28 fatalities and \$1.8 billion in losses.
- **March 1983** – The March 1983 flood damaged approximately 25 residences along Linda and Cirby Creeks in Roseville. Portions of Royer Park were under water as well as areas in the Sierra Lakes Mobile Home Park. Dry Creek overflowed the Darling Way and Riverside Avenue bridges, disrupting traffic and flooding six businesses along Riverside Avenue.
- **February 1986** – This flood was classified as an approximate 70-year event. Placer County was designated a Federal Disaster Area. The flooding caused widespread damage in most of the Dry Creek watershed. Flooding was significant in the Roseville, Rocklin and Loomis areas. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage; the crossing at Rocky Ridge Drive was washed out. Two bridges over Dry Creek were damaged and street cave-ins occurred at a number of locations. Total damages within Placer County were estimated at 7.5 million; damage estimates specific to the Dry Creek Watershed are not available. One person was killed and 62 homes damaged or destroyed within the watershed based upon applications for disaster assistance. Other sources report around 100 homes flooded with water levels up to five feet above floor levels. Dozens of businesses in downtown Roseville were damaged or destroyed. According to information on file with Placer County, as part of the disaster declaration, FEMA reimbursed the County \$376,611; no monies were reimbursed through the State.
- **1992** – Several days of continuous rain followed by a downpour caused Miners Ravine to overflow its banks and caused flooding that resulted in several dramatic rescues of people trapped in homes and vehicles.
- **January 1995** – This flood was classified as an approximate 100-year event. Placer County was designated a Federal Disaster Area. President Clinton toured the Tina/Elisa Way area of Roseville. The total damages within Placer County were estimated at \$8.3 million with 750 damaged or destroyed structures. \$4.2 million in damages were estimated for the Roseville area alone. Of the \$4.2 million dollars in damages, \$1 million was for road and bridge repairs, and \$2 million was for utility repairs. Within the Roseville area of Placer County 385 homes, businesses, apartments, and mobile homes were damaged or destroyed; 2 sewage treatment plants were overtopped; and 1 landfill was damaged. Impassable roads caused the closure of most schools. According to information on file with Placer County, as part of the disaster declaration, FEMA reimbursed the County \$882,158 and \$166,735 was reimbursed through the State. As a result of the 1995 floods, a creek crossing (bridge-where Carolinda Drive crosses the Miners Ravine Creek) in the San Juan water district washed out in two separate incidents (January 9th and February or March). The first washout exposed main 10-inch ACP pipeline and made it vulnerable to high water and swift current. The crossing was rebuilt by the Carolinda Homeowner’s Association and the line went back into service. The second wash out occurred in February or early March, again due to high water and swift currents. This time the pipe was removed and a new bridge was built with the pipeline now being supported by the new bridge. The cost of repairs and replacement was \$30,400, of which \$27,000 was received through disaster funds.
- **1996** – Heavy rain and clogged storm drains caused water to flow into the Cavitt School Gymnasium (Eureka Union School District) in southern Placer County. A wood floor was lost. The \$85,976 in damages was covered by Emergency Services under a disaster declaration. The drainage system has since been modified.

- **January 1997** – A significant amount of rainfall and snowmelt runoff poured out of the Sierra Nevada from December 30, 1996 to January 1997. This was a very warm system and rain was falling at the 9,000 foot elevation. An estimated 25 inches of rain and snowmelt runoff occurred during this period on the Squaw Creek Basin (the upper Truckee River Basin in Placer County). This scenario was typical throughout the region and resulted in extensive flooding on the Truckee, Carson, Walker, and Susan Rivers. Consequently, record flooding occurred on much of the Truckee, Carson, and Walker Basins. In Placer County, flooding eroded away mountainsides, breaking sewer, water, and power lines. The south fork of Squaw Creek jumped its bank and burst through the lodge at the Squaw Valley Ski Resort. All bridges across Highway 89 were destroyed or severely damaged. Avalanches closed Highway 89 in both directions isolating Squaw Valley from the outside world. Log jams caused the creek to diverge and deposit 3,500 cubic yards of gravel, boulders, logs, and debris into the stream channel, piling the material up to six feet deep into homes and condominiums (USDA 1997). Mudslides blocked Squaw Valley Road and almost every other road in the area. In Placer County alone, damage estimates for public property were nearly \$11 million. 137 homes and 22 businesses were damaged within the County. Total damage to private homes, businesses, agriculture, and private roads was near \$10 million. Destruction to the Federal Highway System was nearly \$7.7 million. According to information on file with Placer County, as part of the disaster declaration, FEMA reimbursed the County \$717,754 and \$177,451 was reimbursed through the State.
- **February 1998** – In Placer County, 4 homes in the City of Roseville and 1 home in the Town of Granite Bay were inundated on the 3rd. Specific damages in the County were unavailable. No deaths or injuries were reported.
- **February 2000** – Creek flooding in Auburn closed Gold Rush Plaza. Nine retail shops sustained minor damages. \$45,000 in damages was reported.
- **December 31, 2005 to January 1, 2006** – A series of warm winter storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Localized flooding was reported across eastern Placer County, especially on Blackwood and Ward Creeks, and the Truckee River. Blackwood Creek rose to its second highest level in the last 45 years. \$1 million in property damage in the Tahoe City area was reported. Additionally, I-80 eastbound between Sacramento and Reno, NV, was closed for more than a day due to a massive mudslide, as was both directions of U.S. Highway 50 between Sacramento and South Lake Tahoe.
- **January 2008** – flooding of residential structures at two different property locations occurred in the Auburn area as a result of an intense storm event on January 1, 2008. Property damages were estimated at \$10,000 for one property; minor damages were cited at the other property.
- **December 23, 2014** – Heavy rain showers and thunderstorms brought record rainfall and flooding issues to portions of the Central Valley and foothills. In Placer County, there were 10-12 homes flooded in Granite Bay, causing \$50,000 in damages. In Roseville, roadway flooding at Douglas Blvd. and Sierra College Blvd occurred, with the westbound lanes submerged under two feet of water. 2 vehicles were stuck due to flooding near Gasoline Alley. Near Hidden Valley, an intersection was closed at County Club and Eureka, with vehicles stuck in that location. Flooding occurred at Dry Creek Road and I-80. Also, I-80 and Clipper Gap Rd. Lane 1 had 1-2 feet deep water, 75 feet across, flooding the entire off ramp. Damages occurred in the Placer Hills and Foresthill Fire Protection Districts, as well as the North Star Community Services District. More information on specific damages to these areas can be found in their respective annexes to this Plan.
- **January 31, 2016** – Heavy snows in the Serene Lakes area caused flooding to occur. A bridge was overtopped, rendering it impassible (see below). Front end loaders were used to transport residents from one side of the bridge to the other. No injuries or deaths were reported.

- **January 2017** – Two strong storms brought a range of significant weather impacts to northern interior California. The first storm was very wet and warm, the second not quite as wet but cooler with lower snow levels. Both storms brought strong, damaging winds. The heavy rain brought widespread flooding of small streams and rivers, with some flooding of main stem rivers, mountain snow many feet deep, and numerous trees down on roads, vehicles, and homes. Many roads, including major highways such as Interstate 80, were shut down due to mudslides, heavy snow, flooding, washouts or avalanche suppression. EF0 tornadoes were reported at Lincoln and Natomas. Other significant impacts include numerous accidents due to slippery roads, evacuations and rescues due to flooding. A 5,427-gallon sewer spill discharged to surface water leading to Rock Creek. The spill was unrecoverable due to heavy rain. The bridge on Morton Rd. was washed out by flooding from Canyon Creek. This road is located next to the I80 exit in Alta. The incident isolated 15 homes. An alternative temporary access was established, traversing a steep, windy gravel road over private property. The Placer County Board of Supervisors approved two measures giving both short- and long-term assistance to the isolated community. A new temporary bridge, and then a permanent bridge will be constructed on the site. The estimated cost is \$3 million dollars for the bridge construction. The total cost was estimated by the county to be \$5 million. The Auburn Ravine Grinder station was damaged due to flooding. During the flooding, the three 30,000 gallon tanks could not handle the inundated amount of storm water, causing \$70,000 in damages. These winter storms posed a clear and present danger of flooding, with downed tree and power poles/lines causing widespread power outages, road closures, and damage to public and private infrastructure across the County. Rivers and drainages across the entire county experienced localized flooding; the Tahoe Basin suffered massively from extended power and phone outages; numerous roads were closed due to flooding, rock/mud slides, and downed trees; and Morten Road in Alta is completely obliterated, stranding a small community of homes for an extended period. After the initial warm weather storm of January 8th and 9th moved through, temperatures dropped drastically and nearly record setting amounts of snow precipitation fell on elevations greater than 3,000 feet. Reduced visibility, downed trees and power lines, and avalanche control measures had portions of Interstate 80 and Highways 89 and 273 closed almost continuously for up to three days, beginning on January 10th. On the evening of the 10th, a falling tree took out the last of the three Liberty Utility transmission lines that service the Tahoe Basin; power was cut to nearly 40,000 residents. Some customers were ultimately without power for up to nine days.
- **February 2017** -Storms brought additional rain and widespread flooding and debris flows, as well as mountain snow. Dry Creek flooding blocking Walerga Rd. near intersection with PFE Rd.
- **February 2019** - Heavy snow fell over the mountains and extended down into lower elevations, causing widespread travel problems and road closures. Thunderstorms brought heavy rain and small hail with widespread road flooding. Gusty winds brought down trees and caused power outages. Via Twitter, Placer County reported that Dowd Road at Wise Road near Lincoln was closed due to flooding. Auburn Folsom Rd at Cavitt Atallman Rd. Roadway flooded and water had risen to edge of roadway.

Likelihood of Future Occurrence

1% Annual Chance Flood

Occasional— The 1% annual chance flood (100-year) is the flood that has a 1 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence occasional. However, the 100-year flood could occur more than once in a relatively short period of time.

0.5% Annual Chance Flood

Unlikely—The 0.5% annual chance flood (500-year) is the flood that has a 0.5 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence unlikely.

0.2% Annual Chance Flood

Unlikely—The 0.2% annual chance flood (500-year) is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence unlikely.

Climate Change and Flood

Climate change and its effect on flood in the County has been discussed by two sources:

- Placer County Sustainability Plan –2020
- CAS – 2014

Placer County Sustainability Plan

Although climate change may not change average precipitation levels very much, scientists expect that it will cause more years with particularly intense storm systems that drop enough precipitation over a short enough period to cause flooding. Because of this, floods are expected to occur more often in Placer County. Indirect effects of climate change may also increase flooding in Placer County due to the expected increase in the frequency and severity of droughts, which cause soil to dry out and become hard. When precipitation does return, more water runs off the surface rather than being absorbed into the ground, leading to floods. Wildfires, which are also expected to become more frequent due to climate change, cause a similar effect by baking the surface of the ground into a harder and less penetrable layer. Trees and other vegetation help slow water down, which lets the water absorb into the soil and prevents it from turning into runoff. The loss of trees and other plants from wildfires, pests, diseases, or other climate-related exposures can also increase flooding risk.

CAS

According to the CAS, climate change may affect flooding in Placer County. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Future precipitation projections were shown in Figure 4-41 in Section 4.3.3. Also according to the National Center for Atmospheric Research in Boulder, Colorado, Atmospheric Rivers are likely to grow more intense in coming decades, as climate changes warms the atmosphere enabling it to hold more water.

Vulnerability Assessment

Vulnerability—Extremely High

Historically, the Placer County Planning Area has always been at risk to flooding during the rainy season from November through April. Normally, wintertime storm floodwaters are kept within defined limits by levees, dykes, and open lowlands and cause no damage. But, occasionally, extended heavy rains result in floodwaters exceeding normal high-water boundaries and causing damage. Several areas of the County are subject to flooding by the overtopping of rivers and creeks, levee failures, and the failure of urban drainage systems that cannot accommodate large volumes of water during severe rainstorms.

In addition to the major rivers, there are many streams, channels, canals, and creeks that serve the drainage needs of the County. There is significant threat of flooding in large areas of the County from several of these streams. Many of these streams are prone to rapid flooding with little notice.

Impacts

Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems, especially to critical facilities and infrastructure. Loss of power is usually a precursor to closure of governmental offices and community businesses. Schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Flooding causes instability and erosion along abutments that hold sewer pipes that cross waterways. A failure of the abutment can cause sewage spills in waterways. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Erosion and deposition are occurring continually at varying rates over the Planning Area. Swiftly moving floodwaters cause rapid local erosion as the water carries away earth materials. This is especially problematic in leveed areas. Severe erosion removes the earth from beneath bridges, roads and foundations of structures adjacent to streams. By undercutting it can lead to increased rockfall and landslide hazard.

The deposition of material can block culverts, aggravate flooding, destroy crops and lawns by burying them, and reduce the capacity of water reservoirs as the deposited materials displace water. Impacts from stream bank erosion can also include greater levee maintenance and increased risk of levee failure.

Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.

Health Hazards from Flooding

Certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease-causing agents.

The second type of health problems arise after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a city or county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Warning and Evacuation Procedures

Placer County and its incorporated communities have a variety of systems and procedures established to protect its residents and visitors to plan for, avoid, and respond to a hazard event including those associated with floods and wildfires. This includes Pre-Disaster Public Awareness and Education information which is major component in successfully reducing loss of life and property in a community when faced with a potentially catastrophic incident. Much of this information is not specific to a given hazard event and is always accessible to the public on local County and City websites. Specific warning and evacuation systems

and procedures include information relative to: Warning Systems, Everbridge, ALERT System, dam protocols, evacuation procedures, and sheltering in place. Additional information on these warning and evacuation procedures as well as post-disaster mitigation policies and procedures can be found in Section 4.4, Capabilities, of this Risk Assessment and in the Emergency Management discussions in Appendix C.

Flood Hazard Assessment

This risk assessment for the Placer County LHMP Update assessed the flood hazard specific to Placer County. This included an evaluation of multiple flood hazards including the Special Flood Hazard Area (SFHA) shown on the DFIRM; Repetitive Loss (RL) Areas; localized, stormwater flooding areas; other areas that have flooded in the past, but not identified on the DFIRM; other areas of shallow flooding identified through other studies and sources; levee failure flooding; dam failure flooding; and mudflow flooding especially in significant post-burn areas. This comprehensive flood risk assessment included an assessment of less-frequent flood hazards, areas likely to be flooded, and flood problems that are likely to get worse in the future as a result of changes in floodplain development and demographics, development in the watershed, and climate change or sea level rise. Existing studies, maps, historical data, and federal, state, and local community expertise and knowledge contributed to this current flood assessment for Placer County. An evaluation of the success of completed and ongoing flood control projects and associated maintenance aspects contributed to this flood hazard assessment and the resulting flood mitigation strategy for the Placer County Planning Area. This flood risk assessment for this LHMP Update also includes an assessment of future flooding conditions based on historic development in the floodplains and proposed future development as further described throughout this plan. The flood vulnerability assessment that follows focuses on the flood hazard based on FEMA DFIRMs. Other flood related vulnerability analysis and discussions are included throughout this LHMP Update.

Flood Analysis

The Placer County Planning Area has mapped FEMA flood hazard areas. This section of the vulnerability assessment focuses on the Placer County Planning Area (the 5 incorporated communities and the unincorporated County). GIS was used to determine the possible impacts of flooding within the County and how the risk varies across the Planning Area.

Placer County has a FEMA effective DFIRM dated 11/2/2018, which was obtained from the National Flood Hazard Layer to perform the flood analysis. Each of the DFIRM flood zones that begins with the letter ‘A’ depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-83 explains the difference between DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the County. The effective DFIRM maps for the Placer County Planning Area are shown on Figure 4-75 and Figure 4-76 for the east and west portion of the County, respectively.

Table 4-83 Placer County Planning Area – DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Auburn	Flood Zone Present in City of Colfax	Flood Zone Present in City of Lincoln	Flood Zone Present in Town of Loomis	Flood Zone Present in City of Rocklin	Flood Zone Present in unincorporated County
A	1% annual chance flooding: No base flood elevations provided	X		X			X
AE	1% annual chance flooding: Base flood elevations provided	X		X	X	X	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X		X	X	X	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	X				X	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood			X	X	X	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.			X			X
X (unshaded)	No flood hazard	X	X	X	X	X	X

Source: FEMA

The City of Roseville is not included in this LHMP Update. The City maintains its own Hazard Mitigation Plan, which can be found on the City’s website.

Figure 4-75 Placer County East – DFIRM Flood Zones

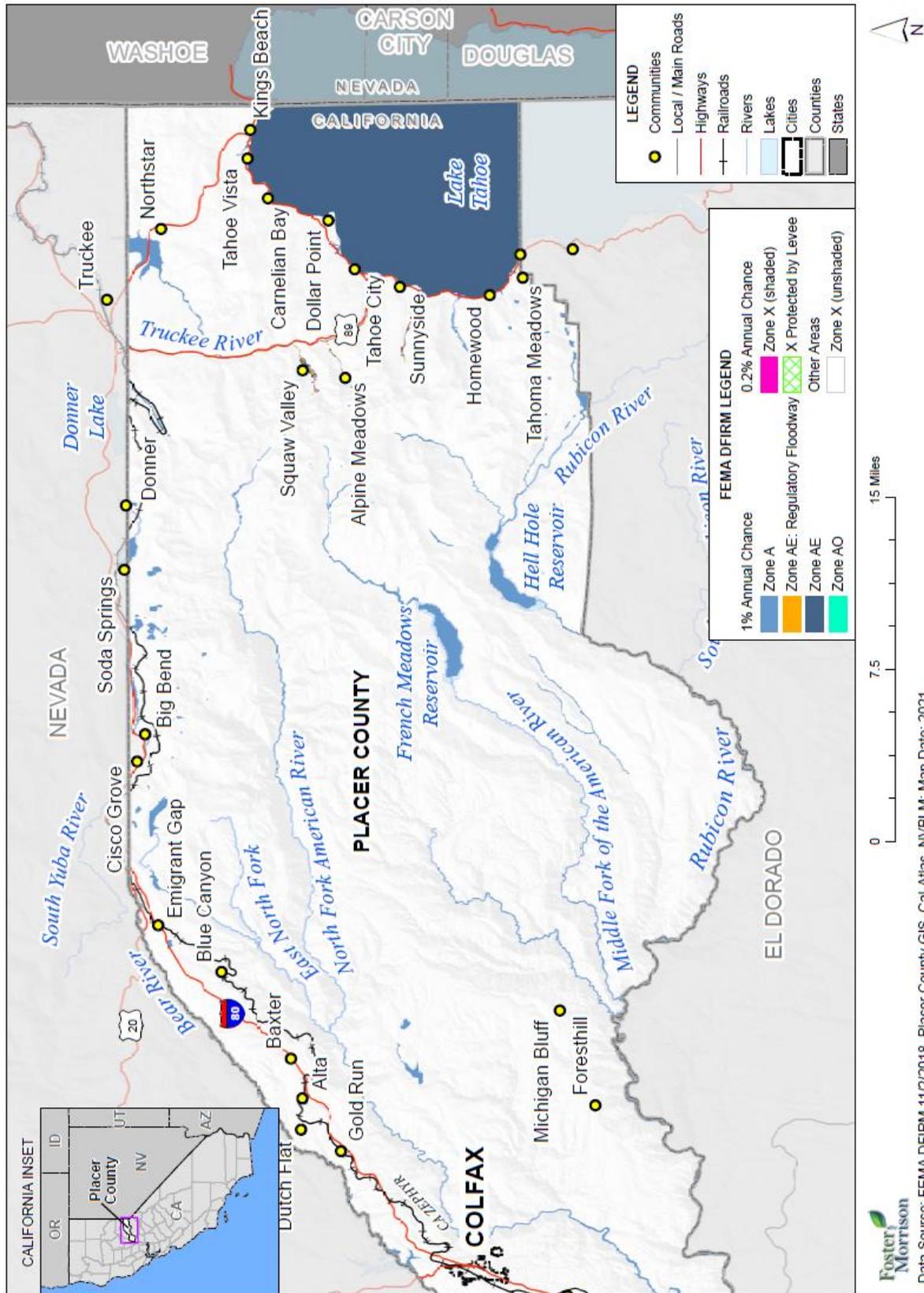
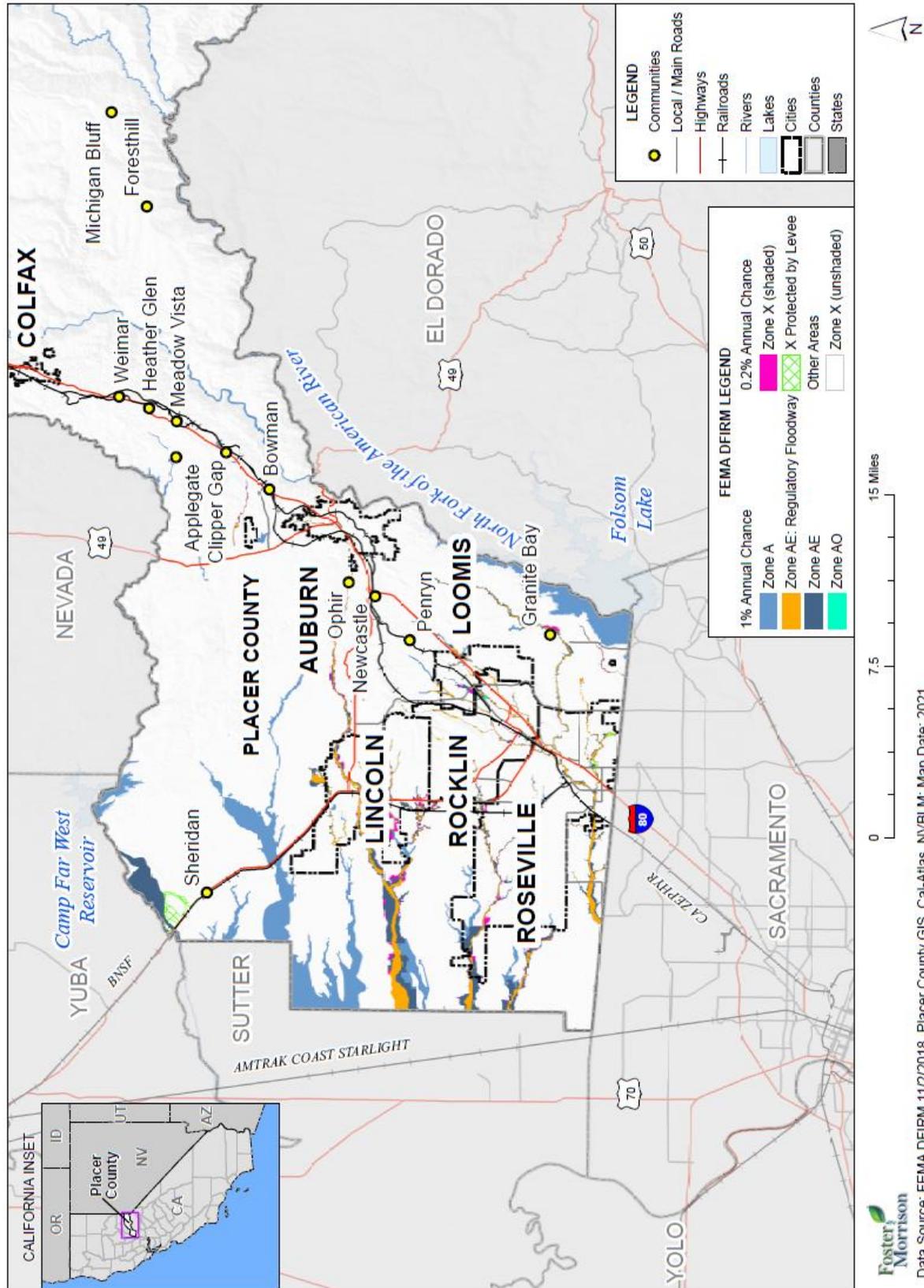


Figure 4-76 Placer County West– DFIRM Flood Zones



Values at Risk and Flood Loss Estimates Analysis

Quantifying the values at risk and estimating losses within mapped FEMA floodplains in the County is an important element in understanding the risk and vulnerability of the Placer County Planning Area to the flood hazard.

Methodology

Placer County's 2020 Parcel and Assessor Data, obtained from Placer County, was used as the basis for the county inventory of parcels, values, and acres. Placer County has a FEMA DFIRM dated 11/2/2018 which was utilized to perform the flood analysis.

In some cases, there are parcels in multiple flood zones, such as Zone A, Zone X, or Shaded X. GIS was used to create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels were segregated and analyzed in this fashion for the Placer County Planning Area. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

Analysis on values at risk to floods in the County is provided for Placer County Planning Area and the unincorporated County in the below results section.

Limitations

It also should be noted that the resulting flood analysis estimates may actually be more or less than that presented in the below tables as the County may include structures located within the 1% or 0.2% annual chance floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the floodplain due primarily to Proposition 13, and to a lesser extent, properties falling under the Williamson Act.

Flood Loss Estimate

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with improved structure values identified in the Assessor's database. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables, but are only present to show the value of the land associated with each flood zone.

The property use categories for the County (derived from zoning code descriptions) were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards, using FEMA Hazus methodologies as previously described in Section 4.3.1. The CRVs were added to the improved parcel values.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percent of damage is primarily related to the flood depth. FEMA’s flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA’s Flood Building Loss Table based on an assumed average flood depth of 2 feet. The end result of the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

The end result of the values at risk and flood loss estimates analysis is an inventory of the numbers, types, and values of parcels and estimated losses subject to the flood hazard by flood zone. Results are presented here first for the Placer County Planning Area and secondly for unincorporated County. Results for the incorporated jurisdictions are presented in their annexes to this Plan.

Placer County Planning Area

Table 4-84 through Table 4-85 contain flood analysis results for the Placer County Planning Area. These tables show the number of parcels and values at risk to the 1% and 0.2% annual chance event for unincorporated Placer County. Table 4-84 shows a summary of the value of improved parcels by 1% and 0.2% annual chance flood zones in the Planning Area. Table 4-85 shows the total values in each flood zone by jurisdiction for the Planning Area.

Table 4-84 Placer County Planning Area– Count and Value of Parcels by 1% and 0.2% Flood Zone*

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	2,157	1,097	\$384,502,094	\$395,121,846	\$250,723,546	\$1,030,347,486
0.2% Annual Chance Flood Hazard	348	212	\$61,914,370	\$80,427,366	\$46,888,325	\$189,230,061
Other Areas	126,702	100,426	\$18,720,089,864	\$38,937,220,013	\$21,838,228,111	\$79,495,537,988
Grand Total	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$22,135,839,982	\$80,715,115,535

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor’s Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City’s website.

Table 4-85 Placer County Planning Area – Count and Value of Parcels by DFIRM Flood Zones by Jurisdiction*

Jurisdiction/ Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Auburn						
1% Annual Chance Flood Hazard	60	23	\$4,128,747	\$7,908,824	\$6,111,916	\$18,149,487
0.2% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0
Other Areas	6,430	5,157	\$644,368,386	\$1,541,085,558	\$902,211,255	\$3,087,665,199
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686
Colfax						
1% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0
Other Areas	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Lincoln						
1% Annual Chance Flood Hazard	126	12	\$8,276,991	\$13,364,910	\$18,493,118	\$40,135,019
0.2% Annual Chance Flood Hazard	191	110	\$23,320,645	\$43,414,916	\$25,929,214	\$92,664,775
Other Areas	21,504	18,584	\$2,399,605,088	\$6,387,701,619	\$3,515,640,807	\$12,302,947,514
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308
Loomis						
1% Annual Chance Flood Hazard	117	98	\$12,400,680	\$30,205,234	\$21,027,153	\$63,633,067
0.2% Annual Chance Flood Hazard	13	12	\$1,492,271	\$2,725,467	\$1,362,734	\$5,580,472
Other Areas	2,865	2,442	\$395,656,406	\$785,637,335	\$479,648,228	\$1,660,941,969
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Jurisdiction/ Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Rocklin						
1% Annual Chance Flood Hazard	185	115	\$23,373,619	\$47,773,479	\$37,270,632	\$108,417,730
0.2% Annual Chance Flood Hazard	47	40	\$4,015,333	\$7,975,437	\$4,436,746	\$16,427,516
Other Areas	23,425	20,854	\$3,078,318,160	\$8,111,424,358	\$4,798,444,657	\$15,988,187,175
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421
Unincorporated Placer County						
1% Annual Chance Flood Hazard	1,669	849	\$336,322,057	\$295,869,399	\$167,820,727	\$800,012,183
0.2% Annual Chance Flood Hazard	97	50	\$33,086,121	\$26,311,546	\$15,159,631	\$74,557,298
Other Areas	71,490	52,678	\$12,137,143,857	\$21,959,202,560	\$12,037,583,327	\$46,133,929,744
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225
Grand Total						
Grand Total	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$22,135,839,982	\$80,715,115,535

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood also includes all parcels in the 1% annual chance floodplain.

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-86 shows a summary table of loss estimates by 1% and 0.2% annual chance flood zone for the Placer County Planning Area. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the Planning Area) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The County should keep in mind that the loss ratio could increase with additional development in the 1% and 0.2% annual chance flood zone, unless development is elevated in accordance with the local floodplain management ordinance.

Table 4-86 Placer County Planning Area – Flood Loss Estimate

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	2,157	1,097	\$395,121,846	\$250,723,546	\$645,845,392	\$129,169,078	0.22%
0.2% Annual Chance Flood Hazard	348	212	\$80,427,366	\$46,888,325	\$127,315,691	\$25,463,138	0.04%
Grand Total	2,505	1,309	\$475,549,212	\$297,611,871	\$773,161,083	\$154,632,216	0.26%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/ Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual flood zone, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood also includes all parcels in the 1% annual chance flood zone.

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

According to the information in Table 4-84 through Table 4-86, the Placer County Planning Area has 1,097 improved parcels and roughly \$646 million of structure and contents value in the 1% annual chance flood zone. There are an additional 212 improved parcels and roughly \$127 million of structure and contents value in the 0.2% annual chance flood event. These values can be refined a step further. Applying the 20 percent damage factor as previously described, there is a 1% chance in any given year of a flood event causing roughly \$129.2 million in damage in the Placer County Planning Area. Applying the same factor, there is a 0.2% chance of a flood event causing approximately \$25.5 million in damage in the Placer County Planning Area. A loss ratio of 0.26% indicates that while the Placer County Planning Area has values at risk in the floodplain, flood losses would be limited compared to the total built environment and the community would likely be able to recover adequately.

Unincorporated Placer County

Table 4-87, Table 4-88, and Table 4-89 contain information for unincorporated Placer County only. Table 4-87 is a summary table which shows improved parcels and structure values summarized by DFIRM flood type. Table 4-88 breaks down Table 4-87 and shows the number of improved parcels and associated structure and other improved values at risk to the each of the FEMA flood zones using the DFIRM data by property use type. Table 4-89 shows potential losses summarized by 1% and 0.2% annual chance flood events with loss estimates and loss ratios.

Table 4-87 Unincorporated Placer County – Count and Value of Parcels* in DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	1,669	849	\$295,869,399	\$167,820,727	\$800,012,183
0.2% Annual Chance Flood Hazard	97	50	\$26,311,546	\$15,159,631	\$74,557,298
Other Areas	71,490	52,678	\$21,959,202,560	\$12,037,583,327	\$46,133,929,744
Unincorporated Placer County Total	73,256	53,577	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone.

The 0.2% annual chance flood also includes all parcels in the 1% annual chance flood zone.

Table 4-88 Unincorporated Placer County – Count and Value of Parcels* and Detailed DFIRM Flood Zone by Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	56	13	\$24,928,810	\$2,326,061	\$2,326,061	\$29,580,932
Commercial	10	3	\$1,131,282	\$809,545	\$809,545	\$2,750,372
Industrial	4	1	\$547,853	\$259,782	\$389,673	\$1,197,308
Institutional	22	0	\$0	\$0	\$0	\$0
Miscellaneous	258	1	\$3,319,417	\$1,542	\$1,542	\$3,322,501
Natural / Open Space	66	16	\$8,644,312	\$3,625,687	\$3,625,687	\$15,895,686
Residential	316	253	\$104,128,683	\$96,037,629	\$48,018,817	\$248,185,129
Zone A Total	732	287	\$142,700,357	\$103,060,246	\$55,171,325	\$300,931,928
Zone AE Floodway						
Agricultural	10	7	\$12,908,368	\$2,664,631	\$2,664,631	\$18,237,630
Commercial	2	0	\$112,806	\$0	\$0	\$112,806
Industrial	2	1	\$2,280,299	\$2,122,416	\$3,183,624	\$7,586,339
Institutional	19	0	\$0	\$0	\$0	\$0
Miscellaneous	72	1	\$3,039,477	\$172,269	\$172,269	\$3,384,015
Natural / Open Space	25	4	\$2,500,127	\$303,824	\$303,824	\$3,107,775

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Residential	99	94	\$16,584,495	\$33,816,322	\$16,908,164	\$67,308,981
Zone AE Floodway Total	229	107	\$37,425,572	\$39,079,462	\$23,232,512	\$99,737,546
Zone AE						
Agricultural	20	4	\$21,419,730	\$1,244,062	\$1,244,062	\$23,907,854
Commercial	5	2	\$2,443,670	\$1,972,827	\$1,972,827	\$6,389,324
Industrial	4	1	\$2,178,454	\$863,673	\$1,295,510	\$4,337,637
Institutional	31	0	\$0	\$0	\$0	\$0
Miscellaneous	120	1	\$6,231,390	\$549,403	\$549,403	\$7,330,196
Natural / Open Space	230	167	\$5,144,571	\$19,610,450	\$19,610,450	\$44,365,471
Residential	296	278	\$118,612,627	\$129,079,543	\$64,539,771	\$312,231,941
Zone AE Total	706	453	\$156,030,442	\$153,319,958	\$89,212,023	\$398,562,423
Zone AO						
Residential	2	2	\$165,686	\$409,733	\$204,867	\$780,286
Zone AO Total	2	2	\$165,686	\$409,733	\$204,867	\$780,286
1% Annual Chance Flood Hazard Total	1,669	849	\$336,322,057	\$295,869,399	\$167,820,727	\$800,012,183
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	1	0	\$61,638	\$0	\$0	\$61,638
Commercial	2	1	\$4,377,518	\$2,538,191	\$2,538,191	\$9,453,900
Industrial	2	0	\$833,701	\$0	\$0	\$833,701
Institutional	7	0	\$0	\$0	\$0	\$0
Miscellaneous	17	0	\$679,539	\$0	\$0	\$679,539
Natural / Open Space	6	1	\$495,852	\$1,065,900	\$1,065,900	\$2,627,652
Residential	51	43	\$24,746,750	\$22,044,787	\$11,022,394	\$57,813,931
Zone X (shaded) Total	86	45	\$31,194,998	\$25,648,878	\$14,626,485	\$71,470,361
X Protected by Levee						
Agricultural	1	1	\$584,704	\$49,939	\$49,939	\$684,582
Miscellaneous	3	0	\$0	\$0	\$0	\$0
Natural / Open Space	6	3	\$1,070,925	\$353,685	\$353,685	\$1,778,295
Residential	1	1	\$235,494	\$259,044	\$129,522	\$624,060

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
X Protected by Levee Total	11	5	\$1,891,123	\$662,668	\$533,146	\$3,086,937
0.2% Annual Chance Flood Hazard Total	97	50	\$33,086,121	\$26,311,546	\$15,159,631	\$74,557,298
Other Areas						
Zone X (unshaded)						
Agricultural	1,241	242	\$335,183,771	\$54,965,032	\$54,965,032	\$445,113,835
Commercial	1,514	945	\$516,795,400	\$787,872,413	\$787,872,413	\$2,092,540,226
Industrial	692	351	\$228,653,940	\$385,986,269	\$578,979,407	\$1,193,619,616
Institutional	617	113	\$50,761,281	\$274,504,591	\$274,504,591	\$599,770,463
Miscellaneous	10,258	237	\$583,668,152	\$33,562,194	\$33,562,194	\$650,792,540
Natural / Open Space	2,187	267	\$176,032,987	\$193,087,442	\$193,087,442	\$562,207,871
Residential	54,981	50,523	\$10,246,048,326	\$20,229,224,619	\$10,114,612,248	\$40,589,885,193
Zone X (unshaded) Total	71,490	52,678	\$12,137,143,857	\$21,959,202,560	\$12,037,583,327	\$46,133,929,744
Other Areas Total	71,490	52,678	\$12,137,143,857	\$21,959,202,560	\$12,037,583,327	\$46,133,929,744
Unincorporated Placer County Grand Total						
Unincorporated Placer County Grand Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/ Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood also includes all parcels in the 1% annual chance flood zone.

Table 4-89 Unincorporated Placer County – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	1,669	849	\$295,869,399	\$167,820,727	\$463,690,126	\$92,738,025	0.158%

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
0.2% Annual Chance Flood Hazard	97	50	\$26,311,546	\$15,159,631	\$41,471,177	\$8,294,235	0.014%
Grand Total	1,766	899	\$322,180,945	\$182,980,358	\$505,161,303	\$101,032,260	0.17%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood also includes all parcels in the 1% annual chance flood zone.

According to Table 4-88 and Table 4-89, unincorporated Placer County has 849 improved parcels and roughly \$464 million of structure and contents value in the 1% annual chance flood zone. The unincorporated County has 50 improved parcels and roughly \$41.5 million in structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described, there is a 1% chance in any given year of a flood event causing roughly \$92.7 million in damage in the unincorporated areas of Placer County. Applying the same factor, there is a 0.2% chance of a flood event causing \$8.3 million in damage to the unincorporated County. A loss ratio of 0.17% indicates that while the unincorporated County has values at risk in the floodplain, flood losses would be limited compared to the total built environment and the community would likely be able to recover adequately.

Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and values at risk to flood hazards, parcel boundary analysis was performed to obtain total acres and flooded acres by flood zone for each parcel. The parcel layer was intersected with the FEMA DFIRM data to obtain the acres flooded. The following is an analysis of flooded acres in the County.

Methodology

GIS was used to calculate acres flooded by FEMA flood zones and property use categories. The Placer County parcel layer and FEMA DFIRM were intersected, and each segment divided by the intersection of flood zone and parcels was calculated for acres. This process was conducted for 1% and 0.2% annual chance floodplain areas, with each segment being defined by zone type (A, AE, 0.2% Annual Chance, and X) and acres. The resulting data tables with flooded acreages were then imported into a database and linked back to the original parcels, including total acres by parcel number. Once this was completed, each parcel contained acreage values for flooded acre by zone type within the parcel. In the tables below, the 1% and 0.2% annual chance flood zones are summarized and then split out by property use, their total flooded acres, total improved acres, and percent of improved acres that are flooded.

Limitations

One limitation created by this type of analysis is that improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall within the flood zone portion of a parcel; thus, areas of improvements flooded calculated through this method may be higher or lower than those actually seen in a similar real-world event.

The following tables represent a summary and detailed analysis of total acres for each FEMA DFIRM flood zone in the Planning Area. Table 4-90 gives summary information for the Planning Area by 1% and 0.2% annual chance flood zone for the entire Placer County Planning Area. Table 4-91 shows the specific DFIRM flood zone designations that make up the 1% and 0.2% annual chance flood zones for the unincorporated County. Details on flooded acres by detailed flood zone for the incorporated jurisdictions in the County are shown in their respective annexes to this Plan Update. In all of these tables, the Other Areas are areas (Zone X Unshaded – areas outside mapped flood hazard areas) where there is no mapped flood hazard area.

Table 4-90 Placer County Planning Area – Flooded Acres Summary

Jurisdiction/ Flood Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
City of Auburn						
1% Annual Chance Flood Hazard	88	0.01%	21	0.01%	67	0.01%
0.2% Annual Chance Flood Hazard	0	0.00%	0	0.00%	0	0.00%
Other Areas	4,429	0.49%	1,900	1.06%	2,529	0.35%
Total	4,517	0.50%	1,922	1.07%	2,596	0.36%
City of Colfax						
1% Annual Chance Flood Hazard	0	0.00%	0	0.00%	0	0.00%
0.2% Annual Chance Flood Hazard	0	0.00%	0	0.00%	0	0.00%
Other Areas	794	0.09%	347	0.19%	447	0.06%
Total	794	0.09%	347	0.19%	447	0.06%
City of Lincoln						
1% Annual Chance Flood Hazard	1,282	0.14%	118	0.07%	1,164	0.16%
0.2% Annual Chance Flood Hazard	336	0.04%	47	0.03%	289	0.04%

Jurisdiction/ Flood Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Other Areas	13,648	1.52%	4,940	2.74%	8,708	1.21%
Total	15,267	1.70%	5,106	2.84%	10,161	1.41%
Town of Loomis						
1% Annual Chance Flood Hazard	224	0.02%	155	0.09%	69	0.01%
0.2% Annual Chance Flood Hazard	26	0.00%	23	0.01%	3	0.00%
Other Areas	4,310	0.48%	3,068	1.70%	1,243	0.17%
Total	4,561	0.51%	3,246	1.80%	1,315	0.18%
City of Rocklin						
1% Annual Chance Flood Hazard	602	0.07%	132	0.07%	470	0.07%
0.2% Annual Chance Flood Hazard	46	0.01%	11	0.01%	34	0.00%
Other Areas	11,877	1.32%	5,600	3.11%	6,277	0.87%
Total	12,524	1.39%	5,743	3.19%	6,781	0.94%
Unincorporated Placer County						
1% Annual Chance Flood Hazard	33,895	3.77%	10,488	5.82%	23,407	3.26%
0.2% Annual Chance Flood Hazard	888	0.10%	554	0.31%	334	0.05%
Other Areas	826,718	91.94%	152,665	84.78%	674,054	93.74%
Total	861,501	95.81%	163,706	90.91%	697,795	97.04%
Grand Total						
Grand Total	899,164	100.00%	180,070	100.00%	719,094	100.00%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/ Assessor's Data

*Percentage of each jurisdiction in the flooded area

The City of Roseville is not included in the calculations of acres at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-91 Unincorporated Placer County – Flooded Acres by Detailed DFIRM Flood Zones by Property Use

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	5,649	0.628%	2,073	1.151%	3,576	0.497%
Commercial	14	0.002%	8	0.004%	7	0.001%
Industrial	73	0.008%	20	0.011%	53	0.007%
Institutional	917	0.102%	0	0.00%	917	0.128%
Miscellaneous	11,519	1.281%	38	0.021%	11,481	1.597%
Natural / Open Space	4,699	0.523%	2,059	1.144%	2,639	0.367%
Residential	1,962	0.218%	1,641	0.912%	320	0.045%
Zone A Total	24,832	2.762%	5,840	3.243%	18,993	2.641%
Zone AE Floodway						
Agricultural	1,343	0.149%	969	0.538%	375	0.052%
Commercial	16	0.002%	8	0.004%	8	0.001%
Industrial	24	0.003%	4	0.002%	21	0.003%
Institutional	56	0.006%	1	0.000%	56	0.008%
Miscellaneous	437	0.049%	1	0.001%	436	0.061%
Natural / Open Space	931	0.104%	381	0.211%	551	0.077%
Residential	541	0.060%	521	0.289%	21	0.003%
Zone AE Floodway Total	3,350	0.373%	1,884	1.046%	1,467	0.204%
Zone AE						
Agricultural	2,052	0.228%	1,224	0.680%	828	0.115%
Commercial	16	0.002%	9	0.005%	7	0.001%
Industrial	60	0.007%	10	0.006%	50	0.007%
Institutional	102	0.011%	0	0.000%	102	0.014%
Miscellaneous	1,075	0.120%	56	0.031%	1,019	0.142%
Natural / Open Space	1,590	0.177%	679	0.377%	911	0.127%
Residential	816	0.091%	785	0.436%	31	0.004%
Zone AE Total	5,711	0.635%	2,764	1.535%	2,947	0.410%
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.000%	0	0.00%	0	0.000%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	1	0.000%	1	0.000%	0	
Zone AO Total	1	0.000%	1	0.000%	0	0.000%
1% Annual Chance Flood Hazard Total	33,895	3.770%	10,488	5.824%	23,407	3.255%
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	138	0.015%	67	0.037%	71	0.010%
Commercial	6	0.001%	3	0.002%	3	0.000%
Industrial	14	0.002%	2	0.001%	12	0.002%
Institutional	14	0.002%	0	0.000%	14	0.002%
Miscellaneous	47	0.005%	0	0.000%	47	0.007%
Natural / Open Space	149	0.017%	74	0.041%	75	0.010%
Residential	80	0.009%	76	0.042%	4	0.001%
Zone X (shaded) Total	448	0.050%	222	0.124%	226	0.031%
X Protected by Levee						
Agricultural	108	0.012%	82	0.046%	26	0.004%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	34	0.004%	0	0.00%	34	0.005%
Natural / Open Space	285	0.032%	236	0.131%	48	0.007%
Residential	13	0.001%	13	0.007%	0	0.00%
X Protected by Levee Total	440	0.049%	332	0.184%	108	0.015%
0.2% Annual Chance Flood Hazard Total	888	0.099%	554	0.308%	334	0.046%
Other Areas						
Zone X (unshaded)						
Agricultural	178,889	19.895%	16,285	9.044%	162,604	22.612%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Commercial	2,213	0.246%	1,505	0.836%	707	0.098%
Industrial	4,566	0.508%	1,041	0.578%	3,525	0.490%
Institutional	21,887	2.434%	913	0.507%	20,974	2.917%
Miscellaneous	453,440	50.429%	3,590	1.993%	449,850	62.558%
Natural / Open Space	46,156	5.133%	16,716	9.283%	29,440	4.094%
Residential	119,567	13.298%	112,615	62.539%	6,953	0.967%
Zone X (unshaded) Total	826,718	91.943%	152,665	84.781%	674,054	93.736%
Other Areas Total	826,718	91.943%	152,665	84.781%	674,054	93.736%
Unincorporated Placer County Grand Total	861,501	95.811%	163,706	90.912%	697,795	97.038%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

FEMA NFIP Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

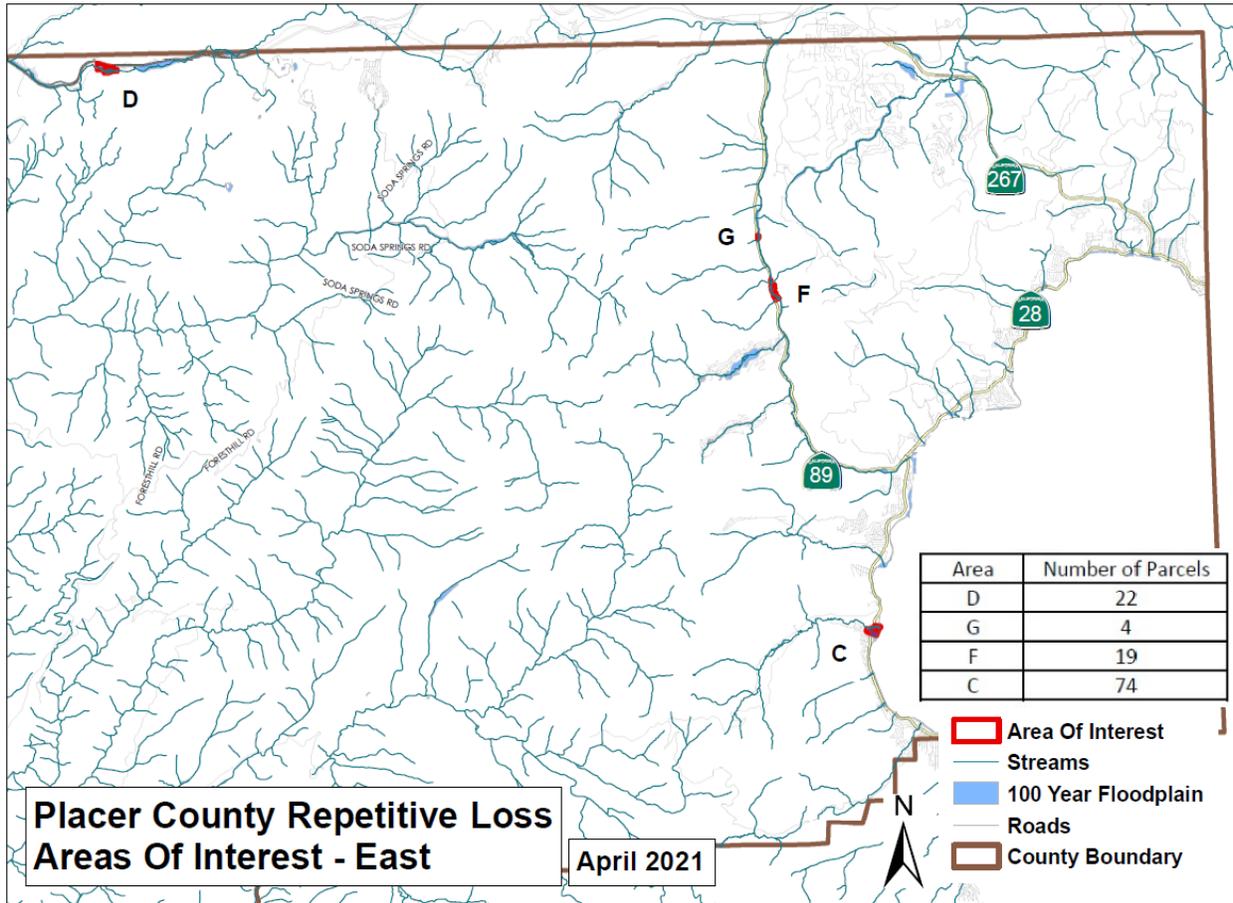
Unincorporated Placer County joined the NFIP on April 18, 1983, and the CRS on October 1, 1991. According to the CRS listing of eligible communities dated October 1, 2020, the County is currently a Class 5, which provides a 25 percent discount on flood insurance for those located within the special flood hazard area (SFHA) and a 10 percent discount for those located in non-SFHA areas. This results in savings of \$107,797 for residents in Placer County.

NFIP insurance data indicates that as of August 21, 2020, there were 817 policies in force in the unincorporated County, resulting in \$233,180,600 of insurance in force. Of these, 802 are for residential properties; 15 are nonresidential. 249 of these are in A zones; 568 policies are for parcels in the B, C, & X zones. There have been 236 closed paid losses totaling \$4,788,314.79; 229 of these were for residential properties and 7 were nonresidential. Of these 236 paid losses, 102 were parcels in A zones and 120 parcels were in B, C, & X zones. Information was not provided on the other 4 claims. There are 44 repetitive loss (RL) structures, and 0 severe repetitive loss (SRL) structures in the County – with 60 paid losses totaling \$1,590,452.20. Of these RL buildings, 22 are in the A zones and 22 are in the B, C, or X zone. Only one

of these RL buildings is a post-FIRM building. According to the County, only 9 RL properties are not mitigated. There have been 25 substantial damage claims since 1978.

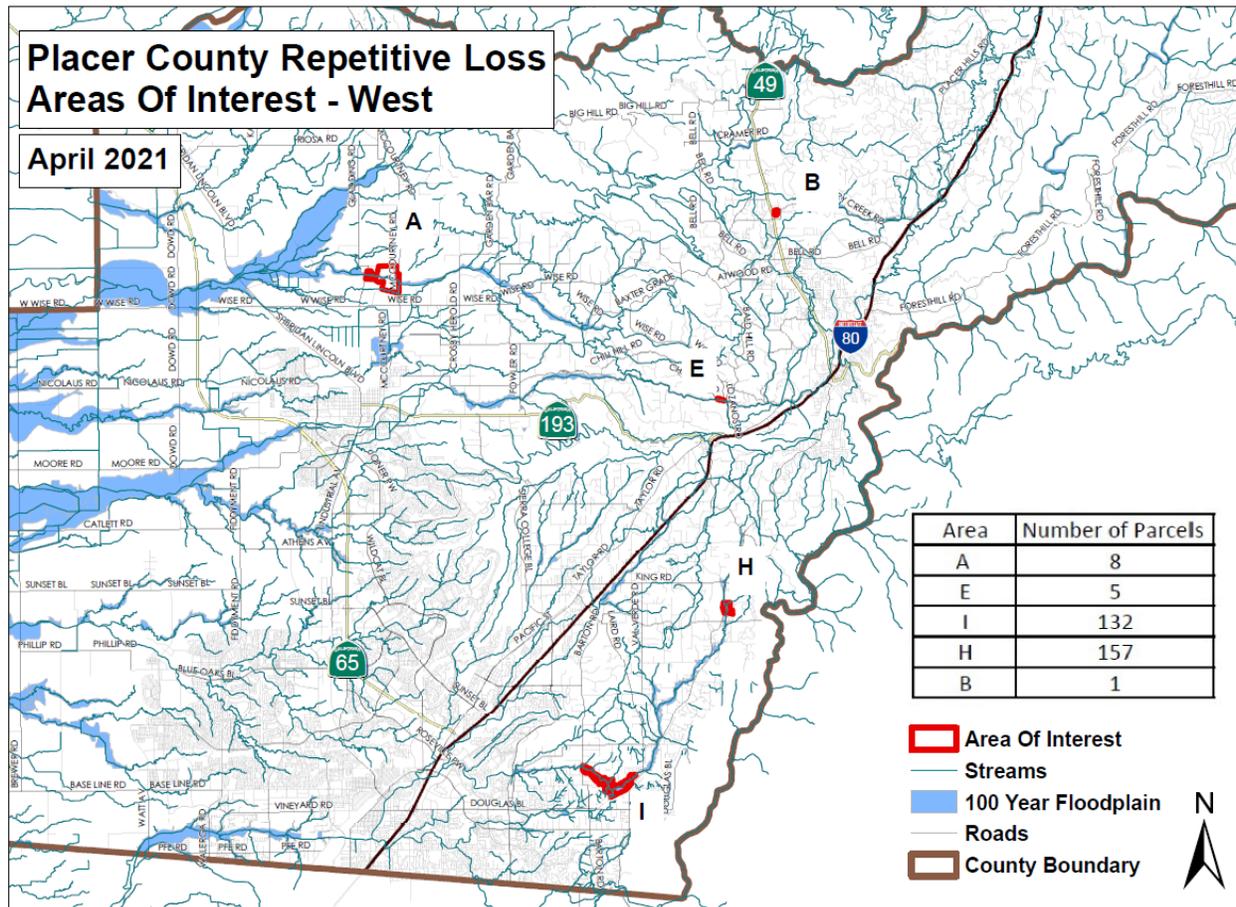
Placer County conducts a RL area analysis based on the 9 RL properties that are yet to be mitigated. Areas of RL for the east and west portions of the County are shown on Figure 4-77 and Figure 4-78, respectively.

Figure 4-77 Placer County Repetitive Loss Areas of Interest – East



Source: Placer County

Figure 4-78 Placer County Repetitive Loss Areas of Interest – West



Source: Placer County

Based on this analysis of insurance coverage, Placer County has significant values at risk to the 1% annual chance and greater floods. Of the 849 improved parcels within the 1% annual chance flood zone, only 249 (or 29.3 percent) of those parcels maintain flood insurance. This can be seen on Table 4-92, along with insurance information from the 5 incorporated communities in the County.

Table 4-92 Placer County Planning Area – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Auburn	23	12	52.2%
City of Colfax	0	0	–
City of Lincoln	12	0	0.0%
Town of Loomis	98	39	33.9%
City of Rocklin	115	39	39.8%

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
Unincorporated County	849	249	29.3%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

The City of Roseville is not included in the CRS table above. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Population at Risk

A separate analysis was performed to determine populations that reside in flood zones. Using GIS, the DFIRM Flood dataset was overlaid on the improved residential parcel data. Those parcel centroids that intersect a flood zone were counted and multiplied by the Census Bureau average household size; and tabulated by flood zone (see Table 4-93). According to this analysis, there is a population of 2,152 in the 1% annual chance flood zone, and 403 in the 0.2% annual chance flood zone for the entire Placer County Planning Area. Of these, in unincorporated Placer County, there is a population of 1,613 and 6 respectively in the 1% and 0.2% annual chance floodplains.

Table 4-93 Placer County Planning Area – Residential Population at Risk to 1% and 0.2% Annual Chance Flooding

Jurisdiction	1% Annual Chance		0.2% Annual Chance*	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Auburn	18	44	0	0
Colfax	0	0	0	0
Lincoln	3	8	104	267
Loomis	95	247	12	31
Rocklin	106	284	37	99
Unincorporated Placer County	625	1,613	44	6
Total	847	2,196	197	403

Source: FEMA DFIRM 11/2/2018, US Census Bureau Average Household Sizes: Auburn (2.19); Colfax (2.30); Lincoln (2.57); Loomis (2.60), Rocklin (2.68); and unincorporated Placer County (2.58)

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

The City of Roseville is not included in the calculations of populations at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Placer County and all jurisdictions to determine critical facilities in the 1% and 0.2 annual chance flood zones. Using GIS, the DFIRM flood zones were overlaid on the critical facility GIS layer. Figure 4-79 shows critical facilities, as well as the DFIRM flood zones. Figure 4-80 and Figure 4-81 zoom in to show critical facilities and DFIRM flood zones in the east and west portions of the County, respectively. Table 4-94 summarizes the critical facilities

in the County by DFIRM flood zone. Table 4-95 details critical facilities by facility type and count for the Planning Area. Details of critical facility definition, type, name and address by flood zone are listed in Appendix F.

Figure 4-80 Placer County Planning Area East – Critical Facilities and DFIRM Flood Zones

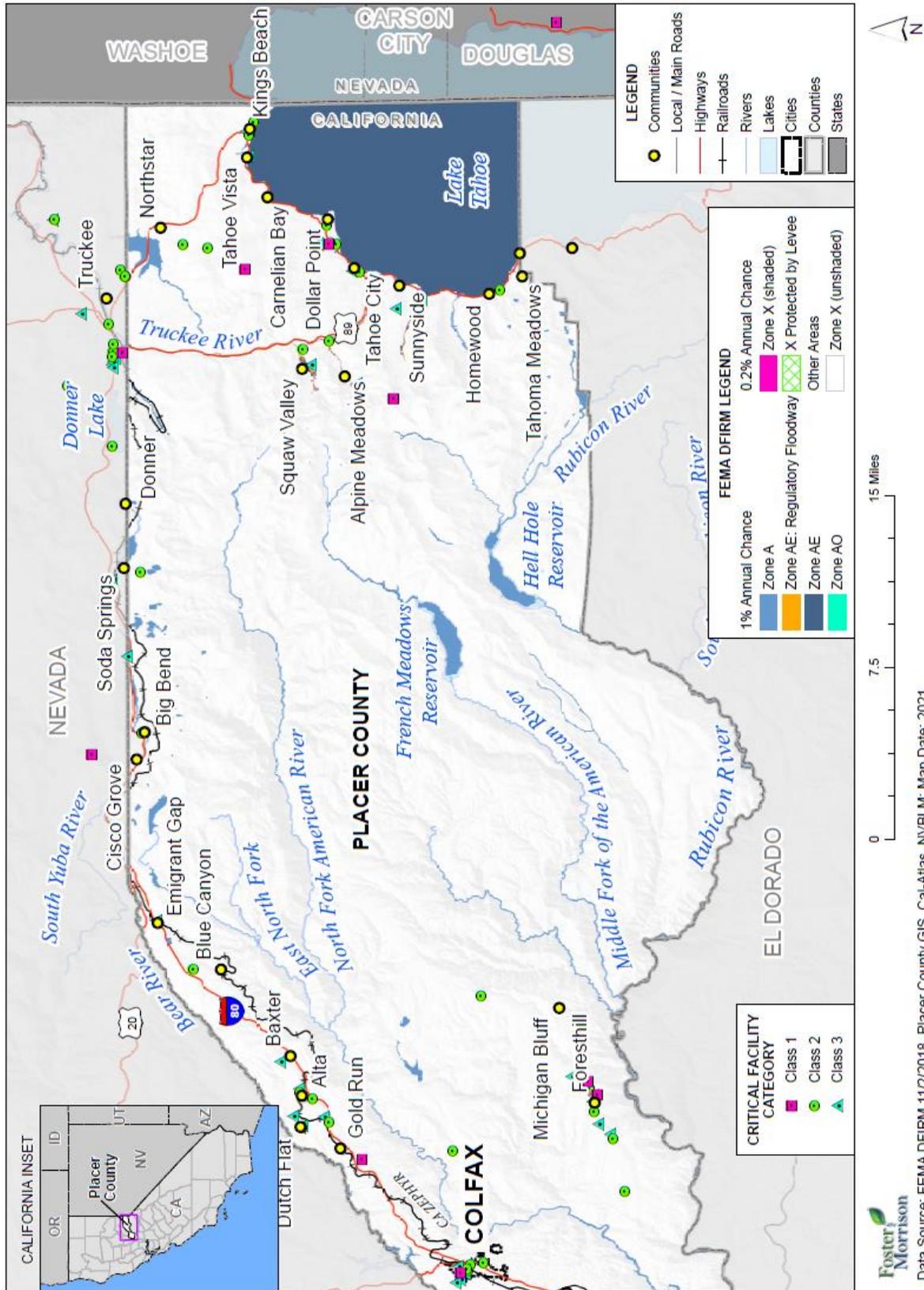


Figure 4-81 Placer County Planning Area West – Critical Facilities and DFIRM Flood Zones

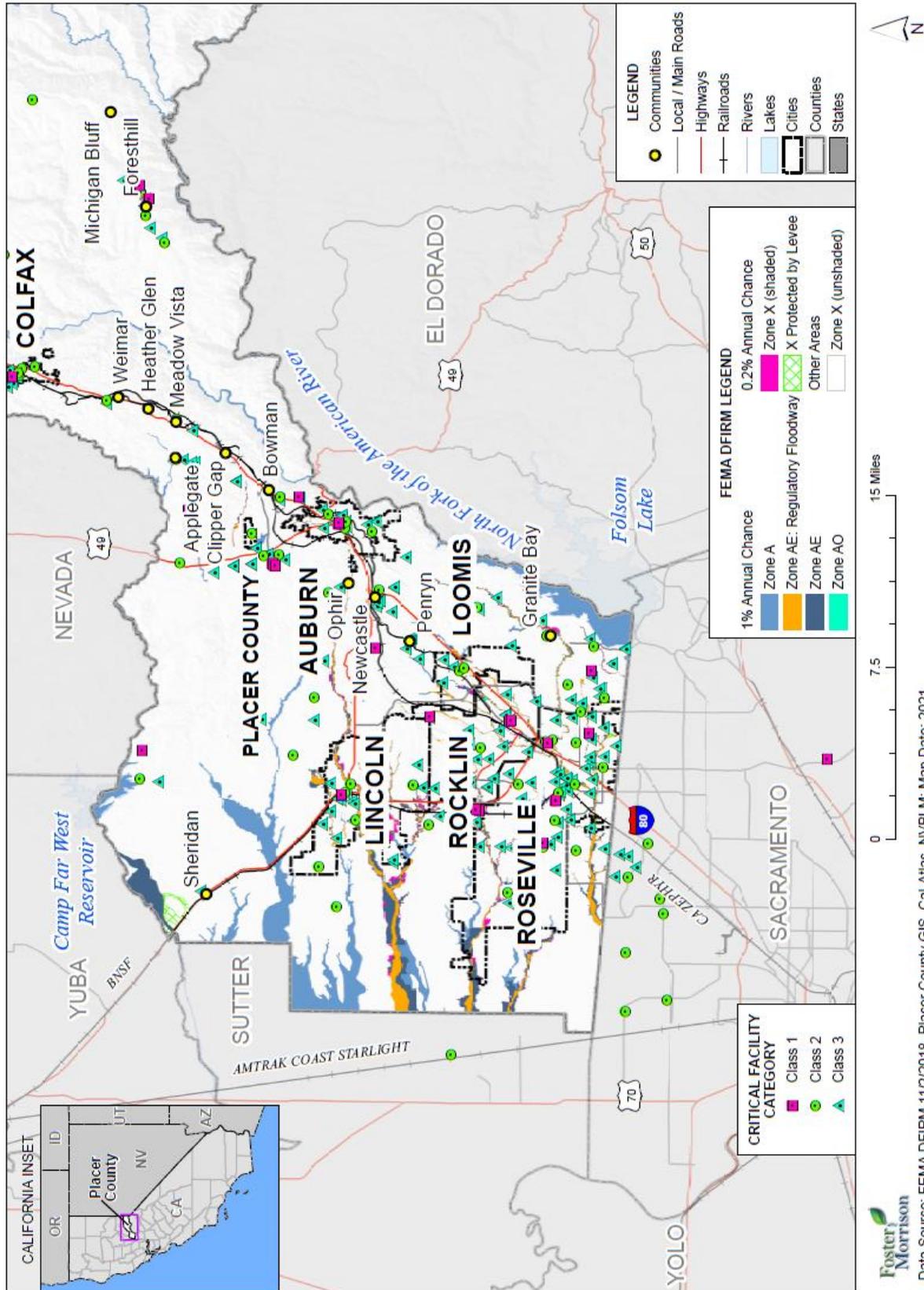


Table 4-94 Placer County Planning Area– Summary of Critical Facilities in DFIRM Flood Zones

Critical Facility Class	Facility Count
1% Annual Chance Flood	
Class 1	0
Class 2	0
Class 3	1
Total	1
0.2% Annual Chance Flood	
Class 1	0
Class 2	0
Class 3	0
Total	0
Other Areas	
Class 1	31
Class 2	84
Class 3	175
Total	290
Unknown – Located in Adjacent County	
Class 1	6
Class 2	19
Class 3	12
Total	37
Grand Total	
	328

Source: Placer County GIS, FEMA 11/2/2018 DFIRM

Table 4-95 Placer County Planning Area– Critical Facilities in DFIRM Flood Zones by Jurisdiction and Facility Category

Jurisdiction/Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Auburn			
Other Areas			
Zone X (unshaded)	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	3
		National/Coast Guard	1

Jurisdiction/Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
	Class 3	Police Station	1
		Fairground	1
		Hall	5
		School	5
Zone X (unshaded) Total			19
Other Areas Total			19
Auburn Total			19
Colfax			
Other Areas			
Zone X (unshaded)	Class 2	Fire Station	2
		Police Station	1
	Class 3	Hall	1
		Water Treatment Plant	1
Zone X (unshaded) Total			5
Other Areas Total			5
Colfax Total			5
Lincoln			
Other Areas			
Zone X (unshaded)	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	3
		Police Station	1
	Class 3	Hall	3
		Hazardous Materials Facility	1
		School	12
		Water Treatment Plant	1
	Zone X (unshaded) Total		
Other Areas Total			24
Lincoln Total			24
Loomis			
Other Areas			
Zone X (unshaded)	Class 2	Fire Station	1
		Police Station	1
	Class 3	School	3

Jurisdiction/Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Zone X (unshaded) Total			5
Other Areas Total			5
Loomis Total			5
Rocklin			
Other Areas			
Zone X (unshaded)	Class 1	Communication Transmission Sites	1
		Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	3
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
		School	19
		Water Treatment Plant	1
Zone X (unshaded) Total			30
Other Areas Total			30
Rocklin Total			30
Unincorporated Placer County			
1% Annual Chance Flood Hazard			
Zone AE	Class 3	Hall	1
Zone AE Total			1
1% Annual Chance Flood Hazard Total			1
Other Areas			
Zone X (unshaded)	Class 1	Communication Transmission Sites	13
		Computer Information Systems Infrastructure	2
		Dispatch Center	2
		Emergency Operation Center	3
		Fire Station	1
		Hospital Control Facility	1
		Telecommunications	2
	Class 2	Airport	1
		CHP Station	2
		Fire Station	51

Jurisdiction/Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
		Hospital	3
		National/Coast Guard	2
		Police Station	6
	Class 3	Fairground	1
		Hall	28
		Hazardous Materials Facility	8
		School	65
		Water Treatment Plant	16
Zone X (unshaded) Total			207
Other Areas Total			207
Unincorporated Placer County Total			208
Adjacent Counties			
Unknown - Located in Adjacent County	Class 1	Communication Transmission Sites	3
		Dispatch Center	3
	Class 2	Airport	1
		CHP Station	1
		Fire Station	16
		Hospital	1
	Class 3	School	11
		Water Treatment Plant	1
Unknown - Located in Adjacent County Total			37
Adjacent Counties Total			37
Grand Total			328

Source: Placer County GIS, FEMA 11/2/2018 DFIRM

Overall Community Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the County during specific times. Natural areas, such as wetlands and riparian areas within the floodplain, often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for Placer County. Based on the risk assessment, it is evident that floods will continue to have potentially devastating economic impacts to certain areas of the County. However, many of the floods in the County are minor, localized flood events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development and Future Flood Conditions

This section provides an analysis of the flood hazard and proposed future development within the County based on FEMA floodplains and also discusses considerations in evaluating future flooding conditions.

Future Development: General Considerations

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas (SFHAs) and enforce those requirements through their local floodplain management ordinances through the issuance of permits. Placer County’s floodplain management ordinance provides standards for development, subdivision of land, construction of buildings, and improvements and repairs to buildings that meet, and in some instances exceed, the minimum requirements of the NFIP.

The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, include requirements that govern the design and construction of buildings and structures in flood hazard areas. FEMA has determined that the flood provisions of the I-Codes are consistent with the requirements of the NFIP (the I-Code requirements shown either meet or exceed NFIP requirements). ASCE 24, a design standard developed by the American Society of Civil Engineers, expands on the minimum NFIP requirements with more specificity, additional requirements, and some limitations.

With the adoption of the International Codes, communities are moving towards a more stringent approach to regulatory floodplain management, beyond the minimum requirements of the NFIP. The adoption and enforcement of disaster-resistant building codes is a core community action to promote effective mitigation. When communities ensure that new buildings and infrastructure are designed and constructed in accordance with national building codes and construction standards, they significantly increase local resilience now and in the future. With continued advancements in building codes, local ordinances should be reviewed and updated to meet and exceed standards as practicable to protect new development from future flood events and to further promote disaster resiliency.

One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that fully considers applicable flood management information and practices. Master planning will also be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. Preservation and maintenance of natural and riparian areas should also be an ongoing priority to realize the flood control benefits of the natural and beneficial functions of these areas.

Future Flood Conditions: The Effects of Climate Change

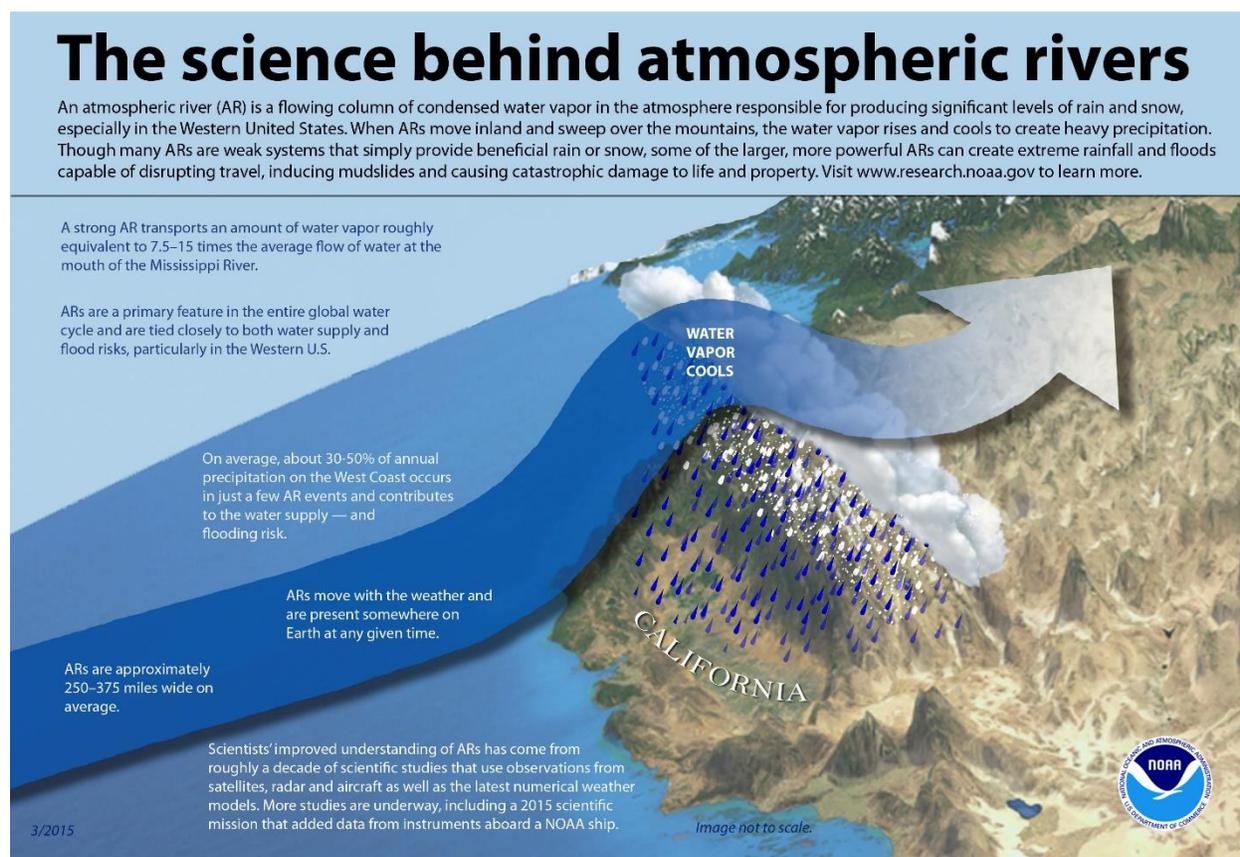
The effects of climate change on future flood conditions should also be considered. While the risk and associated short and long-term impacts of climate change are uncertain, experts in this field tend to agree that among the most significant impacts include those resulting from increased heat and precipitation events that cause increased frequency and magnitude of flooding. Changes associated with climate change and flooding could be significant given the higher elevations in neighboring counties where winter snow could turn to more significant rain events. Increases in damaging flood events will cause greater property damage, public health and safety concerns displacement, and loss of life. In addition, an increase in the magnitude and severity of flood events can lead to potential contamination of potable water and contamination of food crops given the agricultural industry in the County. Displacement of residents can include both temporary and long-term displacement. Increases in insurance rates or restriction of coverage in vulnerable areas may also result.

Placer County will continue to study the risk and vulnerability associated with future flood conditions, both in terms of future growth areas and other considerations such as climate change, as they evaluate and implement their flood mitigation and adaptation strategies for the Placer County Planning Area.

Future Flood Conditions: Atmospheric Rivers

Placer County and the rest of Northern California can be affected by a phenomenon known as an atmospheric river. According to the NOAA, atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow. This can be seen in Figure 4-82.

Figure 4-82 Atmospheric Rivers



Source: NOAA

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

Not all atmospheric rivers cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to the water supply. Atmospheric rivers are a key feature in the global water cycle and are closely tied to both water supply and flood risks — particularly in the western United States.

While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from Dec. 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by Dec. 22, the first full day of winter.

Future Flood Conditions: ARkStorm Scenario

Also to be considered in evaluating potential “worst case” future flood conditions, is the ARkStorm Scenario. Although much attention in California’s focuses on the “Big One” as a high magnitude earthquake, there is the risk of another significant event in California – a massive, statewide winter storm. The last such storms occurred in the 19th century, outside the memory of current emergency managers, officials, and communities. However, massive storms are a recurring feature of the state, the source of rare but inevitable disasters. The USGS Multi Hazards Demonstration Project’s (MHDP) developed a product called ARkStorm, which addressed massive U.S. West Coast storms analogous to those that devastated California in 1861-1862. Over the last decade, scientists have determined that the largest storms in California are the product of phenomena called Atmospheric Rivers, and so the MHDP storm scenario is called the ARkStorm, for Atmospheric River 1000 (a measure of the storm’s size).

Scientific studies of offshore deposits in northern and southern California indicate that storms of this magnitude and larger have occurred about as often as large earthquakes on the southern San Andreas Fault. Such storms are projected to become more frequent and intense as a result of climate change. This scientific effort resulted in a plausible flood hazard scenario to be used as a planning and preparation tool by hazard mitigation and emergency response agencies.

For the ARkStorm Scenario, experts designed a large, scientifically realistic meteorological event followed by an examination of the secondary hazards (e.g., landslides and flooding), physical damages to the intense winter storms of 1861-62 that left California’s Central Valley impassible. Storms far larger than the ARkStorm, dubbed megastorms, have also hit California at least six times in the last two millennia.

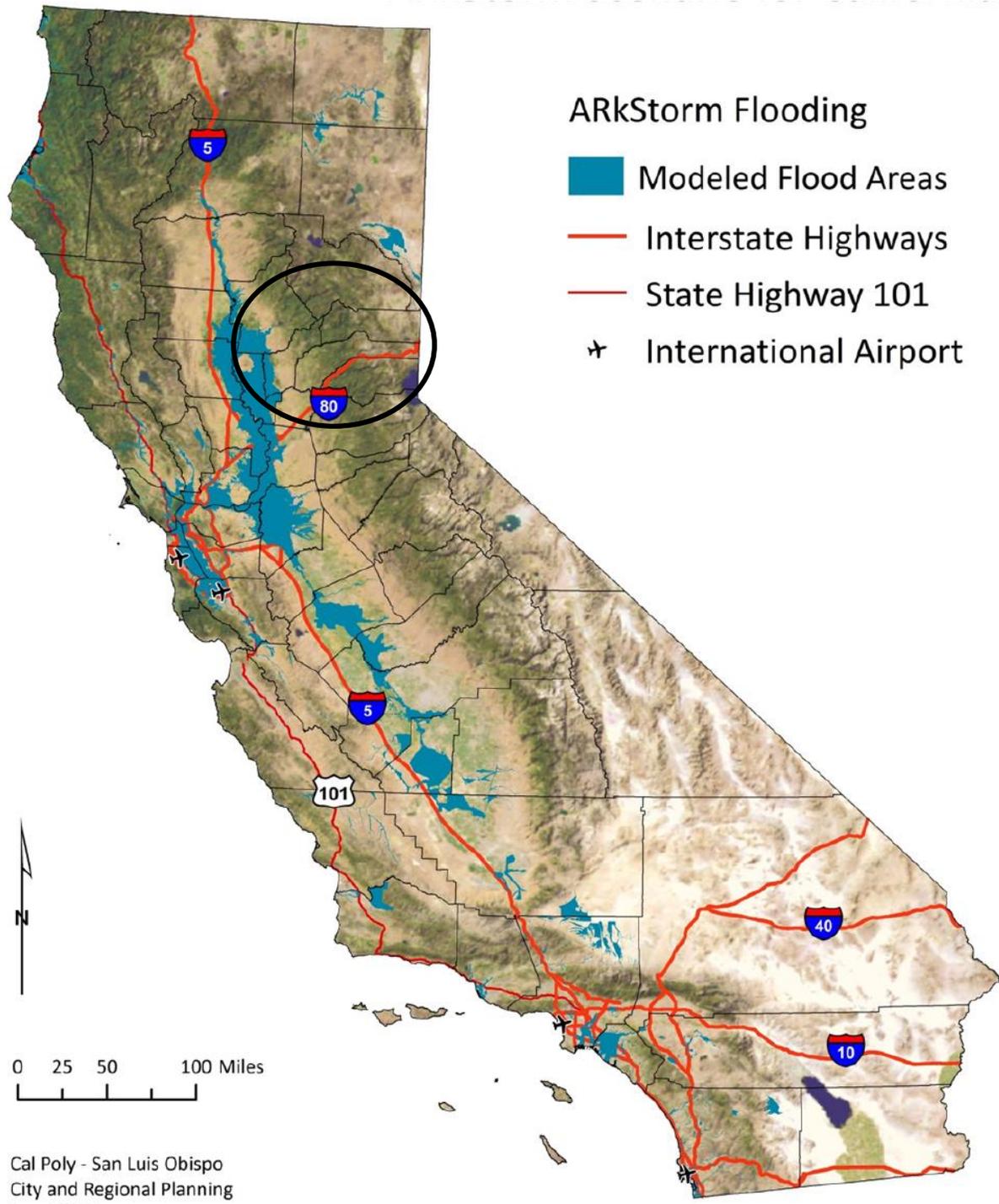
The ARkStorm produces precipitation in many places exceeding levels experienced on average every 500 to 1,000 years. Extensive flooding in many cases overwhelms the state’s flood protection system, which is at best designed to resist 100- to 200-year runoffs (many flood protection systems in the state were designed for smaller runoff events). The Central Valley experiences widespread flooding. Serious flooding also occurs in Orange County, Los Angeles County, San Diego, the San Francisco Bay Area, and other coastal communities. In some places, winds reach hurricane speeds, as high as 125 miles per hour. Hundreds of landslides occur, damaging roads, highways, and homes. Property damage exceeds \$300 billion, most of it from flooding. Agricultural losses and other costs to repair lifelines, dewater flooded islands, and repair damage from landslides brings the total direct property loss to nearly \$400 billion, of which only \$20 to \$30 billion would be recoverable through public and commercial insurance. Power, water, sewer, and other lifelines experience damage that takes weeks or months to restore. Flooding evacuation could involve over one million residents in the inland region and Delta counties.

A storm of ARkStorm’s magnitude has important implications: 1) it raises serious questions about the ability of existing national, state, and local disaster policy to handle an event of this magnitude; 2) it emphasizes the choice between paying now to mitigate, or paying a lot more later to recover; 3) innovative financing solutions are likely to be needed to avoid fiscal crisis and adequately fund response and recovery costs; 4) responders and government managers at all levels could be encouraged to conduct self-assessments and devise table-top exercises to exercise their ability to address a similar event; 5) the scenario can be a reference point for application of FEMA and Cal OES guidance connecting federal, state, and local natural hazards mapping and mitigation planning under the NFIP and Disaster Mitigation Act of 2000; and 6)

common messages to educate the public about the risk of such an extreme event could be developed and consistently communicated to facilitate policy formulation and transformation.

Figure 4-83 depicts an ARkStorm modeled scenario showing the potential for flooding primarily in the Central Valley as the result of a large storm. In Placer County, the modeled scenario suggests the County could be inundated in the western portion of the County in this ARkStorm model scenario.

Figure 4-83 Projected ARkStorm Flooding in California



Cal Poly - San Luis Obispo
City and Regional Planning
June 2013

Source: USGS ARkStorm

Future Development: GIS Analysis

Placer County's 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. Using the GIS parcel spatial file and the APNs, the 2 types and 37 future development projects were mapped. For the flood analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each FEMA flood zone. DFIRM flood zones and future development areas are shown on Figure 4-84 (for the western County), and Figure 4-85 (for the eastern County), and parcels and acreages in those areas are shown in Table 4-96.

Figure 4-84 Unincorporated Placer County – East Future Development in FEMA DFIRM Flood Zones

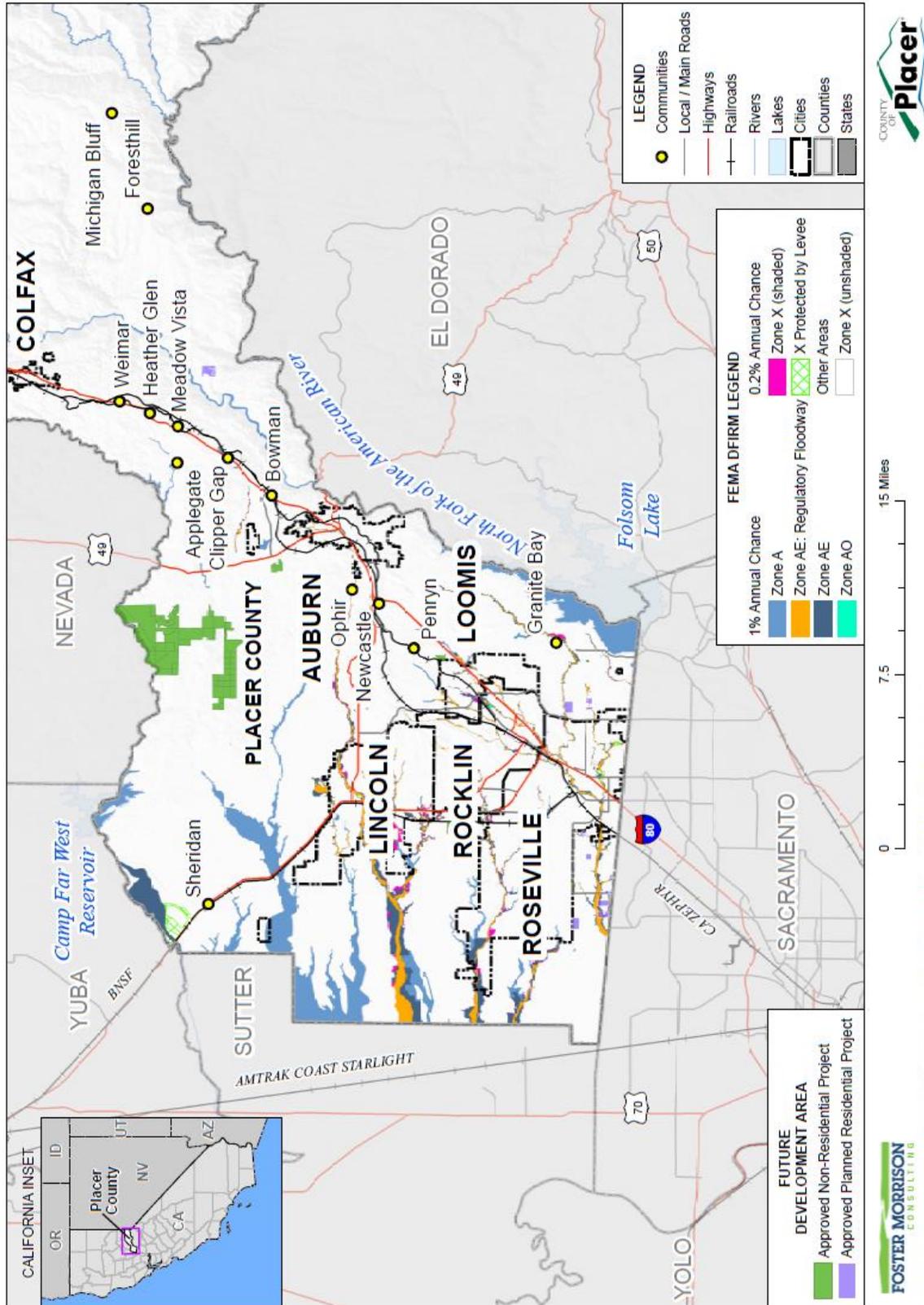
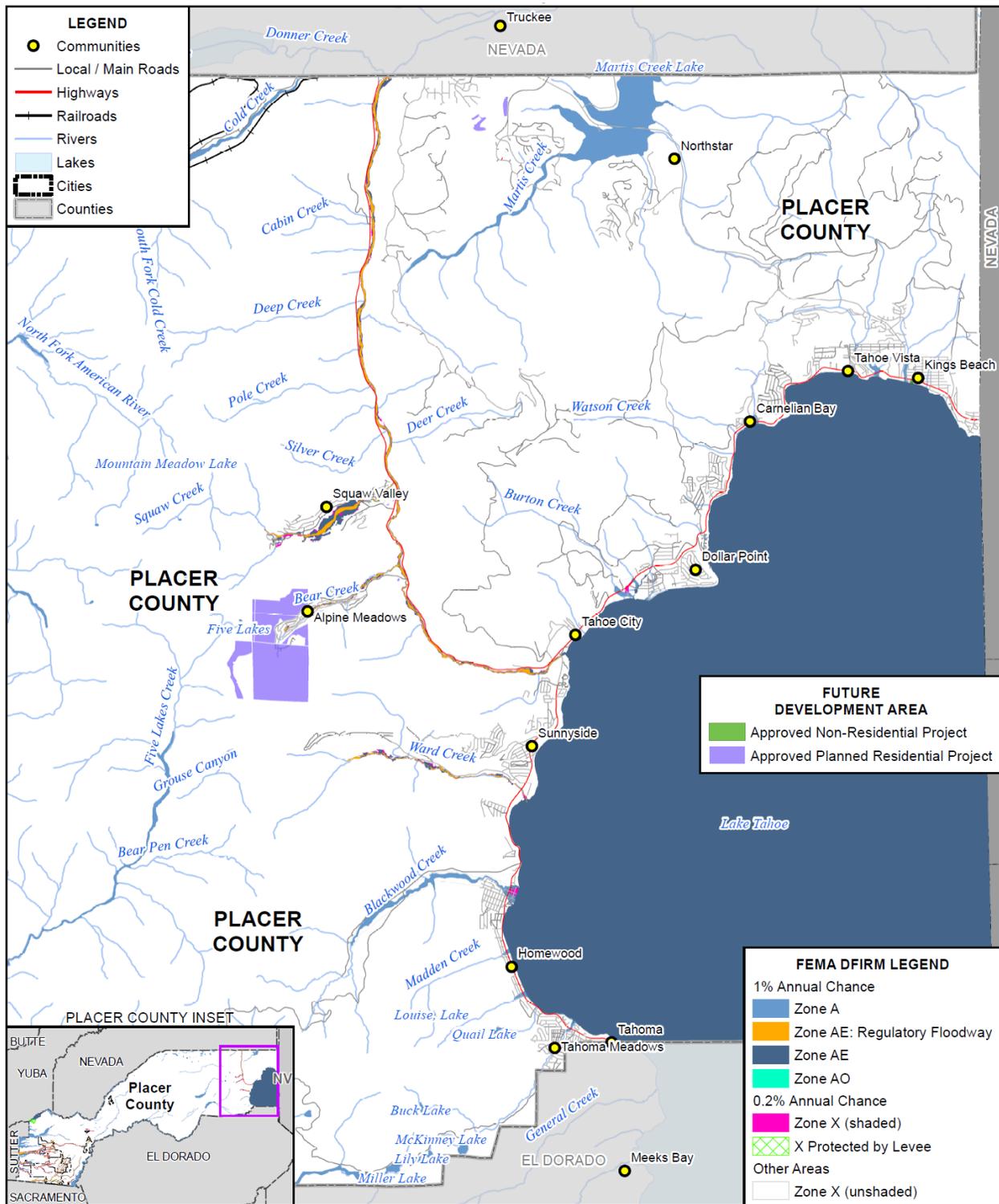


Figure 4-85 Unincorporated Placer County – East Future Development in FEMA DFIRM Flood Zones



FOSTER MORRISON CONSULTING

0 3 6 Miles

COUNTY OF Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table 4-96 Unincorporated Placer County – Future Development in FEMA DFIRM Flood Zones

Flood Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
1% Annual Chance Flood Hazard			
Zone AE			
<i>Approved Planned Residential Project</i>			
Brookwood Estates	1	0	8.3
Glen Willow	1	0	84.0
Approved Planned Residential Project Total	2	0	92.3
Zone AE Total	2	0	92.3
1% Annual Chance Flood Hazard Total	2	0	92.3
Other Areas			
Zone X (unshaded)			
<i>Approved Planned Residential Project</i>			
Alpine Sierra Subdivision	2	0	44.4
Alpine Village Apartments	1	1	1.7
Barton Ranch	13	0	10.0
Belcara Planned Development	3	2	170.7
Brady Estates	1	0	4.9
Brady Vineyard	2	0	32.6
Dollar Creek Crossing	1	0	0.7
Double S Ranch	1	1	36.7
Hopkins Village	2	0	0.2
Lake Vista Estates	2	0	35.5
Mariposa (Parcel J)	4	0	1.8
Mason Trails	1	0	77.5
Morgan Knolls	1	0	15.8
Morgan Place	1	0	11.5
Morgan Ranch (formerly Whisper Creek)	10	3	4.2
Palisades at Squaw	71	16	19.9
Park at Granite Bay	7	1	16.0
Placer Vineyards Property 4B	2	0	22.8
Placer Vineyards Property 7	1	0	92.2

Flood Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Premier Soleil Townhomes	2	0	8.2
Rancho Del Oro	1	0	117.5
Saber City	2	0	5.0
Schaffer's Mill	2	1	43.3
Ventura at Granite Bay	1	0	6.1
White Wolf Subdivision	6	1	1,105.4
Whitehawk I	1	0	17.6
Whitehawk II	1	0	32.0
Approved Planned Residential Project Total	142	26	1,934.2
Approved Non-Residential Project			
Baseline Commercial Center	2		7.0
Catuna Residential Care Home	1	1	2.2
Hidden Falls Regional Park Trail Expansion Project	63	9	5,263.9
Lakeside Redevelopment	7	7	1.9
Placer County Government Center Master Plan Update	2		106.5
Placer Gold Industrial Park	8	1	286.7
Quarry Ridge Professional Office Park	1		3.0
United Auburn Indian Community Tribal School	1	1	42.3
Approved Non-Residential Project Total	85	19	5,713.5
Zone X (unshaded) Total	227	45	7,647.6
Other Areas Total	227	45	7,647.6
Grand Total	229	45	7,739.9

Source: Placer County GIS, FEMA 11/2/2018 DFIRM

4.3.13. Flood: Localized Flooding

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Localized, stormwater flooding also occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

Location and Extent

According to Placer County, numerous parcels and roads throughout the County not included in the FEMA 1% and 0.2% annual chance floodplains are subject to flooding in heavy rains. In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, mudslides, debris areas, and downed trees. The frequency and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff. There is no established scientific scale or measurement system for localized flooding. Localized flooding is generally measured by depth of flooding and the area affected. Localized flooding often happens quickly and has a short speed of onset. Localized flooding often has a short duration. Localized flooding areas in the County are shown in Table 4-63.

Table 4-97 Placer County Localized Flooding Areas

Road Name
Flooding
Industrial Ave, South of Athens
PFE Road, 1 mile west of Walegra
Bianchi Estates – Muirwood Lane, Blackwood Lane, Kenwood Way
Watt Avenue – south of Dyer Lane
Walerga Road Bridge at Dry Creek
Barton Road – at Linda Creek
Dry Creek Road – at Black Oak Road
Dry Creek Road – between Greenstone Ct and parkway
Ayers Holmes Road
Soda Springs Road – at Wabena Creek
Brewer Road – south of Jackson Road
Locust Road – south of Jackson Road
Landslides/Mudslides
Old Foresthill Road
Yankee Jims Road
Downed Trees
Virginiatown Rd (Fowler Rd – Gold Hill Rd)
Fruitvale Road (Garden Bar Rd – Gold Hill Rd)

Road Name
Mt. Pleasant Rd (Mt Vernon Rd – Crosby Harold Rd)
Mt. Vernon Road (Collins Dr – Wise Rd)
Gold Hill Road (Hwy 193 – Wise Rd)
Baxter Grade Road (Wise Rd – Mt. Vernon Rd)
Val Verde Road (Horseshoe Bar Rd – Wells Rd)
Auburn-Folsom Road (Auburn City Limits – King Rd)
Auburn-Folsom Road (Los Lagos – Douglas Blvd)
Wise Road (Ophir Rd – Garden Bar Rd)

Source: Placer County

Past Occurrences

Disaster Declarations

There are no identified state or federal disaster declarations for localized flooding, as shown in Table 4 4. However, localized flooding was likely an issue during previous declarations for severe storms, heavy rains and floods. The County had no USDA disaster declarations since 2002 related to localized flood, as shown on Table 4-6.

NCDC Events

The past occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile in Section 4.2.10.

Hazard Mitigation Planning Committee Events

In 2017, heavy rains fell in January and February, causing localized flooding and road closures. Road closures from these events are shown on Figure 4-86 and detailed in Table 4-98.

Figure 4-86 Placer County – 2017 Road Closure Locations

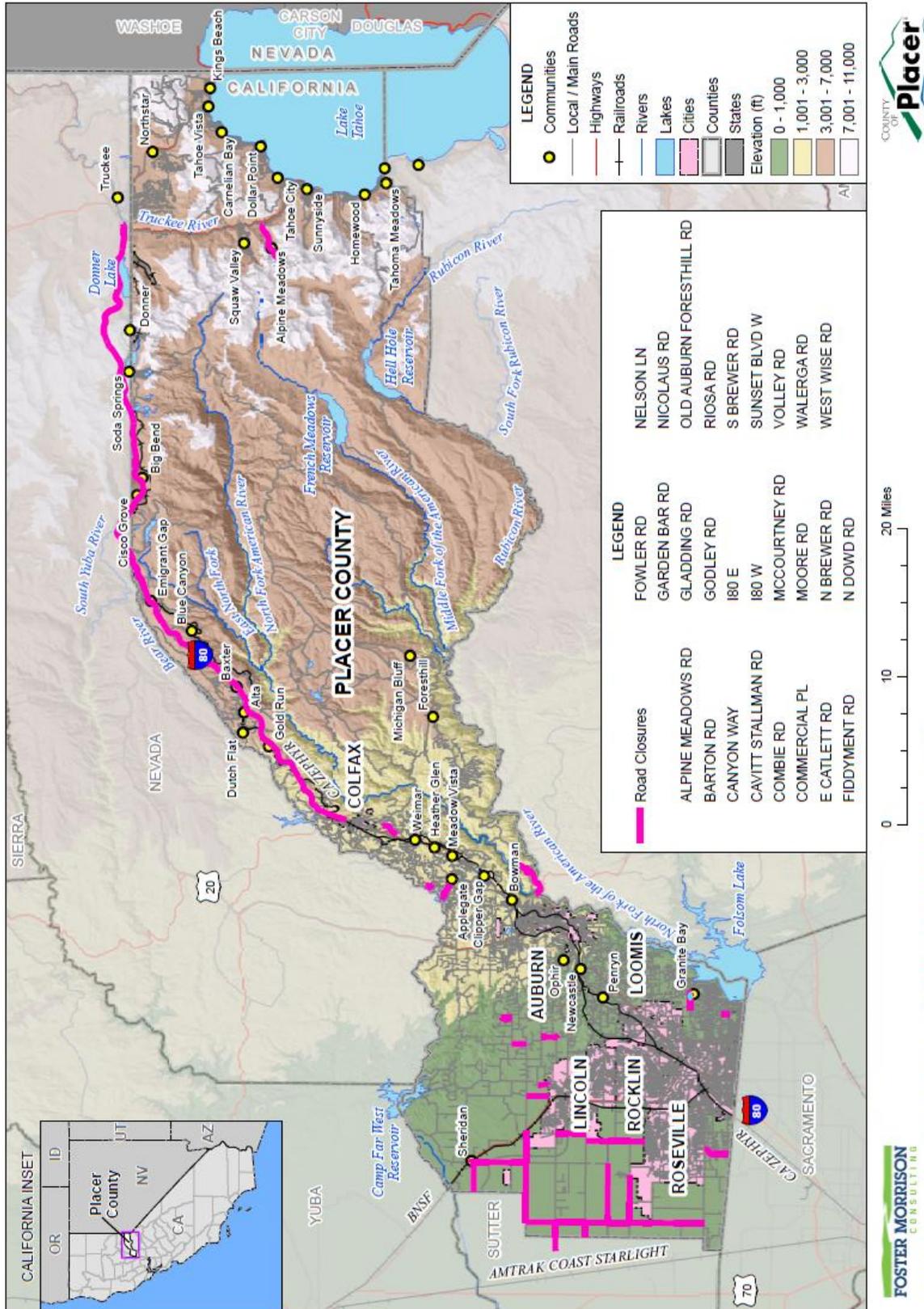


Table 4-98 Placer County – 2017 Road Closures

Road Names	Road Segments
Road Closures	
ALPINE MEADOWS RD	9
BARTON RD	4
CANYON WAY	4
CAVITT STALLMAN RD	5
COMBIE RD	3
COMMERCIAL PL	2
E CATLETT RD	2
FIDDYMENT RD	4
FOWLER RD	3
GARDEN BAR RD	2
GLADDING RD	1
GODLEY RD	2
I80 E	51
I80 W	15
MCCOURTNEY RD	1
MOORE RD	1
N BREWER RD	1
N DOWD RD	2
NELSON LN	4
NICOLAUS RD	2
OLD AUBURN FORESTHILL RD	2
RIOSA RD	1
S BREWER RD	9
SUNSET BLVD W	2
VOLLEY RD	11
WALERGA RD	5
WEST WISE RD	7
(blank)	1
Road Closures Total	156

Likelihood of Future Occurrence

Highly Likely— With respect to localized, stormwater flood issues, the potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. Urban storm drainage systems have a finite capacity. When rainfall exceeds this capacity or systems clog, water

accumulates in the street until it reaches a level of overland release. With older infrastructure, this type of flooding will continue to occur on an annual basis during heavy rains.

Climate Change and Localized Flood

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability Assessment

Vulnerability—Medium

Historically, the Placer County Planning Area has been at risk to flooding primarily during the winter and spring months when stream systems in the County swell with heavy rainfall. Localized flooding also occurs throughout the Planning Area at various times throughout the year with several areas of primary concern unique to each community as detailed above.

Impacts

Localized flooding can cause damage to roads, infrastructure and utilities, as well as to buildings in the County. Temporary road closures due to localized flooding can be a significant issue in the County. In addition to flooding and road closures, damage to these areas during heavy storms includes, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. Local community service districts have seen infiltration and inflow into sewer systems during heavy rain and localized flooding events. Power outages can be a significant concern during these events, especially in those areas that rely on pumping to alleviate local flood conditions. Life safety issues from localized flooding would be more limited. Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.

Future Development

The potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding.

Any floodplain modeling and master planning should be based on the ultimate built-out land use in order to assure that all new development remains safe from future hydrologic conditions. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can continue to result in floodplain impacts.

4.3.14. Landslides, Mudslides, and Debris Flows

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard. Another type of landslide, debris flows, also occur in some areas of the County. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows also occur in post-wildfire burn areas.

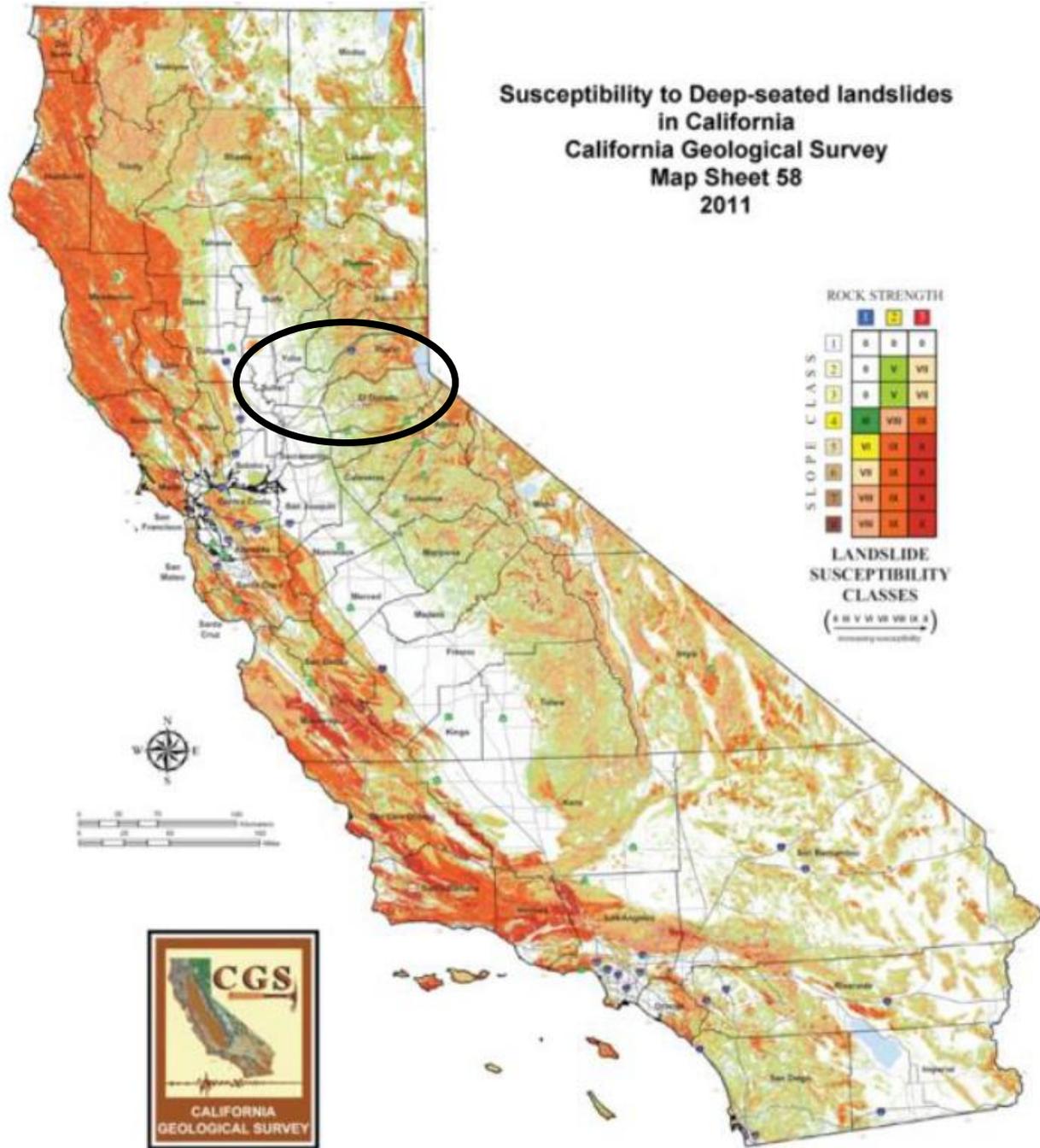
Landslides often accompany or follow other natural hazard events, such as floods, wildfires, or earthquakes. A discussion on the effects of wildfire on landslides and debris flows is included in the wildfire profile in Section 4.3.17. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Location and Extent

The California Geologic Survey has created maps showing areas of landslide susceptibility. According to the CGS, risk is a combination of slope class and rock strength. This can be seen on Figure 4-87. A measure of risk is shown in the legend, while areal extents for the County are shown as well.

Figure 4-87 Landslide Susceptibility



Source: California Geologic Survey

The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Landslides, or ground failure, are dependent on slope, geology, rainfall, excavation or seismic activity. Mudslides are often caused by heavy rainfall. Areas that have recently been subject to wildfire are susceptible to mud slides. The Placer County General Plan Background Report describes areas in Placer County that are particularly prone to landslides. Slope instability and landslide hazards are generally found in areas of eastern Placer County, as seen in active and inactive landslide deposits. Two specific Rock Units identified in the Background Report which show evidence of past landslide activity (and are still considered active landslide areas) include the Valley Springs Tuff, located at Alta and Interstate 80, and Metavolcanic Flows, located in the canyons of the North Fork of the American River. The inactive landslide deposit areas in Placer County include the metavolcanic flow rock units along the canyon slopes of the North and Middle Forks of the American River, and along the Truckee River. Although these landslide areas are no longer active, they could be reactivated by either natural erosion or human activities. Other potential landslide areas identified by the HMPC include Interstate 80 east of Colfax and State Route 49 south of Auburn.

With heavy rain events, landslides/mudslides occur causing road closures for hours and days at a time in some areas. Foresthill road, Old Foresthill road, and Iowa Hill road are areas of recent landslides. Also post fire conditions in any burn scar areas are a concern. Identified by the HMPC, recent landslide areas of concern include the following:

- Alpine Meadows Road
- Alta Forestry Road
- Casa Loma Road
- Foresthill Road
- Norton Grade Road
- Old Foresthill Road
- Ophir Road (two sites) – (1) near Stonehouse Road and (2) near Wise Road
- Rollins Lake Road
- Yankee Jim’s Road
- Middle Fork American River / North Fork American River / Rubicon River canyons Fires burn the material and soils which cause landslides and debris flow into the river and to downstream electric powerhouses and water treatment facilities

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with landslides in Placer County, as shown in Table 4-4. The County had no USDA disaster declarations since 2002 related to landslides, as shown on Table 4-6.

NCDC Events

The NCDC contains no records for landslides in Placer County.

Hazard Mitigation Planning Committee Events

The HMPC reported the following events of landslide in the County:

Notable landslides of record include the following landslides in the Tahoe area along the Truckee River, Squaw Creek, and Bear Creek rivers associated with the 1997 Flood event:

- **Wayne Road Landslide** – The Wayne Road Landslide was the most significant of the three landslides. The Wayne Road Landslide is actually the result of two separate failures occurring in separate drainages. The drainages meet just upslope of the impacted area directly west of the intersection of Sandy Way and Wayne Road. Based on information provided by local residents and Placer County personnel, the homes in the area were also impacted by landsliding in 1982 and in 1986. The 1982 event was larger than the 1986 event. Placer County personnel stated that, following the 1986 landslide, several small sedimentation basins were constructed north of Sandy Way in an attempt to contain future slide debris. These sedimentation basins were obliterated by slide debris during the 1997 event. Slide debris consisted of saturated, loose, silty sand and sandy silt with rock ranging in size from gravel to boulders up to 4 feet in diameter. The debris plugged existing culverts and several feet of slide debris were deposited against the sides of several residences.
- **Sandy Way Landslide** – The Sandy Way Landslide occurred approximately one-quarter mile west of the Wayne Road Landslide, originating just west of Squaw Summit Road, and deposited significant debris upslope of several residences on Sandy Way.
- **Navajo Court Landslide** – The Navajo Court Landslide originated just east of a 300,000-gallon water storage tank located above the intersection of Navajo Court and Squaw Summit Road. The landslide debris flowed downslope, inundating the intersection of Navajo Court and Squaw Summit Road and plugged two culverts beneath Squaw Summit Road. The channel was rerouted to the west and flowed down both sides of Navajo Court, eroding new gullies on both sides of the road. Debris continued downslope, plugged two culverts beneath Christy Lane and deposited a significant amount of debris in the parking lot behind the post office on Squaw Valley Road.
- The County noted that there were post-wildfire landslides after the **2004 Star** and **2014 Kings** fire issues that PCWA is still cleaning out of waterways yearly as of 2021.
- **2011** – A landslide event occurred which damaged PG&E canals inside the County.
- On **February 10, 2017** heavy rains lead to a mudslide and rockslide that closed all lanes of traffic on Interstate 80 in the Alta, CA area. It took CalTrans several days to clean-up the slide and put in temporary barriers and fixes in place until the ground dried up enough to make more permanent fixes. The barriers still exist, but slope stabilization techniques were utilized to reduce but not eliminate the risk of slope failure in this specific location.
- **2018** – Two slides occurred. One at Blacksmith Flat, and the other at Interbay Road. This can be seen on Figure 4-87 and Figure 4-88 . More info can be found in the PCWA Annex to the Plan Update.

Figure 4-88 2018 Blacksmith Road Landslide



Source: PCWA

Figure 4-89 2018 Interbay Road Landslide



Source: PCWA

The County noted that other recent landslides areas include: Old Foresthill Road, Ophir Road (two sites - one near Stonehouse Road and another near Wise Road), and around Yankee Jims Road.

Likelihood of Future Occurrence

Likely—Based on data provided by the HMPC, minor landslides have occurred in the past, probably over the last several hundred years, as evidenced both by past deposits exposed in erosion gullies and recent landslide events. With significant rainfall, additional failures are likely to occur within the identified landslide hazard areas. Given the nature of localized problems identified within the County, minor landslides will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

Climate Change and Landslide and Debris Flows

Climate change and its effect on landslide and debris flows in the County has been discussed by two sources:

- Placer County Sustainability Plan – 2020
- CAS – 2014

Placer County Sustainability Plan

Climate change is expected to cause an increase in intense levels of precipitation, and heavy rainfall or snowfall could increase the number of landslides or make landslides larger than normal. Vegetation, which helps to hold the material of a hillside together, can be stripped away by climate exposures such as increased wildfires, droughts, or disease/pest infestations. Without vegetation to help stabilize the slope, hills may be more likely to slide.

CAS

According to the CAS, climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.3. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability Assessment

Vulnerability—Low

Landslides in Placer County include a wide variety of processes resulting in downward and outward movement of soil, rock, and vegetation. Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Due to the low significance rating for landslide in Placer County, no mapped or tabular analysis was performed.

However, members of the HMPC did note that with the increasing amount of catastrophic fires that Placer County (and the West Coast) has seen in recent years the County has been inundated with a new type of land slide and the costs are tremendous. After both of two recent fires the County has seen the areas within river canyons burn and the materials (both soil and tree remains) slide into the waterways and cause damage to our hydroelectric power system and the water treatment. In addition, it was required to dredge the rivers in successive years as well as remove the logs that cause damage. Overall, approximately \$15 million has been spent to repair the damage and loss of income from the aftereffects. It is also anticipated that there will be a need to perform this work for several more years as the soil and logs continue to slide into the river ways.

Impacts

Impacts from landslides in the County can vary greatly. In unpopulated areas, landslides have little effect except to the extent they fill in waterways and create flooding issues, water conveyance and introduce contaminants. However, if landslides occur in populated areas, damages can be sustained by buildings, critical facilities, infrastructure, and injuries, and in extreme cases deaths, can occur. Landslide can affect ingress and egress routes. Many locations in the County have limited ingress and egress routes. Cutting

off one of these routes can cause multiple issues, from issues with elderly and those who are sick, to limiting emergency response to hazards from police, fire, and other County entities.

Future Development

Although new growth and development corridors could fall in the area affected by moderate risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide areas will continue to occur.

4.3.15. Levee Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

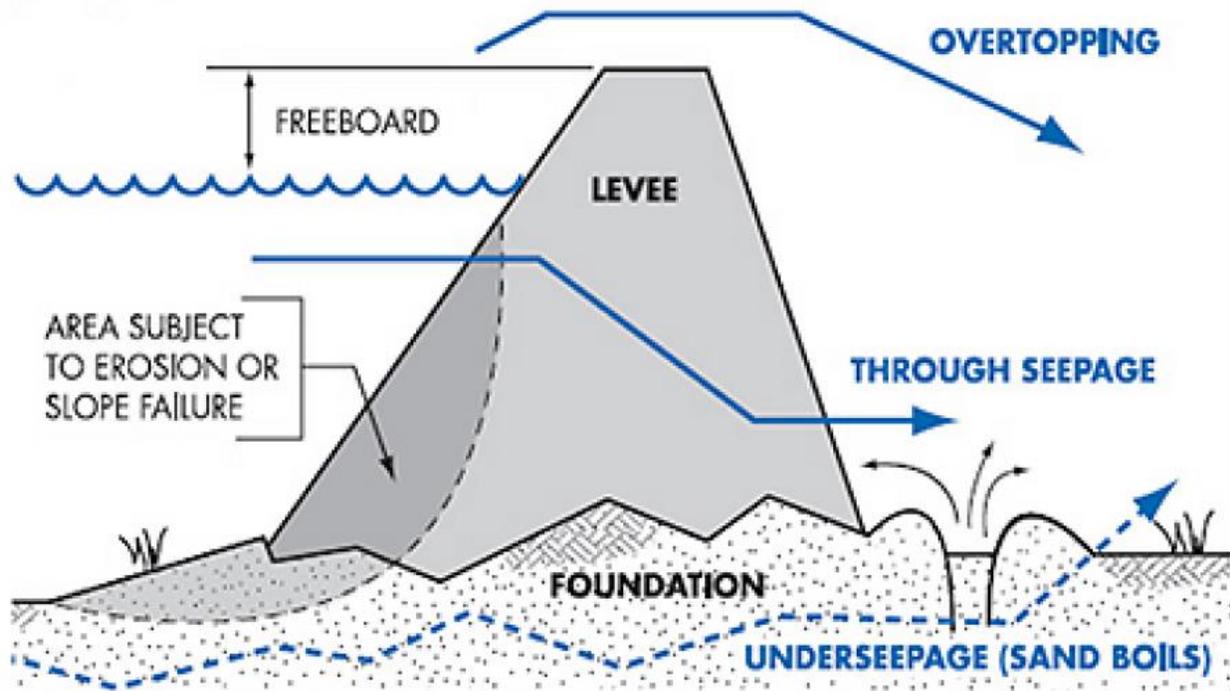
Hazard/Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high-water velocities. It is important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

In addition to overtopping, levee systems can fail or be compromised in a variety of ways. Under-seepage refers to water flowing under the levee through the levee foundation materials, often emanating from the bottom of the landside slope and ground surface and extending landward from the landside toe of the levee. Through-seepage refers to water flowing through the levee prism directly, often emanating from the landside slope of the levee. Both conditions can lead to failure by several mechanisms, including excessive water pressures causing foundation heave and slope instabilities, slow progressing internal erosion, and piping leading to levee slumping. Rodents can burrow into and compromise the levee system. Erosion can also lead to levee failure. Figure 4-90 depicts potential of levee failure.

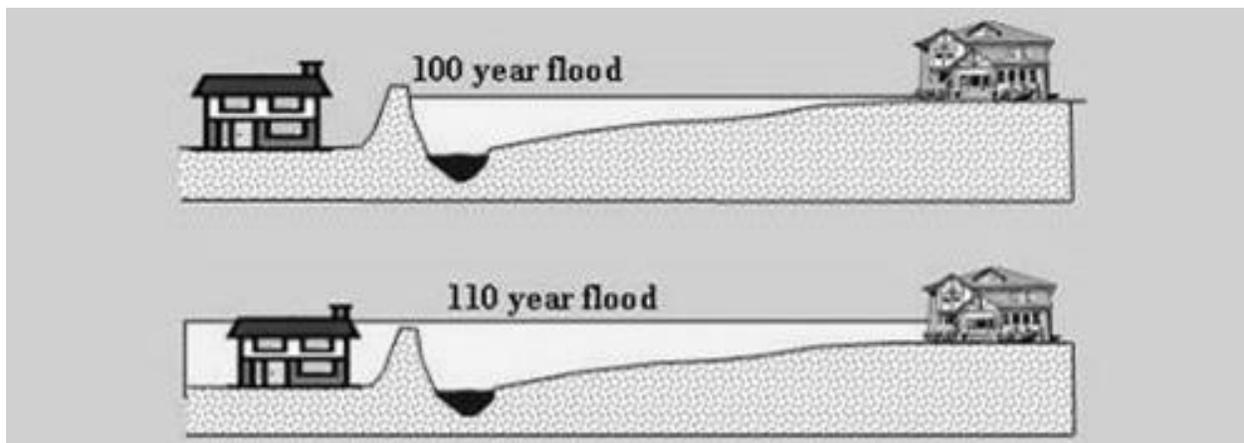
Figure 4-90 Potential Causes of Levee Failure



Source: USACE

Overtopping failure occurs when the flood water level rises above the crest of a levee. As shown in Figure 4-91, overtopping of levees can cause greater damage than a traditional flood due to the often lower topography behind the levee.

Figure 4-91 Flooding from Levee Overtopping



Source: *Levees in History: The Levee Challenge*. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

In addition to the above levee failure causes, streambank erosion can cause levees to fail. When flood waters are high, there is greater erosive capabilities of water. In addition, high winds during times of

flooding can cause additional erosive pressures on levees. Streambank erosion was discussed in more detail in the flood profile of Section 4.3.12.

Location and Extent

The 2018 FIS contained a list of levees in the County. FEMA coordinated with the USACE, the local jurisdictions, and other organizations to compile a list of levees that exist within Placer County. Table 4-99 lists all accredited levees, PALs, and de-accredited levees shown on the FIRM for the FIS. Other categories of levees may also be included in the table. It should be noted that there are levees in the City of Roseville; however, since they are not a participant to this Plan Update, they are not included here.

Table 4-99 Placer County – Levees in FIS

Jurisdictions	Flooding Source	Levee Location	Levee Owner	USACE Levee	Levee ID	Covered under PL84-99 Program?	FIRM Panel
City of Lincoln	Auburn Ravine	Right Bank	City of Lincoln	No	1905047042	No	06061C0718H
Placer County	Bear River	Left Bank	RD 1001	No	1901047016	No	06061C0395H 06061C0685H
Placer County	Bear River	Right Bank	RD 2103	No	1905047000	No	06061C0395H
City of Roseville	Linda Creek	Right Bank	City of Roseville	No	1905047001	No	06061C1032H
City of Roseville	Linda Creek	Right Bank	City of Roseville	No	1905047039	No	06061C1032H
City of Roseville	Linda Creek	Left Bank	City of Roseville	No	1905047040	No	06061C1051H
City of Roseville	Linda Creek	Right Bank	City of Roseville	No	1905047012	No	06061C1051H

Source: Placer County 11/2/2018 Flood Insurance Study

A map of the levees from the National Levee Database (NLD) in the County is shown on Figure 4-92.

Likelihood of Future Occurrence

Unlikely – Due to the low number of past events and the small volume of levees in Placer County, future levee failures should be considered unlikely. It should be noted that the average age of levees in the County is 63 years, according to the NLD.

Climate Change and Levee Failure

In general, increased flood frequency in California is a predicted consequence of climate change. Mechanisms whereby climate change leads to an elevated flood risk include more extreme precipitation events and shifts in the seasonal timing of river flows. This threat may be particularly significant because recent estimates indicate the additional force exerted upon the levees is equivalent to the square of the water level rise. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods.

Vulnerability Assessment

Vulnerability—Low

Levee failure flooding can occur as the result of partial or complete collapse of an impoundment, and often results from prolonged rainfall and flooding. The primary danger associated with dam or levee failure is the high velocity flooding of those properties downstream of the breach. Impacts from this include property damage, critical facility damage, and life safety issues. A levee failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to levee failures is generally confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions.

Vulnerability Analysis

There are two analyses sections below:

- DFIRM X Protected by Levee GIS Analysis
- National Levee Database Analysis

DFIRM X Protected by Levee GIS Analysis

This risk assessment for the Placer County LHMP Update assesses the levee failure hazard specific to Placer County. Existing studies, maps, historical data, and federal, state, and local community expertise and knowledge contributed to this current levee failure assessment for Placer County. An evaluation of the success of completed and ongoing flood control and levee improvement projects and associated maintenance aspects contributed to this levee hazard assessment and the resulting levee failure mitigation strategy for the Placer County Planning Area. This flood risk assessment for this LHMP Update also includes an assessment of future flooding conditions based on historic development in the floodplains and proposed future development as further described throughout this plan. The levee failure vulnerability assessment that follows focuses on the flood hazard based on FEMA DFIRMs.

Placer County has a FEMA effective DFIRM dated 11/2/2018, which was obtained from the National Flood Hazard Layer to perform the levee failure analysis. The X Protected by Levee DFIRM flood zone was extracted from the DFIRMs and analyzed. The effective FEMA flood maps were shown on Figure 4-73 in the Flood:1%/0.5%/0.2% Annual Chance discussion above.

Quantifying the values at risk and estimating losses within mapped FEMA floodplains, including the X-Protected by Levee flood zone, in the County is an important element in understanding the risk and vulnerability of the Placer County Planning Area to the levee failure hazard. The following methodology was followed in determining improved parcel counts and values at risk to levee failure events.

Placer County’s 2020 Parcel and Assessor Data, obtained from Placer County, was used as the basis for the county inventory of parcels, values, and acres. Placer County has a FEMA Q3/DFIRM dated 6/16/2015 which was utilized to perform the levee analysis. This analysis follows the same methodology provided in Section 4.3.10 for the flood hazard. Based on this analysis, values at risk to a levee failure in the County is provided for Placer County Planning Area and the unincorporated County in the below results section.

The end result of the values at risk and flood loss estimates analysis is an inventory of the numbers, types, and values of parcels and estimated losses subject to the levee failure flooding. Results are presented here first for the Placer County Planning Area and secondly for unincorporated County. Results for the incorporated jurisdictions are presented in their annexes to this Plan.

Placer County Planning Area Assets at Risk

Table 4-100 contain levee failure flood analysis results for Placer County. These tables show the number of parcels and values at risk in the X Protected by Levee flood zone for Placer County. Table 4-84 shows a summary of the value of improved parcels in levee protected flood zones in the Planning Area. More details regarding levee flood zones in each jurisdiction can be found in their respective annexes to this Plan Update.

Table 4-100 Placer County Planning Area – Count and Value of Parcels* in X Protected by Levee Flood Zone by Jurisdiction

Jurisdiction/ Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
City of Lincoln						
X Protected by Levee	51	48	\$3,615,466	\$9,117,055	\$4,558,526	\$17,291,047
Unincorporated Placer County						
X Protected by Levee	97	50	\$33,086,121	\$26,311,546	\$15,159,631	\$74,557,298

Source: FEMA 6/16/2015 DFIRM, Placer County 2020 Parcel/Assessor’s Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City’s website.

Unincorporated Placer County Assets at Risk

Table 4-101 contain levee failure flood analysis results for unincorporated Placer County. These tables show the number of parcels and values at risk to the 1% and 0.2% annual chance event for unincorporated Placer County. Table 4-101 breaks down the unincorporated Placer County line from Table 4-100 and shows the number of improved parcels and associated structure and other improved values at risk to the each of the FEMA flood zones using the DFIRM data by property use type.

Table 4-101 Unincorporated Placer County – Count and Value of Parcels* in X Protected by Levee Flood Zone by Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
0.2% Annual Chance Flood						
X Protected by Levee						
Agricultural	1	1	\$584,704	\$49,939	\$49,939	\$684,582
Miscellaneous	3	0	\$0	\$0	\$0	\$0
Natural / Open Space	6	3	\$1,070,925	\$353,685	\$353,685	\$1,778,295
Residential	1	1	\$235,494	\$259,044	\$129,522	\$624,060
X Protected by Levee Total	11	5	\$1,891,123	\$662,668	\$533,146	\$3,086,937

Source: FEMA 6/16/2015 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

Population at Risk

A separate analysis was performed to determine populations that reside in flood zones. Using GIS, the DFIRM flood dataset was overlaid on the improved residential parcel data. Those parcel centroids that intersect an X Protected by Levee flood zone were counted and multiplied by the Census Bureau average household size; and tabulated by flood zone (see Table 4-93).

Table 4-102 Placer County Planning Area – Residential Population at Risk in DFRIM Levee Protected Areas

Jurisdiction	X Protected by Levee	
	Improved Residential Parcels	Population at Risk
Auburn	0	0
Colfax	0	0
Lincoln	3	8
Loomis	0	0
Rocklin	0	0

Jurisdiction	X Protected by Levee	
	Improved Residential Parcels	Population at Risk
Unincorporated Placer County	1	3
Total	4	11

Source: FEMA DFIRM 11/2/2018, US Census Bureau Average Household Sizes: Auburn (2.19); Colfax (2.30); Lincoln (2.57); Loomis (2.60), Rocklin (2.68); and unincorporated Placer County (2.58)

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

The City of Roseville is not included in the calculations of populations at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Critical Facilities at Risk

No critical facilities fall in the X Protected by Levee DFIRM flood zone. As such, no analysis (maps or tables) are presented here. DFIRM flood zones and critical facilities were shown in the Flood Vulnerability section of this Plan Update on Figure 4-79, Figure 4-80, and Figure 4-81.

National Levee Database Analysis

In addition, the NLD has performed a basic analysis for each levee in the County. Information by levee follows. It is important to note, that although the National Levee Database identifies areas that the levee is protecting; these levee protected areas are not areas certified as providing protection against the 1% annual chance or other flood. It only represents those areas that the levee was designed to protect, but as they are not certified, they do not remove anyone within the protected area from the floodplain as represented in FEMA DFIRMs.

Note: Though levees protect the City of Roseville, the City is not participating in this LHMP Update. Levees in the unincorporated County and those protecting participating jurisdictions to this LHMP Update are discussed below. There is also an area in the County that is protected by the Bear River and Yankee Slough levees. This area contains only farmland, protects a small area in Placer County, and is maintained by an agency outside the County. It is not included in the discussion below.

Placer County Levee 1

Placer County Levee 1 is located near Wheatland. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 0.46 miles long. Protected areas were not quantified by the National Levee Database. The NLD noted that the levee was maintained by Reclamation District 2103. Protected areas can be seen on Figure 4-93.

Figure 4-93 Placer County Levee 1 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 0
- Structures at Risk 0
- Property Value \$0

Placer County Levee 5

Placer County Levee 5 is located in the unincorporated County. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 2.12 miles long. Protected areas were not quantified by the National Levee Database. The NLD did not contain a maintaining organization. Protected areas can be seen on Figure 4-94.

Figure 4-94 Placer County Levee 5 Protected Areas



Source: National Levee Database

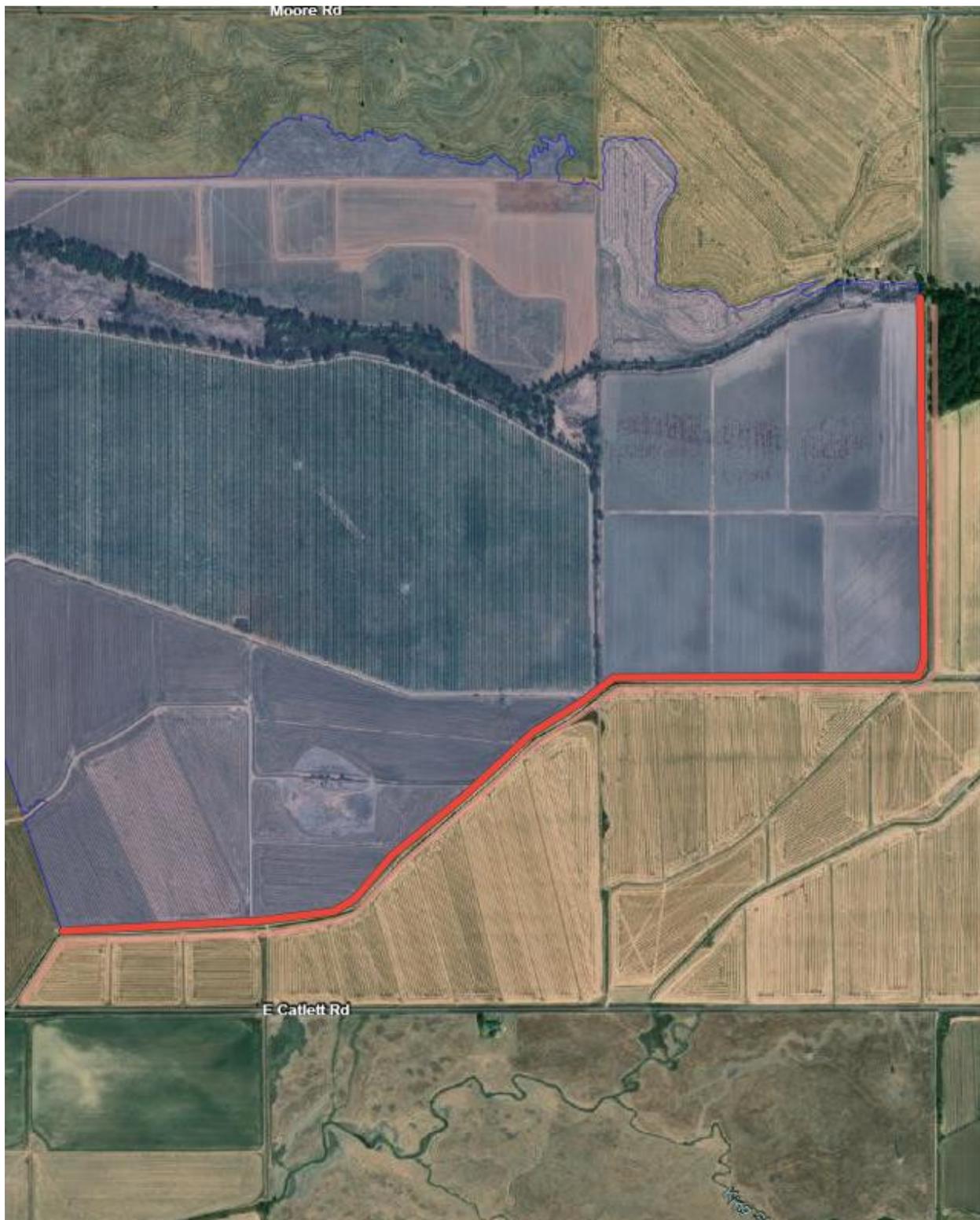
An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 1
- Structures at Risk 1
- Property Value \$444,000

Placer County Levee 6

Placer County Levee 6 is located in the unincorporated County. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 1.99 miles long. Protected areas were not quantified by the National Levee Database. The NLD did not contain a maintaining organization. Protected areas can be seen on Figure 4-95.

Figure 4-95 Placer County Levee 6 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 0
- Structures at Risk 0
- Property Value \$0

Placer County Levee 8

Placer County Levee 8 is located near Wheatland. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 0.5 miles long, and the levee protects 0.57 mi². The NLD noted that the levee was maintained by Reclamation District 2103. Protected areas can be seen on Figure 4-96.

Figure 4-96 Placer County Levee 8 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 0
- Structures at Risk 0
- Property Value \$0

Placer County Levee 9

Placer County Levee 9 is located near Wheatland. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 0.27 miles long, and protects 0.018mi². The NLD noted that the levee was maintained by Reclamation District 2103. Protected areas can be seen on Figure 4-97.

Figure 4-97 Placer County Levee 9 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 0
- Structures at Risk 0
- Property Value \$0

Impacts

Levee failure flooding and associated impacts would vary depending on which structure fails and the nature and extent of the failure and associated flooding. This flooding can present a threat to life and property, including buildings, their contents, and their use. Large flood events can affect lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, agricultural industry, and the local and regional economies. Levee failure flooding can cause many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.

Future Development

With limited levees in the unincorporated County, future development will likely not be affected by this hazard. Should levees be built, future development built in the levee areas would be subject to the building standards in the Placer County Floodplain Ordinance.

4.3.16. Pandemic

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention (CDC) has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning, preparation, and response. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the County is at risk, as pandemic is a regional, national, and international event. The speed of onset of a pandemic is usually short, while the duration is variable, but can last for

more than a year as shown in the 1918/1919 Spanish Flu as well as the current COVID-19 pandemic. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by the numbers who die.

Past Occurrences

Disaster Declaration History

There has been one state and federal disaster declaration due to pandemic, as shown in Table 4-103. The County had no USDA disaster declarations since 2012 related to pandemic, as shown on Table 4-6.

Table 4-103 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

NCDC Events

The NCDC does not track pandemic.

WHO Events

The 20th century saw three outbreaks of pandemic.

- The **1918-1919 Influenza Pandemic (H1N1)**, (aka the Spanish Flu), is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and that over 50 million people died. Approximately 675,000 deaths from the flu occurred in the U.S. alone.
- The **February 1957-1958 Influenza Pandemic (H2N2)** (aka the Asian Flu) was first identified in the Far East. Immunity to this strain was rare in people less than 65 years of age, and a pandemic was predicted. In preparation, vaccine production began in late May 1957, and health officials increased surveillance for flu outbreaks. Unlike the virus that caused the 1918 pandemic, the 1957 pandemic virus was quickly identified, due to advances in scientific technology. Vaccine was available in limited supply by August 1957. The virus came to the U.S. quietly, with a series of small outbreaks over the summer of 1957. When U.S. children went back to school in the fall, they spread the disease in classrooms and brought it home to their families. Infection rates were highest among school children, young adults, and pregnant women in October 1957. Most influenza-and pneumonia-related deaths occurred between September 1957 and March 1958. The elderly had the highest rates of death. By December 1957, the worst seemed to be over. However, during January and February 1958, there was another wave of illness among the elderly. This is an example of the potential “second wave” of infections that can develop during a pandemic. The disease infects one group of people first, infections appear to decrease and then infections increase in a different part of the population. Although the Asian flu pandemic was not as devastating as the 1918-1919 flu, about 69,800 people in the U.S. died.

- The **1968 Influenza Pandemic (H3N2)** was first detected in Hong Kong (aka the Hong Kong Flu). The first cases in the U.S. were detected as early as September of that year, but illness did not become widespread in the U.S. until December. Deaths from this virus peaked in December 1968 and January 1969. Those over the age of 65 were most likely to die. The same virus returned in 1970 and 1972. The number of deaths between September 1968 and March 1969 for this pandemic was 33,800, making it the mildest pandemic in the 20th century.

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**— 2009 H1N1 (sometimes called “swine flu”) was a new influenza virus causing illness in people. This virus was originally referred to as “swine flu” because laboratory testing showed that many of the genes in this new virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that this virus was very different from what normally circulates in North American pigs. It had two genes from flu viruses that normally circulate in pigs in Europe and Asia and bird (avian) genes and human genes. Scientists call this a “quadruple reassortant” virus. This virus spread from person-to-person worldwide, probably in much the same way that regular seasonal influenza viruses spread. On June 11, 2009, the WHO signaled that a pandemic of 2009 H1N1 flu was underway. It was first detected in the United States in early 2009 and spread to the world later that year. About 70 percent of people who were hospitalized with this 2009 H1N1 virus had one or more medical conditions previously recognized as placing people at “high risk” of serious seasonal flu-related complications. This included pregnancy, diabetes, heart disease, asthma, and kidney disease. Young children were also at high risk of serious complications from 2009 H1N1, just as they are from seasonal flu. And while people 65 and older were the least likely to be infected with 2009 H1N1 flu, if they got sick, they were also at “high risk” of developing serious complications from their illness. Some studies estimated that 11 to 21 percent of the global population at the time—or around 700 million to 1.4 billion people (of a total 6.8 billion)—contracted the illness. This was more than the number of people infected by the Spanish flu pandemic, but only resulted in about 150,000 to 575,000 fatalities for the 2009 pandemic. A follow-up study done in September 2010 showed that the risk of serious illness resulting from the 2009 H1N1 flu was no higher than that of the yearly seasonal flu. For comparison, the WHO estimates that 250,000 to 500,000 people die of seasonal flu annually.
- **2019/2020 COVID 19** – During the creation of this LHMP Update, the world was under various forms of lockdown due to COVID-19 (known also as coronavirus). Coronaviruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19. COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don’t develop any symptoms and don’t feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical

attention. As of the beginning of April 2021, there had been roughly 138 million cases worldwide, with 3 million deaths.

HMPC Events

In Placer County, businesses, schools, and governments were affected by the Covid-19 outbreak and associated lockdowns. Affects were still being felt in June of 2021 (the date of this Plan Update). As of mid-June 2021, there had been over 22,600 cases of Covid-19 in the County and around 292 deaths.

Likelihood of Future Occurrence

Likely – The calculation for future occurrence of pandemic must first be considered in light of circumstances. The diseases are naturally occurring in the populations that reside in the County. In addition, this Plan Update is not examining the pandemic potential of these diseases, but instead examines when these diseases manifest in severe injury or fatalities among humans. Given these assumptions and the five outbreaks since 1900, the likelihood of future occurrence is considered likely.

Climate Change and Pandemic

There is much evidence of associations between climatic conditions and infectious diseases. These include several infectious diseases, health impacts of temperature extremes and impacts of extreme climatic and weather events. Changes in infectious disease transmission patterns are a likely major consequence of climate change. It will be important to learn more about the underlying complex causal relationships, and apply this information to the prediction of future impacts, using more complete, better validated, and integrated models.

Vulnerability Assessment

Vulnerability—High

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the County, but can have a significant economic impact on small businesses and others in a community. Pandemic can have varying levels of impact to the citizens of the County, depending on the nature of the pandemic.

Impacts

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) and unemployment rose

significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards. Overall, a Pandemic can result in significant economic impacts to affected communities.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the County could increase exposure to pandemic, and increase the ability of each disease to be transmitted among the population of the County. If the median age of County residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens as well as more vulnerable populations. During 2020, it was reported that one in five adults moved due to COVID-19 or know someone who did according to Pew Research. Many college aged students moved back home, which increased populations in the areas in which they returned.

4.3.17. Seiche

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

U.S. Army Corps of Engineers defines seiche as:

- A standing wave oscillation of an enclosed water body that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric.
- An oscillation of a fluid body in response to a disturbing force having the same frequency as the natural frequency of the fluid system. Tides are now considered to be seiches induced primarily by the periodic forces caused by the sun and moon.
- In the Great Lakes area, any sudden rise in the water of a harbor or a lake whether or not it is oscillatory (although inaccurate in a strict sense, this usage is well established in the Great Lakes area).

Seiches can be generated when the water is subject to changes in wind or atmospheric pressure gradients or, in the case of semi-enclosed basins, by the oscillation of adjacent connected water bodies having a periodicity close to that of the seiche or of one of its harmonics. Other, less frequent causes of seiches include heavy precipitation over a portion of the lake, flood discharge from rivers, seismic disturbances, submarine mudslides or slumps, and tides. The most dramatic seiches have been observed after earthquakes.

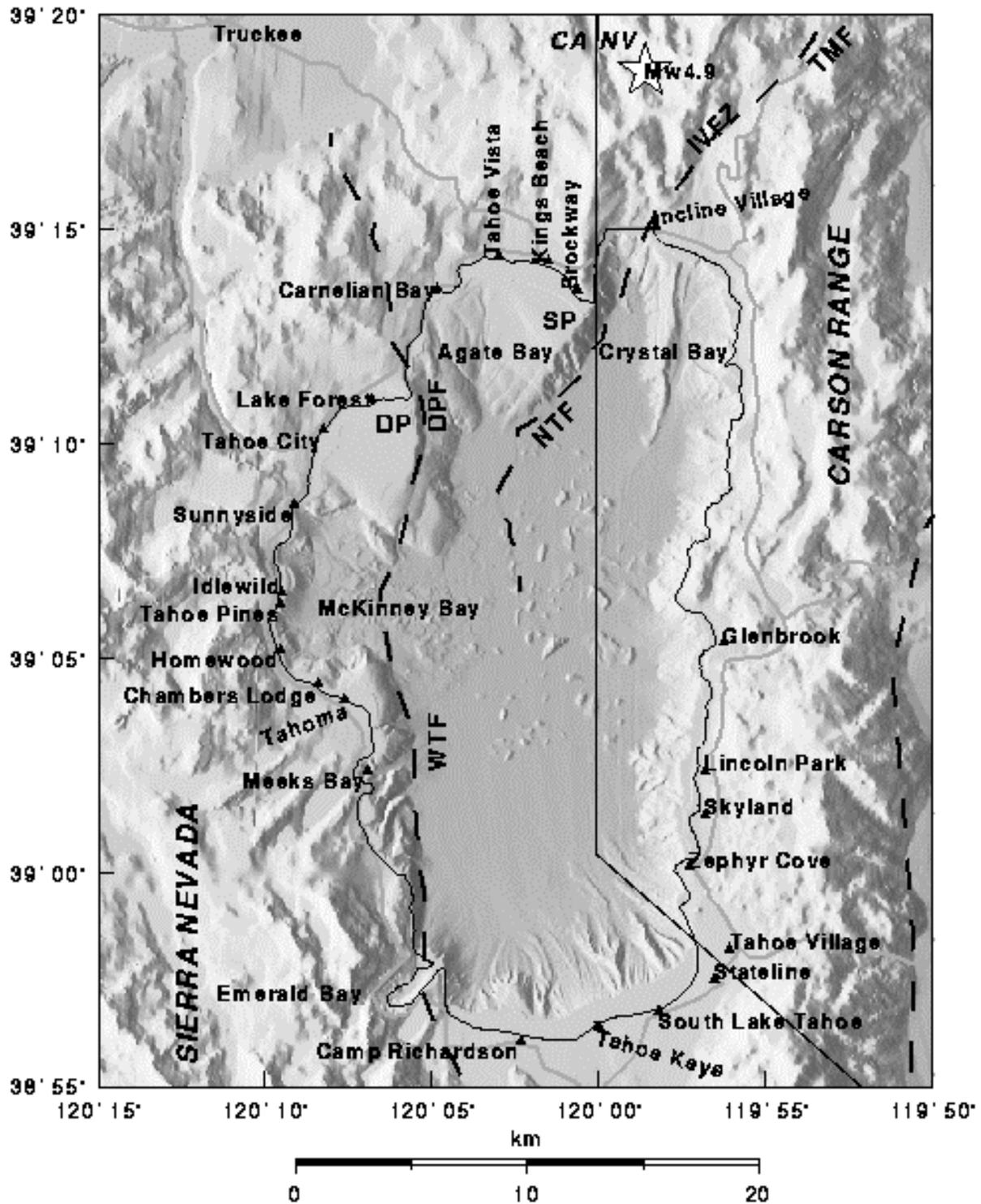
Another way a seiche can occur is a sudden land tilt or drop as a result of fault rupture or other seismic activity. Computer modeling by a group at the University of Nevada at Reno working with a Japanese tsunami expert showed ruptures along either fault could lift or drop the bottom the lake and possibly generate a tsunami. The tsunami in turn could trigger seiche waves within seconds that could crisscross the lake, reach heights of 30 feet or more, and persist for hours.

Location and Extent

Within Placer County, locations with the highest probability of impact are shore areas of Lake Tahoe from 0 to 30 feet above mean lake water level. Speed of onset of seiche is short. The duration of the event tends to be short as well, continuing until the waves naturally dissipate.

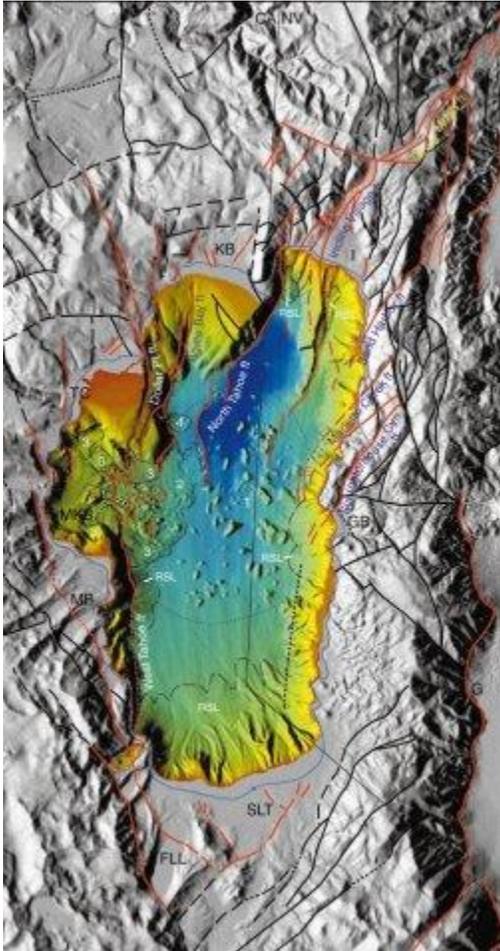
Japanese scientist Kenji Satake had created computer models that suggest the largest waves of a seiche event could hit Sugar Pine Point, Rubicon Point, and the casinos in South Lake Tahoe. Figure 4-98 shows the topography of the Lake Tahoe Basin. Figure 4-99 shows lake bathymetry, while Figure 4-100 shows fault locations.

Figure 4-98 Lake Tahoe Basin Topography



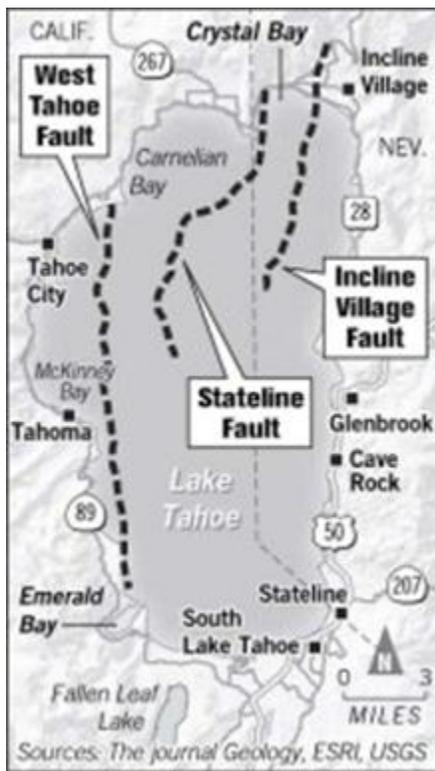
Source: The Potential Hazard from Tsunami and Seiche Waves Generated by Future Large Earthquakes within the Lake Tahoe Basin, California-Nevada, 1999-2000; Gene A. Ichinose, Kenji Satake, John G. Anderson, Rich A. Schweickert, and Mary M. Lahren; Nevada Seismological Laboratory; University of Nevada; (University of Nevada 2000 study)

Figure 4-99 Lake Tahoe Bathymetry



Source: University of Nevada Seismic Laboratory, (Schweickert); USGS

Figure 4-100 Lake Tahoe Fault Locations



Source: ESRI, USGS

Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The three faults directly underneath the lake are considered capable of generating magnitude 7.0 or larger earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point, and the casinos in South Lake Tahoe.

In the event of a magnitude 7 earthquake occurring on either of two major faults under the lake, the lake bottom could drop as much as 4 meters. Water supported by the lake floor could drop a corresponding distance and generate waves that heavily impact the shoreline.

Figure 4-101 below shows three potential vertical displacement (uplift or subsidence) scenarios that could be caused by magnitude 7+ earthquakes along the three discrete fault systems in the Lake Tahoe region. These scenarios were done prior to the 2006 finding of the Stateline fault that traverses Lake Tahoe. It was not included in these scenarios.

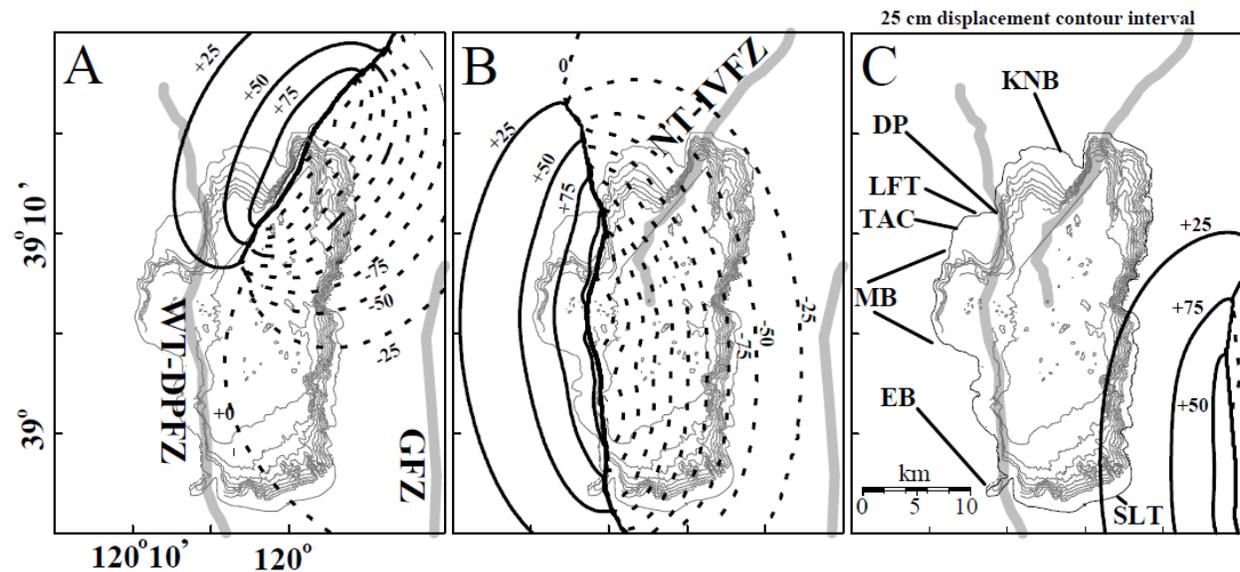
Scenario A represents an earthquake event along the North Tahoe-Incline Village Fault Zone (NT-IVFZ). This scenario projects significant subsidence (0.5-4.0 meters) to the east of the fault in the vicinity of Incline Village and across Crystal Bay and moderate uplift (0.25-1.0 meter) to the west and away from the lake. Shoreline areas near the fault rupture would be inundated due to permanent ground subsidence. Other shoreline areas would be temporarily inundated by tsunami and seiche waves. Seiche wave heights could

exceed 3 meters within shallow bays and shores between Incline Village and Carnelian Bay, and exceed 6 meters at some locations in the South Lake area.

Scenario B represents an earthquake event along the West Tahoe-Dollar Point Fault Zone (WTFZ). This scenario projects significant subsidence (0.5-4.0 meters) across the lake bottom to the east of the fault and moderate uplift (0.25-1.0 meter) to the west across McKinney Bay and away from the lake. Scenario B projects a similar pattern of seiche wave heights as Scenario A except that wave heights in some areas could be as high as 10 meters.

Scenario C represents an earthquake event along the Genoa Fault Zone (GFZ) 7-10 miles east of the lake shore. This scenario projects minor to moderate uplift (0.25-0.75 meter) to the southwest of the lake. Scenario C produces waves with average heights of 0.5 meters, indicating that magnitude 7 earthquakes along faults outside of the lake are not likely to create a large seiche event.

Figure 4-101 Contours of Vertical Component Ground and Lake Bottom Displacements



Source: The Potential Hazard from Tsunami and Seiche Waves Generated by Future Large Earthquakes within the Lake Tahoe Basin, California-Nevada, 1999-2000; Gene A. Ichinose, Kenji Satake, John G. Anderson, Rich A. Schweickert, and Mary M. Lahren; Nevada Seismological Laboratory; University of Nevada; (University of Nevada 2000 study)

Past Occurrences

Disaster Declaration History

There have been no federal or state disasters from seiche in Placer County, as shown in Table 4-4. The County had no USDA disaster declarations since 2002 related to seiche, as shown on Table 4-6.

NCDC Events

The NCDC does not track seiche events.

HMPC Events

There have been no occurrences of major seiche activity at Lake Tahoe in recent years. University of Nevada geologists have found deposits that extend for 10 miles along the McKinney Bay shore from Sunnyside through Tahoma. These deposits indicate a tsunami or seiche with 30-foot-high waves occurred approximately 7,000 years ago.

Research performed by the Scripps Institute of Oceanography in 2005 using acoustic trenching to research the lake's topography indicates that McKinney Bay was formed when a massive landslide slipped into Lake Tahoe which likely caused major seiche activity at that time. Research from the University of Nevada shows evidence of a massive landslide that tumbled from Homewood on the Nevada side.

In 1955, a landslide occurred in Emerald Bay. Seiche activity occurred. Evidence of the landslide can still be seen on the hillside near Emerald Bay.

Recent occurrences of potential causal factors include a magnitude 4.9 earthquake near Incline Village in 1998.

Likelihood of Future Occurrences

Unlikely—There have been no occurrences of major seiche activity at Lake Tahoe in recent years. Based on past occurrences, the likelihood of future occurrence in the near future is unlikely. However, given the evidence of past historical events and the location of faults within the Tahoe area, and the more recent seismic activity in the Tahoe region, a future seiche event at Lake Tahoe is a possibility.

Climate Change and Seiche

Climate change is unlikely to affect earthquake caused seiche; however, landslide caused seiche may be affected by climate change. A discussion on climate change and landslide can be found in Section 4.3.14.

Vulnerability Assessment

Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The two faults directly underneath the lake are considered capable of generating magnitude 7.1 earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point and the casinos in South Lake Tahoe. The seiche risk is potentially devastating as hundreds of houses are built along the lake and more than 17,000 people enjoy the Lake Tahoe shoreline every day in the summer.

In a recent 2008 California Statewide Exercise conducted to evaluate state and regional response capabilities, a seiche scenario was conducted on the Lake Tahoe Basin Area. The potential scenario was developed with input from researchers from the University of Nevada. This exercise scenario provides information on the potential risk and vulnerability of a seiche occurring on Lake Tahoe. The exercise timeline and ground truths provided is reproduced below:

Golden Guardian 2008 Exercise

Timeline and Ground Truths

TIMELINE:

- 8:55 am on November 6 - Mt. Rose is hit with a subterranean magnitude 6.8 earthquake, which causes minor to major damage in the Lake Tahoe Basin. An underwater shelf, in the Crystal Bay area, experiences a sluffing of a large mass of earth, which pushes a large volume of water southward and a smaller amount northward (generating seiche waves). The first wave at 6 ft in height begins to travel southward the width of the lake in Lake Tahoe at 180 miles per hour. As the wave approaches the southern part of Lake Tahoe it meets the rising floor of the lake and pushes up the wave's height to 18-20 feet. It will take the first wave 5 minutes to travel the length of the lake. The wave has pushed 6 ft of water back into Crystal Basin and the Tahoe City area. The wave caused overflow of the dam at "Fannie Bridge" causing the overflowing water downstream into the Truckee River picking up and depositing large amount of debris along the way. A large portion of Tahoe City is underwater. The South Lake Tahoe area is also heavily impacted and underwater, specifically the City of South Lake Tahoe and Tahoe Keys areas.
- 9:03 am - The second wave strikes the South Lake Tahoe area. This wave is moving at 80 miles per hour and is 18-20 feet or better in height. The water continues to push into the already damaged and submerged areas.
- 9:08 am - The second wave strikes the northern area of Lake Tahoe. There is considerable damage and debris into the lake. Any low areas around the lake are reporting damage, flooding and debris (including people and animals).
- 9:13 am - The third wave has traveled the length of the lake and struck the South Lake Tahoe area again. This one was traveling less than 80 miles per hour and is 15-19 feet in height.
- 9:18 am - The third wave strikes the northern end of Lake Tahoe. This time the wave is only traveling at 50 miles per hour and is only 12 feet in height.
- 9:23 am - The fourth and last wave strikes the South Lake Tahoe area and is traveling 30 miles per hour and only 9-12 feet in height.
- 9:28 am - The fourth and last wave strike the North Lake Tahoe area traveling 15 miles per hour and only 3-6 feet in height.

The seiche wave has traveled north to south on Lake Tahoe much like a bathtub wave. There is considerable damage in all low areas near the lake.

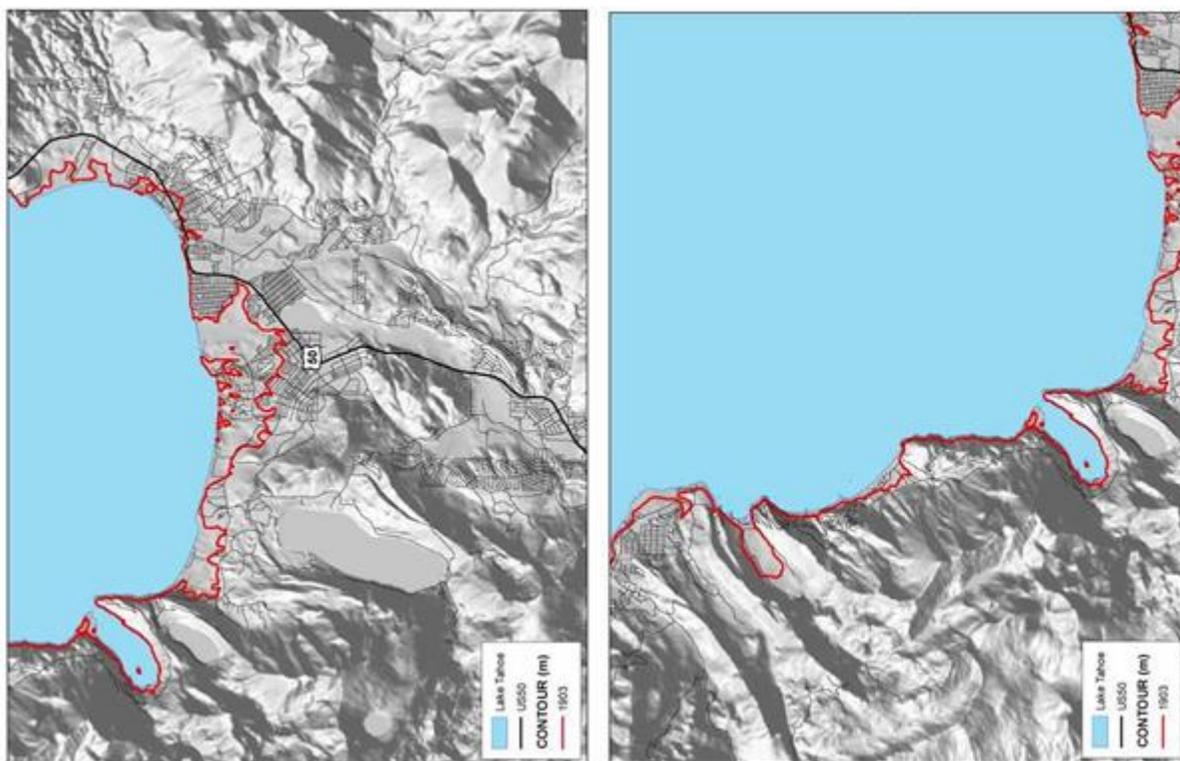
GROUND TRUTHS:

- Shoreline and nearby inland low lying areas of north Lake Tahoe of Placer County will be impacted, specifically west shores, Tahoe City and King Beach.
- HWY 89 from the "Y" south will be closed in certain sections for a minimum of 24-48 hrs due to washout of the highway and or blockage from debris.
- The large & strong waves overflowed the dam located near "Fannie Bridge" resulting HWY 89 from the "Y" north along the Truckee River corridor to close for 24-48 hrs due blockage of the highway from debris and a landslide near Alpine Meadows Road/River Ranch Inn.

- HWY 28 will be close for approx. 24 hrs due to blockage of debris, but unlike HWY 89 no damage/washout of sections of the highway.
- HWY 28 & HWY 267 junction temporarily close for approx. 12 hrs due to blockage by debris; however, HWY 267 remain open.

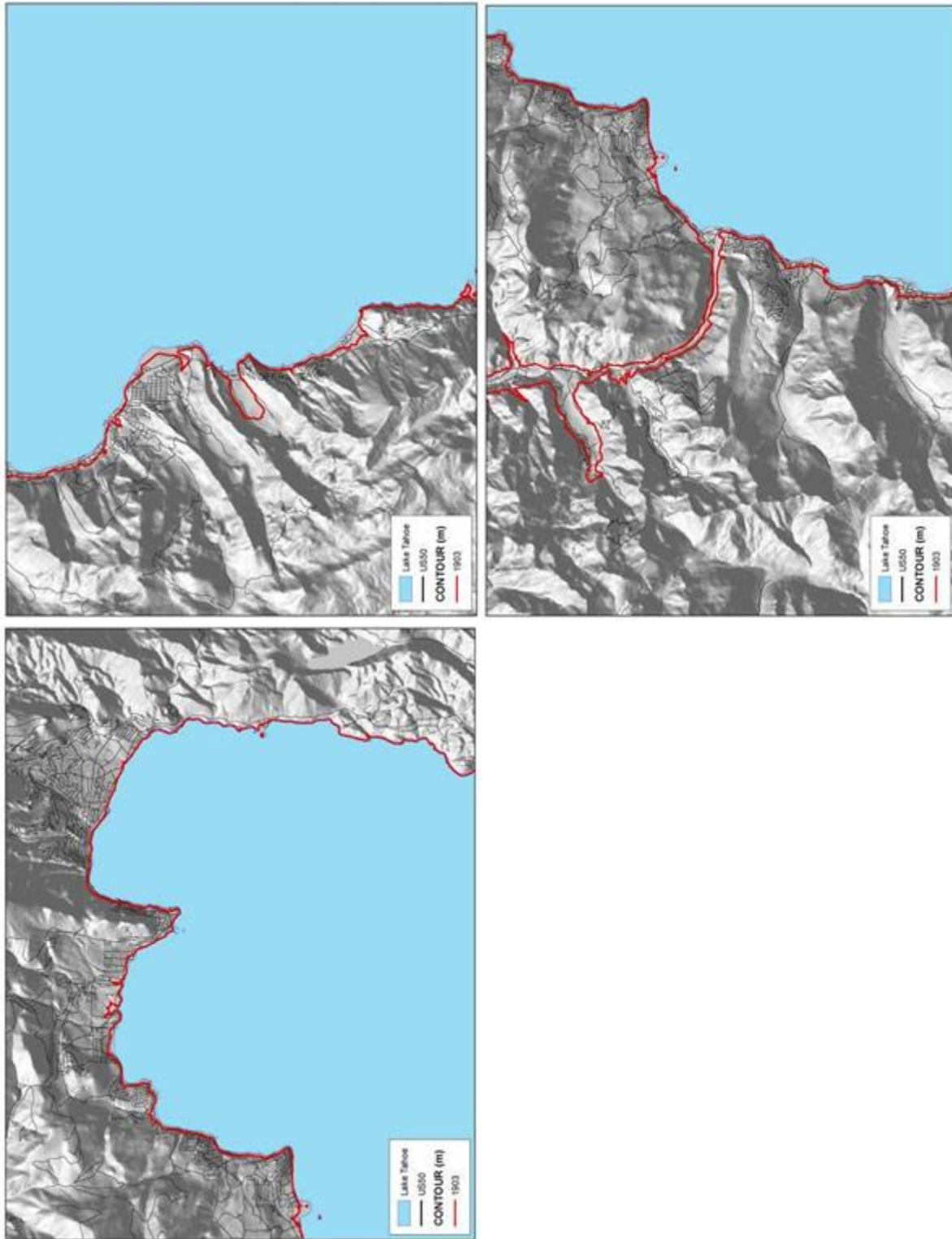
The magnitude 6.8 earthquake modeled for this exercise resulted in a peak acceleration of 0.1 to 0.2 g, a peak velocity of 5-10 cm/s, with felt effects being estimated at a Modified Mercalli Intensity Scale of VI to VII. The seiche was generated by a landslide at the north end of Lake Tahoe. This scenario estimated run-up of waters to elevations 6 m above lake level, with water arriving at shoreline 5 minutes after the earthquake. Inundation mapping of the seiche scenario done as part of the exercise identifies those areas most vulnerable to damage including loss of life and property damage. Figure 4-102 and Figure 4-103 illustrate these inundation areas along Lake Tahoe. The red line on the maps defines the 1903 contour line where floodwaters are expected to reach. It is estimated that about 4,200 people live below the 1903 m countour line using 2002 census data. Estimates indicated that flooding to the 1,903 m elevation will only flood the ground-level floor of structures with entrances near 1,903 m, but will flood more in structures with entrances closer to the lake elevation. Again, depending on the time of day, the potential exists for many more people to be present recreating in the shoreline areas.

Figure 4-102 Placer Seiche Scenario 2008 Exercise: Tahoe Inundation Areas



Source: Placer County

Figure 4-103 Placer Seiche Scenario 2008 Exercise: Tahoe Inundation Areas



Source: Placer County

Future Development

Development in areas located around the lake in potential seiche impact areas consist of primarily infill and redevelopment of both residential and commercial areas.

4.3.18. Tree Mortality

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

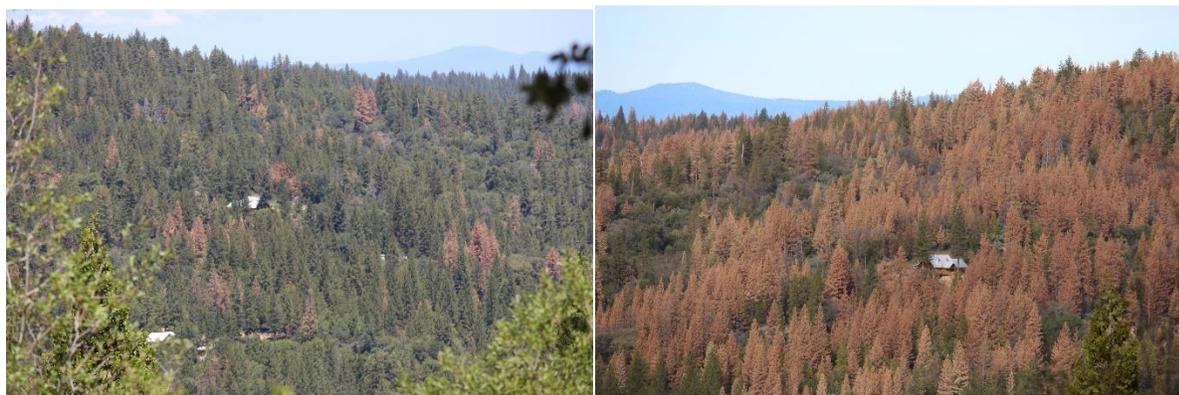
Hazard/Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

The most common driver of tree mortality are forest pests in the bark beetle category. Bark beetles mine the inner bark (the phloem-cambial region) on twigs, branches, or trunks of trees and shrubs. Bark beetles frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. Bark beetles can contribute to the decline and eventual death of trees; however only a few aggressive beetle species are known to be the sole cause of tree mortality. Bark beetle mortality and the scope and scale of mortality is closely linked with two common factors: high stand densities of trees and extended drought – both of which are common occurrences in the forests of Placer County.

Commonly tree mortality incidences have been within endemic background levels and highly localized and dispersed in nature; however, in the past two decades, larger more widespread tree mortality events have occurred in various parts of California creating land management challenges that have notable socio-economic impacts to mountain communities. Forests with high densities of trees are particularly vulnerable during extended drought where endemic bark beetle populations can explode to epidemic proportions in a short amount of time, as recently experienced during the 2012-2016 tree mortality event in the central and southern Sierra Nevada counties (see Figure 4-104).

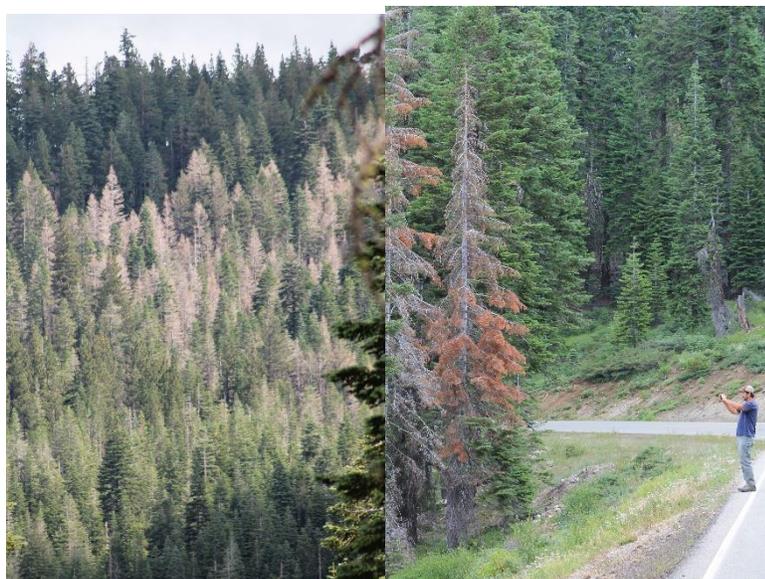
Figure 4-104 Examples of Widespread Tree Mortality Induced by Drought in the Southern Sierra Nevada in May 2015 (left) and February 2016 (right).



Source: CAL FIRE 2021

In addition to bark beetles, many tree mortality factors include a complex of pathogens and insects. For example, various types of fungal root diseases and trunk rots can create water stress on trees that contribute to susceptibility to bark beetle mortality. Outbreaks of forest defoliator insects have also occurred throughout the county. While defoliation events are not huge drivers of mortality, these incidents have contributed to localized areas of concern. These defoliation events make true fir forest stands more vulnerable to fir engraver bark beetle mortality (see Figure 4-105).

Figure 4-105 Tree Mortality as the Result of Pathogen and Insect Complexes



Source: University of California, 2015

Sierra Nevada mixed conifer forests evolved with and are adapted to periodic drought; however high stand densities – in combination with periodic drought and pest/pathogen complexes – make trees particularly susceptible to larger scale mortality events. Widespread mortality events contribute to hazardous fuel accumulations which, in turn, contribute to elevated wildfire hazard. Elevated tree mortality within striking

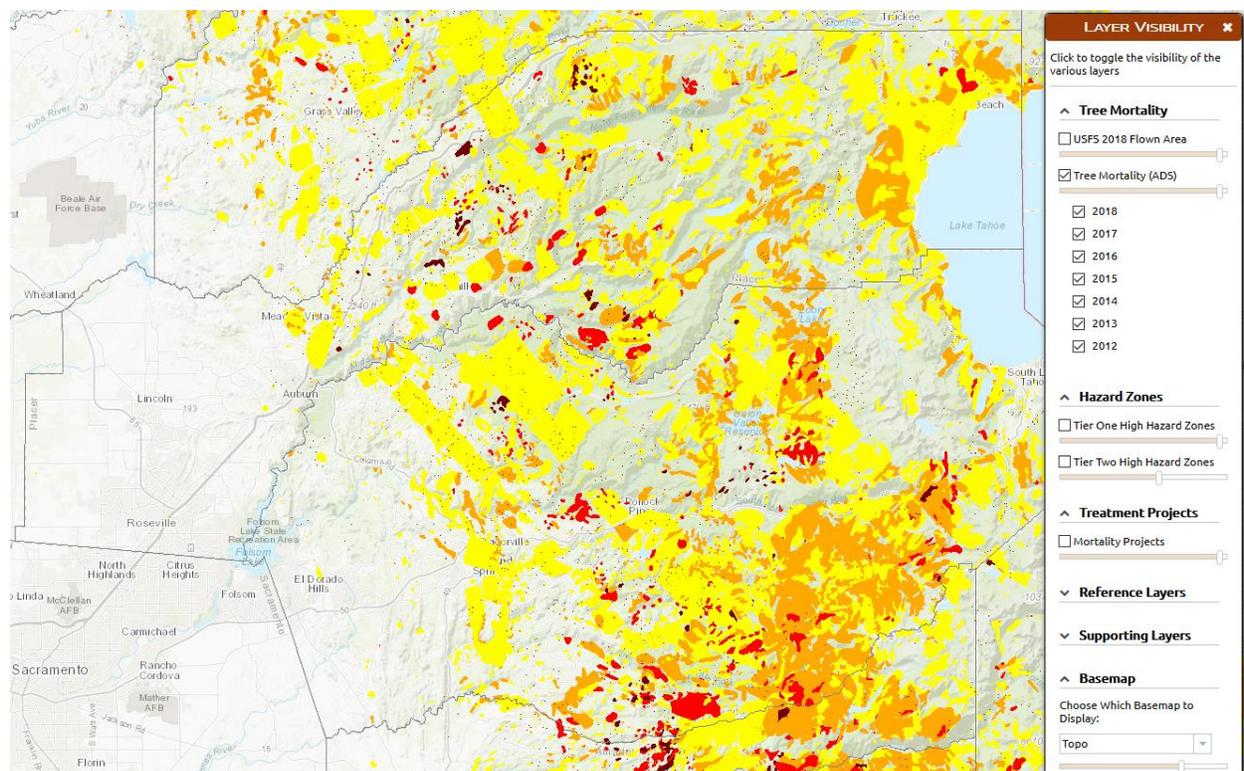
distance of homes, roads, and community infrastructure also contribute to operational complexities and economic burden on rural forested counties.

Location and Extent

Onset of tree mortality events can be relatively fast as seen in Figure 4-106; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map is shown in Figure 4-106. Shown are results of 2012-2018 aerial tree-mortality surveys. Using a color legend, the map shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

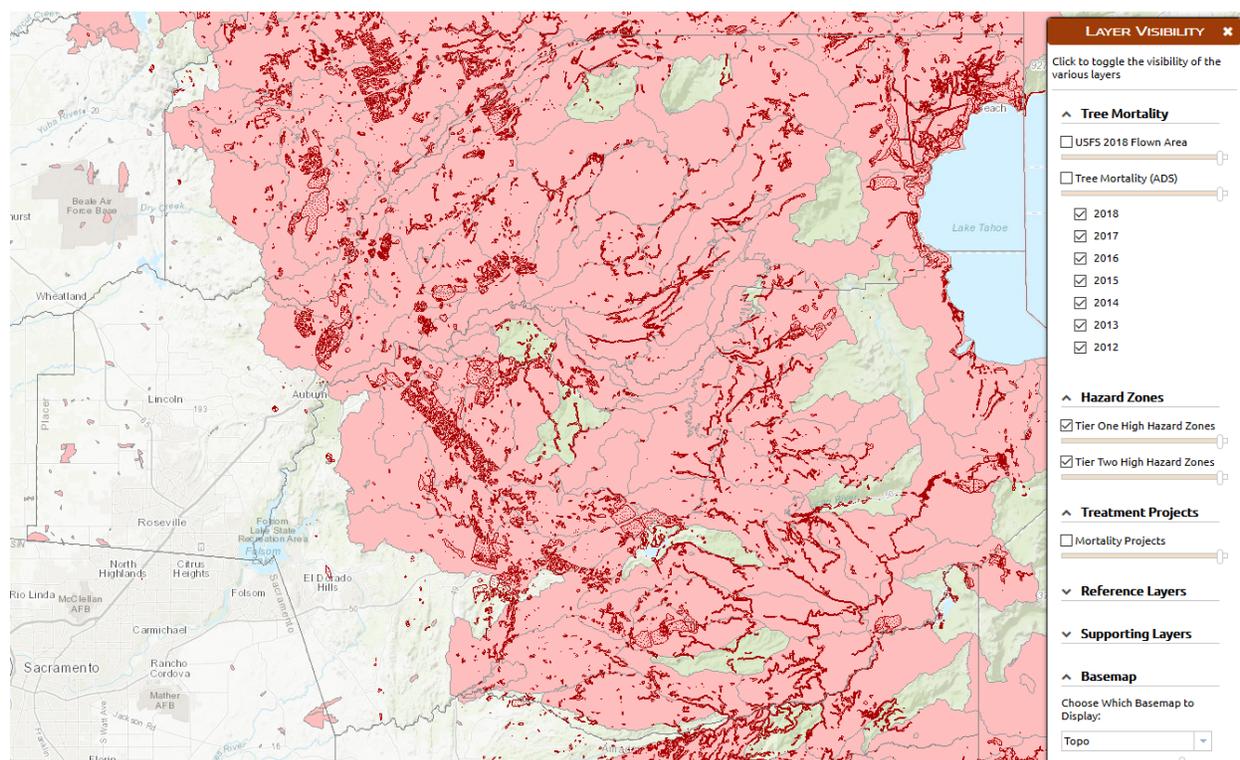
Figure 4-106 Placer County – Tree Mortality Areas



Source: CAL FIRE, map retrieved 12/17/2020

In the past decade, mortality has increased in the eastern portion of Placer County. Placer County is designated as Tier 2 High mortality hazard on the watershed scale along with numerous Tier 1 High hazard “hot spots”. These can be seen on Figure 4-107. The light red areas on the map depict the Tier 1 areas of the County, while the dark red areas on the map depict the Tier 2 areas.

Figure 4-107 Placer County – Tree Mortality Hazard Zones



Source: CAL FIRE, map retrieved 12/17/2020

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations due to tree mortality, as shown in Table 4-4. No USDA disaster declarations have been declared either, as shown in Table 4-6. While not a disaster declaration, on October 30, 2015, Governor Brown proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.

NCDC Events

The NCDC does not track tree mortality events in Placer County.

Hazard Mitigation Planning Committee Events

Widespread tree mortality events have occurred in Placer County primarily due to high tree densities and drought episodes that facilitate a build-up of endemic bark beetle populations. Tree mortality events have also occurred from defoliation insects, plant diseases and from introduction of non-native forest pests. The HMPC noted that there have been a number of tree mortality events in Placer County. Notable events include:

- Douglas-fir tussock moth outbreak in the 1980's
- Late 1980's/Early 1990's mortality of white fir across the Tahoe and Plumas National Forests
- 2012-2018 Drought Related Tree Mortality Event in both pine and fir
- 2014-2016 Sawfly and Douglas-fir tussock moth outbreak

The HMPC noted other events that occurred outside of Placer County. Past tree mortality events in the northern Sierra Nevada have been well documented in scientific literature (Macomber and Woodcock 1994; Ferrell et al 1994; Guarin and Taylor 2005; Preisler et al 2017). Over the past two decades tree mortality events in California forests have impacted numerous forested communities with widespread and large scale economic and social impacts. Examples include:

- Bark beetle outbreak in Southern California: San Bernadino and Lake Arrowhead 2003-2006
- Bark Beetle outbreak in the central and southern Sierra Nevada 2010-2018
- Sudden Oak Death in the Northern California Coast Range 2001-ongoing
- Golden Spotted Oak Borer mortality of Black Oak in Southern California

Likelihood of Future Occurrence

Likely – There have been four (multi-year) tree mortality events in the County since 1980. Given the past events, the lingering drought conditions in California, and the heavily wooded nature of much of the County, tree mortality is considered likely in the future.

Climate Change and Tree Mortality

The Placer County Sustainability Plan noted that climate change is likely to worsen bark beetle infestations. The warmer temperatures and shorter periods of cold weather create a longer period for bark beetles to be active and reproduce. Drought and extreme heat also stress and weaken trees, making them more susceptible to bark beetle infestation.

Tree mortality events are inevitable, particularly considering the climate change predictions for Placer County. Trends, noted by the US Forest Service, suggest that the northern Sierra Nevada may become generally warmer and wetter, with longer periods of prolonged summer drought.

While warmer and wetter weather patterns may increase forest growth, warmer temperatures – in combination with longer periods of prolonged summer drought – will likely increase forest insect and disease outbreaks and the occurrence of high severity fire. High-intensity wildfires, drought, and declining forest health are some effects of climate change that are worsening the threats to forests and reducing forest productivity.

Hotter and drier weather alter forest hydrology and water balance available to forest communities. Increased temperatures alter the timing of snowmelt, affecting the seasonal availability of water with earlier dry conditions which then provides fuel to earlier and hotter fires from stressed trees and shrubs. Drought also reduces trees' ability to produce sap, which protects them from destructive insects and diseases. Research by the US Forest Service has found that large trees may be most susceptible to climate driven mortality – which the authors suggested can also be compounded by high stand densities of small trees due to fire suppression. Others suggest that “regional warming and consequent increases in water deficits are

likely contributors to the increase in mortality rates,” and suggest that exogenous warming trends may be more of a driver of mortality, particularly in large diameter trees, than increasing stand density. Nonetheless, research indicates that warming climate is driving changes in forest structure.

Battles et al. (2008) evaluated the impacts of climate change on the mixed-conifer region in California and provide insight to forest health concerns and management implications for forest managers. This study and others found that changes in climate could “exacerbate forest health concerns” by increasing weakened tree susceptibility to mortality as a result of fire, disease epidemics and insect outbreaks and potentially enabling forest insects and disease to expand ranges or increase potential for widespread damage (Battles et al 2008; Allen et al 2015). These predictions were realized the following decade in the central and southern Sierra Nevada wherein vast stretches of ponderosa pine forest were decimated in a drought driven epidemic. Other research suggest that landscape level tree mortality may drive extreme fire behavior and high severity of future fire events in these forests – emphasizing that tree mortality events have consequences for Placer County communities.

Vulnerability Assessment

Vulnerability—High

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality. These areas were shown on Figure 4-107.

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (ie. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

The HMPC noted that most of the tree mortality resides in the vast forested area of the County on federal lands. Much of this will not be cleaned up as there are too many acres and too little funds to allow for projects to be complemented. There are approximately 500,000 acers of forests and a large portion of them have tree mortality issues, but these are not located near roads to be able to harvest and transport the material top protect form the risk of wildfire. Furthermore, most of these acres are overgrown and have not been treated in decades if at all.

Impacts

Tree mortality affects industrial and non-industrial timber land owners by reducing inventory and degrading timber quality and yield from forest properties. As seen in the central and southern Sierras during the 2012-2018 tree mortality event, the glut of dead timber creates an oversupply beyond what sawmills can handle and process, thereby reducing or eliminating the value of dead trees for salvage. In these cases, tree mortality can create economic hardship on forest landowners of all sizes as they try to mitigate safety hazards posed by standing dead and deteriorating trees and development of future fuel accumulations – which leads to increase fire risk.

During tree mortality events, the cost of removing dead trees far exceeds the salvage value of the tree. This can create an undue burden on forest landowners of all sizes, particularly for residential areas where there are many complexities in removing trees such as power infrastructure, homes, water lines, and other assets that need to be protected.

Future Development

Development standards in California take wildfire into account; however, there are no standards developed for reducing the risk of tree mortality. Areas of Very High Fire Hazard Severity have increased scrutiny regarding development standards and siting. An increase in tree mortality may increase the fire risk and be a factor in development in areas of high tree mortality and wildfire risk as an increase in dead and dry fuels may increase the wildfire risk in the future. Future development could consider mitigating tree hazards within infrastructure (i.e. power and road corridors) to mitigate potential for dead tree hazards in the future.

4.3.19. Wildfire

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Placer County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for the Placer County Planning Area. Generally, the fire season extends from June through October of each year during the hot, dry months; however, recently the fire season has been nearly year around. Fire conditions arise from a combination of high temperatures, an accumulation of vegetation, low humidity, and high winds. Wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

Location and Extent

Wildfire risk in Placer County varies by location. According to the HMPC, within the County, the middle and upper elevations of the County are the primary concern when considering the wildland fire hazard, with their limited access, steep terrain and remote location. Factors contributing to the wildfire risk in Placer County include

- Overstocked forests, severely overgrown vegetation, and lack of defensible space around structures;
- Excessive vegetation along roadsides and hanging over roads, fire engine access, and evacuation routes;
- Drought and overstocked forests with increased beetle infestation or kill in weakened and stressed trees;
- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response as well as the many subdivisions that have only one means of ingress/egress;
- Inadequate or missing street signs on private roads and house address signs;
- Nature and frequency of lightning ignitions; and
- Increasing population density leading to more ignitions.

Wildland Urban Interface

Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI defines the community development into the foothills and mountainous areas of California. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for Placer County consists of communities at risk (discussed in the Vulnerability Assessment below) as well as the area around the communities that pose a fire threat.

There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

WUI fires are the most damaging. WUI fires occur where the natural and urban development intersect. Even relatively small acreage fires may result in disastrous damages. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

The pattern of increased damages is directly related to increased urban spread into historical forested areas that have wildfire as part of the natural ecosystem. Many WUI fire areas have long histories of wildland fires that burned only vegetation in the past. However, with new development, a wildland fire following a historical pattern now burns developed areas. WUI fires can occur where there is a distinct boundary between the built and natural areas or where development or infrastructure has encroached or is intermixed

in the natural area. WUI fires may include fires that occur in remote areas that have critical infrastructure easements through them, including electrical transmission towers, railroads, water reservoirs, communications relay sites or other infrastructure assets. Human impact on wildland areas has made it much more difficult to protect life and property during a wildland fire. This home construction has created a new fuel load within the wildland and shifted firefighting tactics to life safety and structure protection.

Placer County Wildfire Setting

As previously stated, there are areas in the County that are prone to wildfire. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. As a result of effective fire suppression since the 1930s, vegetation throughout the county has continued to grow and accumulate, and hazardous fuels have increased. As such, certain areas in and surrounding Placer County are extremely vulnerable to fires as a result of dense vegetation combined with a growing number of structures being built near and within rural lands. These high fuel hazards, coupled with a greater potential for ignitions, increases the susceptibility of the County to a catastrophic wildfire.
- **Topography** – An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- **Weather** – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. Winds can be significant at times in Placer County. North winds in Placer County are especially conducive to hot, dry conditions, which can lead to “red flag” days indicating extreme fire danger. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, often in difficult to reach terrain for firefighters.
- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned and the intensity of the burn. CAL FIRE measures fuels in the areas as part of their Fire Hazard Severity maps. Extents are measured in the following Fire Hazard Severity Zones (FHSZ) categories (discussed in more detail below):

- Very High
- High
- Moderate
- Non-Wildland/Non-Urban
- Urban/Unzoned

Geographical extents of these FHSZs in the County can be found on Table 4-104.

Table 4-104 Placer County – Geographical Extents of Fire Hazard Severity Zones

Fire Hazard Severity Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Very High	616,198	68.53%	47,276	26.25%	568,921	79.12%
High	39,675	4.41%	7,394	4.11%	32,281	4.49%
Moderate	179,849	20.00%	94,466	52.46%	85,383	11.87%
Non-Wildland/Non-Urban	44,309	4.93%	19,367	10.76%	24,942	3.47%
Urban Unzoned	19,134	2.13%	11,567	6.42%	7,567	1.05%
Unincorporated Placer County Total	899,164	100.00%	180,070	100.00%	719,094	100.00%

Source: CAL FIRE

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time, or may have durations lasting for a week, many weeks, or more.

Post-Wildfire Landslides and Debris Flows

Post-wildfire landslides and debris flows are not generally a concern in Placer County due to the lack of sloped areas. Fires that burn in sloped areas remove vegetation that holds hillsides together during rainstorms. Once that vegetation is removed, the hillside may be compromised, resulting in landslides and debris flows. Mapping of these events has taken place since 2013. Those mapped areas in the County are presented below.

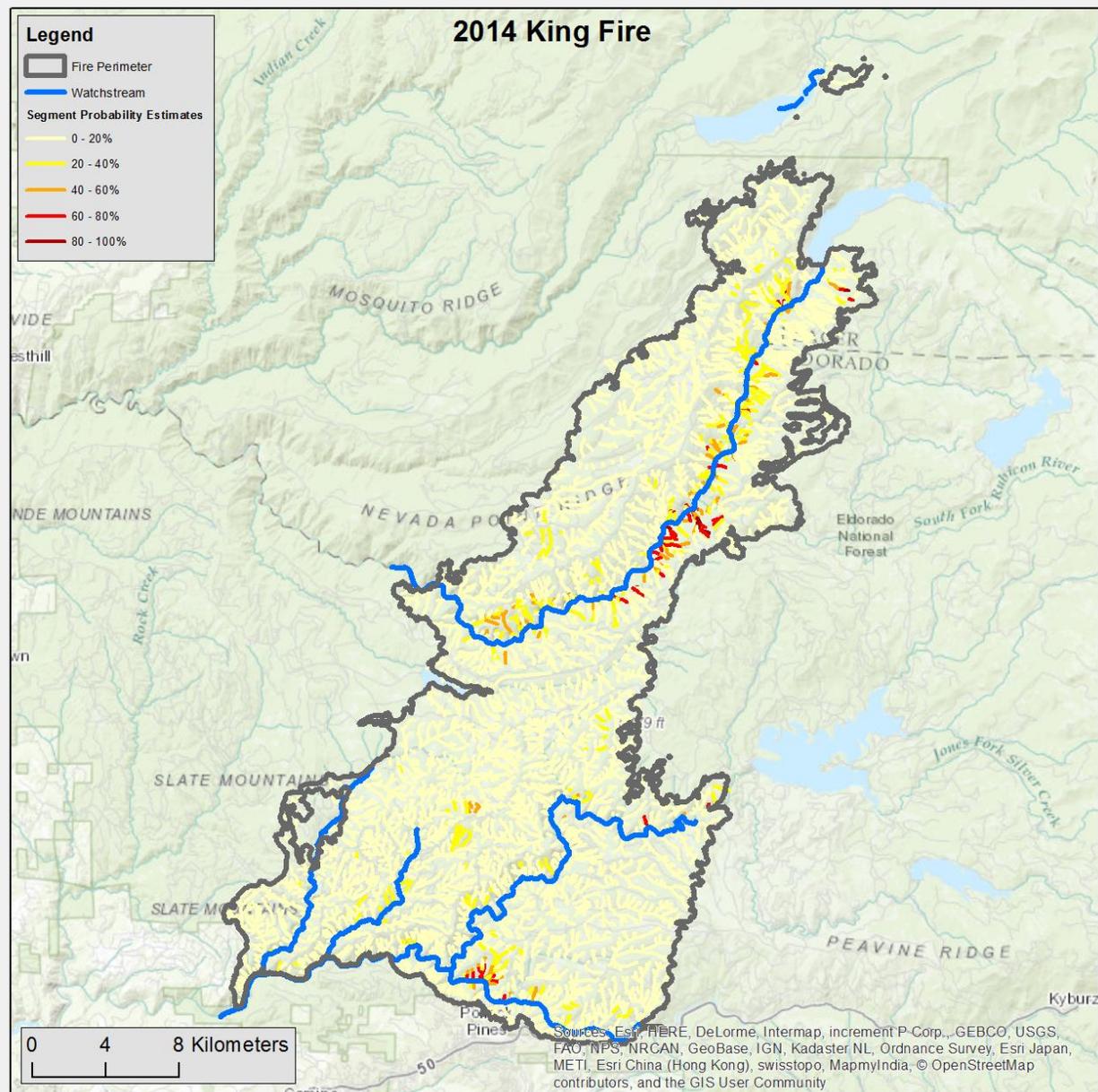
The County noted that there were post-wildfire landslides after the **2004** Star and **2014** Kings fire issues that PCWA is still cleaning out of waterways yearly as of 2021.

2014 King Fire Landslide and Debris Flow Mapping

Post-fire debris flow hazard assessments for the King Fire were performed by the USGS. These assessments are prepared at the request of land and emergency management agencies responsible for managing wildfires impacts. The assessments are presented as a series of maps and geospatial data showing the probability of debris flows and their expected volume for burned drainage basins. Other landslide hazard assessments produced by the USGS are performed at the request of government agencies or sometimes as demonstration products from research to improve methods of hazard and risk assessment.

Figure 4-108 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m³), and combined relative debris flow hazard from the Pawnee Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h).

Figure 4-108 2014 King Fire Landslide Debris Flow Probabilities



Source: USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=61)

Past Occurrences

Disaster Declaration History

Placer County has had five state and six federal disaster declaration from fire events, as shown on Table 4-105. The County had no USDA disaster declarations since 2012 related to wildfire, as shown on Table 4-6.

Table 4-105 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. Events in Placer County in the database are shown in Table 4-106.

*Table 4-106 NCDC Wildfire Events in Placer County 1993 to 7/31/2020**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Wildfire	22	3	22	\$500,525,000	\$0	21	0

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

CAL FIRE Events

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Placer County since 1950 were extracted. Fires greater than 250 acres inside Placer County are listed in Table 4-107, while a complete list of fires that affected the County are detailed in Appendix G. Each of them was tracked by CAL FIRE. Figure 4-109 shows the fires in the CAL FIRE database for the County from 1950 to 2020, colored by the size of the acreage burned.

Figure 4-109 Placer County – Wildfire History CAL FIRE 1950 to 2020

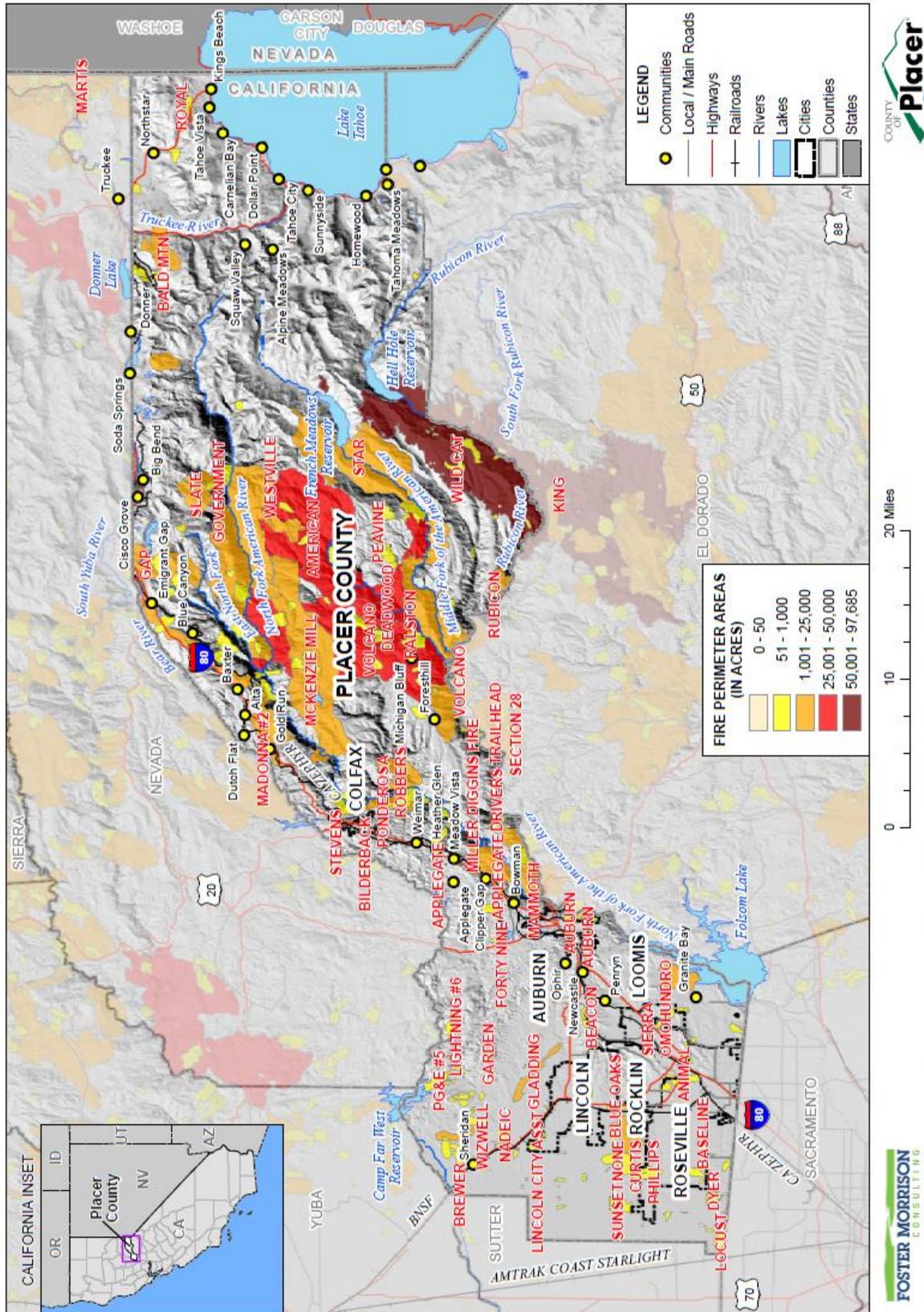


Table 4-107 Placer County – Wildfires by Acres Burned 1950-2020

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Volcano		Smoking	144,798	42,528.97
(blank)		Unknown / Unidentified	155,791	31,957.67
King	9/13/2014	Arson	59,583	29,488.87
Deadwood	(blank)	Unknown / Unidentified	94,293	27,875.51
American	8/10/2013	Miscellaneous	67,099	27,425.87
Mckenzie Mill	(blank)	Unknown / Unidentified	56,683	21,284.78
Star	8/25/2001	Miscellaneous	35,844	16,461.80
Westville	6/21/2008	Lightning	33,876	11,088.30
Government	6/21/2008	Lightning	31,424	9,218.21
Ralston	9/5/2006	Miscellaneous	30,115	8,410.01
(blank)	(blank)	Miscellaneous	26,593	4,714.96
Applegate	9/16/1965	Unknown / Unidentified	4,531	3,528.69
Roadside #51	9/19/1964	Unknown / Unidentified	7,727	3,450.80
Madonna #2	10/30/1959	Unknown / Unidentified	4,677	3,163.71
Ponderosa	8/17/2001	Vehicle	6,709	2,777.60
Robbers	7/11/2012	Arson	4,759	2,634.76
Deadman's Flat	7/18/1925	Miscellaneous	11,802	2,587.41
Gap	8/12/2001	Campfire	8,273	2,408.08
Slate	6/11/1986	Lightning	9,713	2,039.91
Omohundro	7/29/1954	Unknown / Unidentified	2,712	2,025.69
Roadside 3 4 5 6	7/3/1985	Unknown / Unidentified	8,979	1,853.82
Bald Mtn	9/26/1949	Smoking	5,517	1,464.29
Blue Oaks	9/15/2001	Miscellaneous	9,694	1,426.85
Rubicon	8/9/1931	Unknown / Unidentified	4,724	1,274.03
North	9/3/2018	Campfire	14,499	1,119.59
Gladding	9/1/2008	Arson	2,947	1,089.68
Wizwell	7/22/1951	Unknown / Unidentified	3,143	1,049.62
Gillis Hill	9/13/1961	Unknown / Unidentified	2,525	953.58

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Phillips	7/16/2007	Equipment Use	2,171	935.49
Stevens	8/8/2004	Structure	2,632	934.24
Big	8/31/1987	Lightning	6,540	894.42
Curtis	6/29/1984	Unknown / Unidentified	1,773	876.48
Codfish	8/31/2003	Lightning	5,189	841.28
None	9/13/1983	Unknown / Unidentified	3,332	820.78
PG&E #5	6/14/1981	Equipment Use	1,678	812.35
Animal	6/7/1979	Unknown / Unidentified	1,463	771.40
Sunset	8/1/2018	Unknown / Unidentified	2,044	692.44
Auburn	7/17/1961	Unknown / Unidentified	940	653.01
Helester	8/11/1995	Equipment Use	4,518	627.27
Mammoth	7/15/2009	Miscellaneous	1,627	624.93
Sierra	9/18/2002	Vehicle	1,117	594.25
Locust	7/27/2015	Arson	736	587.46
Peavine	6/21/2008	Lightning	5,580	580.54
(blank)	10/29/1986	Debris	1,874	551.57
Lightning #6	7/28/1958	Unknown / Unidentified	1,783	551.16
Green Valley	10/1/1961	Unknown / Unidentified	2,722	526.76
Halsey	8/12/1951	Unknown / Unidentified	813	480.55
Baseline	8/20/2010	Unknown / Unidentified	737	478.84
Iowa Hill	8/9/1969	Unknown / Unidentified	1,962	464.33
Applegate	10/8/2014	Unknown / Unidentified	1,477	458.90
Andressen	6/27/1982	Equipment Use	992	439.41
Nadeic	6/2/1981	Miscellaneous	851	425.16
Beacon	9/3/1950	Unknown / Unidentified	800	406.95
Wild Cat	6/12/1918	Lightning	2,710	386.78
Jacinto	6/5/1970	Unknown / Unidentified	2,473	385.11
Lincoln City Asst	5/30/2001	Arson	1,597	372.04

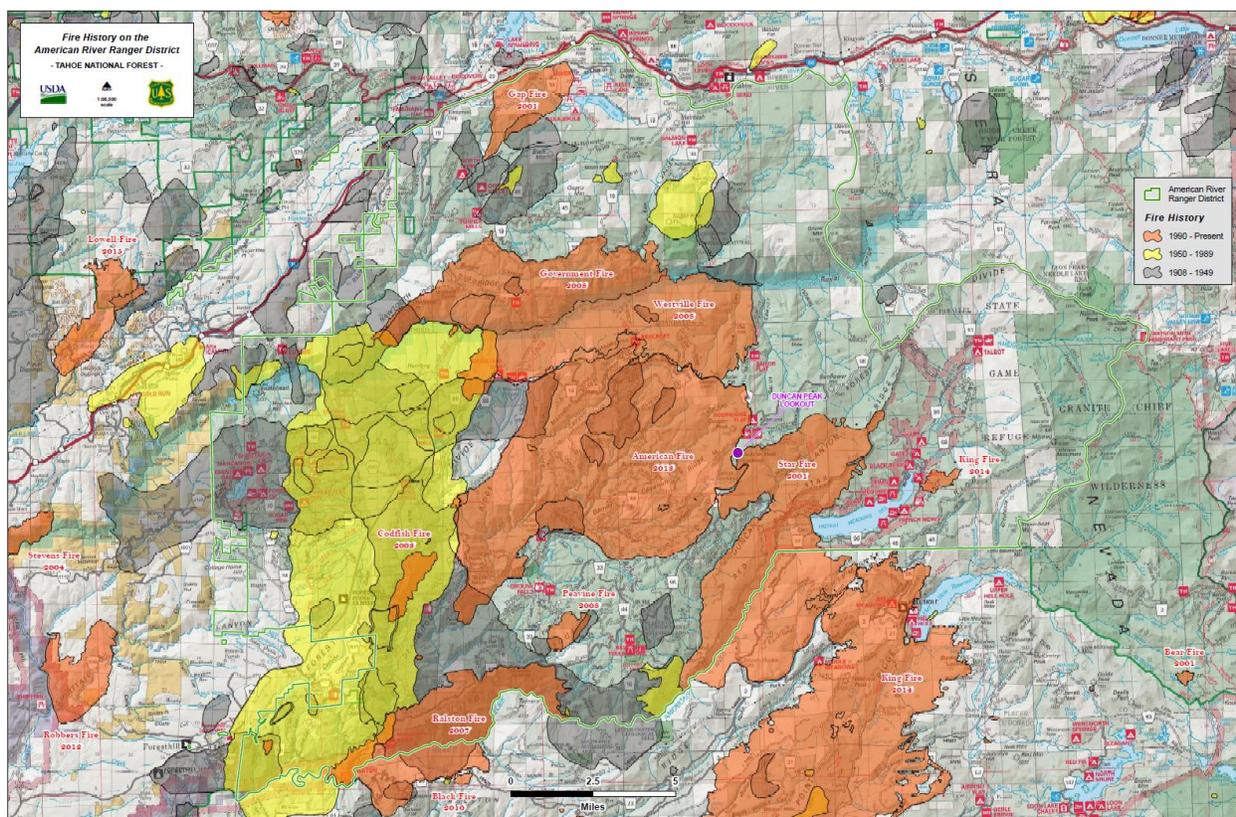
Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Drivers	8/2/2000	Smoking	1,233	348.87
Forty Nine	8/30/2009	Arson	705	343.28
Elliot Ranch	9/8/1949	Lightning	2,164	342.37
Royal	11/17/2003	Debris	1,031	338.75
(blank)		Lightning	4,850	324.25
Sam Babb	9/5/1956	Unknown / Unidentified	2,117	316.52
Big Reservoir	9/8/1959	Campfire	837	299.20
Ponderosa	7/19/1970	Unknown / Unidentified	855	296.64
Brewer	6/19/1964	Unknown / Unidentified	508	292.99
Garden	6/9/2002	Powerline	719	284.20
Pennsylvania	10/4/1921	Miscellaneous	1,601	273.39
SPRR #71	9/16/1965	Unknown / Unidentified	587	268.40
Dyer	7/20/2009	Unknown / Unidentified	1,478	262.24
Mooney	8/5/1953	Unknown / Unidentified	353	258.52

Source: CAL FIRE

US Forest Service Events

The US Forest Service owns land in the County that have seen historic wildfires. These wildfires are not all captured in the CAL FIRE database (though fires that affected the USFS lands may have also affected areas outside USFS lands where CAL FIRES database would contain the fire perimeter). Fire perimeters from USFS are shown on Figure 4-110.

Figure 4-110 Placer County – USFS Fire Events on Federal Land



Source: USFS

Hazard Mitigation Planning Committee

The HMPC also provided the following information on historical fires in the County.

- **1975/1977 Sawmill Fire** – The Sawmill Fire and another fire occurred in the area of Cape Horn and the Alpine Meadows subdivision, just three miles northeast of Colfax.
- **1990 Placer County Fire** – This fire burned approximately 300 acres of grass, brush, and oaks in the area of Placer Canyon. The fire resulted in evacuations and destroyed several outbuildings.
- **2000 Heather Glen Fire** – The Heather Glen Fire, caused by sparks from a lost trailer wheel along Interstate 80, destroyed one home and forced a neighborhood evacuation in Applegate. While only ten acres in size, this fire resulted in \$350,000 in damage.
- **August 12-20, 2001 Narrow Gauge Fire** – This fire near Colfax burned 30 acres and forced closure of I-80 for about an hour due to dense smoke. This fire, blamed on a catalytic converter, was quickly contained as California Department of Forestry air tankers were already in the area and able to respond quickly.
- **August 2001 Gap Fire** – The Gap Fire near Blue Canyon burned 2,462 acres of forest land and caused the closure of Interstate 80.
- **August 17-23, 2001 Ponderosa Fire** – This fire burned 2,780 acres.
- **August 25-September 13, 2001 Star Fire** – The Star Fire started in Eldorado National Forest and spread to Tahoe National Forest and burned approximately 16,761 acres. This can be seen on Figure 4-111.

Figure 4-111 Placer County – Star Fire



Star Fire, August 26, 2001. Eldorado National Forest. Photo Courtesy of USFS.

- **2001 Martis Fire** – This fire east of Truckee burned 20,000 acres; threatened homes; shut down Interstate 80; and damaged railway trestles affecting Amtrak passenger train service. The heavy smoke caused poor air quality and raised health issues for individuals with respiratory problems. While the Martis Fire itself was not in Placer County, there were significant impacts to the County as a result of this fire. The County also contributed major firefighting assistance.
- **2002 Sierra Fire** – Within the communities of Loomis and Granite Bay approximately 595 acres of grass, brush, and oaks burned in the area of Interstate 80, Barton Road, Wells Avenue, Morgan Place, Indian Springs, and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools. One hundred homes were evacuated, and more than 1,000 homes in both communities were threatened. FEMA provided federal funds to assist in fighting this wildfire.
- **2004 Stevens Fire** – The Stevens Fire located at Cape Horn/Iowa Hill near Colfax, was 100 percent contained at 934 acres.
- **2004 Numerous fires** – Numerous fires of varying sizes occurred in Placer County during the 2004 fire season. These include fires caused by equipment sparks, abandoned campfires, arson and undetermined causes.

Figure 4-112 2004 Fires



Photos from website: <http://yubanet.com/stevenstrail.html>; courtesy of Roger Burdick and Robin Yonash.

- **September 2006 Ralston Fire** – The Ralston Fire was a large wildland fire in the area of the North Fork of the Middle Fork of the American River. Approximately 8,400 acres burned.
- **June 2007 Angora Fire** – Although not occurring in Placer County, the Angora fire in nearby El Dorado County (in the Lake Tahoe Basin) burned 3,100 acres of forest and wooded subdivisions and destroyed more than 250 homes as well as 75 commercial and other structures.
- **August 2007 Washoe Fire** – The Washoe Fire started with a structure fire of a home located on the West Shore of Lake Tahoe near the Sunnyside Resort. The fire quickly engulfed one residence, spread to two others and moved into forestlands. The fire spread to two other homes and destroyed them as well. In all, 5 homes were destroyed and 20 acres of forestland burned. Extreme wind fueled and drove the fire, which significantly contributed to the rapid spread.
- **June-July 2008 American River Complex Fire** - Several large wildland fires resulted from a system of major lightning storms that impacted the entire Northern CA region. In Placer County, approx. 10 wildland fires resulted from the lightning storm, and 4 grew to major fires, which later were collectively labeled the American River Complex (ARC) fires. The ARC fires were located in Tahoe National Forest in the North Fork American River watershed northeast of Foresthill, California. The fires consumed approx. 20,500 acres of forest land.
- **September 2008 Gladding Fire** - The wind driven fire started northeast of Lincoln and consumed approximately 960 acres, six residences, and 10 outbuildings.
- **September 2009 49 Fire** – The wind driven fire started about 2 pm near Highway 49 and Rock Creek Road near Auburn. The fire burned 343 acres before being contained. 63 residences and 3 commercial buildings were destroyed, and another 3 residences and 6 commercial properties were severely damaged. The damages were concentrated in neighborhoods east and south of Dry Creek Road. Three people were injured in the wildfire. Most notable about this fire was its location in a well developed area and the speed at which the fire consumed nearby structures. The following photos illustrate the damaging nature of this fire.

Figure 4-113 49er Fire Burn Area



Source: Placer County

Figure 4-114 49er Fire Burn Area



Source: Placer County

- **2012 Robbers Fire** – The Robbers Fire was a human caused fire that was ignited on July 11, 2012. The fire was located northwest of Foresthill, near Shirttail Canyon Road and Yankee Jims Road. The fire burned 2,650 acres, destroyed 1 residence and 4 outbuildings, and caused 12 injuries. Although 1 residence was destroyed, 170 were considered threatened. 912 fire personnel were involved in the firefighting efforts, as were 36 fire engines, 18 water tenders, 7 bulldozers, and 10 helicopter. A 28 year old Sacramento man was charged with unlawfully causing a fire. Firefighting costs and damages were estimated at \$12.4 million.
- **2013 American Fire** – On August 10, the American Fire was ignited near Deadwood Ridge, northeast of Foresthill. Located in Tahoe National Forest, the American Fire burned in steep and hazardous terrain as well as timber fuels that had not burned in several decades. Consumption of heavy fuels contributed to heavy smoke in the surrounding areas. Approximately 540 Forest Service and Cal Fire personnel were assigned to the fire, including 20 hand crews, 13 engines, 11 water tenders, six helicopters, two dozers, and air tankers as available. 27,440 acres were burned in the fire. The burn area from the fire is shown in Figure 4-115.
- **2014 King Fire**– HMPC representatives from Placer Hills and Foresthill Fire Protection Districts noted damaging wildfires that occurred in the Foresthill and Applegate areas during the winter of 2014. Specific information on this can be found in their respective annexes to this plan. The fire started in El Dorado County and crossed into Placer County. 97,717 acres were estimated to have burned. 12 residences were destroyed, as well as 68 other minor structures. 12 injuries occurred that can be attributed to the fire. The burn area from the fire is shown in Figure 4-115.

Figure 4-115 Fire Perimeters from American and King Fires



Source: NOAA/NWS

2014 Applegate Fire – A fire occurred on the east side of I-80 in the Applegate area of Placer County. The fire started on October 8, and its cause was unknown. The fire burned 459 acres before being contained. 6 residences and 4 outbuildings were destroyed. 2 injuries were reported; however, no deaths were reported.

Figure 4-116 Applegate Fire



Source: Placer County

2016 Trail Head Fire – Placer County OES activated the EOC (Level 1 - highest) for this fire in the Todd Valley/Foresthill area on June 28, 2016. The Trailhead posed significant threat to the community of Todd Valley and Foresthill. Due to the steep terrains and remote areas in Placer County and El Dorado, some that haven't had a significant fire in the last 90 years, the fire posed significant challenges for fire suppression efforts. The combined and collaborative efforts between CALFIRE and USFS ultimately stop the fire and limited the destructions to property and forested areas.

2018 North Fire - Placer County OES activated the EOC (Level 3) for this fire on September 3, 2018.

2018 Sliger Fire - Placer County OES activated the EOC (Level 3) for this fire on September 4, 2018. A wildfire in El Dorado County near the Middle Fork of the American River triggered an evacuation order for some Placer County residents near Foresthill. The North Fire burned on both sides of the North Fork of North Fork American River Canyon near North Fork Campground. Updated mapping re-established a total of 500 acres. The North Fork of the American River canyon is steep and remote terrain. Placer County Sheriff's Office closed the following roads and campgrounds: Yuba Gap Road at I-80; Emigrant Gap Road at I-80; Crystal Lake Road at I-80; Onion Valley, North Fork, Tunnel Mills, Lodgepole, Silvertip, and Sunflower Campgrounds.

2018 Camp Fire (Butte County) – While not in Placer County, Placer County OES activated the EOC (Level 3) for his fire on November 14, 2018. The County provided evacuation and mutual aid support to Butte County and other affected nearby counties. Smoke from the fire was also an issue in Placer County.

2020 Fork Fire (El Dorado County) – While not in Placer County, Placer County OES activated the EOC (Level 3) for this on September 8, 2020.

It was noted that 2020 high a high number of red flag warnings. This can be seen on Figure 4-117. While western Placer County has 6 or 7 red flag days, eastern Placer County had 11 in 2020.

- Oct 2017 – Sonoma Complex Fire (Sonoma Co)
- Nov 2018 – Camp Fire (Butte Co)
- Oct 2019 – Kincaid Fire (Sonoma Co)
- Sept 2020 – North Complex Fire (Butte Co)
- 8/15/20 – CZU Lightning Fire (Santa Cruz Co)
- 8/16/20 - LNU Lightning Fire Complex (Napa & Sonoma Counties)
- 8/16/20 – Jones Fire (Nevada Co)
- 9/4/20 – Creek Fire (Fresno Co)
- 9/8/20 - Fork Fire (El Dorado Co)

Public Safety Power Shutoff Events

The County noted that there have been events in the past where wildfires have not occurred, but wildfire conditions were high. During these times of high winds, high temps, and high wildfire risk, a PSPS occurred in the County. Past events of PSPS in the County were discussed in the beginning of Section 4.3.

Likelihood of Future Occurrence

Highly Likely — From May to October of each year, Placer County faces a wildfire threat. Fires will continue to occur on an almost annual basis in the Placer County Planning Area. The threat of wildfire and potential losses constantly increase as human development and population increase in the wildland urban interface area in the County. This results in a highly likely rating of future occurrence.

Climate Change and Wildfire

Climate change and its effect on wildfire in the County has been discussed by two sources:

- Placer County Sustainability Plan – 2020
- Cal-Adapt - 2014

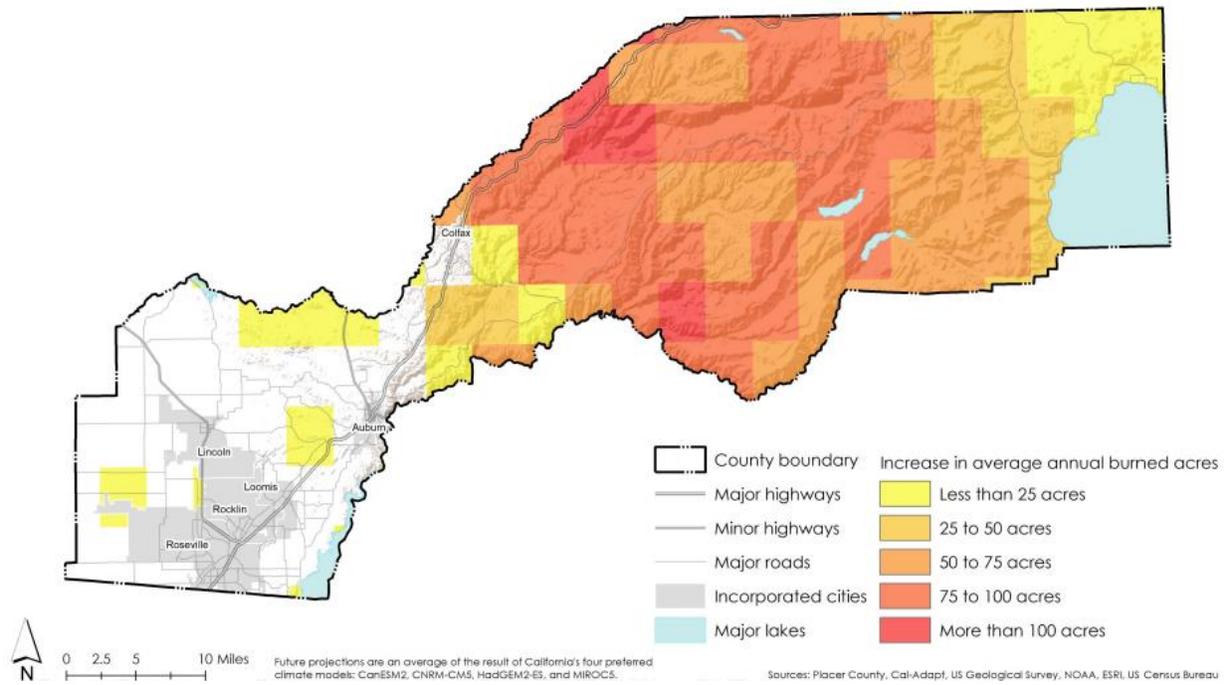
Placer County Sustainability Plan

According to the Placer County Sustainability Plan, climate change is expected to lead to an increase in wildfires throughout California. Warmer temperatures and an increase in drought conditions are likely to create more fuel for fires in the state’s wildlands, leading to a greater chance that a spark will grow into a potentially dangerous blaze. The biggest increase in wildfires is projected to occur along the western slope of the Sierra, although areas closer to Lake Tahoe are also likely to see more areas burned by wildfires. Because wildfires burn the trees and other vegetation that help stabilize a hillside and absorb water, more areas burned by fire may also lead to an increase in landslides and floods. Historically, an average of approximately 2,500 acres of Placer County burns each year.

Under a scenario of moderate GHG emissions, this average is expected to increase to approximately 3,100 acres burned each year between 2040 and 2060, and approximately 3,800 acres burned annually from 2070 to 2099. Under a scenario of high GHG emissions, Placer County is projected to see an average of approximately 3,500 acres burned annually between 2040 and 2060, and approximately 5,800 acres burned

annually from 2070 to 2099. Figure 4-118 shows the average annual increase in burned acreage for locations across Placer County.

Figure 4-118 Placer County – Projected Increase in Wildfire Burn Areas



Source: Placer County Sustainability Plan 2020

Cal Adapt

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt’s wildfire tool predicts the potential increase in the amount of burned areas for the year 2080-2089, as compared to recent (2010) conditions. Based on this model, Cal-Adapt predicts that wildfire risk in Placer County will increase slightly (and much less than other California counties) in the near term and subside during mid-to late-century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in Placer County, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Cal-Adapt has also sought to model annual averages of area burned in the State. Four models have been selected by California’s Climate Action Team Research Working Group as priority models for research contributing to California’s Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:

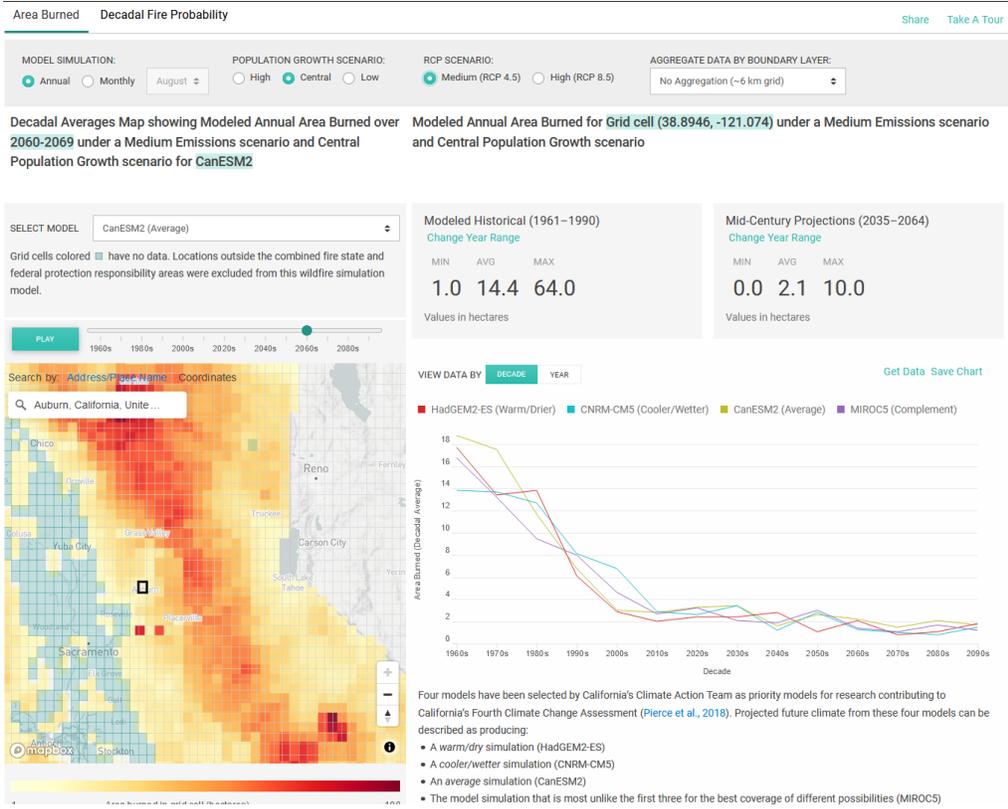
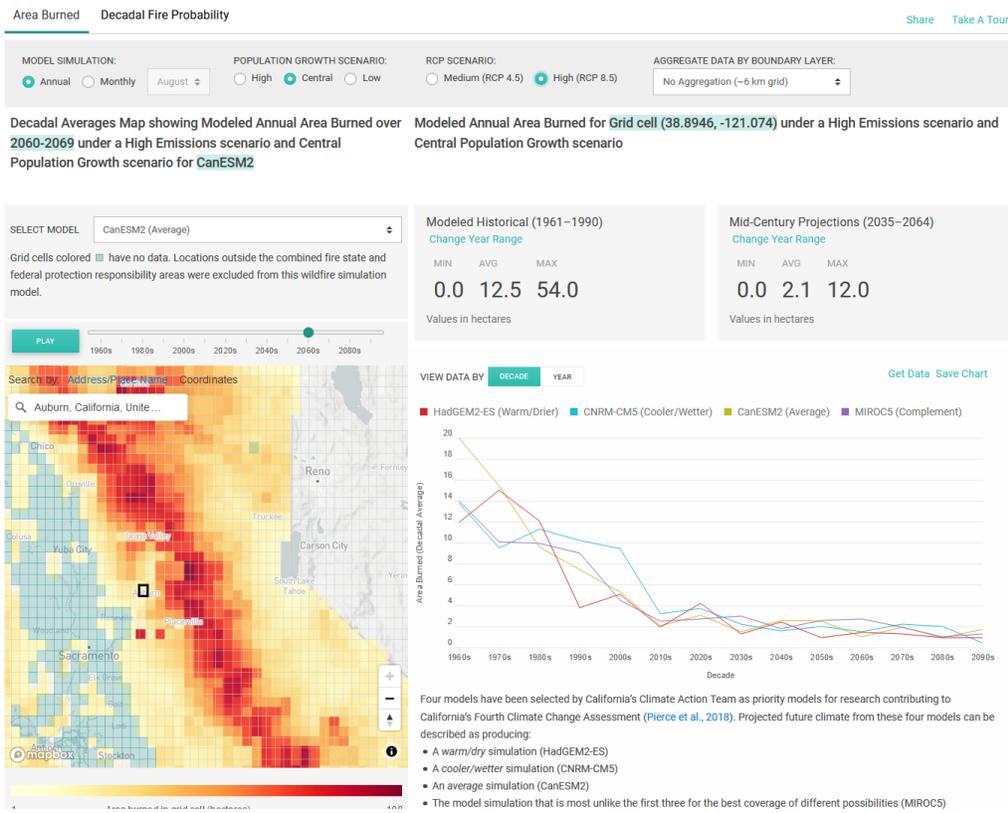
- A warm/dry simulation (HadGEM2-ES) – shown by the red line on the below charts
- A cooler/wetter simulation (CNRM-CM5) – shown by the blue line on the below charts
- An average simulation (CanESM2) – shown by the green line on the below charts

- The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5) – shown by the purple line on the below charts

Future modeled annual averages of area burned from Cal-Adapt for the Placer County Planning (using the quad that contains Auburn) are shown in Figure 4-119. It shows the following:

- The upper chart shows modeled annual averages of area burned for the selected area on map under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows modeled annual averages of area burned for the selected area on map under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-119 Placer County – Future Acreage Burned: High and Low Emission Scenarios



Source: Cal-Adapt – Annual Average of Acres Burned, Retrieved 12/20/2020

Vulnerability Assessment

Vulnerability—Extremely High

Risk and vulnerability to the Placer County Planning Area from wildfire is of concern, with some areas of the County being at greater risk than others as previously described. Fuel loads in portions of the County, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Placer County Communities at Risk to Wildfire

The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. For purposes of the National Fire Plan, the California Department of Forestry and Fire Protection (CAL FIRE) generated a list of California communities at risk for wildfire. The intent of this assessment was to evaluate the risk to a given area from fire escaping off federal lands. Three main factors were used to determine the wildfire threat in the wildland-urban interface areas of California: fuel hazards, probability of fire, and areas of suitable housing density that could create wildland urban interface fire protection strategy situations. The preliminary criteria and methodology for evaluating wildfire risk to communities is published in the Federal Register, January 4, 2001. The National Fire Plan identifies 39 “Communities at Risk” in Placer County. These are shown in Table 4-108.

Table 4-108 Placer County Communities at Risk to Wildfire

Communities at Risk		
Alpine Meadows (Rampart)	Foresthill	North Auburn
Alta	Gold Hill	Northstar
Auburn	Gold Run	Ophir
Baxter	Heather Glen - Applegate	Penryn
Bowman	Homewood	Rocklin
Cape Horn	Iowa Hill	Roseville
Carnelian Bay	Kings Beach	Secret Town
Casa Loma	Lincoln	Shady Glen
Christian Valley (Nielsburg)	Loomis	Sunnyside-Tahoe City
Colfax	Magra	Tahoe Pines
Dollar Point	Meadow Vista	Tahoe Vista
Dutch Flat	Michigan Bluff	Twin Pines – Weimar

Communities at Risk		
Emigrant Gap	Newcastle	Virginiatown

Source: CAL FIRE

Impacts

Wildfires can result in loss of life, injuries, damage to structures, and can cause short-term and long-term disruption to the County. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Potential losses from wildfire can also include those to agricultural lands and crops in the County as well as to natural resources such as wildlife and habitat areas.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also can cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides and mudflows, and erosion during the rainy season. School closures can also occur.

Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.

Wildfire (Smoke) and Air Quality

Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby counties since the 2013 LHMP have created significant air pollution affecting area residents County residents have had to breathe wildfire smoke, from fires both within and outside of the County. Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM_{2.5} which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

With respect to wildfire smoke, in the last few years, the Sacramento area Air Districts have requested the U.S. EPA several times to determine an Exceptional Event finding for the Sacramento Region to exclude data from attainment emissions. Without these Exceptions, the County will most likely not be able to meet the PM standard by the U.S. EPA's deadline which could result in repercussions for the area.

From an air quality perspective, Placer County was impacted by the Mendocino Complex Fire (2018), Carr Fire (2018), Ferguson (2018), August Complex Fire (2020), LNU Lighting Fire (2020), Loyalton Fire (2020) Detwiler (2017), County Fire (2018), and Caples (2019). 10 joint Air Quality and Public Health

Advisories were issued in 2018 and 5 were issued in 2020. The County also had 1 advisory for 2016, 1 advisory for 2017, 1 advisory in 2019.

Insurance in WUI Areas

The HMPC noted that in the WUI areas, there has been increased difficulty in obtaining home insurance and the cost of insurance premiums. Some residents have experienced cancellations of their policies due to catastrophic and recent wildfires occurring throughout California which has reduced the risk tolerance of many insurance companies. This increases costs to those who live in the WUI, and in some circumstances limits where people choose to live.

The HMPC noted additionally that insurance premium increases and policy cancellations not only increase the cost of living (a particular challenge for those in DAC and SDAC communities) it also affects the real estate industry and, in turn, the tax base. This can have implications for schools and infrastructure in the County.

Wildfire – Green Waste and Hazardous Materials

The County noted that during wildfire clean up, large amounts of green waste may need to be dealt with. Green waste is a term that was coined to refer to organic waste that can decompose and has a high concentration of nitrogen. The waste is also commonly referred to as biological waste. Some of the materials that make up green waste include leaves and grass clippings. If these are allowed to dry out, they can create fuels for additional wildfires.

The County also noted that after large wildfires, household hazardous waste is often disposed of. This can cause issues for landfills, as well as for those who handle waste between a household and the landfill. It was noted that the Camp Fire in nearby Butte County had significant issues with hazardous waste.

Wildfire and Power Shortage/PSPS

During periods of wildfire (or during periods of elevated risk due to high temperatures, low humidities, and high winds), PSPS events may be declared in the County. More information on power shortage and failure can be found at the beginning of Section 4.3.

Wildfire Analysis

The Placer County Planning Area has mapped CAL FIRE fire hazard severity zones (FHSZs) based on fire responsibility areas as further described below. GIS was used to determine the possible impacts of wildfire within the County and how the wildfire risk varies across the Planning Area. The wildfire analysis includes an analysis of affected parcels and values by Fire Responsibility areas and by CAL FIRE's FHSZs.

Fire Responsibility Area Analysis

There are various wildland fire protection agencies that have responsibility within the California Counties. There are also numerous fire departments and fire protection districts that serve local areas, many of whom have mutual aid agreements with each other as well as state and federal agencies for fire suppression and

protection. Fire Responsibility areas are generally categorized by Federal Responsibility Areas (FRA), State Responsibility Areas (SRA) and Local Responsibility Areas (LRA).

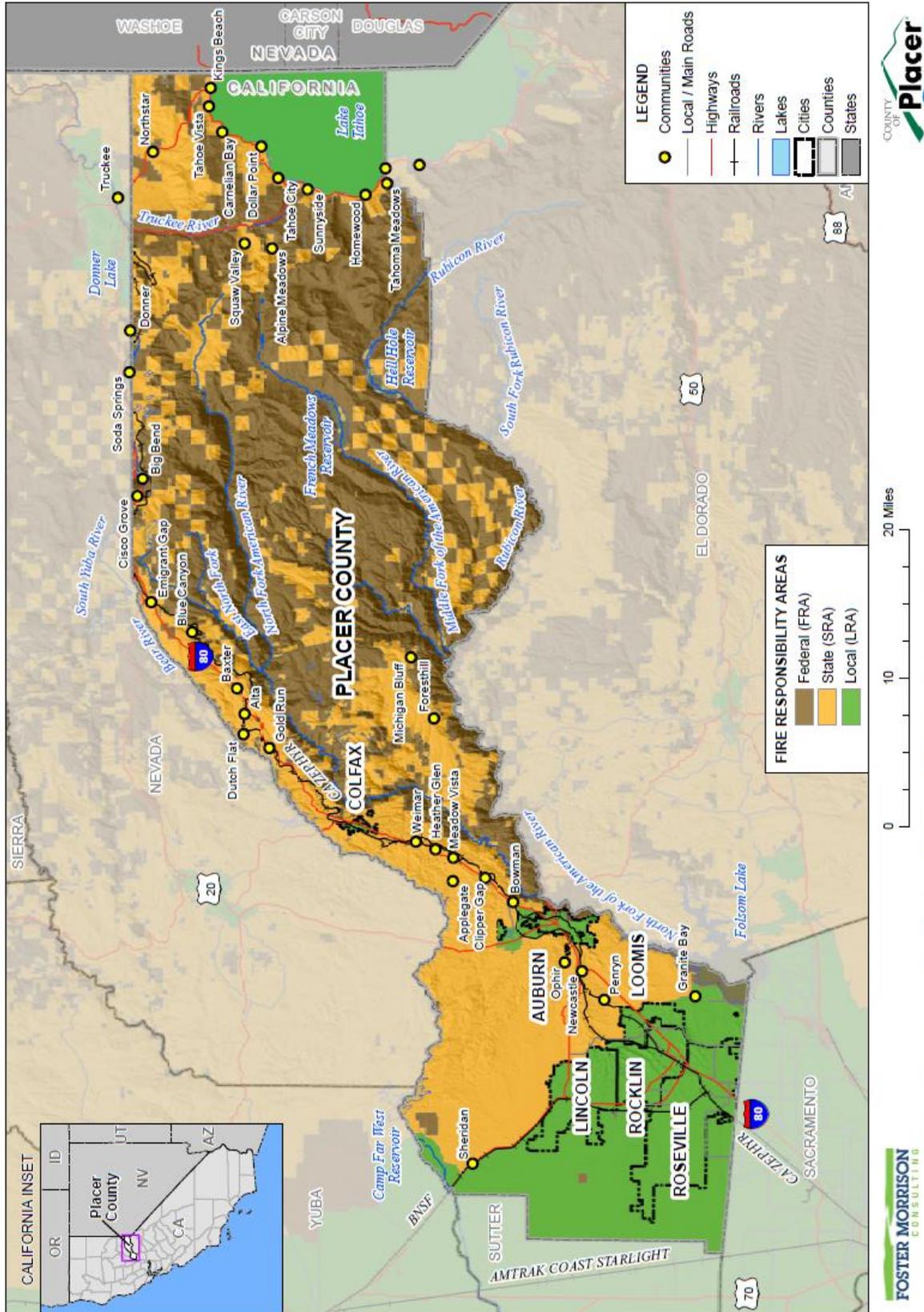
The CAL FIRE data, detailing Fire Responsibility Areas within the County Planning Area, was utilized to determine the locations, numbers, types, and values of land and structures falling within each Fire Responsibility Area. The following sections provide details on the methodology and results for this analysis.

Methodology

CAL FIRE has a legal responsibility to provide fire protection on all SRA lands, which are defined based on land ownership, population density and land use. CAL FIRE's State Responsibility Area layer was used in this analysis to show Placer County's parcel counts and values by FRA, SRA, and LRA.

The fire responsibility area layer was overlaid with the parcel data. Since it is possible for any given parcel to intersect with multiple fire responsibility areas, for purposes of this analysis, the parcel centroid was used to determine which fire responsibility area to assign to each parcel. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessor's database and the FIS parcel layer. Based on this approach, the fire responsibility areas for the Placer County Planning Area were determined and further broken out by property use and included information on both land and improved values. Locations of each responsibility area are shown in Figure 4-120.

Figure 4-120 Placer County Planning Area – Fire Responsibility Areas by FRA, SRA, LRA



FOSTER MORRISON CONSULTING
 Data Source: Cal-Fire Fire Responsibility Area (SRA 20_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Fire Responsibility Areas and Values at Risk Results

Most all of the physical area of Placer County falls in the SRA and FRA. Most of the values at risk associated with the built environment fall in the LRA. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total county values at risk. However, it is highly unlikely the whole County will ever be on fire at once. The County parcel inventory and associated values by fire responsibility area are provided in Table 4-109 for the entire Placer County Planning Area, as described in the Values at Risk in Section 4.2. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the fire hazard severity zones due primarily to Proposition 13 and to a lesser extent properties falling under the Williamson Act.

Table 4-109 Placer County Planning Area – Count and Value of Parcels by Local, State, and Federal Responsibility Areas by Jurisdiction

Jurisdiction / Fire Responsibility Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Auburn					
FRA	76	0	\$0	\$0	\$0
SRA	0	0	\$0	\$0	\$0
LRA	6,414	5,180	\$648,497,133	\$1,548,994,382	\$2,197,491,515
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$2,197,491,515
Colfax					
FRA	0	0	\$0	\$0	\$0
SRA	0	0	\$0	\$0	\$0
LRA	988	711	\$64,997,967	\$152,168,583	\$217,166,550
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$217,166,550
Lincoln					
FRA	0	0	\$0	\$0	\$0
SRA	0	0	\$0	\$0	\$0
LRA	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$8,875,684,169
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$8,875,684,169
Loomis					
FRA	0	0	\$0	\$0	\$0
SRA	0	0	\$0	\$0	\$0
LRA	2,995	2,552	\$409,549,357	\$818,568,036	\$1,228,117,393
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$1,228,117,393
Rocklin					
FRA	0	0	\$0	\$0	\$0
SRA	0	0	\$0	\$0	\$0

Jurisdiction / Fire Responsibility Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
LRA	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$11,272,880,386
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$11,272,880,386
Unincorporated Placer County					
FRA	2,421	0	\$55,451	\$0	\$55,451
SRA	56,473	41,610	\$9,753,417,881	\$16,729,476,718	\$26,482,894,599
LRA	14,362	11,967	\$2,753,078,703	\$5,551,906,787	\$8,304,985,490
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$34,787,935,540
Grand Total					
	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$58,579,275,553

Source: CAL FIRE, Placer County 2020 Parcel/Assessor's Data

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Fire Hazard Severity Zone Analysis

As part of the Fire and Resource Assessment Program (FRAP), CAL FIRE was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as FHSZs, then define the application of various mitigation strategies to reduce risk associated with wildland fires.

Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The fire hazard model developed by CAL FIRE considers the wildland fuels. Fuel is that part of the natural vegetation that burns during the wildfire. The model also considers topography, especially the steepness of the slopes. Fires burn faster as they burn up-slope. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. Finally, the model considers the production of burning fire brands (embers) how far they move, and how receptive the landing site is to new fires.

In 2007, CAL FIRE developed its FHSZ maps for the State of California to provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources. The program is still ongoing with fire hazard severity zone maps being updated based on designated responsibility areas: FRA, SRA, and LRA.

The CAL FIRE data, detailing FHSZs within the Placer County Planning Area, was utilized to determine the locations, numbers, types, and values of land and structures falling within each FHSZ. The following sections provide details on the methodology and results for this analysis.

Methodology

CAL FIRE mapped the SRA FHSZs, or areas of significant fire hazard, based on fuels, terrain, weather, and other relevant factors. Zones are designated with Very High, High, Moderate, Non-Wildland/Non-Urban and Urban Unzoned hazard classes. The goal of this mapping effort is to create more accurate fire hazard zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The FHSZs will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources.

The “Draft” LRA FHSZ (c31fhszl06_1) dated September 2007 layer and the Adopted SRA FHSZ (fhszs06_3_31) dated November 2007 were used to get a complete coverage of Fire Hazards. Additionally, for the City of Auburn and the City of Colfax, the recommended Very High Fire Hazard Severity Zones (c31fhszl06_3) dated December 2008 were used.

Analysis was performed using the FHSZ datasets, and using GIS, the parcel layer was overlaid on the Draft and Adopted FHSZ layers. For the purposes of this analysis, if the parcel centroid intersects the zone’s area, it will be assumed that the entire parcel is in that area. This analysis illustrates the FHSZs specific to the Planning Area and the unincorporated County.

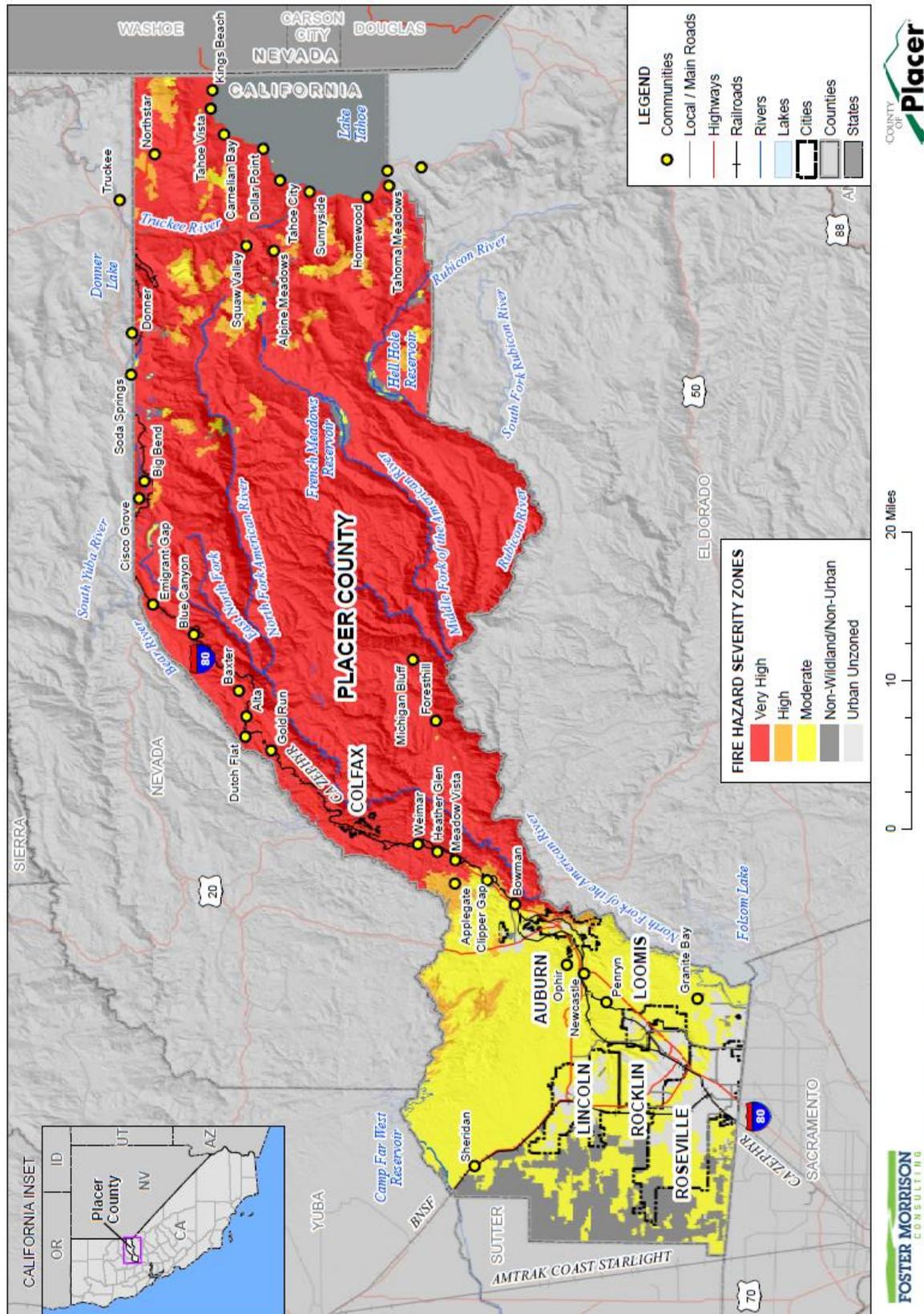
Fire Hazard Severity Zones Analysis Results: Values at Risk

Results are presented in this section for the Placer County Planning Area and the unincorporated County. Detail tables for the incorporated communities are included in their respective annexes to this LHMP Update.

Placer County Planning Area

The FHSZs in Placer County are shown in Figure 4-121. Analysis results for Placer County are summarized in and detailed by property use in Table 4-111. These tables summarize total parcel counts, improved parcel counts, and their improved and land values, and the estimated contents replacement values based on the CRV factors detailed in Table 4-7. Details specific to land uses in the incorporated jurisdictions in the County are shown in their respective annexes to this Plan Update.

Figure 4-121 Placer County Planning Area – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszi06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszi06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table 4-110 Placer County Planning Area – Summary of Count and Value of Parcels in Fire Hazard Severity Zones

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	38,987	26,081	6,761,268,615	11,034,237,290	5,803,504,979	23,599,010,884
High	6,350	4,923	775,345,209	1,718,778,348	942,577,602	3,436,701,159
Moderate	45,905	36,574	6,595,402,045	14,321,453,603	8,065,183,811	28,982,039,459
Non-Wildland/Non-Urban	1,607	908	389,324,100	297,161,753	179,440,526	865,926,379
Urban Unzoned	36,358	33,249	4,645,166,359	12,041,138,231	7,145,133,064	23,831,437,654
Total	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$22,135,839,982	\$80,715,115,535

Source: CAL FIRE, Placer County 2020 Parcel/Assessor's Data

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Table 4-111 Placer County Planning Area – Count and Value of Parcels in Fire Hazard Severity Zones by Jurisdiction

Jurisdiction / Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Auburn						
Very High	110	44	\$6,991,388	\$12,939,355	\$6,469,675	\$26,400,418
High	2,248	1,840	\$191,122,318	\$434,796,230	\$224,123,577	\$850,042,125
Moderate	2,897	2,340	\$310,739,956	\$750,722,502	\$425,810,068	\$1,487,272,526
Urban Unzoned	1,235	956	\$139,643,471	\$350,536,295	\$251,919,851	\$742,099,617
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686
Colfax						
Very High	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Lincoln						
Moderate	10,035	8,008	\$1,183,203,408	\$3,019,599,769	\$1,651,154,114	\$5,853,957,291
Non-Wildland/Non-Urban	985	638	\$107,063,552	\$204,238,966	\$122,079,620	\$433,382,138
Urban Unzoned	10,801	10,060	\$1,140,935,764	\$3,220,642,710	\$1,786,829,405	\$6,148,407,879
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308
Loomis						
High	37	27	\$2,940,043	\$7,221,400	\$3,610,697	\$13,772,140
Moderate	1,288	1,074	\$234,388,266	\$454,276,302	\$250,620,297	\$939,284,865

Jurisdiction / Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Non-Wildland/Non-Urban	7	6	\$894,956	\$1,176,959	\$855,411	\$2,927,326
Urban Unzoned	1,663	1,445	\$171,326,092	\$355,893,375	\$246,951,710	\$774,171,177
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508
Rocklin						
High	80	52	\$29,058,654	\$77,794,570	\$71,806,255	\$178,659,479
Moderate	8,160	6,686	\$1,199,256,172	\$3,194,734,621	\$1,928,183,688	\$6,322,174,481
Non-Wildland/Non-Urban	4	0	\$2,638,707	\$0	\$0	\$2,638,707
Urban Unzoned	15,413	14,271	\$1,874,753,579	\$4,894,644,083	\$2,840,162,092	\$9,609,559,754
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421
Unincorporated Placer County						
Very High	37,889	25,326	\$6,689,279,260	\$10,869,129,352	\$5,692,335,467	\$23,250,744,079
High	3,985	3,004	\$552,224,194	\$1,198,966,148	\$643,037,073	\$2,394,227,415
Moderate	23,525	18,466	\$3,667,814,243	\$6,902,120,409	\$3,809,415,644	\$14,379,350,296
Non-Wildland/Non-Urban	611	264	\$278,726,885	\$91,745,828	\$56,505,495	\$426,978,208
Urban Unzoned	7,246	6,517	\$1,318,507,453	\$3,219,421,768	\$2,019,270,006	\$6,557,199,227
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225
Grand Total						
Grand Total	129,207	101,735	\$19,166,506,328	\$39,412,769,225	\$22,135,839,982	\$80,715,115,535

Source: CAL FIRE, Placer County 2020 Parcel/Assessor's Data

The City of Roseville is not included in the calculations of assets at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Unincorporated Placer County

Analysis results for unincorporated Placer County are summarized by FHSZ in Table 4-112 and broken out by property use in Table 4-113. This table details total parcel counts, improved parcel counts, and their improved and land values, and the estimated contents replacement values based on the CRV factors detailed in Table 4-7.

Table 4-112 Unincorporated Placer County – Summary of Count and Value of Parcels in Fire Hazard Severity Zones

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	37,889	25,326	\$6,689,279,260	\$10,869,129,352	\$5,692,335,467	\$23,250,744,079
High	3,985	3,004	\$552,224,194	\$1,198,966,148	\$643,037,073	\$2,394,227,415
Moderate	23,525	18,466	\$3,667,814,243	\$6,902,120,409	\$3,809,415,644	\$14,379,350,296
Non-Wildland/Non-Urban	611	264	\$278,726,885	\$91,745,828	\$56,505,495	\$426,978,208
Urban Unzoned	7,246	6,517	\$1,318,507,453	\$3,219,421,768	\$2,019,270,006	\$6,557,199,227
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225

Source: CAL FIRE, Placer County 2020 Parcel/Assessor's Data

Table 4-113 Unincorporated Placer County – Count and Value of Parcels in Fire Hazard Severity Zones by Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High						
Agricultural	560	27	\$24,176,370	\$3,767,920	\$3,767,920	\$31,712,210
Commercial	797	434	\$231,469,772	\$270,774,812	\$270,774,812	\$773,019,396
Industrial	257	64	\$22,738,935	\$22,511,992	\$33,767,990	\$79,018,917
Institutional	445	32	\$10,704,643	\$28,049,854	\$28,049,854	\$66,804,351
Miscellaneous	6,428	111	\$248,980,080	\$7,971,074	\$7,971,074	\$264,922,228
Natural / Open Space	1,403	254	\$120,951,394	\$159,953,796	\$159,953,796	\$440,858,986
Residential	27,999	24,404	\$6,030,258,066	\$10,376,099,904	\$5,188,050,021	\$21,594,407,991
Very High Total	37,889	25,326	\$6,689,279,260	\$10,869,129,352	\$5,692,335,467	\$23,250,744,079
High						
Agricultural	69	3	\$9,402,869	\$1,096,254	\$1,096,254	\$11,595,377
Commercial	112	73	\$24,727,328	\$41,769,237	\$41,769,237	\$108,265,802
Industrial	21	14	\$8,325,946	\$14,226,407	\$21,339,612	\$43,891,965
Institutional	38	8	\$1,612,817	\$5,651,621	\$5,651,621	\$12,916,059
Miscellaneous	454	14	\$24,190,589	\$1,943,012	\$1,943,012	\$28,076,613
Natural / Open Space	91	14	\$8,057,690	\$8,195,011	\$8,195,011	\$24,447,712
Residential	3,200	2,878	\$475,906,955	\$1,126,084,606	\$563,042,326	\$2,165,033,887

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High Total	3,985	3,004	\$552,224,194	\$1,198,966,148	\$643,037,073	\$2,394,227,415
Moderate						
Agricultural	547	175	\$208,595,488	\$45,898,299	\$45,898,299	\$300,392,086
Commercial	282	162	\$89,362,007	\$119,421,301	\$119,421,301	\$328,204,609
Industrial	293	167	\$109,781,412	\$185,355,420	\$278,033,126	\$573,169,958
Institutional	175	52	\$26,669,598	\$131,918,758	\$131,918,758	\$290,507,114
Miscellaneous	3,300	108	\$287,574,395	\$18,692,660	\$18,692,660	\$324,959,715
Natural / Open Space	732	139	\$30,780,989	\$30,069,268	\$30,069,268	\$90,919,525
Residential	18,196	17,663	\$2,915,050,354	\$6,370,764,703	\$3,185,382,232	\$12,471,197,289
Moderate Total	23,525	18,466	\$3,667,814,243	\$6,902,120,409	\$3,809,415,644	\$14,379,350,296
Non-Wildland/Non-Urban						
Agricultural	153	62	\$152,912,294	\$10,487,252	\$10,487,252	\$173,886,798
Commercial	2	1	\$22,983	\$155,952	\$155,952	\$334,887
Industrial	3	0	\$32,121,172	\$0	\$0	\$32,121,172
Institutional	6	0	\$0	\$0	\$0	\$0
Miscellaneous	141	2	\$15,841,695	\$1,372,897	\$1,372,897	\$18,587,489
Natural / Open Space	124	47	\$28,974,731	\$9,249,056	\$9,249,056	\$47,472,843
Residential	182	152	\$48,854,010	\$70,480,671	\$35,240,338	\$154,575,019
Non-Wildland/Non-Urban Total	611	264	\$278,726,885	\$91,745,828	\$56,505,495	\$426,978,208
Urban Unzoned						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	340	281	\$179,278,586	\$361,071,674	\$361,071,674	\$901,421,934
Industrial	130	109	\$61,526,782	\$167,138,321	\$250,707,486	\$479,372,589
Institutional	32	21	\$11,774,223	\$108,884,358	\$108,884,358	\$229,542,939
Miscellaneous	405	5	\$20,351,216	\$4,305,765	\$4,305,765	\$28,962,746
Natural / Open Space	170	4	\$5,123,970	\$10,579,857	\$10,579,857	\$26,283,684
Residential	6,169	6,097	\$1,040,452,676	\$2,567,441,793	\$1,283,720,866	\$4,891,615,335
Urban Unzoned Total	7,246	6,517	\$1,318,507,453	\$3,219,421,768	\$2,019,270,006	\$6,557,199,227
Unincorporated Placer County Total	73,256	53,577	\$12,506,552,035	\$22,281,383,505	\$12,220,563,685	\$47,008,499,225

Source: CAL FIRE, Placer County 2020 Parcel/Assessor's Data

Population at Risk

A separate analysis was performed to determine population that reside in FHSZs. Using GIS, the CAL FIRE FHSZ datasets were overlaid on the improved residential parcel data. Those parcel centroids that intersect each FHSZ were counted and multiplied by the Census Bureau average household size; results were tabulated by FHSZ (see Table 4-114). According to this analysis, there is a population of 88,096 in the Moderate FHSZ, 4,740 in the High, 0 and 64,459 in the Very High FHSZ in the County.

Table 4-114 Placer County Planning Area – Residential Populations at Risk in Moderate or Higher Fire Hazard Severity Zones by Jurisdiction

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Auburn	44	96	1,806	3,955	2,205	4,829
Colfax	609	1,401	0	0	0	0
Lincoln	0	0	0	0	7,923	20,362
Loomis	0	0	27	70	3	8
Rocklin	0	0	29	78	6,465	17,326
Unincorporated Placer County	24,404	62,962	2,878	7,713	17,663	45,571
Total	25,057	64,459	4,740	11,816	34,259	88,096

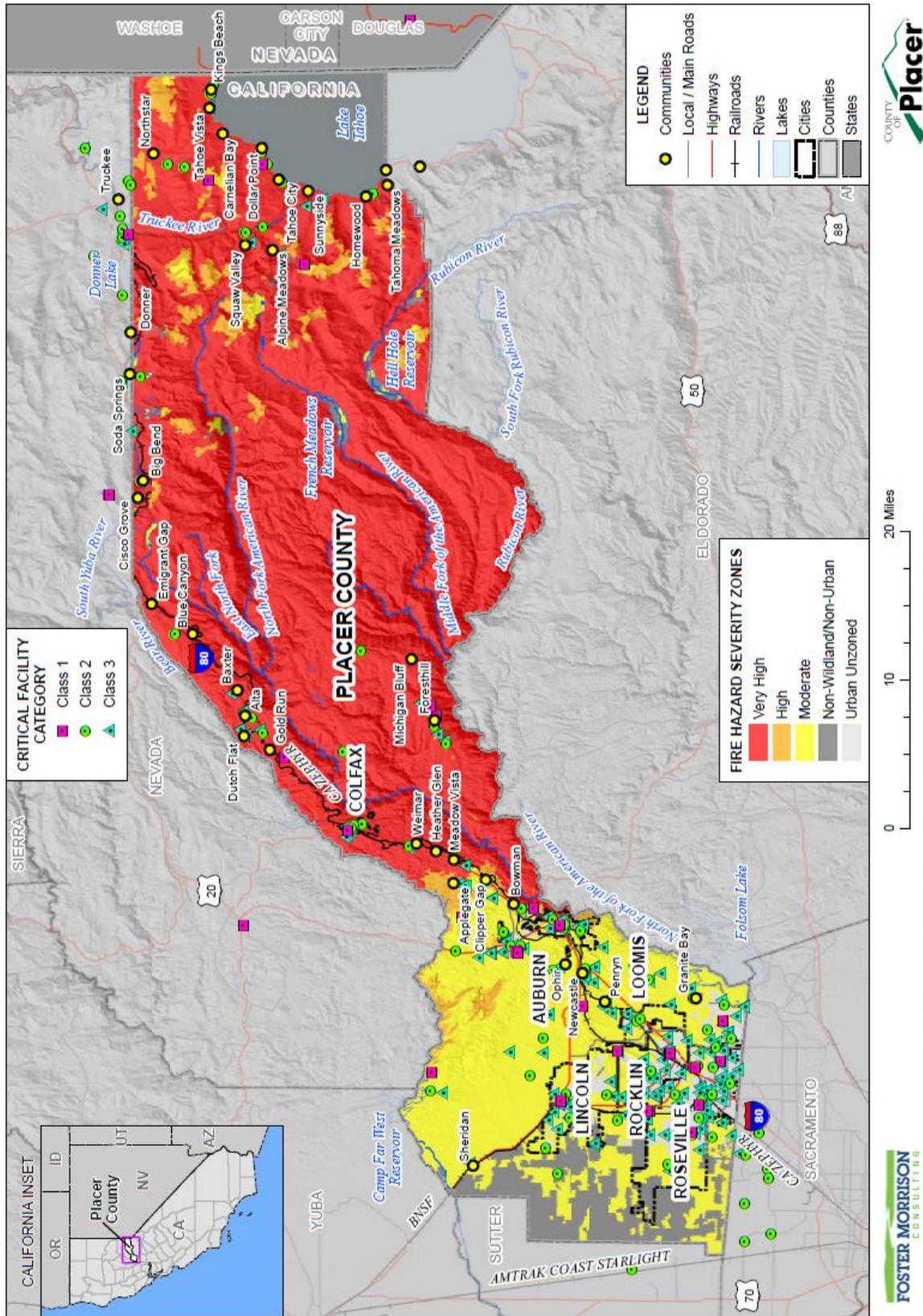
Source: CAL FIRE, US Census Bureau Average Household Sizes: Auburn (2.19); Colfax (2.30); Lincoln (2.57); Loomis (2.60), Rocklin (2.68); and unincorporated Placer County (2.58)

The City of Roseville is not included in the calculations of populations at risk. The City maintains its own Hazard Mitigation Plan, which can be found on the City's website.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Placer County to determine critical facilities in the Fire Hazard Severity Zones. Using GIS, the CAL FIRE, Fire Hazard Severity Zones were overlaid on the critical facility GIS layer. Figure 4-122 shows critical facilities, as well as the Fire Hazard Severity Zones. Table 4-115 details critical facilities by jurisdiction, facility type, and count for the Planning Area. Details of critical facility definition, type, name and address by flood zone are listed in Appendix F.

Figure 4-122 Placer County – Critical Facilities in FHSzs



Data Source: Cal-Fire (Draft 09/2007 - c31fhsz06_1, Adopted 11/2007 - fhsz06_3_31, Recommended 12/2008 - c31fhsz06_3), Placer County GIS, Cal-Atlas, NVBLM, Map Date: 2021.

Table 4-115 Placer County – Critical Facilities in FHSZs

Fire Hazard Severity Zone / Jurisdiction	Critical Facility Class	Critical Facility Type	Facility Count
Auburn			
High	Class 3	School	2
High Total			2
Moderate	Class 2	Fire Station	2
	Class 3	Hall	3
Moderate Total			5
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	1
		National/Coast Guard	1
		Police Station	1
	Class 3	Fairground	1
		Hall	2
		School	3
Urban Unzoned Total			12
Auburn Total			19
Colfax			
Very High	Class 2	Fire Station	2
		Police Station	1
	Class 3	Hall	1
		Water Treatment Plant	1
Very High Total			5
Colfax Total			5
Lincoln			
Moderate	Class 2	Airport	1
	Class 3	Fire Station	2
		School	6
Moderate Total			9
Non-Wildland/Non-Urban	Class 3	Hall	1
		School	1
		Water Treatment Plant	1
Non-Wildland/Non-Urban Total			3
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1

Fire Hazard Severity Zone / Jurisdiction	Critical Facility Class	Critical Facility Type	Facility Count
	Class 2	Fire Station	1
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
		School	5
Urban Unzoned Total			12
Lincoln Total			24
Loomis			
Moderate	Class 2	Police Station	1
Moderate Total			1
Urban Unzoned	Class 2	Fire Station	1
	Class 3	School	3
Urban Unzoned Total			4
Loomis Total			5
Rocklin			
Moderate	Class 1	Communication Transmission Sites	1
	Class 2	Fire Station	1
	Class 3	School	1
		Water Treatment Plant	1
Moderate Total			4
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	2
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
School		18	
Urban Unzoned Total			26
Rocklin Total			30
Unincorporated Placer County			
Very High	Class 1	Communication Transmission Sites	5
		Emergency Operation Center	1
	Class 2	Airport	1
		CHP Station	1
		Fire Station	23
		National/Coast Guard	1

Fire Hazard Severity Zone / Jurisdiction	Critical Facility Class	Critical Facility Type	Facility Count
	Class 3	Police Station	3
		Hall	9
		School	13
		Water Treatment Plant	4
Very High Total			61
High	Class 1	Communication Transmission Sites	1
	Class 2	Fire Station	2
	Class 3	Hall	1
		Hazardous Materials Facility	2
		School	1
		Water Treatment Plant	2
High Total			9
Moderate	Class 1	Communication Transmission Sites	6
		Computer Information Systems Infrastructure	1
		Emergency Operation Center	1
		Hospital Control Facility	1
		Telecommunications	2
	Class 2	CHP Station	1
		Fire Station	18
		Hospital	1
	Class 3	Hall	12
		Hazardous Materials Facility	6
		School	21
		Water Treatment Plant	7
Moderate Total			77
Non-Wildland/Non-Urban	Class 1	Communication Transmission Sites	1
	Class 2	Fire Station	1
Non-Wildland/Non-Urban Total			2
Urban Unzoned	Class 1	Computer Information Systems Infrastructure	1
		Dispatch Center	2
		Emergency Operation Center	1
		Fire Station	1
	Class 2	Fire Station	7
		Hospital	2
		National/Coast Guard	1

Fire Hazard Severity Zone / Jurisdiction	Critical Facility Class	Critical Facility Type	Facility Count
	Class 3	Police Station	3
		Fairground	1
		Hall	7
		School	30
		Water Treatment Plant	3
Urban Unzoned Total			59
Unincorporated Placer County Total			208
Adjacent Counties			
Unknown - Located in Adjacent County	Class 1	Communication Transmission Sites	3
		Dispatch Center	3
	Class 2	Airport	1
		CHP Station	1
		Fire Station	16
		Hospital	1
	Class 3	School	11
		Water Treatment Plant	1
Adjacent Counties Total			37
Grand Total			328

Source: Placer County GIS, CAL FIRE

Overall Community Impact

The overall impact to the community from a severe wildfire includes:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Decreased water quality in area watersheds;
- Increase in post-fire hazards such as flooding, sedimentation, and debris flows/mudslides;
- Damage to natural resource habitats and other resources, such as crops, timber and rangelands;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;
- Negative impact on commercial and residential property values;
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed; and
- Impact on the overall mental health of the community.

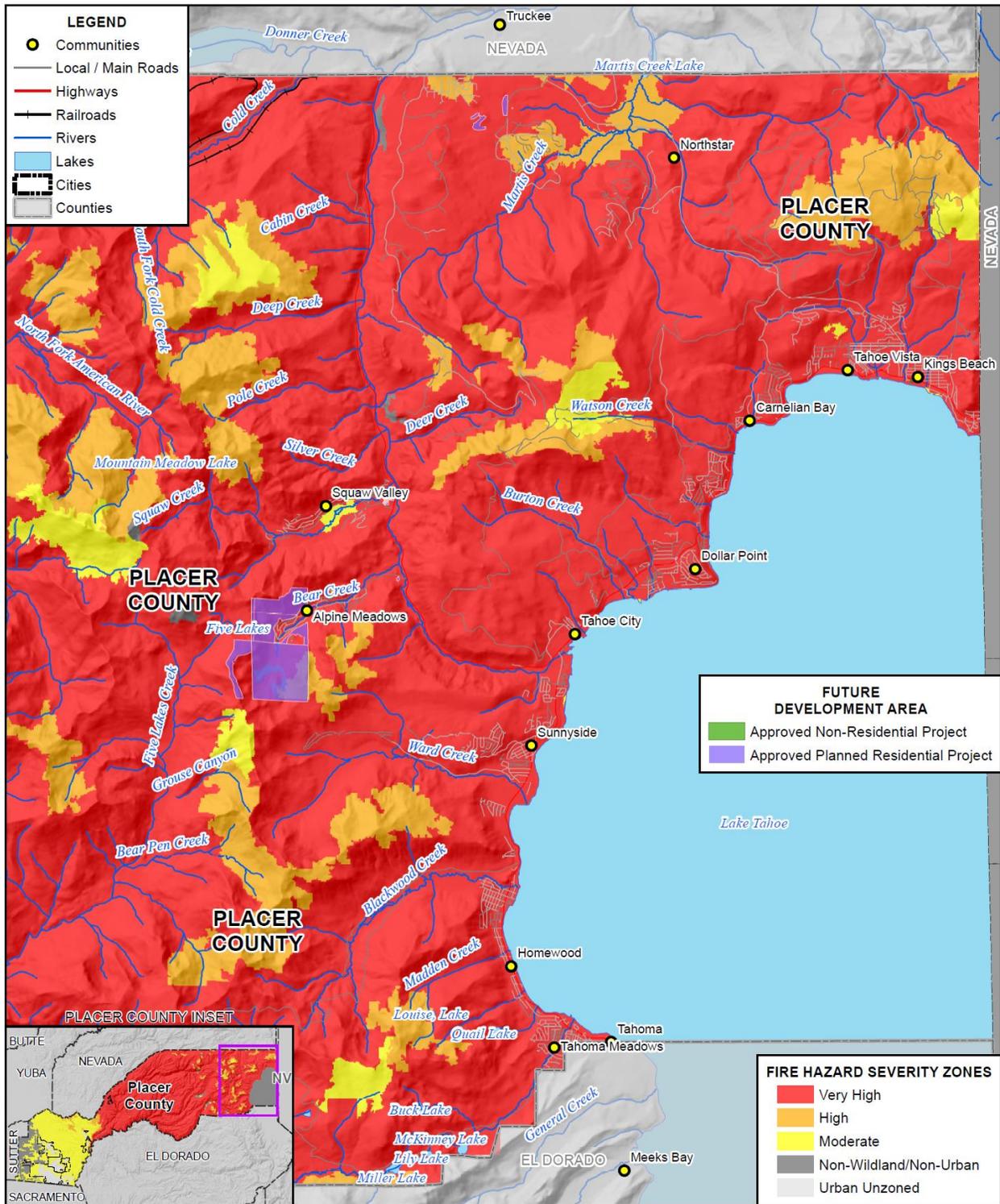
Future Development

Population growth and development in Placer County has recently slowed slightly; however, additional growth and development within the WUI and other high fire hazard areas of the County would place additional values at risk to wildfire. County building codes are in effect to reduce this risk.

GIS Analysis

Placer County's 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. Using the GIS parcel spatial file and the APNs, the 2 types and 37 future development projects were mapped. For the wildfire analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each FHSZ. FHSZs and future development areas are shown on Figure 4-123 (for the western County), and Figure 4-124 (for the eastern County) and parcels and acreages in those areas are shown in Table 4 100.

Figure 4-124 Unincorporated Placer County – East Future Development and FHSZs



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table 4-116 Unincorporated Placer County – Future Development in FHSZs

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Very High			
Approved Planned Residential Project			
Alpine Sierra Subdivision	2		44.4
Alpine Village Apartments	1	1	1.7
Belcara Planned Development	3	2	170.7
Dollar Creek Crossing	1		0.7
Hopkins Village	2		0.2
Palisades at Squaw	71	16	19.9
Schaffer's Mill	2	1	43.3
White Wolf Subdivision	6	1	1,105.4
Approved Planned Residential Project Total	88	21	1,386.2
Approved Non-Residential Project			
Lakeside Redevelopment	7	7	1.9
Approved Non-Residential Project Total	7	7	1.9
Very High Total	95	28	1,388.1
High			
Approved Non-Residential Project			
Hidden Falls Regional Park Trail Expansion Project	21	1	2,307.5
Approved Non-Residential Project Total	21	1	2,307.5
High Total	21	1	2,307.5
Moderate			
Approved Planned Residential Project			
Brady Estates	1	0	4.9
Brady Vineyard	2	0	32.6
Brookwood Estates	1	0	8.3
Double S Ranch	1	1	36.7
Glen Willow	1	0	84.0
Lake Vista Estates	2	0	35.5
Mariposa (Parcel J)	3	0	1.6
Morgan Knolls	1	0	15.8

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Morgan Place	1	0	11.5
Morgan Ranch (formerly Whisper Creek)	10	3	4.2
Placer Vineyards Property 4B	2	0	22.8
Placer Vineyards Property 7	1	0	92.2
Rancho Del Oro	1	0	117.5
Saber City	2	0	5.0
Whitehawk I	1	0	17.6
Whitehawk II	1	0	32.0
Approved Planned Residential Project Total	31	4	522.2
Approved Non-Residential Project			
Baseline Commercial Center	2	0	7.0
Hidden Falls Regional Park Trail Expansion Project	42	8	2,956.4
Placer Gold Industrial Park	8	1	286.7
Quarry Ridge Professional Office Park	1	0	3.0
United Auburn Indian Community Tribal School	1	1	42.3
Approved Non-Residential Project Total	54	10	3,295.5
Moderate Total	85	14	3,817.7
Non-Wildland/Non-Urban			
Approved Planned Residential Project			
Mariposa (Parcel J)	1	0	0.3
Mason Trails	1	0	77.5
Approved Planned Residential Project Total	2	0	77.7
Non-Wildland/Non-Urban Total	2	0	77.7
Urban Unzoned			
Approved Planned Residential Project			
Barton Ranch	13	0	10.0
Park at Granite Bay	7	1	16.0
Premier Soleil Townhomes	2	0	8.2

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Ventura at Granite Bay	1	0	6.1
Approved Planned Residential Project Total	23	1	40.3
Approved Non-Residential Project			
Catuna Residential Care Home	1	1	2.2
Placer County Government Center Master Plan Update	2	0	106.5
Approved Non-Residential Project Total	3	1	108.6
Urban Unzoned Total	26	2	148.9
Grand Total	229	45	7,739.9

Source: Placer County GIS, CAL FIRE

4.3.20. Natural Hazards Summary

Table 4-117 summarizes the results of the hazard identification, hazard profile, and vulnerability assessment for the Placer County Planning Area based on hazards data and input from the HMPC. For each hazard profiled in Section 4.3, this table includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for mitigation actions (as discussed in Chapter 5 of this Plan Update) in the Placer County Planning Area.

Priority Hazards

As detailed in the hazard identification section, those hazards identified as a high or medium significance in Table 4-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact on the Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of a community to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the Placer County Planning Area, enabling the County to focus resources where they are most needed.

Table 4-117 Hazard Identification/Profile Summary and Determination of Priority Hazards

Hazard	Likelihood of Future Occurrence	Priority Hazard
Agriculture Pests and Diseases	Highly Likely	Y
Avalanche	Likely	N

Hazard	Likelihood of Future Occurrence	Priority Hazard
Climate Change	Likely	Y
Dam Failure	Occasional	Y
Drought & Water Shortage	Likely	Y
Earthquake	Occasional	Y
Floods: 1%/0.2% annual chance	Occasional	Y
Floods: Localized Stormwater	Occasional/Highly Likely	Y
Landslides, Mudslides, and Debris Flows	Occasional	N
Levee Failure	Unlikely	N
Pandemic	Likely	Y
Seiche	Unlikely	Y
Severe Weather: Extreme Heat	Highly Likely	Y
Severe Weather: Freeze and Snow	Highly Likely	Y
Severe Weather: Heavy Rains and Storms	Occasional	Y
Severe Weather: High Winds and Tornadoes	Highly Likely	Y
Tree Mortality	Likely	Y
Wildfire	Highly Likely	Y

4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Placer County Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County’s net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this LHMP Update.

A two-step approach was used to conduct this assessment for the County. First, an inventory of common mitigation activities was made through the use of matrixes. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, an inventory and review of existing policies, regulations, plans, and programs was conducted to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the County’s mitigation capabilities that are applicable to the County. These are in addition to, and supplement, the many plans, reports, and technical information reviewed and used for this LHMP Update as identified in Chapter 3 and in Chapter 4.

Similar to the HMPC’s effort to describe hazards, risks, and vulnerability of the County, this mitigation capability assessment describes the County’s existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This assessment

is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; mitigation education, outreach, and partnerships are discussed in Section 4.4.4, and other mitigation efforts are discussed in Section 4.4.5.

4.4.1. Placer County’s Regulatory Mitigation Capabilities

Table 4-118 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Placer County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-118 Placer County Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Plan	Y 2016 2021 update currently underway	The General Plan Safety Element contains a program to address hazards. The Plan identifies mitigation actions and can be used to implement mitigation actions. Please note that this element is currently being updated to incorporate the adaptation strategies provided in the PCSP pursuant to SB 379. The update will reflect the 2016 LHMP and 2012 CWPP and will address the current regulatory requirements as specified in Sections 65302(g)(1)-(5).
Capital Improvements Plan	Y	The CIP addresses facilities that are in need of repair or replacement to protect and improve critical infrastructure. Mitigation projects are considered and included in annual CIPs as feasible.
Economic Development Plan	Y	
Local Emergency Operations Plan	Y 2010	The Placer County EOP update is in progress. It is scheduled to be completed by the end of July 2016.
Continuity of Operations Plan		
Transportation Plan	Y	Regional Plan
Stormwater Management Plan/Program	Y 2004	
Engineering Studies for Streams		
Community Wildfire Protection Plan	Y 2015	This project addresses fire hazards in the County. It contains mitigation actions and a mitigation strategy to reduce fire risk in the County.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Oil by Rail Plan (2015) for the County. The plan details risk to the County and how the County will respond to any oil by rail spill. Groundwater Sustainability Plan - Development of the GSP is currently underway and is expected to be completed in January 2022. Subsequent implementation of the GSP will include mitigation actions that will address hazards.

Building Code, Permitting, and Inspections		
	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: CBC 2019. It is enforced by the building department.
Building Code Effectiveness Grading Schedule (BCEGS) Score	Y	Score: 2/2
Fire department ISO rating:		Rating:
Site plan review requirements		The floodplain is identified through County GIS database
Land Use Planning and Ordinances		
Zoning ordinance	Y	This is an effective measure and is adequately administered and enforced.
Subdivision ordinance	Y	This is an effective measure and is adequately administered and enforced.
Floodplain ordinance	Y	The ordinance limits development in the floodplain and follows FEMA's guidelines. County staff administers and enforces ordinance
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	County enforces a Stormwater Quality Ordinance and WUI ordinance. There are also defensible space programs.
Flood insurance rate maps	Y	Maps are maintained at the County. New maps are being developed to better identify flood hazard. Mapping is part of County GIS database
Elevation Certificates	Y	All elevation certificates are maintained at the county. New development is required to provide an elevation certificate for any new or substantially improved structure that is within the special flood hazard area
Acquisition of land for open space and public recreation uses	Y	The County has a program to purchase open space and general and specific plans which detail uses
Erosion or sediment control program	Y	The County has a stormwater quality program and ordinance
Other		
How can these capabilities be expanded and improved to reduce risk?		
<p>Expand Everbridge (Reverse 911) warning system polygons to cover smaller more detailed hazard areas (i.e., Joe Rogers flood hazard area, etc.)</p> <p>Additional funding for capital projects would allow a more proactive approach to reduce hazards and implement mitigation actions. Funding for additional staff would allow the County more opportunities to seek funding opportunities and to expedite projects.</p>		

As indicated in the tables above, Placer County has several plans and programs that guide the County's mitigation of development of hazard-prone areas. Starting with the Placer County General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

Placer County General Plan (2013 – being updated in 2021)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals

for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation), housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies.

Goals and policies related to mitigation from the General Plan are the following:

Land Use Element

Goals/Policy	Explanation
Land Use Element	
Goal 1.A:	To promote the wise, efficient, and environmentally-sensitive use of Placer County lands to meet the present and future needs of Placer County residents and businesses.
Policy 1.A.1.	The County will promote the efficient use of land and natural resources.
Policy 1.A.2.	The County shall permit only low-intensity forms of development in areas with sensitive environmental resources or where natural or human-caused hazards are likely to pose a significant threat to health, safety, or property.
Goal 1.F:	To designate adequately-sized, well-located areas for the development of public facilities to serve both community and regional needs.
Policy 1.F.2.	The County shall seek to locate new public facilities necessary for emergency response, health care, and other critical functions outside areas subject to natural or built environment hazards.
Goal 1.K:	To protect the visual and scenic resources of Placer County as important quality-of-life amenities for County residents and a principal asset in the promotion of recreation and tourism.
Policy 1.K.6.	The County shall require that new development on hillsides employ design, construction, and maintenance techniques that: <ul style="list-style-type: none"> a. Ensure that development near or on portions of hillsides do not cause or worsen natural hazards such as erosion, sedimentation, fire, or water quality concerns; b. Include erosion and sediment control measures including temporary vegetation sufficient to stabilize disturbed areas; c. Minimize risk to life and property from slope failure, landslides, and flooding; and, d. Maintain the character and visual quality of the hillside.

Public Facilities Element

Goals/Policy	Explanation
Public Facilities Element	
Goal 4.E	To manage rainwater and stormwater at the source in a sustainable manner that least inconveniences the public, reduces potential water-related damage, augments water supply, mitigates storm water pollution, and enhances the environment.
Policy 4.E.1	The County shall encourage the use of natural stormwater drainage systems to preserve and enhance natural features.

Goals/Policy	Explanation
Policy 4.E.2.	The County shall support efforts to acquire land or obtain easements for drainage and other public uses of floodplains where it is desirable to maintain drainage channels in a natural state.
Policy 4.E.3.	The County shall consider using stormwater of adequate quality to replenish local groundwater basins, restore wetlands and riparian habitat, and irrigate agricultural lands.
Policy4.E.4.	The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County Land Development Manual.
Policy 4.E.5.	The County shall continue to implement and enforce its Grading, Erosion and Sediment Control Ordinance and Flood Damage Prevention Ordinance.
Policy 4.E.6.	The County shall continue to support the programs and policies of the watershed flood control plans developed by the Flood Control and Water Conservation District.
Policy 4.E.7.	The County shall prohibit the use of underground storm drain systems in rural and agricultural areas, unless no other feasible alternatives are available for conveyance of stormwater from new development or when necessary to mitigate flood hazards.
Policy 4.E.8.	The County shall consider recreational opportunities and aesthetics in the design of stormwater ponds and conveyance facilities.
Policy 4.E.9.	The County shall encourage good soil conservation practices in agricultural and urban areas and carefully examine the impact of proposed urban developments with regard to drainage courses.
Policy4.E.10.	The County shall strive to improve the quality of runoff from urban and suburban development through use of appropriate site design measures including, but not limited to vegetated swales, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, rooftop and impervious area disconnection, porous pavement, and other best management practices (BMPs).
Policy 4.E.11.	The County shall require new development to adequately mitigate increases in stormwater peak flows and/or volume. Mitigation measures should take into consideration impacts on adjoining lands in the unincorporated area and on properties in jurisdictions within and immediately adjacent to Placer County.
Policy 4.E.12.	The County shall encourage project designs that minimize drainage concentrations and impervious coverage and maintain, to the extent feasible, natural site drainage conditions.
Policy 4.E.13.	The County shall require that new development conforms with the applicable programs, policies, recommendations, and plans of the Placer County Flood Control and Water Conservation District.
Policy 4.E.14.	The County shall require projects that have significant impacts on the quantity and quality of surface water runoff to allocate land as necessary for the purpose of detaining post-project flows, evapotranspiring, infiltrating, harvesting/using, and biotreating stormwater, and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.
Policy 4.E.15.	The County shall require that new development in primarily urban development areas incorporate low impact development measures to reduce the amount of runoff, to the maximum extent practicable, for which retention and treatment is required.
Policy 4.E 16.	The County shall identify and coordinate mitigation measures with responsible agencies for the control of storm drainage systems, monitoring of discharges, and implementation of measures to control pollutant loads in urban storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Environmental Health Division, Placer County Department of Public Works and Facilities, CDRA Engineering and Surveying Division, Placer County Flood Control and Water Conservation District).
Policy 4.E.17.	The County shall strive to protect domestic water supply canal systems from contamination resulting from spillage or runoff.

Goals/Policy	Explanation
Policy 4.E.18	The County shall, wherever feasible, require that proponents of new projects encase, or otherwise protect from contamination, domestic water supply canals where they pass through developments with lot sizes of 2.3 acres or less; where subdivision roads are constructed within 100 feet upslope or upstream from canals; and within all commercial, industrial, institutional, and multi-family developments.
Policy 4.E.19.	The County shall require that proponents of new projects fence domestic water supply canals where they pass through development with lot sizes between 2.3 and 4.6 acres; and on a case-by-case basis as determined by the entity responsible for the canal. This fencing shall be installed inside the project property line, and the proponent or subsequent landowner shall be responsible for fence maintenance. Said fencing shall be designed to impede pedestrian trespass of the canal area and to impede any dumping of materials into the canal.
Policy 4.E.20.	The County shall continue to implement and enforce its Stormwater Quality Ordinance.
Goal 4.F	To protect the lives and property of the citizens of Placer County from hazards associated with development in floodplains and manage floodplains for their natural resource values.
Policy 4.F.1.	The County shall require that arterial roadways and expressways, residences, commercial and industrial uses and emergency facilities be protected, at a minimum, from a 100-year storm event.
Policy 4.F.2.	The County shall recognize floodplains as a potential public resource to be managed and maintained for the public's benefit.
Policy 4.F.3.	The County shall continue to work closely with the U.S. Army Corps of Engineers, the Resource Conservation District, the Federal Emergency Management Agency, the State Department of Water Resources, the Central Valley Flood Protection Board, and the Placer County Flood Control and Water Conservation District, in defining existing and potential flood problem areas.
Policy 4.F.4.	The County shall require evaluation of potential flood hazards prior to approval of development projects. The County shall require proponents of new development to submit accurate topographic and flow characteristics information and depiction of the 100-year floodplain boundaries under fully developed, unmitigated runoff conditions.
Policy 4.F.5.	The County shall attempt to maintain natural conditions within the 100-year floodplain of all rivers and streams except under the following circumstances: a. Where work is required to manage and maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, California Department of Fish and Wildlife regulations, and Clean Water Act provisions administered by the U.S. Army Corps of Engineers.
Policy 4.F.6.	The County shall continue to coordinate efforts with local, state, and federal agencies to achieve adequate water quality and flood protection.
Policy 4.F.7.	The County shall cooperate with the Placer County Flood Control and Water Conservation District, surrounding jurisdictions, the cities in the County, and other public agencies in planning and implementing regional flood control improvements, plans, and programs.
Policy 4.F.8.	The County shall, where possible, view flood waters as a resource to be used for waterfowl habitat, aquifer recharge, fishery enhancement, agricultural water supply, and other suitable uses.
Policy 4.F.9	The County shall continue to implement floodplain zoning and undertake other actions required to comply with state floodplain requirements, and to maintain the County's eligibility under the Federal Flood Insurance Program.
Policy 4.F.10.	The County shall preserve or enhance the aesthetic qualities of natural drainage courses in their natural or improved state compatible with flood control requirements and economic, environmental, and ecological factors.
Policy 4.F.11.	To the extent that funding is available, the County shall work to solve flood control problems in areas where existing development has encroached into a floodplain.

Goals/Policy	Explanation
Policy 4.F.12.	The County shall promote the use of natural or non-structural flood control facilities, including off-stream flood control basins, to preserve and enhance creek corridors.
Policy 4.F.13.	The County shall continue to implement and enforce its Grading, Erosion and Sediment Control Ordinance and Flood Damage Prevention Ordinance.
Policy 4.F.14.	The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County's Land Development Manual.
Goal 4.I:	To protect residents of and visitors to Placer County from injury and loss of life and to protect property and watershed resources from fires.
Policy 4.I.1.	The County shall encourage local fire protection agencies in Placer County to maintain the following minimum fire protection standards (expressed as Insurance Service Organization (ISO) ratings): a. ISO 4 in urban areas b. ISO 6 in suburban areas c. ISO 8 in rural areas
Policy 4.I.2.	The County shall encourage local fire protection agencies in the County to maintain the following standards (expressed as average response times to emergency calls): a. 4 minutes in urban areas b. 6 minutes in suburban areas c. 10 minutes in rural areas
Policy 4.I.3.	The County shall require new development to develop or fund fire protection facilities, personnel, and operations and maintenance that, at a minimum, maintains the above service level standards.
Policy 4.I.4.	The County shall work with local fire protection agencies to identify key fire loss problems and design appropriate fire safety education programs to reduce fire incidents and losses.
Policy 4.I.5.	The County shall work with local fire protection agencies and implement ordinances to control fire losses and fire protection costs through continued use of automatic fire detection, control, and suppression systems.
Policy 4.I.6.	The County shall continue to promote standardization of operations among fire protection agencies and improvement of fire service levels.
Policy 4.I.7.	The County shall maintain and strengthen automatic aid agreements to maximize efficient use of available resources.
Policy 4.I.8.	The County shall work with local fire protection agencies to maintain a pre-fire planning program with selected high-risk occupancies reviewed at least annually.
Policy 4.I.9.	The County shall ensure that all proposed developments are reviewed for compliance with fire safety standards by responsible local fire agencies per the Uniform Fire Code and other County and local ordinances.
Policy 4.I.10.	The County shall work with local fire protection agencies to inventory and eliminate structurally unsafe and fire-hazardous housing units that are beyond repair or rehabilitation.
Policy 4.I.11.	The County shall encourage local fire protection agencies to provide and maintain advanced levels of emergency medical services (EMS) to the public.

Natural Resources Element

Goals/Policy	Explanation
Natural Resources Element	
Goal 6.A:	To protect and enhance the natural qualities of Placer County's rivers, streams, creeks and groundwater.
Policy 6.A.2	The County shall require all development in the 100-year floodplain to comply with the provisions of the Placer County Flood Damage Prevention Ordinance.
Policy 6.A.4.	Where stream protection is required or proposed, the County should require public and private development to: <ol style="list-style-type: none"> a. Preserve stream zones and stream setback areas through easements or dedications. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a stream is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval; b. Designate such easement or dedication areas (as described in a. above) as open space; c. Protect stream zones and their habitat value by actions such as: 1) providing an adequate stream setback, 2) maintaining creek corridors in an essentially natural state, 3) employing stream restoration techniques where restoration is needed to achieve a natural stream zone, 4) utilizing riparian vegetation within stream zones, and where possible, within stream setback areas, 5) prohibiting the planting of invasive, non-native plants (such as Vinca major and eucalyptus) within stream zones or stream setbacks, and 6) avoiding tree removal within stream zones; d. Provide recreation and public access near streams consistent with other General Plan policies; e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas; and/or are stabilized with permanent vegetation that will prevent the transport of sediment off site; and 2) temporary vegetation sufficient to stabilize disturbed areas.
Policy 6.A.10	The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
Policy 6.A.11.	Where the stream zone has previously been modified by channelization, fill, or other human activity, the County shall require project proponents to restore such areas by means of landscaping, revegetation, or similar stabilization techniques as a part of development activities.
Policy 6.A.15.	The County shall encourage the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.
Goal 6.B	To protect wetland communities and related riparian areas throughout Placer County as valuable resources.
Policy 6.B.1.	The County shall support the "no net loss" policy for wetland areas regulated by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.

Goals/Policy	Explanation
Policy 6.B.2.	The County shall require new development to mitigate wetland loss in both federal jurisdictional and non-jurisdictional wetlands to achieve "no net loss" through any combination of the following, in descending order of desirability: (1) avoidance; (2) where avoidance is not possible, minimization of impacts on the resource; or (3) compensation, including use of a mitigation and conservation banking program that provides the opportunity to mitigate impacts to special status, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas. Non-jurisdictional wetlands may include riparian areas that are not federal "waters of the United States" as defined by the Clean Water Act.
Goal 6.D:	To preserve and protect the valuable vegetation resources of Placer County.
Policy 6.D.1	The County shall encourage landowners and developers to preserve the integrity of existing terrain and natural vegetation in visually-sensitive areas such as hillsides, ridges, and along important transportation corridors.
Policy 6.D.2.	The County shall require developers to use native and compatible non-native species, especially drought-resistant species, to the extent possible in fulfilling landscaping requirements imposed as conditions of discretionary permits or for project mitigation.
Policy 6.D.3.	The County shall support the preservation of outstanding areas of natural vegetation, including, but not limited to, oak woodlands, riparian areas, and vernal pools.
Policy 6.D.7.	The County shall support the management of wetland and riparian plant communities for passive recreation, groundwater recharge, nutrient catchment, and wildlife habitats. Such communities shall be restored or expanded, where possible.
Policy 6.D.9.	The County shall require that development on hillsides be limited to maintain valuable natural vegetation, especially forests and open grasslands, and to control erosion.
Goal 6.E:	To preserve and enhance open space lands to maintain the natural resources of the County.
Policy 6.E.1.	The County shall support the preservation and enhancement of natural land forms, natural vegetation, and natural resources as open space to the maximum extent feasible. The County shall permanently protect, as open space, areas of natural resource value, including wetlands, riparian corridors, unfragmented woodlands, and floodplains.
Policy 6.E.2	. The County shall require that new development be designed and constructed to preserve the following types of areas and features as open space to the maximum extent feasible: a. High erosion hazard areas; b. Scenic and trail corridors; c. Streams, riparian vegetation; d. Wetlands; e. Significant stands of vegetation; f. Wildlife corridors; and g. Any areas of special ecological significance.

Agriculture/Forestry Element

Goals/Policy	Explanation
Agriculture/Forestry Element	
Goal 7.A	To provide for the long-term conservation and use of agriculturally-designated lands.
Policy 7.A.4.	The County shall provide protection from flooding for agricultural and related activities from flooding.
Goal 7.D:	To maximize the productivity of Placer County's agriculture uses by ensuring adequate supplies of water.

Goals/Policy	Explanation
Policy 7.D.1.	The County shall support efforts to deliver adequate surface water to agricultural areas with deficient water supplies.
Policy 7.D.2.	The County shall encourage water conservation by farmers. To this end, the County shall, through the Agricultural Commissioner and U.C. Cooperative Extension, continue to provide information on irrigation methods and best management practices. The County shall also support conservation efforts of the California Farm Bureau, resource conservation districts, Natural Resources Conservation Service, and irrigation districts.
Policy 7.D.3.	The County should participate with cities and special districts in establishing programs for the agricultural re-use of treated wastewater in a manner that would be economically beneficial to agriculture.
Policy 7.D.4.	The County shall participate and encourage multi-agency participation in water projects where such coordination can improve the likelihood of providing affordable irrigation water to areas of Placer County with deficient water supplies.
Policy 7.D.5.	The County will work with local irrigation districts to preserve local water rights to ensure that water saved through conservation may be stored and used locally, rather than appropriated and used outside of Placer County.
Policy 7.D.6.	The County shall encourage the use of reclaimed water where appropriate for agricultural production.

Safety Element

Goals/Policy	Explanation
Safety Element – Seismic and Geologic Hazards	
Goal 8.A	To minimize the loss of life, injury, and property damage due to seismic and geological hazards.
Policy 8.A.1	The County shall require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., ground shaking, landslides, liquefaction, critically expansive soils, avalanche).
Policy 8.A.2	The County shall require submission of a preliminary soils report, prepared by a California registered civil engineer and based upon adequate test borings, for every major subdivision and for each individual lot where critically expansive soils have been identified or are expected to exist.
Policy 8.A.3	The County shall prohibit the placement of habitable structures or individual sewage disposal systems on or in critically expansive soils unless suitable mitigation measures are incorporated to prevent the potential risks of these conditions.
Policy 8.A.4	The County shall ensure that areas of slope instability are adequately investigated and that any development in these areas incorporates appropriate design provisions to prevent landsliding.
Policy 8.A.5	In landslide hazard areas, the County shall prohibit avoidable alteration of land in a manner that could increase the hazard, including concentration of water through drainage, irrigation, or septic systems; removal of vegetative cover; and steepening of slopes and undercutting the bases of slopes.
Policy 8.A.6	The County shall require the preparation of drainage plans for development in hillside areas that direct runoff and drainage away from unstable slopes.
Policy 8.A.7	In areas subject to severe ground shaking, the County shall require that new structures intended for human occupancy be designed and constructed to minimize risk to the safety of occupants.

Goals/Policy	Explanation
Policy 8.A.8	County shall continue to support scientific geologic investigations which refine, enlarge, and improve the body of knowledge on active fault zones, unstable areas, severe ground shaking, avalanche potential, and other hazardous conditions in Placer County.
Policy 8.A.9	The County shall require that the location and/or design of any new buildings, facilities, or other development in areas subject to earthquake activity minimize exposure to danger from fault rupture or creep.
Policy 8.A.10	The County shall require that new structures permitted in areas of high liquefaction potential be sited, designed, and constructed to minimize the dangers from damage due to earthquake-induced liquefaction.
Policy 8.A.11	The County shall limit development in areas of steep or unstable slopes to minimize hazards caused by landslides or liquefaction.
Safety Element – Flood Hazards	
Goal 8.B	To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards.
Policy 8.B.1	The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams.
Policy 8.B.2	The County shall continue to participate in the Federal Flood Insurance Program.
Policy 8.B.3	The County shall require flood proofing of structures in areas subject to flooding.
Policy 8.B.4	The County shall require that the design and location of dams and levees be in accordance with all applicable design standards and specifications and accepted state-of-the-art design and construction practices.
Policy 8.B.5	The County shall coordinate with neighboring jurisdictions to mitigate the impacts of new development in Placer County that could increase or potentially affect runoff onto parcels downstream in a neighboring jurisdiction.
Policy 8.B.6	The County shall prohibit the construction of facilities essential for emergencies and large public assembly in the 100-year floodplain, unless the structure and access to the structure are free from flood inundation.
Policy 8.B.7	The County shall require flood control structures, facilities, and improvements to be designed to conserve resources, incorporate and preserve scenic values, and to incorporate opportunities for recreation, where appropriate.
Policy 8.B.8	The County shall require that flood management programs avoid alteration of waterways and adjacent areas, whenever possible.
Safety Element – Fire Hazards	
Goal 8.C	To minimize the risk of loss of life, injury, and damage to property and watershed resources resulting from unwanted fires.
Policy 8.C.1	The County shall ensure that development in high-fire-hazard areas is designed and constructed in a manner that minimizes the risk from fire hazards and meets all applicable state and County fire standards.
Policy 8.C.2	The County shall require that discretionary permits for new development in fire hazard areas be conditioned to include requirements for fire-resistant vegetation, cleared fire breaks, or a long-term comprehensive fuel management program. Fire hazard reduction measures shall be incorporated into the design of development projects in fire hazard areas.
Policy 8.C.3	The County shall require that new development meets state, County, and local fire district standards for fire protection.

Goals/Policy	Explanation
Policy 8.C.4	The County shall refer development proposals in the unincorporated County to the appropriate local fire agencies for review for compliance with fire safety standards. If dual responsibility exists, then both agencies shall review and comment relative to their area of responsibility. If standards are different or conflicting, the more stringent standards shall be applied.
Policy 8.C.5	The County shall ensure that existing and new buildings of public assembly incorporate adequate fire protection measures to reduce the potential loss of life and property in accordance with state and local codes and ordinances.
Policy 8.C.6	The County shall encourage fire protection agencies to continue education programs in schools, service clubs, organized groups, industry, utility companies, government agencies, press, radio, and television in order to increase public awareness of fire hazards within the County.
Policy 8.C.7	The County shall work with local fire protection agencies, the California Department of Forestry and Fire Protection, and the U.S. Forest Service to promote the maintenance of existing fuel breaks and emergency access routes for effective fire suppression.
Policy 8.B.8	The County shall encourage and promote installation and maintenance of smoke detectors in existing residences and commercial facilities that were constructed prior to the requirement for their installation. 8.C.9. The County shall work with local fire agencies.
Policy 8.B.9	The County shall work with local fire agencies to develop high-visibility fire prevention programs, including those offering voluntary home inspections and promoting awareness of home fire prevention measures.
Policy 8.B.10	The County shall continue to implement state fire safety standards through enforcement of the applicable standards contained in the Placer County Land Development Manual.
Policy 8.B.11	The County shall continue to work cooperatively with the California Department of Forestry and Fire Protection and local fire protection agencies in managing wildland fire hazards.
Policy 8.B.12	The County shall support annexations and consolidations of fire districts and services to improve service delivery to the public.
Safety Element – Airport Hazards	
Goal 8.D	To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from airport hazards.
Policy 8.D.1	The County shall ensure that new development around airports does not create safety hazards such as lights from direct or reflective sources, smoke, electrical interference, hazardous chemicals, or fuel storage in violation of adopted safety standards.
Policy 8.D.2	The County shall limit land uses in airport safety zones to those uses listed in the applicable airport comprehensive land use plans (CLUPs) as compatible uses. Exceptions shall be made only as provided for in the CLUPs. Such uses shall also be regulated to ensure compatibility in terms of location, height, and noise.
Policy 8.D.3	The County shall ensure that development within the airport approach and departure zones complies with Part 77 of the Federal Aviation Administration Regulations (objects affecting navigable airspace).
Safety Element – Emergency Management	
Goal 8.E	To ensure the maintenance of an Emergency Management Program to effectively prepare for, respond to, recover from, and mitigate the effects of natural or technological disasters.
Policy 8.E.1	The County shall continue to maintain, periodically update, and test the effectiveness of its Emergency Operations Plan.

Goals/Policy	Explanation
Policy 8.E.2	The County shall continue to coordinate emergency preparedness, response, recovery, and mitigation activities with special districts, service agencies, voluntary organizations, cities within the County, surrounding cities and counties, and state and federal agencies.
Policy 8.E.3	The County shall continue to provide promotional programs that inform the general public of emergency preparedness and disaster response procedures.
Policy 8.E.4	The County shall, through its Office of Emergency Services, maintain the capability to effectively respond to emergency incidents.
Policy 8.E.5	The County shall maintain an emergency operations center to coordinate emergency response, management, and recovery activities.
Policy 8.E.6	The County shall ensure that the siting of critical emergency response facilities such as hospitals, fire stations, sheriff's offices and substations, dispatch centers, emergency operations centers, and other emergency service facilities and utilities have minimal exposure to flooding, seismic and geological effects, fire, avalanche, and explosions.
Safety Element – Public Safety and Emergency Management Facilities	
Goal 8.F	To protect public health and safety through safe location of structures necessary for the protection of public safety and/or the provision of emergency services.
Policy 8.F.1	The County shall not locate new County structures necessary for the protection of public safety and/or the provision of emergency services in areas subject to inundation, subsidence, slope failure, surface rupture, or ground failure in a seismic event. Exception to this policy may be granted if the only alternative location would be so distant as to jeopardize the safety of the community, given that adequate precautions are taken to protect the facility.
Policy 8.F.2	The County shall, within its authority, ensure that emergency dispatch centers, emergency operations centers, communications systems, vital utilities, and other essential public facilities necessary for the continuity of government be designed in a manner that will allow them to remain operational during and following an earthquake or other disaster.
Safety Element – Hazardous Materials	
Goal 8.G	To minimize the risk of loss of life, injury, serious illness, damage to property, and economic and social dislocations resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous materials wastes.
Policy 8.G.1	The County shall ensure that the use and disposal of hazardous materials in the County complies with local, state, and federal safety standards.
Policy 8.G.2	The County shall discourage the development of residences or schools near known hazardous waste disposal or handling facilities.
Policy 8.G.3	The County shall review all proposed development projects that manufacture, use, or transport hazardous materials for compliance with the County's Hazardous Waste Management Plan (CHWMP).
Policy 8.G.4	The County shall ensure that the mining and processing of toxic metals in the County is conducted in compliance with applicable environmental protection standards and minimizes impacts on adjacent lands and the surrounding natural environment.
Policy 8.G.5	The County shall strictly regulate the storage of hazardous materials and wastes.
Policy 8.G.6	The County shall require secondary containment and periodic examination for all storage of toxic materials.
Policy 8.G.7	The County shall ensure that industrial facilities are constructed and operated in accordance with current safety and environmental protection standards.

Goals/Policy	Explanation
Policy 8.G.8	The County shall require that new industries that store and process hazardous materials provide a buffer zone between the installation and the property boundaries sufficient to protect public safety. The adequacy of the buffer zone shall be determined by the County.
Policy 8.G.9	The County shall require that applications for discretionary development projects that will generate hazardous wastes or utilize hazardous materials include detailed information on hazardous waste reduction, recycling, and storage.
Policy 8.G.10	The County shall require that any business that handles a hazardous material prepare a plan for emergency response to a release or threatened release of a hazardous material.
Policy 8.G.11	The County shall encourage the State Department of Health Services and the California Highway Patrol to review permits for radioactive materials on a regular basis and to promulgate and enforce public safety standards for the use of these materials, including the placarding of transport vehicles.
Policy 8.G.12	The County shall identify sites that are in appropriate for hazardous material storage, maintenance, use, and disposal facilities due to potential impacts on adjacent land uses and the surrounding natural environment.
Policy 8.G.13	The County shall work with local fire protection and other agencies to ensure an adequate Countywide response capability to hazardous materials emergencies.
Safety Element – Avalanche Hazards	
Goal 8.H	To minimize the risk of loss of life, injury, and damage to property due to avalanche.
Policy 8.H.1	The County shall maintain maps of potential avalanche hazard areas.
Policy 8.H.2	The County shall require new development in areas of avalanche hazard to be sited, designed, and constructed to minimize avalanche hazards.
Policy 8.H.3	The County shall not issue permits for new development in potential avalanche hazard areas (PAHA) as designated in the Placer County Avalanche Management Ordinance unless project proponents can demonstrate that such development will be safe under anticipated snow loads and conditions of an avalanche.
Safety Element – Public Health	
Goal 8.I	To provide municipal-type environmental health services to the unincorporated urban development areas in Western Placer County.
Policy 8.I.1	Within overall County budgetary constraints, the County shall strive to provide one environmental health specialist per every 9,000 persons in the Western Placer County.
Policy 8.I.2	The County shall endeavor to identify and control important diseases transmitted by environmental factors in the Western Placer County.

Placer County Ordinances

The Placer County General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the General Plan and/or are critical to the mitigation of hazards identified in this plan.

Emergency Services (Chapter 2, Title 2.88)

The declared purposes of this article are to provide for the preparation and carrying out of plans for the protection of persons and property within this county in the event of an emergency; the direction of the

emergency organization; and the coordination of the emergency functions of this county with all other public agencies, corporations, organizations, and affected private persons. As used in this article, “emergency” means the actual or threatened existence of conditions of disaster or of extreme peril to the safety of persons and property within the county caused by such conditions as air pollution, fire, flood, storm, epidemic, riot, drought, sudden and severe energy shortage, or earthquake or other conditions including conditions resulting from war or imminent threat of war, but other than conditions resulting from a labor controversy, which conditions are or are likely to be beyond the control of the services, personnel, equipment, and facilities of the county, requiring the combined forces of other political subdivisions to combat, or with respect to regulated energy utilities, a sudden and severe energy shortage requiring extraordinary measures beyond the authority vested in the California Public Utilities Commission.

The Placer County disaster council is created and shall consist of the following:

- The county executive officer, who shall be chairperson;
- The assistant director of emergency services, who shall be vice-chairperson;
- Such chiefs of emergency services as are appointed by the board of supervisors, provided for in a current emergency plan of the county;
- Such representative of civic, business, labor, veterans, professional, or other organizations having an official emergency responsibility, as may be appointed by the board of supervisors.

It shall be the duty of the Placer County disaster council, and it is empowered, to develop and recommend for adoption by the board of supervisors, emergency and mutual aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements.

Fire Prevention (Chapter 9, Article 9.32)

Part 3, Fire Hazards

This fire hazards ordinance requires all structures to maintain a fire break or clearing for a distance of 30 feet from the structure and keep the roofs free from all flammable debris. This part also sets requirements for burning permits, smoking restrictions in fire danger areas, and for the use and possession of fireworks.

Part 4, Hazardous Vegetation Abatement on Unimproved Parcels

This Fire Prevention ordinance applies to areas defined as the North Tahoe Fire Protection District, Alpine Springs County Water District, Squaw Valley Public Service District and Northstar Community Services District.

The Placer County BOS supports the improved parcel defensible space obligations found in Public Resources Code (PRC) 4291. PRC 4291 does not address hazardous vegetation abatement on unimproved parcels and the potential impact that hazardous vegetation on an unimproved parcel could have on an adjacent improved parcel. This part extends and supplements state law to ensure defensible space activities are accomplished on unimproved parcels adjacent to improved parcels and along roadways and fire access easements so that land owners benefit from the application of PRC 4291 on unimproved parcels.

Drainage of Water, Obstructing Natural Watercourse, Causing Flooding or Damage to County Highway Prohibited (Chapter 12, Article 12.12)

This article makes unlawful the draining of water from private land onto a public highway which results in flooding or damage to the highway. Also prohibited is obstruction of a natural watercourse so as to cause interference with, or damage or hazard to, public highways.

Avalanche Management Areas (Chapter 12, Article 12.40)

This article identifies potential avalanche hazard areas (PAHA) in order to give notice to the public of identified PAHAs; to minimize health and safety hazards, disruption of commerce, and extraordinary public expenditures; and to detail proper siting, design, and construction safeguards for constructing in PAHAs.

Water Conservation Requirements (Chapter 13, Article 13.04)

This article sets forth water conservation requirements applicable to all new and existing construction in the portion of Placer County lying east of the crest of the Sierra Nevada Range.

Dry Creek Watershed Drainage Improvement Zone (Chapter 15, Article 15.32)

This article specific to the Dry Creek Watershed area supplements existing County policies of requiring on- and off-site drainage improvements to accommodate increased runoff resulting from new development and the expansion of existing development. This article establishes a drainage improvement zone for the Dry Creek watershed area. It requires the payment of specified fees and annual assessments as a condition of new development and the expansion of existing development within the watershed area for the installation and maintenance of roadway drainage and stormwater drainage improvements.

Development Fees for Fire Protection (Chapter 15, Article 15.36)

The purpose of this article is to authorize the collection of development impact mitigation fees in any unincorporated area of Placer County to ensure the provision of the capital facilities necessary to maintain current levels of fire protection services necessitated by new development.

Grading, Erosion, and Sediment Control (Chapter 15, Article 15.48)

The purpose of this article is to regulate grading on property within the unincorporated area of Placer County to safeguard life, limb, health, property and public welfare; to avoid pollution of watercourses with hazardous materials, nutrients, sediments, or other earthen materials generated on or caused by surface runoff on or across the permit area; and to ensure that the intended use of a graded site is consistent with the Placer County general plan, any specific plans adopted thereto and applicable Placer County ordinances including the zoning ordinance, flood damage prevention ordinance, (Article 15.52) environmental review ordinance (Chapter 18 Placer County Code) and applicable chapters of the California Building Code.

Flood Damage Prevention Regulations (Chapter 15, Article 15528)

It is the purpose of this article to promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- Insure that potential buyers are notified that property is in an area of special flood hazard; and
- Insure that those who occupy the areas of special flood hazard assume responsibility for their actions (Prior code § 4.1310.30).

In order to accomplish its purpose, this article includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in increasing damage in erosion, flood heights, or flood velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Controlling fill, grading, dredging, and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or may increase flood hazards in other areas (Prior code § 4.1310.40).

Of specific interest are the construction requirements for elevation and flood-proofing. Specifically, these require new construction and substantial improvements to have the lowest floor, including basement, elevated a minimum of base flood elevation plus one foot. It is further recommended that the finish floor be a minimum of two feet above the base flood elevation.

Subdivisions: Design Standards and Improvements (Chapter 16, Article 16.08)

Placer County's subdivision ordinance regulates the design and improvement of land divisions and the dedication of public improvements needed in connection with land divisions. The ordinance includes provisions for the following hazard-related issues: erosion control, flooding and drainage, water supply, and fire suppression.

Zoning Ordinance (Chapter 17)

The purpose of the zoning ordinance is to classify and regulate the best use of buildings, structures, and land in the unincorporated area of Placer County in a manner consistent with the Placer County General

Plan. This ordinance is designed to ensure management of land use in a manner that will assure the orderly development and beneficial use of the unincorporated areas of Placer County for residential, commercial, industrial, agricultural, forestry, open space and other purposes. To further these objectives, this ordinance includes requirements for reducing hazards to the public resulting from the inappropriate location, use or design of buildings and land uses in relation to natural and built hazards. It addresses setbacks, buffers, natural resources protection and drainage. For example, the flood hazard combining district identifies areas subject to the 100-year floodplain and requires that new development in this combining zone abide by standards within the Placer County Flood Damage Prevention Ordinance (Article 15.52). Likewise, the geological hazard combining district was established to identify areas where geological and soil conditions may present hazards to life or property. All land use permit applications for projects located within this district require a report describing all geological and avalanche hazards in the region proposed for development.

Building and Construction Codes Adopted (Title 15, Chapter 15.04)

This article adopts the California Building Code, 2013 Edition Volumes 1 and 2, based on the 2012 International Building Code including, the administrative provisions in Chapter 1, Division II and among the Appendices, Appendix C Group U - Agricultural Buildings and Appendix J - Grading, as published by the International Code Council (ICC) as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24 of the California Code of Regulations, Part 2. (Ord. 5731-B § 4, 2013; Ord. 5629-B § 3, 2010).

This article adopts the California Fire Code, 2013 Edition Volumes 1 and 2, including, the administrative provisions in the California Building Code, Chapter 1, Division II based on the 2012 International Fire Code including the Appendices, as published by the International Code Council (ICC) as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24 of the California Code of Regulations, Part 9. (Ord. 5731-B § 18, 2013; Ord. 5629-B § 3, 2010)

Placer County Plans/Studies

Debris Management Plan (2019)

For the protection of the public health, safety, and welfare of residents and visitors, Placer County recognizes the responsibility to be prepared for a debris-generating incident.

Disasters can produce substantial volumes of debris, creating hazardous conditions that endanger the public and disrupt the essential daily lifestyle and economy of the community.

Disasters will result in large expenditures of labor, equipment, materials, and supplies at substantial cost. It is imperative that Placer County is prepared to provide an early, safe, and quick response to restoring environmentally safe and economically viable conditions to the disaster-affected areas. It is to this end that Placer County developed this Debris Management Plan (DMP).

The DMP addresses how response to a debris-generating incident will be coordinated at the local and regional level. The DMP does not address routine debris incidents that the County can manage; the

operational concepts reflected in this plan focus on potential large-scale disasters that can generate significant volumes of debris requiring an unusual or extraordinary response.

Groundwater Sustainability Plan (western County- expected to be completed in 2022)

The groundwater plan will identify management actions that would be triggered if groundwater levels fall below defined levels, enabling us to mitigate declines in groundwater capacity. We are currently conducting modeling of the basin that will factor in future climate change impacts. Data on that will be available in the coming months, and we can provide drafts as they are available. The final report is due for completion in January 2022. Meeting materials, past reports, and updates are found here: <https://westplacergroundwater.com/get-involved/>.

Stormwater Management Plan, 2003-2008 (Revised March 1, 2004).

This comprehensive plan is designed to ultimately reduce pollution in stormwater runoff in compliance with the County's National Pollutant Discharge Elimination System (NPDES) stormwater permit within portions of western Placer County (excludes Foresthill and Colfax). The plan includes processes for accomplishing the goals of minimizing construction site runoff as well as post-construction stormwater management in newly developed and redeveloped areas.

Placer County Flood Control and Water Conservation District's Stormwater Management Manual, 1990.

The primary purpose of the District is to protect lives and property from the effects of flooding through comprehensive, coordinated flood prevention planning, using consistent standards to evaluate flood risk, and by implementing flood control measures such as requiring new development to construct detention basins and operation and management of a flood warning system. This manual presents policy, guidelines, and specific criteria for the development and management of natural resources, facilities and infrastructure for stormwater management. Flooding is recognized as the primary problem associated with development occurring adjacent to streams and the consequent increase in stormwater runoff. The plan refers to the Basic Drainage Law Requirements which include four general principles that apply to development projects in general. The principles dictate what upstream and downstream property owners must do to minimize alteration to existing, functional drainage patterns in the region of their property.

Watershed Management Plans

A watershed management plan is a document that guides efforts to control pollution, manage stormwater, and protect and improve local streams and the uplands that surround them. These plans also provide collaborative agreement among government, other local stakeholders, and citizens during the planning process. Placer County has been involved in the development of a number of comprehensive watershed management plans. These watershed plans guide the County and other stakeholders in protecting, managing, and improving environmental resources and habitat. Watershed Management Plans in Placer County include:

- Dry Creek Coordinated Management Plan;

- Dry Creek Watershed Control Plan
- Auburn Ravine/Coon Creek Ecosystem Restoration Plan;
- Cross Canal Watershed Flood Control Plan
- Pleasant Grove/Curry Creek Ecosystem Restoration Plan;
- Auburn Ravine Restoration Plan;
- Auburn Bowman Community Plan Hydrology Study
- Rock Creek Restoration Plan; and
- Squaw Creek Restoration Plan.

Auburn/Bowman Community Plan, Hydrology Study, JMM 1992

This study covers the Auburn/Bowman area and includes flood mitigation recommendations.

Dry Creek Watershed Flood Control Plan, 2011 (Updated)

This plan covers the Dry Creek Watershed area and includes flood mitigation recommendations. The primary purposes of this Update to the Dry Creek Watershed Flood Control Plan, prepared for the Placer County Flood Control and Water Conservation District, are to update the hydrologic analysis of the watershed, provide recommendations for feasible means to reduce future flood damages, identify possible means to mitigate development impacts on flooding, and recommend an updated funding plan. The 1992 Dry Creek Watershed Flood Control Plan recommended structural and non-structural measures to correct existing deficiencies and mitigate for impacts of future development. Some of the recommendations have been implemented while many have not due to environmental and/or economic constraints. This Plan Update evaluates the hydrology of the watershed and provides recommendations to correct existing deficiencies and mitigate impacts of future development using an overall watershed approach with the objective of identifying measures that will be both feasible and effective.

Placer County Conservation Plan (PCCP)

As part of the Placer Legacy Program, County staff initiated the preparation of a Natural Community Conservation Plan and Habitat Conservation Plan to comply with the State and Federal Endangered Species Act, and to programmatically comply with the Federal Clean Water Act related to wetlands. This effort, now referred to as the Placer County Conservation Plan (PCCP), is proceeding for the first phase of the PCCP covering western Placer County.

The PCCP is intended to address the impacts associated primarily with unincorporated growth in west Placer and growth associated with the build out of Lincoln’s updated General Plan. Development in western Placer County will require the preservation of approximately 54,300 acres of land between now and 2050.

Placer County Community Wildfire Protection Plan 2012

The Placer County CWPP provides recommendations to reduce the threat of wildfire-related damage to people, property, and ecological elements within the County. This document estimates the hazards and risks associated with wildland fire in proximity to WUI within each applicable Fire Safe Council areas. This information, in conjunction with identification of the values at risk, defines areas of special interest and allows for prioritization of mitigation efforts. From the analysis of the data presented, solutions and

mitigation recommendations are offered that aid homeowners, land managers, and other interested parties in developing short-term and long-term planning efforts.

Lake Tahoe Basin Community Wildfire Protection Plan 2015

This Community Wildfire Protection Plan was developed by the Tahoe Fire and Fuels Team (TFFT), an action-oriented forum of organizations involved in implementing the Lake Tahoe Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy. It builds on previous planning efforts, and covers the wildland-urban interface for all Lake Tahoe Basin fire protection districts and departments. The CWPP examines common issues faced by Lake Tahoe communities and general strategies for mitigation. And provides an in-depth assessment of each TFFT geographic division and provide specific recommendations, actions, and projects for improving community resiliency to wildfire.

Placer County Emergency Operations Plan (2010, 2021 Update in Process)

The Emergency Operations Plan, including the Placer Operational Area, includes information on hazards facing the County and associated response and recovery information.

There are multiple annexes to the EOP. They include:

- Continuity of Government/Continuity of Ops
- Rescue/Search and Rescue Operations
- Mass Evacuation
- Recovery
- Hazardous Materials
- Public Health Emergencies
- Dam Failure and Flood
- Avalanche
- Volunteer Donation Management
- CyberSecurity
- Terrorism

Placer County Warning and Evacuation Procedures

Placer County and its incorporated communities have a variety of systems and procedures established to protect its residents and visitors to plan for, avoid, and respond to a hazard event including those associated with floods and wildfires. This includes Pre-Disaster Public Awareness and Education information which is major component in successfully reducing loss of life and property in a community when faced with a potentially catastrophic incident. Much of this information is not specific to a given hazard event and is always accessible to the public on local County and City websites. An overview of specific warning and evacuation systems and procedures are summarized further below.

Warning Systems

Flooding and wildfires can occur quickly and with little warning. In the event of a severe flood, wildfire or other natural hazard event, the Placer County OES webpage will identify current emergencies and associated protocols at: <http://www.placer.ca.gov/Departments/CEO/Emergency/CurrentEmergencyInfo.aspx>. The County will also provide emergency information and broadcast warnings on local radio and television stations as well as on social media websites such as Facebook and Twitter. The new Everbridge system may be activated and helicopters may be used to broadcast warnings/alerts via a PA system. If time and condition/safety permits, vehicle patrol units may also broadcast warnings in affected areas. County OES also works closely with the National Weather Service for issuing an Emergency Alert System (EAS).

Everbridge

In 2015, Placer County and all participating cities to this plan established the Everbridge System employed for issuing flood warnings, alerts and evacuation notices to the public. The Placer County Flood Control and Water Conservation District coordinated with County OES, Sheriff, County Planning, and Department of Public Works and Facilities for this system. Flood warning zones across the County were created and Sheriff's dispatch will take the lead in employing Everbridge and issuing specific flood event warnings as necessary. The District will continue to assist during an event by providing technical input to OES as to the need for a warning issuance as well as any resulting evacuations.

Placer Alert

Placer Alert is an emergency notification system powered by Everbridge which allows public safety agencies to help protect lives and property by providing critical information to residents during emergencies and dangerous situations. Public safety agencies can quickly send out an emergency alert to citizens in any affected geographic area. The current database includes only traditional wire-line telephone (the "land line" phone you may have in your home). If a resident want the system to send alerts to other communication devices that the resident use, such as cell phone, email, text message, the resident will have to provide your contact information by logging into the system and signing up for alerts.

ALERT System

The County's network of ALERT Flood Warning gauges, including numerous precipitation gages and stream level gages located throughout western Placer County provide real time monitoring information on current flood conditions which assist in informing the activation of additional warning and evacuation of affected areas. Currently the County is proposing ALERT 2 type upgrades to be funded by the State DWR FERP program over the next several years. This stream level information is broadcast as necessary throughout the County during heavy rain events where a potential for flooding exists.

Dam Protocols

Placer County OES and Placer County Sheriff's Office (PCSO) Dispatch receive printed copies of Emergency Action Plans from FERC regulated dams as well as non-FERC dams such as those owned by

PCWA, PG&E, NID, and SMUD. The County receives annual updates for the EAPs and participates in their scheduled annual drills and exercises. The EAPs contain maps of affected downstream areas and include warning levels and protocols/procedures for making notifications and evacuations. Should an event trigger the activation of the EAP including notification protocols, county OES receives this information via direct phone calls from the originating source/agency or from PCSO Dispatch and/or Cal OES. County OES then follows the notification and evacuation procedures called for in the EAP.

Evacuation Procedures

The 2010 Placer County Emergency Operations Plan includes addresses the planned response to emergency situations associated with natural disasters and emergencies in or affecting Placer County. The EOP is intended to facilitate multi-agency and multi-jurisdictional coordination in emergency operations. It seeks to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system to return the County the local jurisdictions to their normal state of affairs.

The EOP includes multiple annexes, one of which is the Mass Evacuation Annex. This Annex addresses evacuation policies and procedures due to natural hazards and other events. Emergency evacuation planning involves multiple governmental agencies and private organizations performing such functions as threat identification, warning, evacuation decision making, communications, traffic control, and shelter and medical needs management.

In addition to the Mass Evacuation Annex to the EOP, the County has several evacuation plans covering various areas of the County:

- East Side Emergency Evacuation Plan
- Emergency Evacuation Plan for Rural Lincoln Communities
- Greater Colfax Area Emergency Action Plan
- Foresthill Divide Iowa Hill Divide Emergency Plan

The purpose of these area-specific Evacuation Plans is to help increase preparedness and to facilitate the efficient and rapid evacuation of threatened communities. These plans include maps and prescribe specific responsibilities for first responders, County staff and other state, federal and non-profit contributing agencies for conducting an emergency evacuation of one or more communities as part of a larger natural disaster or human-caused incident. An overview of a sample evacuation plan, the East Side Evacuation Plan is provided below.

East Side Evacuation Plan

This is a plan for a physical evacuation of one or more communities in the unincorporated Placer County area on the eastern side of the County that is necessitated by a larger incident, most probably a forest fire or flood. For the purposes of this plan, the “eastern side” comprises all of Placer County from just west of Cisco Grove to the Nevada State line not including the areas within the Tahoe National Forest and the Lake Tahoe Basin Management Unit. The dense forests, rugged terrain, and the scarcity of roads in the area – problems that present difficulties for first responders and residents/transients alike - complicate any evacuation. Many agencies helped to develop this plan to help increase preparedness, and facilitate the

efficient and rapid evacuation of threatened communities in the far eastern end of the County. While focusing on fire-induced evacuations, the plan remains applicable to all evacuations in general.

Placer County Post Disaster Mitigation Policies and Procedures

The Placer County EOP is intended to facilitate multi-agency and multi-jurisdictional coordination during emergencies including hazard events. Through its policies and procedures it seeks to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. The County is in the process of updating the EOP by September 2021, followed by the annexes by end of 2022.

Post disaster recovery procedures for all hazards, including flood, are primarily addressed in the Recovery Annex to the EOP. As detailed in the EOP, the goal of the recovery phase of an emergency incident or natural disaster is to return the residents, public services and private sector in an impacted area to their pre-disaster state, and through implementation of hazard mitigation measures, seek to prevent, as much as possible, similar damage, destruction or chaos after incidents and disasters in the future. The Recovery Annex includes detailed objectives, responsibilities and procedures for restoration of services and returning of the affected area to its pre-emergency condition. Mitigation is emphasized as a major component of recovery efforts. As part of the recovery planning, a Cal OES approved Debris Management Plan is also being developed for incorporation into the emergency management program for the County.

The Recovery Annex includes and is divided into two parts:

- Part One identifies the organization for and responsibilities of County agencies and Departments specifically for recovery. Since most large incidents are multi-jurisdictional, in all probability, recovery will be coordinated by the County working in its Operational Area (OA) role which allows it to coordinate emergency activities with all political entities in the County, i.e., the cities and special districts. Whereas overall recovery will be coordinated by the OA, in single jurisdiction incidents or disasters as well as multi-jurisdictional incidents, individual jurisdiction's always work directly with state and federal organizations for much of the recovery effort.
- Part Two is a compendium of information on recovery and provides definitions of the various types, levels and providers of recovery aid and assistance. Numerous types and levels of disaster assistance from federal, state and county sources are available to individuals, businesses and government agencies. The type and extent of the emergency or declared disaster determines which sort and how much of each type assistance is ultimately provided.

The post-disaster recovery annex details roles, responsibilities, and protocols for both short and long term recovery and includes information for:

- Initial Damage Assessment (windshield survey and safety assessment)
- Detailed Damage Assessment, with an initial priority on public and critical infrastructure and services
- Establishing Recovery Assistance Facilities and Information Centers
- Procedures for Individual Assistance, Public Assistance, and Post-disaster Mitigation

Sheltering in Place

All stakeholders (i.e. county, fire districts/departments, special districts, utility districts, ARC, and the community at large) agreed on the need for emergency shelters. Stakeholders participated in regular meetings (monthly, quarterly, or semi-annually) and drills/exercises (annually or bi-annually) where emergency shelter is discussed as one of the topics. Stakeholders conduct planning meetings or phone/televideo conferences for forecasted/anticipated event such as severe weathers as well as unscheduled events wild land fires, floods, and earthquake. These forums foster education and collaborative efforts amongst the stakeholders and better prepare them to respond to emergency events. Good progress has been made in the initiative over the past several years. Some of the significant completed work includes:

Western Placer: Development of the Foresthill Divide & Iowa Hill Divide Emergency Plan first published and disseminated by PCOES in August 2006, updated in January 2009, and is currently being updated. The primary purpose of the plan is to pre-establish evacuation protocols and pre-identified evacuation routes and sites for the emergency responders, local residents, and general public in case of large wildland fires occurring in the areas. Due to the remote location of the two areas and limited road access, the plan provides a contingency plan for the community. Although the plan does not address shelter in place for the individual residents in their home, it does address a contingency plan for the communities to shelter in place in pre-identified sites; thereby minimizing risk and danger due to limited road accesses. Furthermore, the plan addresses facilities and supporting resources for each of the pre-identified sites (e.g. food, water, medical, etc.).

Placer County Water Agency (a special district and not a county department/agency) built a facility in Foresthill. The agency worked with the County to identify the facility as a potential site for use as an emergency shelter.

Eastern Placer: The County worked closely with the American Red Cross (ARC) to identify facilities in the North Tahoe area (including Truckee) for use as emergency shelters. Schools in Tahoe City, Kings Beach, and Truckee have been identified and the ARC continues to conduct on-site assessments of the facilities for suitability as emergency shelters. Additionally, the ARC has fielded three trailers in the areas with each trailer containing 50 cots, blankets, pillows, and a generator to support each shelter.

The County is planning to build a government facility in the North Tahoe area in the future. Discussion are underway to designate the facility as an emergency shelter, equipped with generators and supporting resources.

Crude Oil/Hazmat by Rail Operational Guide, 2015

The production of crude oil in North America has increased by over 500% in the last 5 years - the majority of this product is being transported by rail. First Responders and Emergency Managers are scrambling to address the increased volume over rail. Placer and portions of Nevada County are situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay area. While crude oil is not currently traveling via this route, many believe that when the refineries in the Bay Area are retrofitted to accept Bakken crude, the Sierra Nevada route will be used to bring crude to Bay Area refineries.

Cooperation from the Railroad officials including Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) is essential for any coordinated response plan. Through a Unified Command, the railroad will bring a wealth of specialized equipment and personnel through on-call staff and regional contractors. These resources take time to assemble and respond. First Responders will be on scene for a period of time and charged with scene stabilization and the protection of the public. This operational guide will cover the first two operational periods while more definitive resources are being mobilized.

Community Plans

Placer County has developed numerous community plans. The following are available online:

- Alpine Meadows General Plan
- Auburn/Bowman Community Plan
- Carnelian Bay Community Plan
- Colfax General Plan
- Dry Creek/West Placer Community Plan
- Foresthill Divide Community Plan
- Granite Bay Community Plan
- Horseshoe Bar/Penryn Community Plan
- Kings Beach Community Plan and Industrial Plan
- Martis Valley Community Plan
- Meadow Vista Community Plan
- Newcastle/Ophir Area General Plan
- North Stateline Community Plan
- North Tahoe Area General Plan
- Ophir General Plan
- Sheridan Community Plan
- Squaw Valley Area General Plan
- Sunset Industrial Area Plan Update (in process)
- Tahoe Basin Community Plan Update (in process)
- Tahoe City Area General Plan
- Tahoe City Community Plan
- Tahoe Vista Community Plan
- Weimar/Applegate/Clipper Gap General Plan
- West Shore Area General Plan
- Sunset Industrial Plan.

Watershed Restoration Plans and Projects

Watershed planning and restoration includes all of the activities related to preserving, protecting and restoring the streams, wetlands, forests and other natural resources within a watershed.

The Natural Resources Division is managing a number of grants that are affiliated with the implementation of the Placer Legacy Program and watershed restoration projects. The majority of the funding applies to watershed-based planning efforts associated with CALFED Bay-Delta Program (to restore the ecological

health and improve water management for beneficial uses in the Bay-Delta System) or Proposition 204 (The Safe, Clean, Water Supply Act of 1996). Specific restoration projects include:

- Auburn Ravine Restoration Plan
- Miners Ravine Restoration Project
- Miners Ravine Fish Passage Project
- Rock Creek Restoration Plan
- Squaw Creek Restoration Plan
- Sundance Properties Wetlands Restoration Project

Greenway Plans

Placer County has two Greenway plans under development – one in the Dry Creek watershed in south Placer County, the second along the Truckee River in the Sierra. Greenways are corridors of linear open space established for wildlife habitat and open space conservation and/or recreation. Greenways may be held on public land, voluntarily retained on private land, or conserved through public-private partnerships.

The plans signal the start of a multi-year effort to create new public recreational opportunities, increase the mobility of cyclists, walkers, and joggers, and enrich the lives of Placer’s residents and visitors. The plans are:

- Dry Creek Greenway Regional Vision
- Truckee River Corridor Access Plan

4.4.2. Placer County’s Administrative/Technical Mitigation Capabilities

Table 4-119 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County.

Table 4-119 Placer County Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Principal advisory body on planning and land use matters, and regulations related to planning, land use, and long range plans for development. Coordination is effective.
Disaster Council	Y	Developed for this planning process.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Preventative Maintenance program to service emergency generators ensuring operational effectiveness when needed.”
Mutual aid agreements	Y	There are cooperative fire agreements among departments inside and bordering the County.
Other		

Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y/FT	Staff is adequately trained to enforce regulations regarding hazards. Staff coordinates with other departments on an as needed basis.
Floodplain Administrator	Y/FT	The floodplain administrator is a CFM
Emergency Manager	Y/FT	Staff is adequately trained to enforce regulations regarding hazards. Staff coordinates with other departments on an as needed basis.
Community Planner	T/FT	Staff is adequately trained to enforce regulations regarding hazards. Staff coordinates with other departments on an as needed basis.
Civil Engineer	Y/FT	Staff is adequately trained to enforce regulations regarding hazards. Staff coordinates with other departments on an as needed basis.
GIS Coordinator	Y/FT	Staff is adequately trained to enforce regulations regarding hazards. Staff coordinates with other departments on an as needed basis.
Other		
Technical		Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Everbridge (Reverse 911)
Hazard data and information		
Grant writing		
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The County is looking for a dedicated grant writer. Funding for these positions is always a concern. Expand Everbridge (Reverse 911) warning system polygons to cover smaller more detailed hazard areas (i.e., Joe Rogers flood hazard area, etc.) Explore opportunities to implement battery back-up power source for critical facilities.”		

4.4.3. Placer County’s Fiscal Mitigation Capabilities

Table 4-120 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 4-120 Placer County Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Funding for mitigation projects is limited to projects associated with providing service in that fee area. A portion of sewer fees go to replacing portable generators that CARB requires to be phased out to comply with applicable laws and regulations. Generators ensure that we retain the needed temporary power supplies at critical facilities during power outages.
Impact fees for new development	Y	Drainage mitigation fees are collected within the Dry Creek watershed and used for infrastructure and improvements to accommodate or mitigate increased runoff from new development. This drainage mitigation Dry Creek Trust Fund is managed by the Placer County Flood Control and Water Conservation District.
Storm water utility fee	N	Prop 218 limits the ability to create a stormwater utility.
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	N	
Other federal funding programs	Y	
State funding programs	Y	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Additional impact fees could be developed for other flood hazard areas within Placer County such as for the Cross Canal watershed. For repetitive loss structure and frequent flooded areas can continue to seek federal (FEMA) grants to assist with raising structures or purchase to remove. Fees collected for water and sewer services are limited to the use for projects that will provide service to that fee area. If additional funding from state and federal programs or other resources were available, the scope of work for these projects could focus on more mitigation actions to address hazards.		

4.4.4. Placer County Mitigation Education, Outreach, and Partnerships

Table 4-121 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 4-121 Placer County Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	See the action in Chapter 5 for more information.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	Y	
Public-private partnership initiatives addressing disaster-related issues	Y	In the fall of 2015, the County commenced a joint effort with Valley Vision on a Business Resiliency Initiative in the County for outreach, education, and general preparedness.
Other	Y	Building inspectors attend a minimum of two-four technical trainings each year. Many inspectors are certified by Cal OES for damage assessment efforts. Handouts are available for Wildland-Urban Interface standards as well as defensible space and safe residential driveway access standards.
How can these capabilities be expanded and improved to reduce risk?		
Public-private partnership initiatives addressing disaster-related issues” in 2018 FEMA maps were updated to digital format. There were several public outreach events in 2017 to publicize the mapping. Digital maps which updated existing and added new special flood hazard areas are now available at FEMA and county websites to better inform the public of local flood risks. Future FEMA floodplain mapping efforts will also have a public outreach component in order to better educate the public about flood hazards and reducing risk. Become a StormReady community. This will increase ability to plan for and better prepare public for adverse events. Outreach programs can continue to improve by providing information in multiple formats and through a variety of platforms. Agencies and departments can also continue to work together to share and combine messages to make outreach programs more efficient. Providing outreach through several outlets and more frequently will assist to reach a larger audience and make messaging more effective. Additional funding would allow more opportunities for educational campaigns and messages.		

Placer County noted that it has multiple partnerships. Some of these are discussed below.

Coordinating with local and state partners to prepare for wildfire

Preparing for wildfire takes all forms in Placer County. CAL FIRE Nevada-Yuba-Placer Unit / Placer County Fire Department, local fire districts, federal fire partners, cities, fire safe communities and Placer County all work toward creating and maintaining defensible space around homes and infrastructure, regional fuel breaks, fire education campaigns and more. One example is CAL FIRE's recently completed North Fork American River Shaded Fuel Break. The project is designed to protect the residents of Placer County and help safeguard over 5,500 structures and critical infrastructure such as the Union Pacific Rail Line, Interstate 80, the Kinder Morgan Petroleum Pipeline, and Pacific Gas and Electric power and water infrastructure that serves approximately 500,000 customers.

Working together on forest restoration and water conservation

The French Meadows Project is a forest restoration and fuels reduction project located in the headwaters of the Middle Fork American River in the Tahoe National Forest. It is an extensive public-private partnership of numerous regional and federal partners - all working together to not only improve the health and resilience of a vital municipal watershed, but also to address critical barriers to increasing the pace and scale of forest restoration in the Sierra.

The Middle Fork Project is a multi-purpose water supply and hydro-generation project designed to conserve and control waters of the Middle Fork American River, the Rubicon River, and several associated tributary streams.

The Auburn Shaded Fuel Break is part of a larger fuel break that extends along the North Fork of the American River to Colfax. It is unique in that it lies within a wildland-urban-interface (WUI) between rugged, forested terrain and denser urban areas. For this reason, the shaded fuel break is a critical element that protects the City of Auburn from wildfires.

Combining efforts to reduce wildfire risk

Placer County partners with the Placer Resource Conservation District on multiple programs, one being the low-cost Chipper Program to help homeowners improve their defensible space. Placer County Parks Division's goat grazing program is an environmentally friendly option for open space management and fire risk reduction. Placer County Environmental Utilities Division's green waste recycling program helps residents reach their defensible space goals.

4.4.5. Other Mitigation Efforts

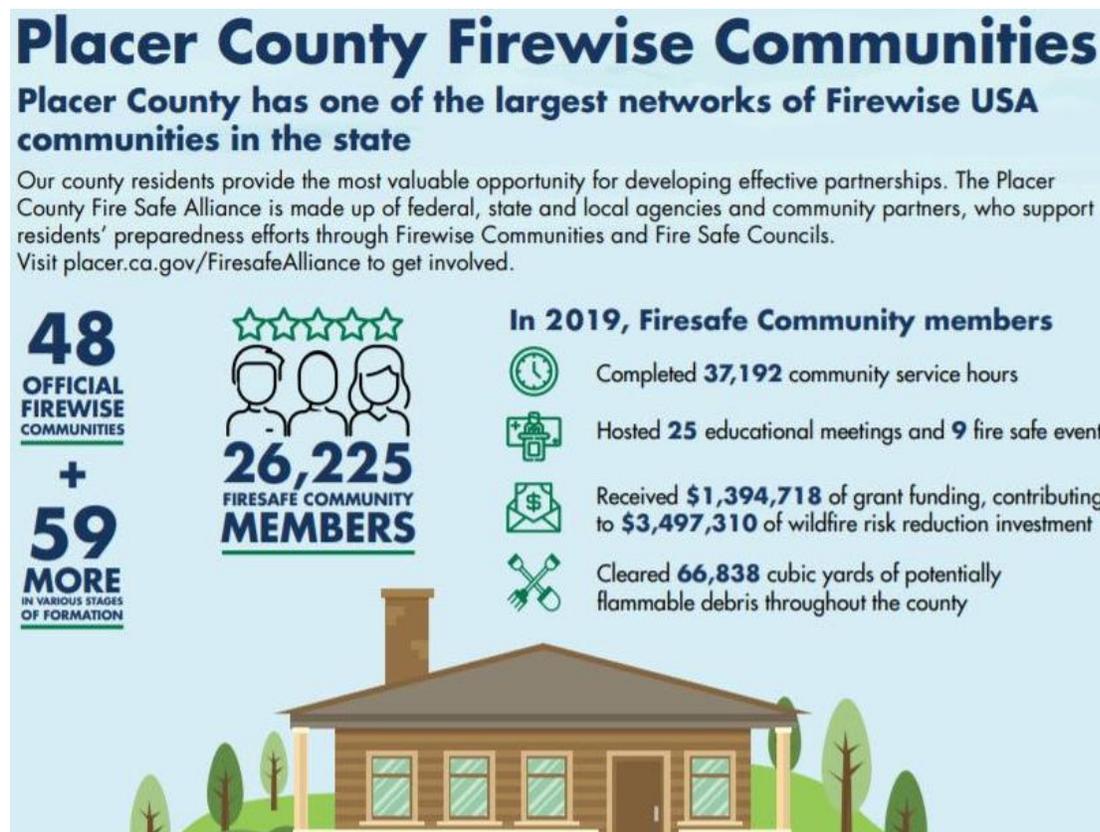
The County has data on tree mortality and formed a task force. The state also formed a tree mortality task force.

On April 8, 2021 it was noted that Placer County has removed 5,200 trees threatening county infrastructure, marking the completion of its hazardous tree removal project.

Placer County has one of the largest networks of Firewise USA communities in the state. County residents provide the most valuable opportunity for developing effective partnerships. The Placer County Fire Safe

Alliance is made up of federal, state and local agencies and community partners, who support residents' preparedness efforts through Firewise Communities and Fire Safe Councils. Visit placer.ca.gov/FiresafeAlliance to get involved.

Figure 4-125 Placer County Firewise Communities



Source: Placer County

Placer Alert

The Placer Alert public notification system, operated by the Placer County Sheriff's Office, is vital for informing residents during an emergency. Be prepared and sign up for notifications at PlacerAlert.org.

Ready Placer

Visit ReadyPlacer.org to learn more about what the county is doing and what you can do to ensure you are prepared. Put together emergency supply kits in an easy-to-carry "go bag" so you're ready to go at a moment's notice in the event of a wildfire or other disaster.

Placer County Sustainability Plan

On January 28, 2020, the Placer County Board of Supervisors approved the first-ever Placer County Sustainability Plan (PCSP) - a road map to meet California's greenhouse gas emission reduction goals and reduce the county's vulnerability to climate risks like worsening wildfire severity. The PCSP is a

comprehensive program that outlines various programs and policies that will be undertaken by the community and the County as a whole, in order to reduce greenhouse gas emissions and enhance community resiliency to long-term changes associated with climate-related hazards.

Chapter 5 Mitigation Strategy

Requirement §201.6(c)(3) and §201.7(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for this Placer County Local Hazard Mitigation Plan (LHMP) Update. It describes how the County and participating jurisdictions met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the Hazard Mitigation Planning Committee (HMPC) led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the LHMP Update process, a comprehensive review and update of the mitigation strategy portion of the 2016 LHMP was conducted by the HMPC. Some of the initial goals and objectives from the 2016 Sutter County LHMP were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, reorganized to reflect the completion of or progress towards the 2016 actions, the updated risk assessment and the new priorities of this 2021 LHMP Update. To support the new LHMP goals, the mitigation actions from 2016 were reviewed and assessed for their value in reducing risk and vulnerability to the Placer County Planning Area from identified hazards and evaluated for their inclusion in this LHMP Update (See Chapter 2 What’s New). Section 5.2 below identifies the new goals and objectives of this LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP Update:

- Communicate the hazard information collected and analyzed through this planning process as well as mitigation success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the action plan recommendations of this Plan.
- Use existing rules, regulations, policies, and procedures already in existence.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

Given the flood hazard in the Placer County Planning Area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities. Detailed below is a description of Placer County’s flood management program to ensure continued compliance with the NFIP. A brief description of the County’s CRS program is also provided below. Also to be considered are the numerous flood mitigation actions contained in this LHMP Update that support the ongoing efforts by the County and participating jurisdictions to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program. A summary of the flood management programs and continued compliance with the NFIP for the incorporated communities are detailed in their jurisdictional annexes.

Placer County’s Flood Management Program

Placer County has participated in the Regular Phase of the NFIP since 1983. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS) was created in 1990. Placer County has been in the CRS program since 1991. The program is designed to recognize floodplain management activities that are above and beyond the NFIP’s minimum requirements. CRS is designed to reward a community for implementing public information, mapping, regulatory, loss reduction and/or flood preparedness activities. On a scale of 10 to 1, Placer County is currently ranked Class 5 community, which gives a 25% premium discount to individuals in the Placer County Special Flood Hazard Area (SFHA), and a 10% discount to policyholders outside the SFHA.

Presently, the County manages its floodplains in compliance with NFIP/CRS requirements and implements a floodplain management program designed to protect the people and property of the County. Floodplain regulations are a critical element in local floodplain management and are a primary component in the County’s participation in the NFIP. As well, the County’s floodplain management activities apply to existing and new development areas, implementing flood protection measures for structures and maintaining drainage systems to help reduce the potential of flooding within the County.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County’s NFIP status and floodplain management program are discussed in Table 5-1. Additional information on the County’s CRS program follows.

Table 5-1 Unincorporated Placer County NFIP Status

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	817 policies \$523,082 in premiums \$233,180,600 in coverage

NFIP Topic	Comments
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	236 paid claims \$4,788,314.79 in paid losses 25 substantial damage claims
How many structures are exposed to flood risk within the community?	849 improved parcels in 1% annual chance floodzone 50 improved parcels in 0.2% annual chance floodzone
Number of Repetitive and Severe Repetitive Loss Properties	44 Repetitive Loss Properties 0 Severe Repetitive Loss Properties
Describe any areas of flood risk with limited NFIP policy coverage	Based on this analysis of insurance coverage, Placer County has significant values at risk to the 1% annual chance and greater floods. Of the 849 improved parcels within the 1% annual chance flood zone, only 249 (or 29.3 percent) of those parcels maintain flood insurance.
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Placer County's Floodplain management group provides the full suite of administrative services necessary to achieve and maintain a CRS Class 5, including all of those identified in the example provided.
What are the barriers to running an effective NFIP program in the community, if any?	None
Compliance History	
Is the community in good standing with the NFIP?	Yes, Placer County had a Community Assistant Visit in 2019 and was rated highly with no compliance issues.
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	November 18, 2019
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	April 18, 1983
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet and Exceed: See Appendix C for Details
Provide an explanation of the permitting process.	Clearly outlined in the floodplain ordinance. This process is strictly enforced.
Community Rating System (CRS)	
Does the community participate in CRS?	Yes

NFIP Topic	Comments
What is the community's CRS Class Ranking?	5
What categories and activities provide CRS points and how can the class be improved?	See below
Does the plan include CRS planning requirements?	Yes, in accordance with the CRS Activity 510 requirements of the 2017 CRS Coordinator's Manual

Source: FEMA, 12/2020/Placer County

The activities credited by the CRS program provide direct benefits to Placer County and its residents, including:

- Enhanced public safety;
- A reduction in damage to property and public infrastructure;
- Avoidance of economic disruption and losses;
- Reduction of human suffering; and
- Protection of the environment.

The activities that Placer County implements and receives CRS credits include:

- **Activity 310 – Elevation Certificates:** The Public Works Department, Floodplain Management Division maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request. Certificates are kept for post-FIRM buildings in computer format. Elevation Certificates, plans, regulations and other records are maintained in a secure location away from the permit office.
- **Activity 320 – Map Information Service:** Credit is provided for furnishing inquirers with flood zone information from the community's latest Flood Insurance Rate Map (FIRM), publicizing the service annually and maintaining records. Credit is also provided for the community furnishing additional FIRM information about problems not show on the FIRM and flood depth data.
- **Activity 330 – Outreach Projects:** Credit is provided for informational outreach projects, general outreach projects, and a targeted outreach project. An outreach brochure and floodplain management updated is mailed annually to all properties with structures in the community's Special Flood Hazard Area (SFHA). The community also provides flood information through displays at public buildings and community events, as well as on their website.
- **Activity 340 – Hazard Disclosure:** Credit is provided for the local real estate agents disclosure of flood hazards to prospective buyers. An outreach brochure is mailed by the County annually to real estate agents and lenders in the community. Credit is also provided for state and community regulations requiring disclosure of flood hazards.
- **Activity 350 – Flood Protection Information:** Documents relating to floodplain management are available in the reference section of the Placer County Library. Credit is also provided for floodplain information displayed on the community's website.
- **Activity 360 – Flood Protection Assistance:** The community provides technical advice and assistance to interested property owners and annually publicizes the service. Credit is provided for offering one-on-one advice regarding property protection and aking site visits before providing advice.
- **Activity 370- Flood Insurance Promotion:** The community collects flood insurance information, determines flood insurance coverage, presents data to governing board and reassess data every five years. Credit is provided for assessing the community's current level of flood insurance coverage and assessing shortcomings.

- **Activity 420 – Open Space Preservation:** Park land and other such uses located in the floodplain are credited as open space preservation. Credit is provided for preserving approximately 5 percent of the SFHA as open space. Credit is also provided for regulations and incentives that minimize development in the SFHA.
- **Activity 430 – Higher Regulatory Standards:** Credit is provided for enforcing regulations that require freeboard for new and substantial improvement construction, cumulative substantial improvement, lower substantial improvement, and local drainage protection. Credit is also provided for enforcement of building codes, a Building Code Effectiveness Grading Schedule (BCEGS) Classification of 2/2, state mandated regulatory standards and regulations administration.
- **Activity 440 – Flood Data Maintenance:** Credit is provided for maintaining and using digitized maps in the day-to-day management of the floodplain. Credit is also provided for establishing and maintaining a system of benchmarks and maintaining copies of all previous FIRMs.
- **Activity 450 – Stormwater Management:** The community enforces regulations for stormwater management, soil and erosion control, and water quality. Credit is also provided for watershed master planning.
- **Section 502 – Repetitive Loss Category:** Based on the updates made to the NFIP Report of Repetitive Losses as of September 2018, Placer County has nine repetitive loss properties and is a Category B community for CRS purposes. All requirements for a Category B community have been met.
- **Activity 510 – Floodplain Management Planning:** Credit is provided for the adoption and implementation of the Placer County Local Multi-Hazard Mitigation Plan on May 17, 2016. A progress report must be submitted on an annual basis.
- **Activity 530 – Flood Protection:** Credit is provided for 41 buildings that have been elevated to protect them from flood damage.
- **Activity 540 – Drainage System Maintenance:** Portions of the community's drainage system are inspected throughout the year and maintenance is performed as needed. Credit is also provided for listing problem sites that are inspected more frequently and for implementing an ongoing Capital Improvements Program. The community enforces a regulation prohibiting dumping in the drainage system and annually publicizes the regulation.
- **Activity 630 – Dam Safety:** All California communities currently receive CRS credit for the State's dam safety program.
- **Activity 710 – County Growth Adjustment:** All credit in the 400 series is multiplied by the growth rate of the County to account for growth pressures. The growth rate for Placer County is 1.11.

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard Mitigation actions are essential to weaving long-term resiliency into all community recovery efforts so that at-risk infrastructure, development, and other community assets are stronger and more resilient for the next severe storm event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps communities become more resilient and sustainable. It is often most efficient to fund all eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial.

Integration of mitigation into post disaster recovery efforts should be considered by all communities as part of their post disaster redevelopment and mitigation policies and procedures. As detailed in Section 4.4, the Capability Assessment for the unincorporated County and in the Annex's for the other participating jurisdictions, post-disaster redevelopment and mitigation policies and procedures are evaluated and updated as part of the Emergency Operations Plan (EOP) updates and other emergency management plans for each community.

These EOP's, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. Mitigation is emphasized as a major component of recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities will enable the communities to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant funding opportunities available pre- and post- disaster include the following.

FEMA HMA Grants

Cal OES administers three main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Building Resilient Infrastructure and Communities (BRIC), replacing the former Pre-Disaster Mitigation (PDM) Program, and (3) Flood Mitigation Assistance Program. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants

The California Department of Housing and Community Development administers the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to \$30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

Requirement §201.6(c)(3)(i) and §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the HMPC.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Placer County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2016 LHMP as well as a list of other sample goals to consider. The team was told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was asked to provide two goal statements. Goal statements were collected and grouped into similar themes and provided to the HMPC. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal. Edits and refinements to these new goals and resulting objectives were provided by the HMPC until the team came to consensus on the final goals and objectives for this 2021 LHMP Update.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the Placer County Planning Area.

Goal 1: Minimize risk and vulnerability of Placer County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment

- Minimize loss of life and injury and protect public health and safety of all Placer County residents and visitors, including at-risk populations
- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards
- Minimize impacts to natural and cultural resources
- Minimize impacts to watersheds/promote watershed health

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Harden critical facilities, infrastructure, and utilities; create redundancy and reliability to prevent or minimize loss and facilitate recovery
- Design and/or retrofit critical facilities, infrastructure, and utilities necessary for continuity of government to allow them to remain operational during and following a disaster
- Minimize impacts of extended power outages

Goal 3: Improve public awareness, education, communication, and preparedness for all hazards

- Enhance public outreach, education, and preparedness program to include all hazards of concern
- Increase public knowledge of the risk and vulnerability to identified hazards and their recommended responses to disaster events to reduce losses
- Utilize multiple public outreach avenues and modern communication platforms, such as new technologies, social media, and others
- Provide information and alerts about potential, developing, and ongoing emergency situations through extensive alert and warning systems that convey information to all residents, in multiple languages and formats to ensure it is widely accessible
- Educate public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities including multi-jurisdictional efforts
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels, at a minimum
- Develop funding mechanisms to enhance emergency services for additional staffing and enhanced services
- Increase first responders' awareness of vulnerable populations and other priority needs during a hazard event; (use of enhanced technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Ensure a more resilient County that can adapt to the hazards created or exacerbated by Climate Change

- Integrate the results and adaptive policies of the Climate Vulnerability Assessment (prepared under the Placer County Sustainability Plan) into the implementation of the Local Hazard Mitigation Plan
- Reduce the County's greenhouse gas (GHG) emissions as specified in the Placer County Sustainability Plan in order to reduce the hazards exacerbated by climate change
- Consider climate change adaptation strategies in flood and inundation hazard planning
- Consider climate change adaptation strategies in planning for very high fire hazard severity zones
- Protect groundwater and reduce the impacts from drought and climate change

Goal 6: Reduce fire severity and mitigate undesirable fire outcomes in Placer County

- Reduce life safety issues, property loss, and damages associated with wildfires
- Prevent and reduce wildfire ignitions and wildfire-related losses
- Restore and maintain fire resilient landscapes on both public and private lands
- Create fire adaptive communities by facilitating interagency cooperation and communication and support between agencies and the public
- Mitigate undesirable fire outcomes for the environment, watersheds, and quality of life

Goal 7: Maintain FEMA Eligibility/Position the communities for grant funding

- Maintain requirement of updating LHMP every 5 years
- Continue to increase number of participating jurisdictions in future LHMP Updates to provide eligibility for FEMA pre- and post-mitigation funding and eligibility for other related funding sources
- Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP's Community Rating System (CRS) where feasible

5.3 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii) and §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated at the completion of the risk assessment as part of the second prioritization process to determine which hazards were priorities for mitigation strategy planning. Only those hazards that were determined to be a priority hazard for each participating jurisdiction were considered further in the development of hazard-specific mitigation actions. Those hazards not considered a priority for mitigation strategy development were eliminated from further consideration because the risk of a hazard event in the County is unlikely, the vulnerability of the county is low, or capabilities are already in place to mitigate negative impacts. Further, the resulting mitigation strategy presented in this Chapter focuses on those mitigation actions that each jurisdiction has the authority, resources, and capacity to consider for implementation over the next 5-years covered by this LHMP Update.

Table 5-2, Table 5-3, Table 5-4, and Table 5-5 provide a listing of priority hazards by jurisdiction to be addressed in the mitigation strategy portion of this Plan.

Table 5-2 Placer County Planning Area: Mitigation Action Priority Hazards by Jurisdiction – Unincorporated County and Incorporated Jurisdictions

Priority Hazards for Mitigation Action Development	Placer County	Auburn	Colfax	Lincoln	Loomis	Rocklin
Agricultural Hazards	X					
Avalanche	X					
Climate Change	X	X		X	X	
Dam Failure	X					
Drought & Water Shortage	X	X	X	X	X	X
Earthquake	X			X	X	
Floods: 1%/0.2% annual chance	X			X	X	
Floods: Localized Stormwater	X	X		X	X	X
Landslides, Mudslides, and Debris Flows						
Levee Failure						
Pandemic	X		X	X	X	X
Seiche	X					
Severe Weather: Extreme Heat	X	X	X	X		X
Severe Weather: Freeze and Snow	X	X		X		X
Severe Weather: Heavy Rains and Storms	X					X

Priority Hazards for Mitigation Action Development	Placer County	Auburn	Colfax	Lincoln	Loomis	Rocklin
Severe Weather: High Winds and Tornadoes	X		X		X	
Tree Mortality	X	X	X			
Wildfire	X	X	X	X	X	X

Table 5-3 Placer County Planning Area: Mitigation Action Priority Hazards by Jurisdiction – Special Districts

Priority Hazards for Mitigation Action Development	Alta Fire	Alpine Springs	Foresthill Fire	Foresthill PUD	Nevada Irrigation District	Newcastle Fire	Northstar CSD
Agricultural Hazards					X		
Avalanche		X			X		
Climate Change	X	X	X		X	X	
Dam Failure				X	X		X
Drought & Water Shortage	X	X	X	X	X	X	
Earthquake	X	X			X		X
Floods: 1%/0.2% annual chance		X			X	X	
Floods: Localized Stormwater	X	X	X		X	X	
Landslides, Mudslides, and Debris Flows	X	X			X		
Levee Failure					X		
Pandemic		X			X		X
Seiche							
Severe Weather: Extreme Heat	X		X		X	X	
Severe Weather: Freeze and Snow	X	X			X	X	X
Severe Weather: Heavy Rains and Storms	X	X			X	X	
Severe Weather: High Winds and Tornadoes	X	X	X		X		
Tree Mortality	X	X	X		X	X	X
Wildfire	X	X	X		X	X	X

Table 5-4 Placer County Planning Area: Mitigation Action Priority Hazards by Jurisdiction – Special Districts

Priority Hazards for Mitigation Action Development	North Tahoe Fire	North Tahoe PUD	Olympic Valley Fire	Placer County Flood Control	Placer County Resource Conservation	Placer County Water Agency	Placer Hills FPD
Agricultural Hazards					X	X	
Avalanche	X		X				
Climate Change	X				X	X	X
Dam Failure			X	X		X	
Drought & Water Shortage	X	X		X	X	X	X
Earthquake	X	X	X				
Floods: 1%/0.2% annual chance		X	X	X		X	X
Floods: Localized Stormwater	X	X	X	X	X	X	X
Landslides, Mudslides, and Debris Flows			X			X	
Levee Failure				X			
Pandemic	X	X				X	
Seiche	X	X					
Severe Weather: Extreme Heat		X					X
Severe Weather: Freeze and Snow	X	X	X				X
Severe Weather: Heavy Rains and Storms	X		X	X		X	
Severe Weather: High Winds and Tornadoes	X						
Tree Mortality	X	X	X		X	X	X
Wildfire	X	X	X	X	X	X	X

Table 5-5 Placer County Planning Area: Mitigation Action Priority Hazards by Jurisdiction – Special Districts

Priority Hazards for Mitigation Action Development	San Juan Water	Sierra Joint CC	South Placer Fire	Tahoe City PUD	Truckee FPD	Placer County Air Pollution Control
Agricultural Hazards						
Avalanche						
Climate Change	X		X			X
Dam Failure	X					

Priority Hazards for Mitigation Action Development	San Juan Water	Sierra Joint CC	South Placer Fire	Tahoe City PUD	Truckee FPD	Placer County Air Pollution Control
Drought & Water Shortage	X	X	X	X		
Earthquake	X		X			
Floods: 1%/0.2% annual chance	X		X			
Floods: Localized Stormwater		X	X			
Landslides, Mudslides, and Debris Flows						
Levee Failure			X			
Pandemic	X	X				
Seiche						
Severe Weather: Extreme Heat	X		X			X
Severe Weather: Freeze and Snow	X		X			
Severe Weather: Heavy Rains and Storms	X		X			
Severe Weather: High Winds and Tornadoes	X		X	X		
Tree Mortality				X		
Wildfire	X	X	X	X	X	X

It is important to note, however, that all the Hazards Addressed in this Plan are included in the countywide multi-hazard public awareness mitigation action and those included for the incorporated communities, as well as in other multi-hazard, emergency management actions, and other hazard-specific actions, providing benefits to all participating jurisdictions to this Plan.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and

identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

The initial list of mitigation actions from the 2016 LHMP and new actions identified during this planning process were reviewed and prioritized via an LHMP mitigation action voting website for inclusion in this 2021 LHMP Update. The Placer County mitigation action voting website established at <https://fostermorrison.aweeba.com/> included the list of actions brainstormed during the mitigation strategy meetings and provided a mechanism for everyone to vote on their priority actions for further development as detailed further below. This comprehensive review of mitigation measures was performed using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, HMPC members were each provided with nine weighted votes, indicating High (worth 5 points), Medium (worth 3 points), and Low (worth 1 point) priorities. The team was asked to use the votes to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a

quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this LHMP Update.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized mitigation action plan for the Placer County Planning Area.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii) and §201.7(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This mitigation action plan was developed to present the recommendations developed by the HMPC for how the Placer County Planning Area can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. This mitigation action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-6 identifies all mitigation actions for all participating jurisdictions to this LHMP Update. For each mitigation action item included in Table 5-6, a detailed mitigation implementation strategy has been developed. Only those actions where the County is the lead jurisdiction are detailed further in this section. Actions specific to other participating jurisdictions, or where other jurisdictions are taking the lead, are detailed in each respective jurisdictional annex to this Plan.

The mitigation action plan detailed below contains both new action items developed for this LHMP Update as well as old actions that were yet to be completed from the 2016 Plan. Table 5-6 indicates whether the action is new or from the 2016 LHMP and Chapter 2 contains the details for each 2016 mitigation action item indicating whether a given action item has been completed, deleted, or deferred.

As described throughout this LHMP Update, Placer County has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and

prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the communities to consider for implementation over the next 5-years covered by this 2021 Update. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-6. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this LHMP Update came down to the actual priorities of communities, individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this LHMP Update during annual plan reviews and the formal 5-year update process.

It is also important to note that Placer County and the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as stormwater and drainage plans, flood and water management plans, and capital improvement budgets and reports. These actions are considered to be part of this Plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this Plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participating communities are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-6 benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this Plan.

Table 5-6 Placer County Planning Area Mitigation Actions

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Placer County						
Multi-Hazard Actions						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Unincorporated Placer County	2016 Action	X	X		Prevention
Action 2. Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Public Information
Action 3. Critical Facility Infrastructure Improvements	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. Protect Sewer Infrastructure and Utilities	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 5. Trail System Way Finding and Directional Signage	Unincorporated Placer County and all jurisdictions	2016 Action	X	X		Public Information Emergency Services
Action 6. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.	Unincorporated Placer County and all jurisdictions	New Action	X	X		Public Information Emergency Services
Action 7. Evacuation Warning	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Public Information Emergency Services
Action 8. Battery Back-up Systems to provide building resiliency	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 9. Emergency Generator / Installation, Maintenance, & Upgrade of Emergency Generators at Road Maintenance Yards	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Property Protection Emergency Services
Action 10. Earthquake Retrofit / Seismic Assessment of County Infrastructure	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Action 11. StormReady Certification for Placer County	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Agricultural Hazard Actions						
Action 12. Agriculture – A-rated Invasive Insect Pest Infestation	Unincorporated Placer County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Avalanche Actions						
Action 13. Update local ordinances and development standards to reflect updated avalanche hazard information.	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention
Climate Change Actions						
Action 14. Green Waste	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 15. Reduce Organic Waste Disposal	Unincorporated Placer County and all jurisdictions	New Action	X	X		Prevention Property Protection Natural Resource Protection
Dam Failure, Flood: 1%, 0.5%, 0.2% annual chance, Flood: Localized Flood, and Severe Weather: Heavy Rains and Storms Actions						
Action 16. Elevate Repetitive Loss Structures in 100-year Floodplain	Unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects
Action 17. Elevate Remaining 95 Homes in the Dry Creek Watershed	Unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 18. Community Rating System (CRS) Maintain and Enhance	Unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services Public Information
Action 19. Bridge and Culvert replacement and drainage improvements	Unincorporated Placer County and all jurisdictions	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 20. Bell Drive Sewer Pipeline Repair	Unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 21. Annual Flood Exercise	Unincorporated Placer County and all jurisdictions	New Action	X	X	X	Prevention Emergency Services
Drought & Water Shortage, Severe Weather: Extreme Heat, Tree Mortality, and Wildfire Actions						
Action 22. Improve and Protect Water Systems	Unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 23. Groundwater Sustainability Planning	Unincorporated Placer County	New Action	X	X		Prevention Natural Resource Protection
Action 24. Fuel Breaks - Wildland Urban Interface (WUI)	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 25. Public Education & Awareness	Unincorporated Placer County	New Action	X	X		Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 26. Fuel Break - Large Strategic	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 27. Natural Systems Protection / Education and Awareness Programs - Placer County Wildland Urban Interface (WUI) Strategic Planning	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 28. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 29. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 30. Defensible Space Programs	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 31. Fuel Break - North Fork of American River	Unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Pandemic Actions						
Action 32. HHS Pandemic Planning	Unincorporated Placer County	New Action	X	X		Prevention Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Auburn						
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Auburn	2016 Action	X	X	X	Public Information
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Auburn	New Action	X	X		Prevention
Action 3. Continue Annual Weed Abatement Ordinance	City of Auburn	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Implement Wildland-Urban Interface Planning and Risk Mitigation Project	City of Auburn	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Integrate community and ecological resiliency to climate change hazards, such as drought, extreme heat, flood, and vector-borne diseases.	City of Auburn	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
City of Colfax						
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Colfax	2016 Action	X	X		Public Information
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Colfax	New Action	X	X		Prevention
Action 3. Continue Annual Weed Abatement Ordinance	City of Colfax	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Colfax Schools Evacuation Site Shaded Fuel Break	City of Colfax	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District	City of Colfax	2016 Action	X	X		Prevention Property Protection
Action 6. Drought and Water Shortage Mitigation	City of Colfax	New Action	X	X		Prevention Property Protection Natural Resource Protection
City of Lincoln						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Lincoln	2016 Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Lincoln	New Action	X	X	X	Public Information
Action 3. Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge	City of Lincoln	2016 Action	X	X	X	Structural Projects
Action 4. McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span	City of Lincoln	2016 Action	X	X	X	Structural Projects
Action 5. Lakeview Farms Regional Volumetric Mitigation Facility	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 6. Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream Restoration And Culvert Improvement	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 7. "O" Street Drainage Improvements	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 8. 7th Street Drainage Improvements	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 9. Auburn Ravine at State Route 193 Bridge	City of Lincoln	2016 Action	X	X	X	Property Protection Natural Resource Protection
Action 10. Auburn Ravine at State Route 65 Bridge	City of Lincoln	2016 Action	X	X	X	Property Protection Natural Resource Protection
Action 11. Ingram Slough – Orchard Creek Return Channel	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 12. Markham Ravine – Updated FEMA Analysis And Mapping	City of Lincoln	2016 Action	X	X	X	Prevention
Action 13. Markham Ravine Drainage Improvements – Union Pacific Railroad & State Route 65 Crossings	City of Lincoln	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 14. Auburn Ravine Stream Restoration Projects (Analysis and Repairs)	City of Lincoln	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 15. Markham Ravine Streambed Restoration Projects (Analysis Only)	City of Lincoln	2016 Action	X	X	X	Prevention
Action 16. Coon Creek Streambed Restoration Projects (Analysis Only)	City of Lincoln	2016 Action	X	X	X	Prevention
Action 17. Fire Prevention and Fuels Management Plan	City of Lincoln	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Town of Loomis						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Town of Loomis	2016 Action	X	X		Prevention

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Town of Loomis	New Action	X	X	X	Public Information
Action 3. Renewal Of Town of Loomis RMA permit	Town of Loomis	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 4. Climate Change Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 5. Drought and Water Shortage Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 6. Earthquake Mitigation and Preparedness	Town of Loomis	New Action	X	X		Prevention Public Information
Action 7. Pandemic/Epidemic Mitigation	Town of Loomis	New Action	X	X		Prevention Public Information
Action 8. Severe Weather - Heavy Rains Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 9. Tree Mortality Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Wildfire Mitigation	Town of Loomis	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Rocklin						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Rocklin	2016 Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	City of Rocklin	New Action	X	X	X	Public Information
Action 3. Open Space Fire Prevention and Vegetation Management Prescribed Grazing	City of Rocklin	2016 Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Creek Channel and Draining Way Clearing and Maintenance	City of Rocklin	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 5. GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents	City of Rocklin	2016 Action	X	X		Prevention Emergency Services
Alta Fire Protection District						
Action 1. Reflective Addressing	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Emergency Services
Action 2. Alta FireWise Community Established and Continuing	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection
Action 3. Apparatus Water Fill & Drafting Location Improvements	AFPD and unincorporated Placer County	2016 Action	X	X		Property Protection Natural Resource Protection Emergency Services
Action 4. Emergency Communications and Information System Improvements (HAM Radio and GMRS communications)	AFPD and unincorporated Placer County	2016 Action	X	X		Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Evacuation / Reunification Center Improvements	AFPD and unincorporated Placer County	2016 Action	X	X		Emergency Services
Action 6. Home Hardening Education and Projects	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects Public Information
Action 7. Natural Systems Protection /Community Fuel Breaks	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 8. Natural Systems Protection / Education and Awareness Programs	AFPD and unincorporated Placer County	2016 Action	X	X		Prevention Public Information
Alpine Springs County Water District						
Action 1. Fire Fuels Mitigation	ASCWD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Emergency Electrical Generator Replacement Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Emergency Services
Action 3. Water Storage Tank Replacement Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Project Natural Resource Protection
Action 4. Mineral Springs Soil Bank Stabilization Project	ASCWD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Alpine Meadows Consolidated Defensible Space Continuation Project	ASCWD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Foresthill Fire Protection District						
Action 1. Chipper Program for Foresthill FPD	FFPD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Foresthill Public Utility District						
Action 1. Drought, Dam Failure/ additional of radial gates to dam	FPUD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Nevada Irrigation District						
Action 1. 2015 Agricultural Water Management Plan – Updated 2021	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Avalanche Mitigation	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 3. Canal Culvert Replacement Program	NID and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 4. Centennial Water Supply Project	NID and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Combie Phase 1 Replacement	NID and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 6. Continuity of Operations Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Emergency Services
Action 7. Pandemic Planning	NID and unincorporated Placer County	New Action	X	X		Prevention
Action 8. Dam Failure Mitigation	NID and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 9. Water Conservation and Drought Preparedness	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Drought Contingency Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Flood Mitigation	NID and unincorporated Placer County	New Action	X	X	X	Prevention Emergency Services
Action 12. Healthy Forest Management and Wildfire Mitigation Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 13. Forest Resilience Program	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 14. Injury and Illness Prevention Program	NID and unincorporated Placer County	New Action	X	X		Prevention

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 15. Public Safety Plan (FERC)	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 16. North Auburn Treatment Plant VFD's and Permanent Backup Generator	NID and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 17. Orr Creek Diversion	NID and unincorporated Placer County	2016 Action	X	X	X	Structural Projects Property Protection
Action 18. Owner's Dam Safety Program, Revision 3.0	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Emergency Services
Action 19. Raw Water Master Plan	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Raw Water Replacement Program	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 21. Reservoir Cleaning	NID and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 22. Resilient Headwaters Forests	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 23. Tree Mortality Mitigation	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 24. 2015 Urban Water Management Plan – Updated 2021	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 25. Vegetation Management Plan (Hydroelectric Facilities)	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 26. Water Planning Projections	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 27. Water Service Auburn Valley CSD	NID and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 28. Forest Resilience and Wildfire Risk Reduction	NID and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Newcastle Fire Protection District						
Action 1. Private roadway and driveway vegetation clearances.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Address signage for residential and commercial structures.	NFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 3. Provide Advanced Life Support (ALS) services utilizing paramedics on the engine company.	NFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Defensible space inspection and implementation throughout the District.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Relocate and construct a new fire station for the Newcastle Fire Protection District.	NFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects
Action 6. Participate and collaborate with the Greater Auburn Area Fire Safe Council (GAAFSC) and contribute to the Community Wildfire Protection Plan (CWPP)	NFPD and unincorporated Placer County	New action	X	X		Prevention
Action 7. Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation	NFPD and unincorporated Placer County	New action	X	X	X	Prevention Emergency Services
Northstar Community Services District and Fire Department						
Action 1. Tree Mortality	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Wildfire Mitigation	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Critical Power Interruption Emergency Response Plan	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 4. Emergency Action Plan – Reservoir A Dam	NCSD & FD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
North Tahoe Fire Protection District						
Action 1. Avalanche: Risk Reduction, Response Plan, and Pre-Incident Training	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Communications: Upgrades, Development, Maintenance, and Enhancement of Interoperability Radio Systems	NTPFD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 3. Community Wildfire Prevention Plan Implementation: Forest Management, Fuels Reduction, Defensible Space, Home Hardening, Curbside Chipping, Greenwaste Disposal, Tree Marking, Fire Adapted and Firewise Communities, Outreach & Education	NTPFD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information
Action 4. GIS Technology, Equipment, Database and Mapping Improvements	NTPFD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 5. Pandemic Preparedness and Response Plan	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 6. Tahoe Emergency Notifications System (TENS)	NTPFD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 7. Water for Fire Suppression Collaborative	NTPFD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information Emergency Services
North Tahoe Public Utility District						
Action 1. Backup Generator Installation at Critical Facilities	NTPUD and unincorporated Placer County	New action	X	X		Prevention Property Protection Emergency Services
Action 2. Fuels Reduction around Critical Infrastructure and Access Roads, and within the North Tahoe Regional Park	NTPUD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 3. Increased Fireflow Capacity and Reliability for Dollar Cove and Carnelian Water Systems	NTPUD and unincorporated Placer County	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection Public Information
Action 4. Cybersecurity Assessment and Improvements	NTPUD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 5. Seismic Analysis and Retrofit of Critical Infrastructure	NTPUD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Structural Projects
Action 6. Sewer Main Replacements in Shorezone of Lake Tahoe	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 7. Water Booster Pump Station Rehabilitation/Replacement	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 8. Water System Interties	NTPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 9. Joint Grant Application with North Tahoe Public Utilities District (NTPUD) for an Emergency Back-up Generator System at the North Tahoe Event Center (NTEC) located at 8318 North Lake Blvd, Kings Beach, CA 96143.	NTPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 10. Kings Beach Grid Watermain Replacement and Fire Hydrant Installation Project	NTPUD and unincorporated Placer County	New action	X	X		

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 11. NTPUD Water System Infill and Fire Suppression Improvements Project	NTPUD and unincorporated Placer County	New action	X	X		
Olympic Valley Fire Department/Olympic Valley Public Service District						
Action 1. Community-Wide Emergency Notification System	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Prevention Emergency Services
Action 2. Emergency Water Supply Interconnection to Martis Valley	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 3. OVPSD/Mutual Water Company Intertie	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. Squaw Creek Siphon	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 5. Water Tank Earthquake Retrofit Projects	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Emergency Services
Action 6. Easement Abatement/Maintenance of Emergency Access	OVFD/OVPSD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 7. Towable Generator for Powering Booster Stations	OVFD/OVPSD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 8. Emergency Water Supply Interconnection to Martis Valley	OVFD/OVPSD and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Placer County Flood Control District						
Action 1. FEMA CTP DFIRM Mapping Study	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection
Action 2. Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. Update the Flood Control Plan for the Cross Canal Watershed	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection
Action 4. Upgrade Flood Warning System to ALERT 2, Add Additional Gage Locations and Flood Forecasting Capabilities	PCFCD and unincorporated Placer County	2016 Action	X	X	X	Prevention Property Protection Emergency Services
Placer County Resource Conservation District						
Action 1. Fuel Breaks - Wildland Urban Interface (WUI)	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Fuel Break - Large Strategic	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Defensible Space Programs (Placer County Chipper Program)	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Landowner Technical Assistance (Healthy Soils/ Carbon Farm Management Program)	PCRCDD and unincorporated Placer County	New Action	X	X		Prevention Natural Resource Protection Public Information
Placer County Water Agency						
Action 1. Develop Operable Dam Spillway Gates at Hell Hole Reservoir	PCWA and unincorporated Placer County	New Action	X	X	X	Structural Projects Emergency Services
Action 2. Alternate Intake for Alta Water Treatment Plant	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. Canal Access for Fire Fighting and water source	PCWA and unincorporated Placer County	New Action	X	X		Emergency Services
Action 4. Back-up and Stand-By Power Generation for critical community drinking and fire suppression water supply.	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Emergency Services
Action 5. Lake Arthur Pumping Station	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 6. Monte Vista Spill Improvements and Cedar Creek Canal Encasement in Pipe	PCWA and unincorporated Placer County	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 7. Pulp Mill Canal Pipeline Encasement	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 8. Permanent Pumps in Rock Creek Reservoir (PG&E Reservoir)	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 9. Vegetation Management at PCWA Wooden Flumes	PCWA and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas.	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 11. Wildfire prevention or Wildfire firefighting enhancements.	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 12. Replace Wooden Flume Structures	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 13. Reservoir - dam capacity and water management improvement projects. (was De-Silt Reservoirs)	PCWA and unincorporated Placer County	2016 Action	X	X	X	Property Protection Structural Projects
Action 14. Rockfall anchoring, stabilization, rockfall netting and slide debris mitigation. (was Hillside Slope Stabilization)	PCWA and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects
Action 15. Zone 3 Automation	PCWA and unincorporated Placer County	New Action	X	X	X	Prevention Property Protection Structural Projects
Action 16. Pumps at Halsey Forebay	PCWA and unincorporated Placer County	New Action	X	X		Property Protection Structural Projects

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 17. Backup Electrical Generation at American River and Ophir Road Pump Stations	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services
Action 18. Sierra Forest Restoration Partnerships	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 19. Colfax to Applegate Water Reliability Project	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Emergency Evacuation / Transit Priority Lane Infrastructure – Highways 89 and 267	PCWA and unincorporated Placer County	New Action	X	X		Prevention Property Protection Emergency Services
Placer Hills Fire Protection District						
Action 1. Address signage for residential and commercial structures.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 2. Defensible space inspection and implementation throughout the District.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Private roadway and driveway vegetation clearances.	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Participate and collaborate with the Placer Sierra Fire Safe Council (PSFSC) and contribute to the Community Wildfire Protection Plan (CWPP)	PHFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation	PHFPD and unincorporated Placer County	New action	X	X	X	Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
San Juan Water District						
Action 1.Updating the 2015 Urban Water Management Plan	SJWD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 2.Dam Failure Mitigation	SJWD and unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects
Action 3.Earthquake Mitigation	SJWD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects
Action 4. Redundant/backup power system	SJWD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 5. Water main bridge crossing replacement/strengthening	SJWD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects
Sierra Joint Community College District						
Action 1. Campus safety: fire, earthquake, active shooter, power outage, health emergencies, and pandemics.	SJCCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Action 2. Storm Water Flooding Mitigation	SJCCD and unincorporated Placer County	New action	X	X	X	Property Protection Structural Projects
Action 3. Drought Tolerant Landscaping	SJCCD and unincorporated Placer County	New action	X	X		Prevention Property Protection Public Information
Action 4. Fuel Reduction	SJCCD and unincorporated Placer County	New action	X	X		Property Protection Natural Resource Protection
Action 5. Emergency Power Generation	SJCCD and unincorporated Placer County	New action	X	X		Prevention Property Protection Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
South Placer Fire Protection District						
Action 1. Vegetation Management in Open Space Areas	SPFPD and unincorporated Placer County	2016 Action	X	X		Prevention Property Protection Natural Resource Protection
Action 2. Shaded Fuel Break along west shore of Folsom Lake - Granite Bay	SPFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 3. Backup Generator Installation for Fire Stations	SPFPD and unincorporated Placer County	New action	X	X		Prevention Emergency Services
Tahoe City Public Utility District						
Action 1. West Shore Storage Augmentation Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 2. Tahoe Cedars Water System Interconnection and Distribution Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 3. Madden Creek Water System Interconnection and Distribution Project	TCPUD and unincorporated Placer County	New action	X	X		Property Protection Structural Projects Natural Resource Protection Emergency Services
Action 4. West Lake Tahoe Regional Water Treatment Plant	TCPUD and unincorporated Placer County	2016 Action	X	X		Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2016 Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Truckee Fire Protection District						
Action 1. 2022 CWPP	TFPD and unincorporated Placer County	New action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Placer County Air Pollution Control District						
Action 1. Wildfire Smoke Impact Response – Public Education & Outreach	PCAPCD and unincorporated Placer County	New action	X	X		Emergency Services Public Information
Action 2. Local Air Quality Sensors to provide instantaneous public information on local PM concentrations due to wildfire smoke.	PCAPCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services Public Information
Action 3. Wildfire Smoke Impact Response – Clean Air Centers for Vulnerable Populations	PCAPCD and unincorporated Placer County	New action	X	X		Prevention Emergency Services Public Information

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Aquatic Invasive Species, Climate Change, Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.5%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Extreme Cold and Freeze, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (Assembly Bill (AB) 2140).

Project Description: Specifically, this section requires that each applicable jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Agency/ Department/Partners: Placer County Community Resource Department Agency (CDRA) - Planning

Cost Estimate: Jurisdictional board/staff time

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding: Local budgets

Timeline: As soon as possible after receipt of BOS adoption resolution and receipt of FEMA final approval letter of 2021 LHMP (Fall/Winter 2021)

Project Priority: High

Action 2. Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: All (priority and non-priority) hazards

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Placer County, its incorporated jurisdictions, and special districts are participating jurisdictions to the Placer County Local Hazard Mitigation Plan Update. Each jurisdiction plays a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The County, cities, and special districts will work with other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this LHMP Update, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County and City office buildings, libraries, and other public places and events;
- Continue sustaining Ready Placer program to outreach & educated the public on natural hazards and human caused hazards, including potential impacts of extreme weather from climate changes.
- Develop public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County, City, and other special district outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Agency/ Department/Partners: Placer County, Cities, and all other participating jurisdictions

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Project Priority (H, M, L): H

Action 3. Critical Facility Infrastructure Improvements

Hazards Addressed: Multi-hazard (Aquatic Invasive Species, Climate Change, Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.5%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Extreme Cold and Freeze, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Placer County Environmental Utilities manages critical facilities and infrastructure for water systems, sewer, and solid waste. Several hazards can threaten the operation of these systems, such as wildfires, drought, pandemic, severe weather, and flood. These hazards can stop operation of facilities and infrastructure if power is lost, systems are damaged, if operations are required to close down, communication is lost, if there are water shortages and/or contamination, or other interruptions or damage caused by hazards. Critical facilities include, sewer systems, wastewater treatment, wells, potable water systems, water systems for fire suppression, solid waste collection, solid waste sorting facilities, landfill operations, and other critical infrastructure and utilities.

Project Description: The project is for critical facility and infrastructure improvements against multiple hazards to prevent interruption of necessary services. Examples may include installing backup generators or other power supplies, hardening systems, adding or upgrading components for resiliency, upgrading equipment to continue operation and/or improve efficiency, ensuring adequate equipment and supplies, increasing capacity, improving landfill gas collection systems, installing/upgrading monitoring systems, upgrading or increasing communication systems, providing education and outreach, and other projects to protect critical facilities, infrastructure, and operations.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Environmental Utilities have ongoing plans and projects to protect and improve critical infrastructure and facilities. An increase in funding would allow more opportunities for planning and implementing projects.

Responsible Agency/ Department/Partners: Placer County, other jurisdictions within Placer County, waste haulers and operators, Fire agencies

Cost Estimate: Independent project costs will vary from approximately \$10,000 to \$2,000,000.

Benefits (Losses Avoided): Continuous and efficient operation of critical facilities, infrastructure, and services.

Potential Funding: FEMA mitigation funding, Clean Water State Revolving Fund, CalRecycle grants, Sustainable Groundwater Management Grants, USDA Rural Utility Services

Timeline: Currently underway and ongoing indefinitely.

Project Priority (H, M, L): High

Action 4. *Protect Sewer Infrastructure and Utilities*

Hazards Addressed: Flood, Severe Weather, Drought

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Flooding and severe weather storm events pose a risk to sewer systems and infrastructure. Inflow and infiltration (I & I) get into sewer systems and can cause overflow. To reduce the risk of overflow, facilities require hardening, flood proofing and/or raising or relocating facilities and infrastructure out of flood prone areas. To prevent overflow during these events, emergency pumping is also required. During hazardous events, power is also lost at these sites, which poses a significant threat to overflow if there is not a backup power source. Flood and severe weather require a high demand of labor and costs to prevent damage and overflow of systems.

Stormwater and flooding are also a threat to utilities that require creek crossings, due to damage and erosion. This causes ongoing inspections and repairs/maintenance at these sites. Hardening utilities and infrastructure would create a more reliable system with less risks of overflow, damage, and labor/costs caused by emergency events.

Drought leads to accelerated root intrusion into the sewer system, which leads to blockages. Placer County reports from 2009-2018 show that root intrusion has been the leading cause of spills for the sewer system.

Project Description: The project is to protect utilities and infrastructure from flooding, severe weather, and drought. Examples may include, flood proofing facilities/utilities, relocating or raising infrastructure/utilities above the base flood elevation and out of flood prone areas, installing SCADA systems, hardening facilities/utilities, repairing or replacing facilities/utilities, ongoing inspections, securing/managing contracts for emergency pumping, installing additional holding tanks at lift stations, upsizing and repairing sewer lines/force mains, bringing infrastructure and facilities to current standards, constructing or upgrading sewer treatment facilities, eliminating and/or ensuring structural integrity of sewer creek crossings, clearing or reducing root intrusion, updating Sewer Systems Management Plans and Sanitary Sewer Overflow Response Procedures, installing generators and other backup power sources, ensuring adequate equipment and fuel supply, providing education/outreach, and other projects to protect utilities.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Environmental Utilities currently has a Capital Project List, which has identified areas or facilities that are in need of repair or replacement. Projects are ongoing, but more funding is required to harden and protect facilities and infrastructure from these hazards.

Responsible Agency/ Department/Partners: Placer County Environmental Utilities

Cost Estimate: Independent project costs will vary from approximately \$10,000 to \$2,000,000.

Benefits (Losses Avoided): Reducing or eliminating overflows and damage to critical infrastructure and utilities, and to the keep the system operating efficiently.

Potential Funding: FEMA mitigation funding, Clean Water State Revolving Fund, USDA Rural Utility Services

Timeline: Underway and ongoing indefinitely.

Project Priority (H, M, L): High

Action 5. Trail System Way Finding and Directional Signage

Hazards Addressed: Multi Hazard (Search and Rescue)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Placer County has one of the nation’s most extensive recreational trail networks with over 500 miles of public trails located on County, State, and Federally owned property. A need has arisen to improve way finding and directional signage. Many trails are currently non-descript of landmarks for miles on end, and this creates delay in emergency response along trails. Signage will include mile markers along remote trails to aid reporting parties in describing the location of incidents along trails to first responders. Directional and interpretive signage will also alert trail users of hazards and preparedness planning.

Other Alternatives: Close trails to the public if delay in emergency response increases hazards to unacceptable levels.

Existing Planning Mechanism(s) through which Action Will Be Implemented: A pilot program of mile marking signage has been implemented in the Dry Creek West Placer Area of Placer County. A Park and Trail Master Plan will be undertaken by Placer County beginning in 2015. The Master Plan will complete in 2021 including trail safety signage standards.

Responsible Office/Partners: Placer County Department of Parks and Open Space, State Parks, U.S. Forest Service/Bureau of Land Management/Bureau of Reclamation, local Land Trusts.

Project Priority: High

Cost Estimate: \$125,000

Benefits (Losses Avoided): Decrease emergency response time in public open space areas. Educate trail users in hazard avoidance and readiness planning.

Potential Funding: Grants, Development Fees, other

Timeline: 2021 through 2025

Action 6. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.

Hazards Addressed: Multi-Hazards (primarily for wildland fires, but applicable for other events such as floods, earthquakes, seiche, dam and levee failures, severe weathers & storms, etc.)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In the Wildland Urban Interface (WUI) and other hazard areas, communities, industrial landowners, along with local, state, and federal agencies should work collaboratively to identify and pursue funding to improve access for evacuations. Currently, many communities have limited access for evacuations in and out of the community in the WUI and other hazard areas. In fact, a number of existing “at risk” communities in Placer County presently only have “one way” in and out of their community.

Many of the County’s communities have evacuation plans. Efforts by the County should continue to work towards providing plans to those communities without one. As part of evacuation planning efforts, provide alternatives to constructing and or re-purposing existing routes to mitigate wildfires, floods, and other related hazards to communities. Some communities only have one way in and out in the case of an evacuation. Some roads are narrow with no turnouts and in need of annual fuel reduction and mowing of roadsides for fire safety. This is important in case temporary refuge sites need to be used during evacuations as a last resort, as not all possible refuge sites have annual fuel reduction completed. Some designated shelters have no cooling systems to filter smoke for at risk populations. All of these issues should be addressed in future evacuation planning and associated efforts.

Project Description: Coordinate with Partners to identify alternate evacuation roads for communities with only one road out of community. Improve existing road surfaces in need of improvement for commonly used primary and secondary routes out of communities. Evacuation roads should have fuel reduction and roadside mowing completed on a regular schedule. Other related efforts: facilitate/coordinate evacuation exercises with allied agencies and stakeholders; evacuation route signing for highest risk communities. Emergency preparedness publications and maps for residents, businesses and visitors. Address Senate Bill 99 (2019, Nielsen) (GC 65302) that requires, upon the next revision of the housing element on or after January 1, 2020, to review and update the safety element to include information identifying residential developments in hazard areas that do not have at least 2 emergency evacuation routes. This effort should also consider options for shelters, refuge areas, safety zones, and signage.

Other Alternatives: No action, continue with a disjointed approach to evacuation in the County.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Emergency Operations Plan, Placer County CWPP, PG&E Public Safety Power Shutoff plan, Emergency Action Plans, Placer County General Plan

Responsible Agency/ Department/Partners: County Agencies (OES, Sheriff, Fire Department, Planning, GIS, Public Works - Roads), CALFIRE, CalTrans, CHP, USFS, Fire Districts, Community Service Districts (CSD), Fire Safe Councils

Cost Estimate: Unknown at this time

Benefits (Losses Avoided): Improve emergency preparedness of roads, related infrastructures, and personal preparation. Improve speed & coordination of evacuations. Improve public safety. Save lives.

Potential Funding: State & FEMA grants

Timeline: 1-5 years and ongoing

Project Priority (H, M, L): High

Action 7. Evacuation Warning

Hazards Addressed: Multi-Hazards (primarily for wildland fires, but applicable for other events such as floods, earthquakes, seiche, dam and levee failures, severe weathers & storms, etc.)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Placer County and its incorporated communities have a variety of systems and procedures established to protect its residents and visitors to plan for, avoid, and respond to hazard events, including those associated with floods, wildfires, dam/levee failures, earthquake, etc.

Project Description: This project involves enhancing current systems, utilizing new technologies and better coordination of efforts to provide real time information on current or developing emergencies. Flooding and wildfires can occur quickly and with little warning. In the event of a severe flood, wildfire or other natural hazard event, the Placer County OES webpage will identify current emergencies and associated protocols at: <https://www.placer.ca.gov/5852/Ready-Placer> The County will also provide emergency information and broadcast warnings on local radio and television stations as well as on social media websites such as Facebook and Twitter. The new Everbridge system may be activated and helicopters may be used to broadcast warnings/alerts via a PA system. If time and condition/safety permits, vehicle patrol units may also broadcast warnings in affected areas. County OES also works closely with CalOES and the National Weather Service for issuing an Emergency Alert System (EAS).

Other Alternatives: Utilize existing systems and protocols

Existing Planning Mechanism(s) through which Action Will Be Implemented: Current systems in place (Everbridge (mass notification), & flood ALERT), however, there are annual costs to sustain & maintain these systems. As population and housing/infrastructures/developments continue to increase, newer technologies need to be obtain and implement.

Responsible Agency/ Department/Partners: County Agencies (OES, Sheriff, Fire Districts & Departments, Planning, GIS, Public Works - Roads), CALFIRE, CalOES, and NWS

Cost Estimate: \$60,000 - \$80,000

Benefits (Losses Avoided): Improve emergency preparedness and responses by providing real time information on current or developing emergencies.

Potential Funding: State & FEMA grants

Timeline: Ongoing

Project Priority (H, M, L): High

Action 8. Battery Back-up Systems to provide building resiliency

Hazards Addressed: Multi-hazard (Aquatic Invasive Species, Climate Change, Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.5%/0.2% annual chance, Floods: Localized Stormwater, Levee Failure, Pandemic, Severe Weather: Extreme Cold and Freeze, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Wildfire).

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Critical buildings without back-up generator power will be exposed to potential shut-downs during an electrical outage event. Battery back-up systems today are now more sophisticated in their design and control; and more economical to install. However, installation requires major electrical rework to a facility and large amounts of space to house the battery systems.

Project Description: Evaluate the feasibility to install a battery back-up system within our larger critical infrastructure facilities. These include Community Development Resource Center, Finance Administration Building, Auburn Justice Center, and Auburn Jail, among others.

Other Alternatives: Solar panels, but limited to daylight

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer staff are evaluating renewable resource options which include battery back-up systems in conjunction with solar panel electrical generation.

Responsible Agency/ Department/Partners: Facilities Management

Cost Estimate: Cost TBD depending on actual facility and nature of backup system

Benefits (Losses Avoided): In addition to creating a back-up power source during critical need periods, battery systems can also reduce daily peak loads in order to save energy costs and reduce kW demand from the grid.

Potential Funding: General Fund, State and FEMA mitigation grants

Timeline: 3-5 years

Project Priority (H, M, L): M

Mitigation Action Worksheet

Action 9. Emergency Generator / Installation, Maintenance, & Upgrade of Emergency Generators at Road Maintenance Yards

Hazards Addressed: Provides uninterrupted road maintenance crew services during an emergency event which are necessary to provide roadway access and mobility to the travelling public and emergency services crews during an emergency event.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The various Road Maintenance Division Corporation Yards cannot operate during Public Safety Power Shutoffs (PSPS) and other emergencies when power is lost. Without power equipment and vehicles are unable to refuel, maintenance shops cannot operate, and offices have limited capabilities which limits road maintenance crew abilities to respond to roadway emergencies needed to provide access for the traveling public and emergency services. The Lincoln Corporation Yard does not currently have an emergency generator and cannot operate when power is lost. The other road maintenance yards are equipped with generators, but the equipment is in various conditions from fair good to poor.

Project Description: Install an emergency generator as well as all electrical infrastructure needed for backup power at the Lincoln Corporation Yard. Assess the condition of the existing emergency generators and backup power infrastructure at all County road maintenance corporation yards and retrofit backup power systems to assure responsiveness during an emergency event.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: Placer County / Department of Public Works / Road Maintenance Division

Cost Estimate: \$500,000

Benefits (Losses Avoided): Improved emergency response of road maintenance crews assuring roadway access for the travelling public.

Potential Funding: None

Timeline: Assessment & Planning 2022, Implementation 2023

Project Priority (H, M, L): H

Action 10. Earthquake Retrofit / Seismic Assessment of County Infrastructure

Hazards Addressed: Determine the seismic vulnerability of Placer County infrastructure including bridges, essential roadway facilities, buildings, and utilities and determine a plan of action to ensure the safety and functionality of public infrastructure during and after a seismic event.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Placer County resides in an area of moderate to low seismicity with several fault zones including the Melones, Bear Mountain, DeWitt Fault, North Tahoe-Incline Village, and West Tahoe-Dollar Point fault zones which can generate between a 5 and 7 magnitude earthquake. The County completed a seismic retrofit of the Foresthill Bridge near Auburn in 2014 using Federal Highway Bridge Program funds; the project was initiated by Caltrans in 2000 who performed a seismic screening of local bridges statewide. The County needs to complete a similar screening of all public infrastructure to determine the seismic risk and a plan of action which can be implemented to mitigate potential safety and operational risk associated with a seismic event.

Project Description: Perform an engineering seismic assessment of all public infrastructure Countywide including bridges, essential roadway facilities, buildings, and utilities and determine a plan of action to ensure the safety and functionality of public infrastructure during and after a seismic event.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: Placer County / Department of Public Works

Cost Estimate: \$500,000

Benefits (Losses Avoided): Assess seismic risk and vulnerabilities. Determine specific mitigations to avoid injury, loss of life, and operational ability during and after a seismic event.

Potential Funding: None

Timeline: Assessment and Planning 2022-2023

Project Priority (H, M, L): H

Agricultural Hazards

Action 11. Agriculture – A-rated Invasive Insect Pest Infestation

Hazards Addressed: Ag hazards

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: There are a variety of insect pests, including exotic fruit flies and other species that are regulated by the California Department of Food and Agriculture (CDFA) and United States Department of Agriculture (USDA) and designated “A-rated” pests due to the threat they pose to California’s agricultural industry and environment. If one of these insect pest species were to become established in Placer County, it would trigger an immediate quarantine of all produce within the quarantine boundaries, prevent the sales of all produce in the quarantine area, and possibly even trigger international trade restrictions on California if the infestation were large enough.

Project Description: The county Agriculture Department operates an insect pest detection program with over 1,000 pest detection traps which are regularly monitored and inspected. These traps provide a first line of defense against invasive insect pests. Additionally, the Agriculture Department conducts high-risk pest exclusion inspections of incoming plant material shipments from other states to ensure that they do not inadvertently introduce invasive species to Placer County. Ultimately, if a pest is found to be established in Placer County, the county would partner with CDFA and USDA to implement and enforce a quarantine and eradication program to first keep the pest from spreading further, and second to eliminate the pest from Placer County and California.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: CDFA - Plant Health - PEST EXCLUSION BRANCH > Exotic Fruit Fly Regulatory Response Manual (ca.gov)

Responsible Agency/ Department/Partners: Placer County Agriculture Department, CDFA, USDA

Cost Estimate: \$340,000 per year for all pest prevention activities

Benefits (Losses Avoided): Placer County’s gross value of fruit and nut crops is approximately \$23 million dollars, and the total economic activity associated with the production is more than double that number. Depending on the size of a possible quarantine, it could impact all or some portion of that \$40+ million worth of economic activity.

Potential Funding: Pest prevention activities are funded by a combination of federal Farm Bill funding, state general fund, industry fees, county general fund, and Unrefunded Gasoline Tax.

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 12. StormReady Certification for Placer County

Hazards Addressed: Multi-Hazard (Climate Change, Drought and Water Shortage, Flood Severe Weather: Heat, Freeze and Snow, Heavy Rains and Storms, High Winds and Tornadoes)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The National Weather Service established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather-related warnings for the public. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations. Some 98 percent of all Presidentially declared disasters are weather related, leading to around 500 deaths per year and nearly \$15 billion in damage. The StormReady program helps arm America's communities with the communication and safety skills needed to save lives and property--before, during and after the event. StormReady helps community leaders and emergency managers strengthen local safety programs.

Project Description: Placer County OES, in conjunction with the County Stormwater and Flood Programs, will work to submit a StormReady application for certification.

To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center,
- Have more than one way to receive severe weather warnings and forecasts and to alert the public,
- Create a system that monitors weather conditions locally,
- Promote the importance of public readiness through community seminars, and
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

Being designated a StormReady community by the National Weather Service is a good measure of a community's emergency warning program for weather hazards. It is also credited by the CRS.

Other Alternatives: Continue utilizing the National Weather Service for storm information

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Emergency Operations Plan and related Annexes

Responsible Agency/ Department/Partners: Placer County OES, with support from County Department of Public Works, Stormwater and Flood Programs

Cost Estimate: Staff time of \$8,000 to \$10,000

Benefits (Losses Avoided): A StormReady certification will lead to better communication to save lives and protect property during major storm events.

Potential Funding: Local budgets

Timeline: Within 1 year

Project Priority (H, M, L): High

Avalanche Actions

Action 13. Update local ordinances and development standards to reflect updated avalanche hazard information.

Hazards Addressed: Avalanche, climate change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The warmer temperatures brought on by climate change are projected to cause more rapid melting of snow, which may destabilize snow on hillsides, causing an avalanche. Climate change is likely to cause more intense winter storms (leading to more periods with heavier snowfall), and warmer conditions are likely to cause a greater percent of precipitation to fall as rain instead of snow. A combination of these factors may also increase the avalanche risk in Placer County.

Project Description: Update the Placer County Zoning Ordinance, Development Standards, and other policy and guidance documents to include development principles for site design that act to reduce physical and life damage caused during an avalanche event. Define the process for evaluating local development regulations based on the development principles so that strategic code changes can be made in the community. Develop site analysis tools for various land use types to determine the scale of risk associated with Avalanche Risk.

Other Alternatives: Conduct an assessment of existing development located within a high risk for avalanche event and identify mitigation and funding opportunities for necessary retrofits, education, and evacuation planning.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County General Plan, Safety Element Goals, Policies, and Implementation Program Placer County Sustainability Plan, GHG Reduction Plan and Adaptation Strategies CEQA, Environmental Review

Responsible Agency/ Department/Partners: Community Development Resource Agency Planning Services Division

Cost Estimate: \$85,000

Benefits (Losses Avoided): Avoided damage to new homes located in or near avalanche prone areas.

Potential Funding: Staff budgets, grants

Timeline: 1-3 years

Project Priority (H, M, L): Medium

Climate Change Actions

Action 14. Green Waste

Hazards Addressed: Climate Change and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Programs and resources need to be available to allow green waste to be removed from properties to reduce fuels for wildfire risks and severity. If green waste is disposed of instead of being recycled, the decomposition of green waste in the landfill will create methane and contribute to climate change. Facilities are receiving more green waste in recent years and do not have enough cost-effective opportunities for green waste to be recycled. In return, there may be a higher cost to drop off green waste at facilities, which will discourage property owners from removing green waste and reducing fuels.

Additionally, facilities need to improve capabilities to receive green waste. County facilities have had an increase in green waste drop off that has created longer lines, wait times, and more traffic. Facilities need to improve efficiency in receiving green waste to encourage property owners to reduce fuels.

Project Description: The project is to enhance programs and improve capabilities/efficiency to receive and recycle green waste. Examples of projects are to improve efficiency at facilities, increase or expand drop-off facilities and locations, support biomass projects, increase recycling/composting opportunities, provide education and outreach, support special programs or events, and other projects to reduce green waste and to efficiently recycle or reuse green waste material.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Environmental Utilities is currently looking at projects to improve efficiency and increase green waste opportunities. It will require multiple projects and programs to improve overall efficiency and opportunities to recycle green waste and reduce fuels. Additional planning mechanisms will be required.

Responsible Agency/ Department/Partners: Placer County, Fire agencies, waste haulers, waste facilities, recycling facilities

Cost Estimate: Independent project costs will vary from approximately \$10,000 to \$2,000,000.

Benefits (Losses Avoided): Reduction in fuel for wildfires and reduction/avoidance of organic waste in landfills to reduce climate change

Potential Funding: FEMA mitigation funding, USDA Rural Utility Services, CalRecycle grants

Timeline: Projects are currently in the planning phase and will likely be ongoing to continuously improve green waste programs.

Project Priority (H, M, L): High

Action 15. *Reduce Organic Waste Disposal*

Hazards Addressed: Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The decomposition of organic waste creates methane, which contributes to climate change. SB 1383 emission reduction targets include a 75% reduction in statewide disposal of organic waste by 2025. According to CalRecycle, organic material accounts for more than a third of the material in California's waste stream. Reducing organic waste disposal is part of the AB 32 (California Global Warming Solutions Act of 2006) Scoping Plan, is fundamental to ARB's Short Lived Climate Pollutant strategy, and is one of California's strategies for reaching the statewide 75 percent recycling goal (CalRecycle).

To reduce climate change impacts, organic waste can be diverted and turned into products, such as compost, fertilizers, and biofuels. Placer County is currently diverting green waste that gets sorted from disposable materials at the materials recovery facilities. Food waste is collected from a portion of businesses in the County and is turned into compost. There is still a significant portion of food waste from residential households, multifamily dwellings, and other businesses that have opportunities for diversion, but these opportunities require funding and programs to allow more organic waste to be diverted.

Project Description: The project is to increase and implement organics waste (food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste) reduction/recycling programs to reduce greenhouse gas emissions from the decomposition of organic waste in landfills. Examples of projects are to improve efficiency in the collection and sorting of organics waste, expanding or adding new organics waste recycling facilities, increasing access to recycling facilities, developing new programs to support organics waste diversion, improve and increase opportunities for edible food recovery, providing education and outreach, and other similar projects that will assist in reducing organic waste disposal.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Material recovery facilities are investigating options for organics waste diversion and/or expansion, but more planning mechanisms are required to implement this project. The County and other jurisdictions are currently planning for programs and projects. No other formal implementation plans are in place at this time.

Responsible Agency/ Department/Partners: This project will require planning and collaboration from many entities, such as Placer County, other jurisdictions within Placer County, businesses, facilities, waste haulers, food recovery organizations, residents, etc.

Cost Estimate: Independent project costs will vary from approximately \$10,000 to \$2,000,000.

Benefits (Losses Avoided): Reduce greenhouse gas emissions and climate change impacts.

Potential Funding: FEMA mitigation funding, CalRecycle grant programs, USDA Rural Utility Services

Timeline: Reducing organic waste disposal will be an ongoing effort. It is likely that the implementation of several new projects will be required during the next four years.

Project Priority (H, M, L): High

Dam Failure, Flood: 1%, 0.5%, 0.2% annual chance, Flood: Localized Flood, and Severe Weather: Heavy Rains and Storms Actions

Action 16. Elevate Repetitive Loss Structures in 100-year Floodplain

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Placer County is a participant in the National Flood Insurance Program Community Rating System. As a participant in the CRS program, Placer County reviews the Repetitive Loss (RL) properties within its jurisdiction and annually notifies surrounding property owners of the RL property. In order to mitigate for RL properties, the structures can be elevated such that the finish floor is elevated above the 100-year flood elevation. RL properties include but are not limited to the following:

- 2 RL properties in Granite Bay
- 1 RL property in Loomis
- 1 RL property in Newcastle
- 1 RL property in Lincoln
- 1 RL property in Soda Springs
- 1 RL property in Olympic Valley
- 1 RL property in Tahoe City
- 1 RL property in Homewood

Other Alternatives: Other than elevating the structure, alternatives include; acquisitions/relocations, dry flood proofing of non-residential structures, minor localized flood control projects, and demolition of NFIP-insured structures on acquired or restricted real property.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Elevate RL structures using grants when available

Responsible Office/Partners: Placer County Department of Public Works and Facilities

Cost Estimate: Elevation is estimated at \$100,000 to \$150,000 per structure.

Benefits (Losses Avoided): Reduce flood losses and create a safer community

Potential Funding: Potential Grant Programs

Timeline: 2-10 years

Project Priority: Medium

Action 17. Elevate Remaining 95 Homes in the Dry Creek Watershed

Hazards Addressed: Flood

Issue/Background: Homes in the Dry Creek Watershed have a history of flooding. These 95 homes could benefit from being elevated above flood levels.

Goals Addressed: 1, 2, 3, 4, 5, 7

Other Alternatives: Other than elevating the structure, alternatives include; acquisitions/relocations, dry flood proofing of non-residential structures, minor localized flood control projects, and demolition of NFIP-insured structures on acquired or restricted real property.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Available funding and homeowner cost sharing where possible. Funding thru Federal or State grant sources if available.

Responsible Office/Partners: Placer County Department of Public Works and Facilities

Cost Estimate: Elevation is estimated at \$100,000 to \$150,000 per structure.

Benefits (Losses Avoided): Reduce flood losses and create a safer community

Potential Funding: Potential Grant Programs

Timeline: 2-10 years

Project Priority: Medium

Action 18. Community Rating System (CRS) Maintain and Enhance

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS:

- Reduce flood losses;
- Facilitate accurate insurance rating; and
- Promote the awareness of flood insurance

Other Alternatives: Stop participation in the CRS and leave home owners uninformed about flood risks.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Outreach through implementation of the CRS program. Currently a Class 5 community. Enhancement of program would require establishment of freeboard.

Responsible Office/Partners: Placer County Department of Public Works and Facilities

Cost Estimate: \$60,000 per year to maintain rating

Benefits (Losses Avoided): Reduce flood losses and create a safer community

Potential Funding: County General Funds

Timeline: On Going

Project Priority: Medium

Action 19. Bridge and Culvert replacement and drainage improvements

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Continue to review and identify bridge, culverts and drainage improvements

Other Alternatives: Continue to respond to events in a piecemeal fashion.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Funding thru Federal or State grants and road funds.

Responsible Office/Partners: Placer County Department of Public Works and Facilities

Cost Estimate: Cost dependent on project. \$50,000 - \$10,000,000

Benefits (Losses Avoided): Reduce flood losses and maintain safe public roads

Potential Funding: Grant Programs

Timeline: 2-10 years

Project Priority: Medium

Action 20. Bell Drive Sewer Pipeline Repair

Hazards Addressed: Flood, Severe Weather

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: An above ground sewer pipe crosses a creek near Bell Drive in Granite Bay. Erosion has occurred along the soil bank that is located adjacent to the concrete pipe support. The erosion has displaced soil, rock, and other concrete, and the pipe is now being pushed to the side by concrete. Further erosion or future storm events or floods is likely to cause the pipe to fail and cause a sewage spill into the waterway.

Project Description: The project is to repair the sewer pipe crossing over the creek. Activities will consist of replacing the pipe support foundation, removing a concrete chunk and a boulder that are impacting the pipe, removing loose soil, and other tasks that might be needed to repair the sewer pipe and structural supports.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Environmental Utilities is currently evaluating the project to determine all activities required to repair the pipe.

Responsible Agency/ Department/Partners: Placer County Environmental Utilities

Cost Estimate: \$100,000 to \$200,000

Benefits (Losses Avoided): Repairing the pipe before it fails will prevent a sewage spill into the water and will ensure ongoing operation of critical infrastructure.

Potential Funding: Local sewer district funds.

Timeline: Completion by fall 2023.

Project Priority (H, M, L): High

Action 21. Annual Flood Exercise

Hazards Addressed: Flood, Dam Failure

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: There must be at least one exercise and evaluation of the flood warning and response plan each year that is compliant with the National Incident Management System (NIMS). This process is described in the Homeland Security Exercise Evaluation Program. The exercise can be for a flood, levee failure, dam failure, or hurricane. This criterion can be met if the plan is implemented in response to an actual flood-related event, or threat of a levee failure. In either case, there must be an evaluation of the performance of the plan and recommended changes that may be needed, as is usually documented in an after-action report. This criterion is part of the national emergency preparedness cycle

Project Description: A requirement of CRS is to conduct an annual exercise as part of preparedness efforts to address areas of concerns of flooding concerns. As such, Placer County OES in partnership with County Department of Public Works – Stormwater and Floodplain Programs plan to host and conduct an annual exercise with allied agencies and stakeholders. Can include review of the flood threat recognition system, emergency warning dissemination, flood response operations, critical facility planning, and the potential of becoming a StormReady community.

Other Alternatives: Not having the annual drill could mean when a large incident occurs, the response to and management of the incident may be less than ideal.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCOES Training and Exercise Program

Responsible Agency/ Department/Partners: Placer County OES, Placer County Department of Public Works – Stormwater and Floodplain Programs, Placer County Flood Control District

Cost Estimate: Exercise planning/design staff and participants time

Benefits (Losses Avoided): Excellent realistic training for all personnel and staffs at all levels, and the cooperative effort and training among various allied agencies, stakeholders, and local government leads to a more effective response to real incidents without a significant cost factor. More effective response saves lives and reduces property damage.

Potential Funding: Local budget or grants

Timeline: Annually late fall ideally

Project Priority (H, M, L): M

Drought & Water Shortage, Severe Weather: Extreme Heat, Tree Mortality, and Wildfire Actions

Action 22. Improve and Protect Water Systems

Hazards Addressed: Wildfire and Drought

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Placer County Environmental Engineering and Utilities Division provides support related to the design, operation, and maintenance of the County's public water systems in the community of Sheridan and in Truckee off Cabin Creek Road. The system in Sheridan serves the community, and the Cabin Creek system serves the Eastern Regional Landfill and the Tahoe Area Regional Transit County facilities. In addition, the County provides and maintains numerous water systems for fire suppression.

Wildfire and drought potentially threaten the system's ability to adequately provide potable water and to meet the level of demand by the community and for fire suppression. Fires can damage the system, potentially contaminate water sources, and prevent water availability. Drought can reduce water availability, which may require conservation, and also impact supply needed by the community or during a wildfire event.

There is an important need to improve water systems in the County, but funding sources have not been available to make improvements to reduce threats to the system from these hazards.

Project Description: The project is to improve and protect water systems for suppression and resiliency against wildfire and drought. Examples include strengthening water systems, improving equipment, preventing contamination, improving water quality, increasing water volume and/or flow, improving fire suppression abilities, increasing reliability, installing backup power sources or generators, installing new systems, making water systems more accessible, ensuring adequate equipment and supplies, water conservation projects, projects to protect/improve groundwater and surface water, constructing additional water storage facilities, providing education and outreach, and other projects to protect or improve water systems and availability.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Environmental Utilities maintains the County public water systems and systems for fire suppression. This includes ongoing monitoring and maintenance of these systems. Additional funding and resources are needed to plan and implement projects to improve and protect the water systems.

Responsible Agency/ Department/Partners: Placer County Environmental Utilities, Fire agencies

Cost Estimate: Independent project costs will vary from approximately \$10,000 to \$2,000,000.

Benefits (Losses Avoided): Ensuring adequate and safe water supply for community systems and fire suppression systems.

Potential Funding: FEMA mitigation funding, USDA Rural Utility Services, Sustainable Groundwater Management Grants

Timeline: Maintenance and monitoring are ongoing. Additional projects may be implemented at the time that funding is available.

Project Priority (H, M, L): High

Action 23. Groundwater Sustainability Planning

Hazards Addressed: Drought and Water Shortage, Agricultural Hazards

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Placer County depends on groundwater for drinking water resources and agriculture. The Sustainable Groundwater Management Act (SGMA) was enacted in 2014 to prevent overdraft in groundwater basins or to bring overdrafted groundwater basins into sustainability (balanced levels of pumping and recharge). SGMA requires local agencies to form sustainability agencies and adopt sustainability plans for high- and medium-priority groundwater basins. The long-term planning required by SGMA and described in GSPs will provide a buffer against drought and climate change and contribute to reliable water supplies regardless of weather patterns in the State.

The West Placer Groundwater Sustainability Agency (WPSGA) was formed by a Memorandum of Agreement in 2017 to manage groundwater in the western Placer County portion of the North American Subbasin (NASb). The WPGSA member agencies include Placer County, the cities of Roseville and Lincoln, Placer County Water Agency, and Nevada Irrigation District. California American Water Company is a participating agency. The WPGSA is working cooperatively with other Groundwater Sustainability Agencies to develop a single Groundwater Sustainability Plan (GSP) for the Subbasin which covers portions of west Placer County, Sutter County, and Sacramento County.

Although the NASb is not in overdraft conditions and the subbasin is generally healthy, it has been designated by the DWR as a High Priority subbasin primarily due to the extent of groundwater use and potential for future population growth.

Project Description: Support the West Placer Groundwater Sustainability Agency’s efforts to develop and implement a Groundwater Sustainability Plan in accordance with State the SGMA. The GSP must include ongoing monitoring and management of groundwater as well as identify projects and management actions that could be implemented should the basin become at risk. As one example, the WPGSA is investigating lands in western Placer County that can potentially be used for groundwater recharge during times of excess surface water flow. Ongoing GSP implementation will include semiannual groundwater monitoring, annual reporting, five-year GSP updates, and implementation of projects and management actions as needed.

Other Alternatives: If local agencies do not take action to develop and implement GSPs, the State can intervene and take control over the management of local groundwater resources.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The GSP is the planning mechanism. The development of the GSP is currently underway and must be submitted to the California Department of Water Resources (DWR) by January 31, 2022. Once the GSP is submitted, the GSAs will immediately transition into implementation, which will include groundwater monitoring, annual reporting, five-year GSP updates, and implementation of projects and management actions as needed. Specific projects will need to be consistent with existing land use policies, permitted by local and state agencies, and will be subject to CEQA review.

Responsible Agency/ Department/Partners: The WPGSA agencies (Placer County, City of Roseville, City of Lincoln, Placer County Water Agency, Nevada Irrigation District, California American Water).

Cost Estimate: The estimated cost to create the GSP is \$2 million, but costs of implementing the GSP will vary and are to be determined.

Benefits (Losses Avoided): Implementation of the GSP will include ongoing monitoring of the groundwater basin, which means early identification of any “undesirable results” as defined in SGMA – such as lowering of groundwater levels, degradation of water quality, surface water depletion, and other conditions. Having pre-defined Projects and Management Actions (i.e. mitigation measures), and defined criteria for which they are triggered, will enable the WPGSA agencies to act quickly to protect groundwater levels.

Potential Funding: The five GSAs will share the cost of developing the GSP and ongoing implementation, which will be allocated by acreage. The Department of Water Resources has allocated \$1 million in grant funding for development of the GSP, which will cover about half the estimated cost. The grant requires a 50 percent cost-share by each GSA. The West Placer GSA share of this is approximately \$241,000. Costs for ongoing implementation are currently being calculated. Costs for implementing projects and management action will vary and are currently being reviewed. Placer County has committed to funding and implementing a groundwater recharge project in west Placer County. The Placer Vineyards Specific Plan located in western Placer County includes a Development Agreement provision with the intent to maintain groundwater levels to support affordable local groundwater supply for agriculture. The provision established a fee of \$1,000 per residential unit to support implementation of supportive infrastructure, but does not include funding for planning purposes, such as permitting or CEQA.

Timeline: Completion of the GSP is due January 31, 2022. Implementation of the GSP will occur indefinitely.

Project Priority (H, M, L): High

Action 24. Fuel Breaks - Wildland Urban Interface (WUI)

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The purpose of a Shaded Fuel Break within the WUI is to minimize destruction to communities from wildfire and to protect and enhance natural resources, watershed and habitat of western

Placer County. When complete, these projects will help protect the community's identified as "Communities at Risk from Wildfire" and identified as communities with the WUI, listed in the CWPP.

This practice applies to all communities within the WUI where protection from wildfire is needed. These Shaded Fuel breaks are planned thinning of dense vegetation in an area approximately 300 feet wide where fire does not easily move from the ground into the overhead tree canopy and to allow fire resources to utilize such a location to increase probability of success during fire suppression activities. Fuel break width will be dependent upon the fuels and topography in any given area.

Project Description: For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP WUI, for that specific Fire Safe Council.

The Placer County Fire Safe Alliance and Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop shaded fuel breaks to protect specific communities and watersheds within the WUI.

Other Alternatives: Rely on the individual property owner or land managers within the WUI to develop fuel breaks to protect resources and assets from fire that may spread from the wildland into urban areas.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement shaded fuel breaks identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County, Stakeholders, & Landowners

Cost Estimate: The costs for the individual projects are identified in the Western Slope CWPP Project Planning Worksheets.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and cities within the County.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): High

Action 25. Public Education & Awareness

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Public education through community outreach is a must in Placer County. We have 23 individual high-risk communities in the County ranging from 200 to 2500 residents each. Each Fire Safe Council, Firewise Community, and the Fire Safe Alliance attempts to meet with as many of these

residents as possible to provide information on defensible space and Firewise requirements. Most is done through attending Municipal Advisory Council, HOA, community events, and local community group meetings. Each FSC would develop an annual calendar defining the meetings and events to attend. These events range from 15-minute presentations to local and government groups as well as multiple day events (i.e. local fair and seasonal home shows).

Project Description: There are approximately 36,000 habitable structures in the Western Placer County SRA (five FSC's) boundaries. This is the fourth largest density of parcels with habitable structure in the state SRA areas. The goal is to provide each Fire Safe Council, Firewise Community, and the Fire Alliance with documentation and presentation tools that are consistent with the CAL FIRE communications goal of "To provide information and education to people of all ages, in public forums, through the media and worldwide web, and the distribution and display of printed material". Having consistent, quality education material will help us educate the public on "THEIR" roll to manage their defensible space and prevent the spread of wildfire into and out of their communities. While the majority of habitable structures are within the 23 communities at risk, education sessions will take place inside and outside of the communities. Outside meaning local fairs, seasonal home shows, Municipal Advisory Council meetings and other public events.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. While public service messages and media helps tell the public of their responsibility for defensible space and fire mitigation, specific and direct communications and training information increases the chance of reaching the public.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County, CALFIRE, Placer Resource Conservation District

Cost Estimate: Previous assessment shows a first-year cost of \$41,000 and an annual cost of \$17,500 per year, after year one.

Benefits (Losses Avoided): This program would provide the tools and resources to develop, purchase, and maintain needed public education material to educate Placer County residents on wildfire prevention and Firewise Community techniques.

Potential Funding: County, State, and Federal funding.

Timeline: County, State, and Federal funding.

Project Priority (H, M, L): High

Action 26. Fuel Break – Large Strategic

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Large Strategic Fuel Break projects will provide landscape scale community protection in our area. When complete, these projects will help protect the communities identified as “Communities at Risk from Wildfire” listed in the National Fire Plan.

Project Description: This practice applies to all communities where protection from wildfire is needed. These Strategic Fuel breaks are planned and located on the landscape as part of a conservation management system for a land unit where there is a need to control the risk of the spread of fire into our communities as well as to protect watersheds, critical infrastructure, and commerce traveling on our freeways and railways. Typically, they break up large, continuous tracts of dense natural fuels, thus limiting uncontrolled spread of fire, and are commonly associated with firebreaks (permanent or temporary strips of bare or vegetated land planned to retard fire). For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP for that specific Fire Safe Council area.

The Placer County Fire Safe Alliance and Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop large strategic fuel breaks to protect specific communities and watersheds within the County.

Other Alternatives: Rely on the individual property owner or land managers to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement strategic fuel breaks identified in the Western Slope CWPP. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County

Cost Estimate: The cost for the individual projects is identified in the Western Slope CWPP Project Planning Worksheets

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and city’s within the County.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): H

Action 27. Natural Systems Protection / Education and Awareness Programs – Placer County Wildland Urban Interface (WUI) Strategic Planning

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Pre-incident assessments of the fire environment and resources at risk allow first responders to focus on responding versus reacting. Residential development in fire dependent ecosystem has created hazardous firefighting and life safety considerations for first responders. Many of these WUI communities within Placer County are bound by steep, deep inaccessible topography with poor access, steep slopes, heavy fuels, and recurring fire occurrence.

Project Description: This project will result in multiple cooperators sharing knowledge and involving the community in a fire safety planning project that will establish a strategic knowledge base for incident management and fuel management applications. Inventoried elements include structure locations, defensible space, road systems, emergency vehicle access, community closure points, water sources, at-risk assets and potential incident related locations.

These elements are all input into Geographic Information System (GIS) for development of planning area maps with a written pre-attack plan and made available to all emergency responders within Placer County.

This project includes residential education that stresses the importance of fire awareness, defensible space and evacuation procedures and preparation as part of the planning process.

The long term measurable outcomes of this project are reduction of risk of death and injuries, reduced property loss and devastation from wildfire, flood or other hazard.

Placer County Fire, CAL FIRE, Placer OES and multiple local fire districts have worked together to identify strategies and resources that will reduce risk from wildfire and improve the management of emergency incidents within the developed wildland urban interface (WUI) throughout Placer County.

Other Alternatives: Do nothing. Rely on local knowledge being available at the time of emergency.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project is a permanent component of the local CAL FIRE Fire Plan. It originated as a grass roots effort of various public safety and resource conservation cooperators. The pre-planning component will be a product that will be carried by local engines, Placer County OES, Placer County Sheriffs and input into the Emergency Command Center CAD dispatch program.

Responsible Agency/ Department/Partners: Placer County / CAL FIRE Nevada Yuba Placer Unit

Cost Estimate: Moderate costs, (<\$100,000), return on investment estimated in millions of dollars in lessened impacts from wildfire.

Benefits (Losses Avoided): Reduced risk of loss of life and property, injury to first responders throughout the wildland urban interface communities within Placer County.

Potential Funding: County, State and Federal funding.

Timeline: Long term, 5 year intensive for data development, continuous for updates.

Project Priority (H, M, L): H

Action 28. Fuel Break - North Fork of American River

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The North Fork American River Fuel Break project area is a critical point of intersection between the wild land of the rugged North Fork American River canyon and the densely populated WUI areas throughout the Interstate 80 corridor.

Project Description: Extension of the existing Auburn shaded fuel break north, protecting the at risk communities that line the North Fork of the American River. The North Fork is federally listed as a Wild and Scenic River and has numerous management and suppression restrictions on it in case of a fire. The North Fork American River is a primary source of domestic water from Auburn, downstream to the San Francisco Bay Area. Wildfire threat is constant and continual thereby justifying the investment in protection of these vital resources.

Extension will involve crossing the communities of Auburn, Applegate, Meadow Vista, Weimar and Colfax that line Interstate 80. A conservative estimate of structures that would derive benefit from this fuel break is +/- 5,500, worth an approximate value of \$1.925 Billion.

The area has an active large fire history, encompassing the communities impacted by the 2014 Applegate fire, 2012 Robbers fire, 2009 49 fire, 2004 Stephens fire and the Ponderosa fire in 2001.

Potential economic impact from closure of the economic corridor of Highway 80 has been estimated at 1 million dollars per closure hour of lost revenue to the economy of the state. The transcontinental railroad also weaves throughout these communities and project area. Closure of that system can equal 1 million dollars per minute of lost revenue to the economy.

Other Alternatives: Rely on the individual property owner or land manager to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility. This is the current practice which has led to a disjointed arrangement of small fuel treatments that make strategic utilization difficult.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project is a permanent component of the local CAL FIRE Fire Plan. CEQA compliance for the fuel break is currently being funded through CAL FIRE SRA Fee grant to be completed by 2017. Continued development of funding opportunities and on the ground implementation will be completed through an interagency partnership fostered by the Placer County Fire Alliance that will cross multiple fire districts.

Responsible Agency/ Department/Partners: Placer County/ CAL FIRE Nevada Yuba Placer Unit / Placer County RCD

Cost Estimate: High

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities along the North Fork American River.

Potential Funding: County, State and Federal funding.

Timeline: This project is active. CEQA compliance will be completed by early 2017. On the ground, work could begin immediately after CEQA completion.

Project Priority (H, M, L): H

Action 29. Fuel Break - North Fork of American River

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The North Fork American River Fuel Break project area is a critical point of intersection between the wild land of the rugged North Fork American River canyon and the densely populated WUI areas throughout the Interstate 80 corridor.

Extension of the existing Auburn shaded fuel break north, protecting the at risk communities that line the North Fork of the American River. The North Fork is federally listed as a Wild and Scenic River and has numerous management and suppression restrictions on it in case of a fire. The North Fork American River is a primary source of domestic water from Auburn, downstream to the San Francisco Bay Area. Wildfire threat is constant and continual thereby justifying the investment in protection of these vital resources.

Extension will involve crossing the communities of Auburn, Applegate, Meadow Vista, Weimar and Colfax that line Interstate 80. A conservative estimate of structures that would derive benefit from this fuel break is +/- 5,500, worth an approximate value of \$1.925 Billion.

The area has an active large fire history, encompassing the communities impacted by the 2014 Applegate fire, 2012 Robbers fire, 2009 49 fire, 2004 Stephens fire and the Ponderosa fire in 2001.

Potential economic impact from closure of the economic corridor of Highway 80 has been estimated at 1 million dollars per closure hour of lost revenue to the economy of the state. The transcontinental railroad also weaves throughout these communities and project area. Closure of that system can equal 1 million dollars per minute of lost revenue to the economy.

Project Description: The project includes shaded fuel break construction on 100 acres within the footprint of the North Fork American River Shaded Fuel Break priority project. Dead and down material up to 10 inches in diameter will be treated through chipping or pile and burn efforts. Chips generated will be removed to an offsite location when available. The limbs of dead and down trees greater than 12 inches in diameter will be treated and the remaining trunk will be left in place unless several trees have created a piled concentration. In this case, the remaining tree trunks will be separated by at least 10 feet from any other logs and left on site. Brush will be piled and burned on site or removed, unless islands are pre-designated or agreed to by the contract administrator or his designee.

All vegetation stumps heights will be cut no higher than 6 inches above the ground. All cuts will be a flat or parallel cut to the ground. Standing dead trees with red needles still attached shall be felled and treated using the dead and down prescription as required in Item 2 and 3 above. Snags that pose a hazard to crews working in the area will be felled. Live trees 3 inches and greater in DBH will be pruned (live and dead limbs) up to a height of 10 feet. Limbs will be pruned when branches are larger than 1/2 inches' diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of total tree height. Trees < 4 feet high do not require pruning. Trees less than 12 inches DBH will be spaced leaving 17 feet – 20 feet between crowns.

Communities with enhanced protection include Colfax, Weimar, Iowa Hill, Gold Run and Dutch Flat. Landowner agreements are in development.

Other Alternatives: Rely on the individual property owner or land manager to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility. This is the current practice which has led to a disjointed arrangement of small fuel treatments that make strategic utilization difficult.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project is a permanent component of the local CAL FIRE Fire Plan. CEQA compliance for the fuel break is currently being funded through CAL FIRE SRA Fee grant to be completed by 2017. Continued development of funding opportunities and on the ground implementation will be completed through an interagency partnership fostered by the Placer County Fire Alliance that will cross multiple fire districts.

Responsible Agency/ Department/Partners: Placer County/ CAL FIRE Nevada Yuba Placer Unit / Placer County RCD

Cost Estimate: High

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities along the North Fork American River.

Potential Funding: County, State and Federal funding.

Timeline: This project is active. CEQA compliance will be completed by early 2017. On the ground work could begin immediately after CEQA completion.

Project Priority (H, M, L): H

Action 30. Defensible Space Programs

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: There are many areas in the County in the High and Very High Fire Hazard Severity Zones.

Project Description: These projects address the ongoing need to manage fuels in and around privately owned homes, businesses and communities, freeways and roadways, and “Assets at Risk” in Placer County. Small communities, individual property owners and infrastructure assets can be impacted by roadside fire starts and fire starts moving into or out of private property.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. Spread from fire starts within their property can only be prevented or contained by the fire prevention and fuel management work done by the owner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County

Cost Estimate: The cost for the individual projects is identified in the Western Slope CWPP Project Planning Worksheets.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and cities within the County. Loss of assets at risk can have significant impact on those outside of the County. Communication links and interstate transportation can be significantly impact by wildfire along the Interstate 80 corridor.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): H

Action 31. Fuel Break – North Fork of American River

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The North Fork American River Fuel Break project area is a critical point of intersection between the wildland of the rugged North Fork American River canyon and the densely populated WUI areas along the Interstate 80 corridor. The project protects the at-risk communities that line the North Fork of the American River.

The far southern extent of the fuel break includes the Auburn shaded fuel break then travels north and east parallel to Interstate 80. The furthest northern extent of the fuel break includes Casa Loma, just east of Moody Ridge. The main phases of the NFARFB lie near Colfax (Phase 1), Weimar (Phase 2), Clipper Gap and Auburn (Phase 3). The balance of the fuel break would occur in subsequent phases. All wildland fires near the project pose an immediate risk to interstate commerce. Potential economic impact from closure of

Highway 80 has been estimated at 1 million dollars per closure hour of lost revenue to the economy of the state. Closure of the Union Pacific Rail Line for mere hours would have a ripple effect that impacts merchant shipping in western ports. Closure of that system can equal 1 million dollars per minute of lost revenue to the economy. The Kinder Morgan pipeline delivers gas and oil As many as 500,000 customers receive power from infrastructure along this corridor and the watershed is a primary source of domestic water from Alta to Auburn, Sacramento and downstream to the San Francisco Bay Area.

The area has an active large fire history with regular events threatening communities including the Applegate fire (2014), Robbers fire (2012), 49 fire (2009), Stephens fire (2004) and the Ponderosa fire (2001). Wildfire threat is constant and continual thereby justifying the investment in protection of these vital resources.

Portions of the North Fork American is federally listed as a Wild and Scenic River and has numerous management and suppression restrictions in the event of a fire. Full buildout of the NFARFB involves work in the communities of Auburn, Clipper Gap, Applegate, Weimar, Colfax, Cape Horn, Gold Run, Moody Ridge, Alta, and Casa Loma. A conservative estimate of number of structures and infrastructure values that would derive benefit from this fuel break is +/- 10,500 structures worth an approximate value of \$4.25 Billion.

Project Description: The project includes shaded fuel break construction using hand treatment, mechanical treatment, prescribed fire, and herbicide treatment. Dead and down material up to 10 inches in diameter will be treated through chipping or pile and burn efforts. Chips generated will be removed to an offsite location when available. The limbs of dead and down trees greater than 12 inches in diameter will be treated and the remaining trunk will be left in place. Brush will be piled and burned on site or removed, unless islands are predesignated or agreed to by the contract administrator or his designee.

All vegetation stumps heights will be cut no higher than 6 inches above the ground. All cuts will be a flat or parallel cut to the ground. Standing dead trees less than 14 inches DBH with red needles still attached shall be felled and treated using the dead and down prescription as required above. Snags of any size that pose a hazard to crews working in the area will be felled, limbs treated and logs left on site. Live trees 3 inches and greater in DBH will be pruned (live and dead limbs) up to a height of 10 feet. Limbs will be pruned when branches are larger than 1/2 inches' diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of total tree height. Trees < 4 feet high do not require pruning. Trees less than 12 inches DBH will be spaced leaving 17 feet – 20 feet between crowns.

Other Alternatives: Rely on the individual property owner or land manager to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility. This is the current practice which has led to a disjointed arrangement of small fuel treatments that make strategic utilization difficult.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project is a permanent component of the local CAL FIRE Unit Fire Plan. CEQA compliance for the fuel break is currently being funded through various state grants and other state funding. Full CEQA completion through MND is planned for completion Fall 2021. Continued development of funding opportunities and on the

ground implementation will be completed through an interagency partnership fostered by the Placer County Fire Alliance that will cross multiple fire districts.

Responsible Agency/ Department/Partners: Placer County/ CAL FIRE Nevada Yuba Placer Unit / Placer County RCD

Cost Estimate: High

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities that border the North Fork American River.

Potential Funding: County, State and Federal funding.

Timeline: This project is active. CEQA compliance for Phase I was met by Governor's Executive Order. Phase II begins Fall 2021 and will involve finalization of Mitigated Negative Declaration for the entire fuel break extending from Auburn to Colfax. Phase III is tentatively scoped for 2023-2024. Other subsequent phases too occur as funding and environmental compliance will allow.

Project Priority (H, M, L): H

Pandemic Actions

Action 32. HHS Pandemic Planning

Hazards Addressed: Pandemic influenza, COVID-19, other novel or reemerging viruses

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: We have experienced 2 pandemics in the past decade: H1N1 and COVID-19. It is difficult to slow down during a prolonged pandemic in order to update plans and capture both what is happening and what needs to happen. Lessons learned over the past 16 months need to be incorporated in updated pandemic plans.

Project Description: HHS will review and update the HHS All Hazard Plan and HHS Pandemic Plan to ensure that all lessons learned are incorporated in current, functional plans. Updated plans will be distributed to stakeholders for review and input. Updated plans will ultimately be incorporated into trainings, drills, and exercises.

Other Alternatives: The Placer Health Care Coalition, organized and convened by HHS, would also benefit from review and update of response plans related to infectious diseases and the role of the healthcare community in responding during pandemics.

Existing Planning Mechanism(s) through which Action Will Be Implemented: HHS has a program manager who is responsible for developing, distributing, training, and exercising HHS emergency preparedness plans. Forums exist to share plans with stakeholders for review and input.

Responsible Agency/ Department/Partners: Health and Human Services, Office of the Director

Cost Estimate: \$50,000

Benefits (Losses Avoided): Reduce morbidity and mortality

Potential Funding: PHEP Base, CRI, HPP, State Pandemic Influenza, ELC ED Expansion, FEMA grants

Timeline: July 1, 2021 – June 30, 2022

Project Priority (H, M, L): H



Chapter 6 Plan Adoption

Requirement §201.6(c)(5) and §201.7(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this LHMP Update is to secure buy-in from Placer County and participating jurisdictions, raise awareness of the plan, and formalize the plan’s implementation. The adoption of this 2021 LHMP Update completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of the Disaster Mitigation Act (DMA) of 2000. For Placer County and the incorporated communities this adoption also establishes compliance with AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan. Two resolutions were created – one for Placer County and the incorporated communities and one for participating Special Districts.

The governing board for each participating jurisdiction has adopted this 2021 Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolutions and the executed copies are included in Appendix D: Adoption Resolutions.

Chapter 7 Plan Implementation and Maintenance

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of this LHMP Update is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the LHMP Update into existing planning mechanisms and how to address continued public involvement.

Chapter 3 Planning Process includes information on the implementation and maintenance process since the 2016 LHMP Update was adopted. This section includes information on the implementation and maintenance process for this 2021 LHMP Update.

7.1 Implementation

Once adopted, this LHMP Update faces the truest test of its worth: implementation. While this Plan contains many worthwhile actions, the County will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful LHMP implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as general plans, stormwater plans, Emergency Operations Plans (EOPS), evacuation plans, and other hazard and emergency management planning efforts for Placer County. The County already implements policies and programs to reduce losses to life and property from hazards. This LHMP Update builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation can be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Placer County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This could include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the County will be in a better position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal programs and earmarked funds, benefit assessments, and other state and federal grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The elected officials and staff appointed to head each department within the County are charged with implementation of various activities in this LHMP Update. During the quarterly reviews as described later in this section, an assessment of progress on each of the goals and activities in the LHMP Update should be determined and noted. At that time, recommendations were made to modify timeframes for completion of activities, funding resources, and responsible entities. On a quarterly basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the Plan Update entirely and activities addressing problems unforeseen during Plan development may be added.

7.1.1. Role of Hazard Mitigation Planning Committee (HMPC) in Implementation and Maintenance

With adoption of this LHMP Update, the participating jurisdictions will be responsible for the LHMP implementation and maintenance. The HMPC identified in Appendix A (or a similar committee) will reconvene quarterly each year to ensure mitigation strategies are being implemented and the County continues to maintain compliance with the NFIP. As such, Placer County will continue its relationship with the HMPC, and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in the implementation and update of this Plan;
- Report on Plan progress and recommended changes to the County Board of Supervisors; and
- Inform and solicit input from the public.

The primary duty of the County is to see the LHMP Update successfully carried out and to report to their governing board and the public on the status of LHMP implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate LHMP implementation and to update this Plan as progress, roadblocks, or changing circumstances are recognized.

7.2.1. Maintenance Schedule

The Placer County Office of Emergency Services (County OES) is responsible for initiating Plan reviews. In order to monitor progress and update the mitigation strategies identified in the mitigation action plan, Placer County OES and the HMPC will revisit this Plan quarterly each year and following a hazard event. The HMPC will meet quarterly to review progress on LHMP implementation, and the County as a participating CRS community will provide annual evaluation reports for Activity 510. The HMPC will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this LHMP Update anticipated to be fully approved and adopted in 2021, the next formal Plan update for the Placer County Planning Area will occur in 2026. With a formal FEMA Plan approval required in 2026 for the next LHMP Update, Placer County OES will initiate efforts to obtain a planning grant for the 2026 LHMP Update in 2024, with a new LHMP development process initiated in early 2025.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the LHMP. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this LHMP will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to this LHMP Update to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. Updating of this LHMP will be by written changes and submissions, as the HMPC deems appropriate and necessary, and as approved by the County Board of Supervisors. In keeping with the five-year update process, the HMPC will convene

public meetings to solicit public input on this LHMP Update and its routine maintenance and the final product will be again adopted by the County Board of Supervisors and governing boards for the other Participating Jurisdictions.

Quarterly Plan Review Process

For the LHMP Update review process, Placer County OES, as lead along with the County CRS Coordinator, will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the LHMP. The LHMP is intended to be a living document. The review of the 2021 LHMP Update will normally occur on a quarterly basis each year and will be conducted by the HMPC as follows:

- The Placer County OES will place an advertisement in the local newspaper advising the public of the date, time, and place for each quarterly review of the LHMP Update and will be responsible for leading the meeting to review the Plan.
- Notices will be mailed to the members of the HMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- County/City/District officials will be noticed by email and telephone or personal visit and urged to participate.
- Members of the County's Planning Commission and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted, and a copy of the current Plan will be available for public comment at Placer County.
- After the review meeting, minutes of the meeting and a quarterly report will be prepared by the HMPC and forwarded to the news media (public) and the ISO/CRS specialist for the CRS program. The report will also be presented to the County Board of Supervisors for review, and a request will be made that the Board take action to recognize and adopt any changes resulting from the review.
- A copy of the 2021 LHMP Update will be continually posted on the Internet as will the annual CRS Activity 510 report.

Criteria for Quarterly Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the LHMP. More specifically, the reviews should include the following information:

- Community growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether or not the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.

- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the 2021 LHMP Update recommendations and their underlying principles into other County plans and mechanisms. Where possible, Plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this LHMP’s capability assessment, the County already implements policies and programs to reduce losses to life and property from hazards. This Plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- County general and master plans
- County Emergency Operations Plans and other emergency management efforts
- County ordinances
- Flood/stormwater management/master plans
- Community Wildfire Protection plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

HMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this LHMP with these other plans, programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the LHMP into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, the County should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan. Evidence of such adoption (by formal, certified resolution and text within the body of the Safety Element) shall be provided to CAL OES and FEMA.
2. Integration of flood actions identified in this mitigation strategy with implementation priorities in existing Watershed, Flood, and Stormwater Drainage Plans. Key people responsible for development and implementation of the County's Watershed Master Plans, Flood Plans, and Stormwater Master Plan participated on the HMPC. Key projects were identified and integrated specifically into this LHMP, while others currently of lessor priority should be referenced in their source document. Actual implementation of these projects will likely occur through the watershed, flood, and stormwater plans' processes through the efforts of each responsible department.
3. Use of risk assessment information to inform future updates of the hazard analysis in the Placer County Emergency Operations Plans.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of the Plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the LHMP implementation and seek additional public comment. The Plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Quarterly Reviews

The public will be noticed by placing an advertisement in the newspaper specifying the date and time for the review and inviting public participation. The HMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the HMPC reconvenes for the next LHMP Update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the Plan. In reconvening, the HMPC will identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the LHMP Update draft. The subcommittee will also coordinate this public outreach process with any public information programs established pursuant to the 2017 guidelines from the Community Rating System (CRS).



Annex A City of Auburn

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Auburn, a previously participating jurisdiction of the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Auburn, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

A.2 Planning Process

As described above, Auburn followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table A-1 City of Auburn – Planning Team

Name	Position/Title	How Participated
Dave Spencer	Fire Chief	Attended Meetings, Reviewed Annex, Provided Mitigation Actions
Mark D’Ambrogi	Fire Marshal, PHF	Reviewed Annex, Provided Past Occurrences
John Rogers	Battalion Chief	Attended Meetings, Reviewed Annex
Shelby Davis	Fire Engineer	Reviewed Annex, Filled Out Capability Tables

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table A-2.

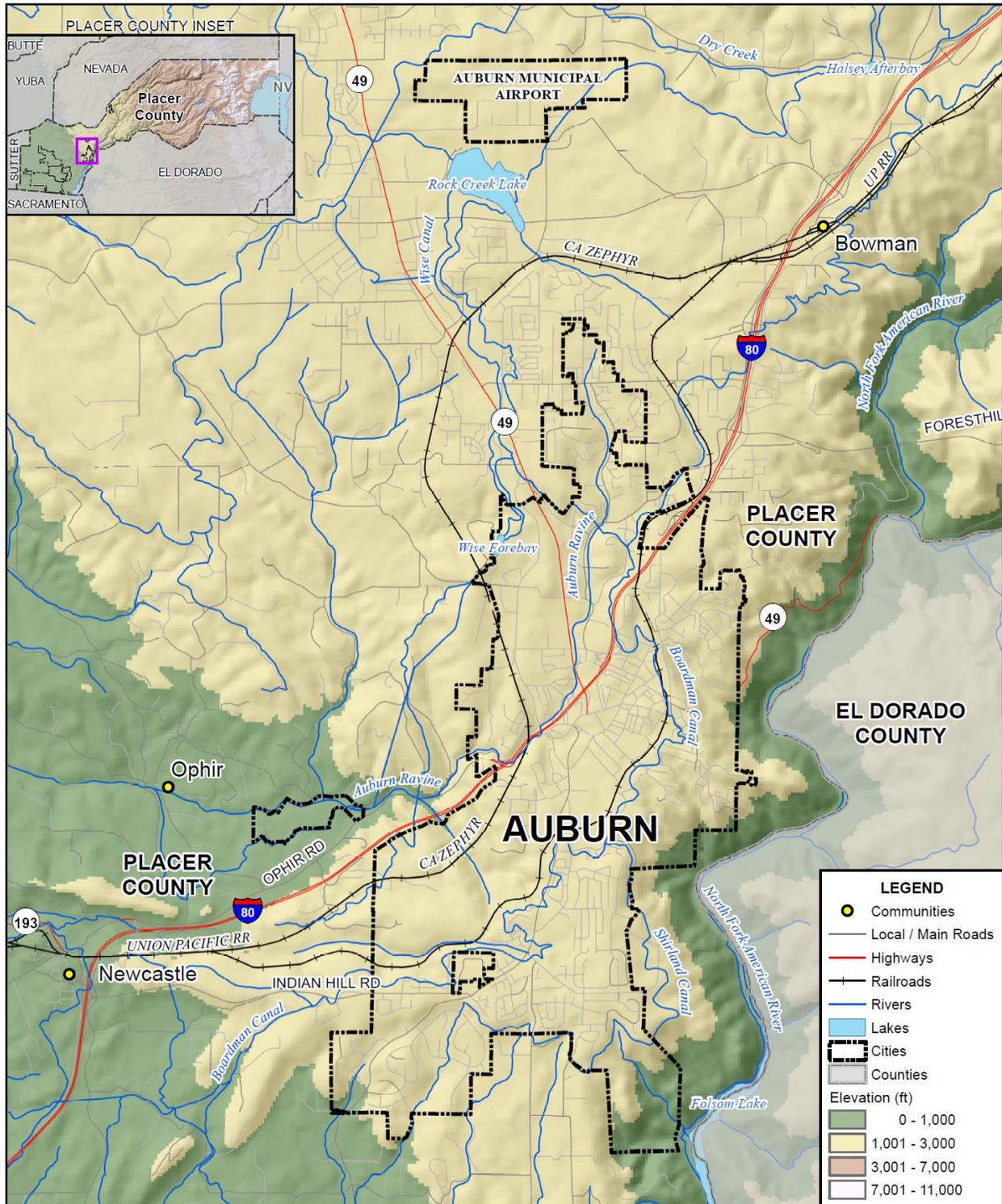
Table A-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
2021 City of Auburn Safety Element	Policy 1.4.A.

A.3 Community Profile

The community profile for the City of Auburn is detailed in the following sections. Figure A-1 displays a City map and the location of Auburn within Placer County.

Figure A-1 City of Auburn



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

A.3.1. Geography and Climate

The City of Auburn is located on the western slope of the Sierra Nevada Range at elevations between 1,000 and 1,400 feet above mean sea level (msl). Auburn is the county seat of Placer County and is also located at the crossroads of I-80 and Highway 49. The City is about 7.5 square miles in area and rests near the confluence of the North and Middle Forks of the American River. Mountainous wilderness, canyons, and the western slope of the Sierra Nevada Range lie adjacent eastward; while gentle rolling foothills well-suited for agriculture lie to the west. The crest of the Sierra Nevada lies approximately 45 miles eastward and the Central Valley lies approximately 10 miles to the west.

Auburn consists of two distinct areas: the incorporated city and the greater Auburn area. Auburn’s average temperatures ranges from the high 80°F to mid-90°F during the summer to the mid 30°F to high 40°F during the winter. Auburn receives an average of 34.47 inches of rain and 1.2 inches of snow annually.

A.3.2. History

Auburn is well known for its California gold rush history. In 1849, a mining camp became officially known as Auburn and by 1850, Auburn’s population had reached 1,500 people. A Frenchman named Claude Chana first discovered gold in the Auburn Ravine in 1848. By 1849 the North Fork Dry Diggings had become a well-established mining camp. Later in the year, the camp was officially named Auburn. Because Auburn was a short distance from Sacramento, centrally located in the gold country, and located just below the snow line, it became known as the “jumping off” spot for the miners. By 1865, Auburn had developed into a permanent town, with the Central Pacific Railroad connecting people to the area. Auburn was first incorporated in 1860 and again in 1888. By 1900 the population of Auburn was just over 2,000.

A.3.3. Economy

The City’s economic base consists of retail sales and services; recreational and healthcare services; and light manufacturing. Auburn owns and operates the Auburn Municipal Airport. The City encourages industrial growth through its Airport Industrial Park and light industry in other parts of the City.

US Census estimates show economic characteristics for the City of Auburn. These are shown in Table A-3 and Table A-4. Mean household income in the City was \$86,222. Median household income in the City was \$66,314.

Table A-3 City of Auburn – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	10	0.2%
Construction	514	8.2%
Manufacturing	339	5.4%
Wholesale trade	66	1.0%
Retail trade	589	9.4%

Industry	Estimated Employment	Percent
Transportation and warehousing, and utilities	304	4.8%
Information	192	3.1%
Finance and insurance, and real estate and rental and leasing	365	5.8%
Professional, scientific, and management, and administrative and waste management services	729	11.6%
Educational services, and health care and social assistance	1,457	23.2%
Arts, entertainment, and recreation, and accommodation and food services	831	13.2%
Other services, except public administration	423	6.7%
Public administration	467	7.4%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table A-4 City of Auburn – Income and Benefits

Income Bracket	Percent
<\$10,000	5.5%
\$10,000 – \$14,999	5.3%
\$15,000 - \$24,999	12.4%
\$25,000 – \$34,999	9.1%
\$35,000 – \$49,999	8.2%
\$50,000 – \$74,999	16.1%
\$75,000 – \$99,999	11.5%
\$100,000 – \$149,999	16.1%
\$150,000 – \$199,999	8.9%
\$200,000 or more	7.2%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

The largest employers within the City of Auburn include the County of Placer, Placer Union High School District, Pacific Gas & Electric, Auburn Union Elementary School District, and Pride Industries.

From its origins as a mining camp, Auburn has emerged as a community of strong historic character, cultural enrichment, economic diversity, and a destination point for outstanding outdoor recreation. Auburn’s historic culture is being sustained by way of its museums and antique stores and the preservation and renovation of its residences and commercial buildings. Four commercial districts provide a wide variety of shopping and dining experiences.

The nearby Auburn State Recreation Area (ASRA) and the American River Canyon support a diverse range of recreational activities from whitewater rafting and kayaking to fishing and hiking. Auburn is also home to many challenging sporting endurance events, including: Western States 100 mile Endurance Run/Ultra Marathon; the Tevis Cup 100 mile equestrian ride; and the Rio Del Lago 100 mile endurance run.

A.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the City of Auburn was 14,594.

A.4 Hazard Identification

Auburn identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Auburn (see Table A-5).

Table A-5 City of Auburn—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Limited	Occasional	Limited	Medium	High
Earthquake	Extensive	Occasional	Catastrophic	Medium*	Low
Floods: 1%/0.2% annual chance	Limited	Unlikely	Negligible	Low	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Significant	Unlikely	Limited	Low	Medium
Pandemic	Significant	Unlikely	Limited	Medium*	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	Medium/High*	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Critical	Low	Low
Tree Mortality	Limited	Likely	Limited	Medium	High
Wildfire	Extensive	Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths. Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability. Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability. Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

*Though initially considered priorities for the City, the following are considered low priority hazards for mitigation action purposes:

A.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Auburn’s hazards and assess the City’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table A-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

A.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section A.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

A.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Auburn’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table A-6 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the City.

Table A-6 City of Auburn – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	4	3	\$67,279	\$44,949	\$44,949	\$157,177
Commercial	480	344	\$81,553,506	\$197,788,839	\$197,788,839	\$477,131,184
Industrial	47	26	\$5,706,494	\$11,762,352	\$17,643,528	\$35,112,374
Institutional	86	25	\$6,491,701	\$43,335,739	\$43,335,739	\$93,163,179
Miscellaneous	870	9	\$16,739,467	\$2,183,737	\$2,183,737	\$21,106,941
Natural/ Open Space	134	10	\$365,302	\$774,045	\$774,045	\$1,913,392
Residential	4,869	4,763	\$537,573,384	\$1,293,104,721	\$646,552,334	\$2,477,230,439
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686

Source: Placer County 2020 Parcel/Assessor's Data

Critical Facilities and Infrastructure

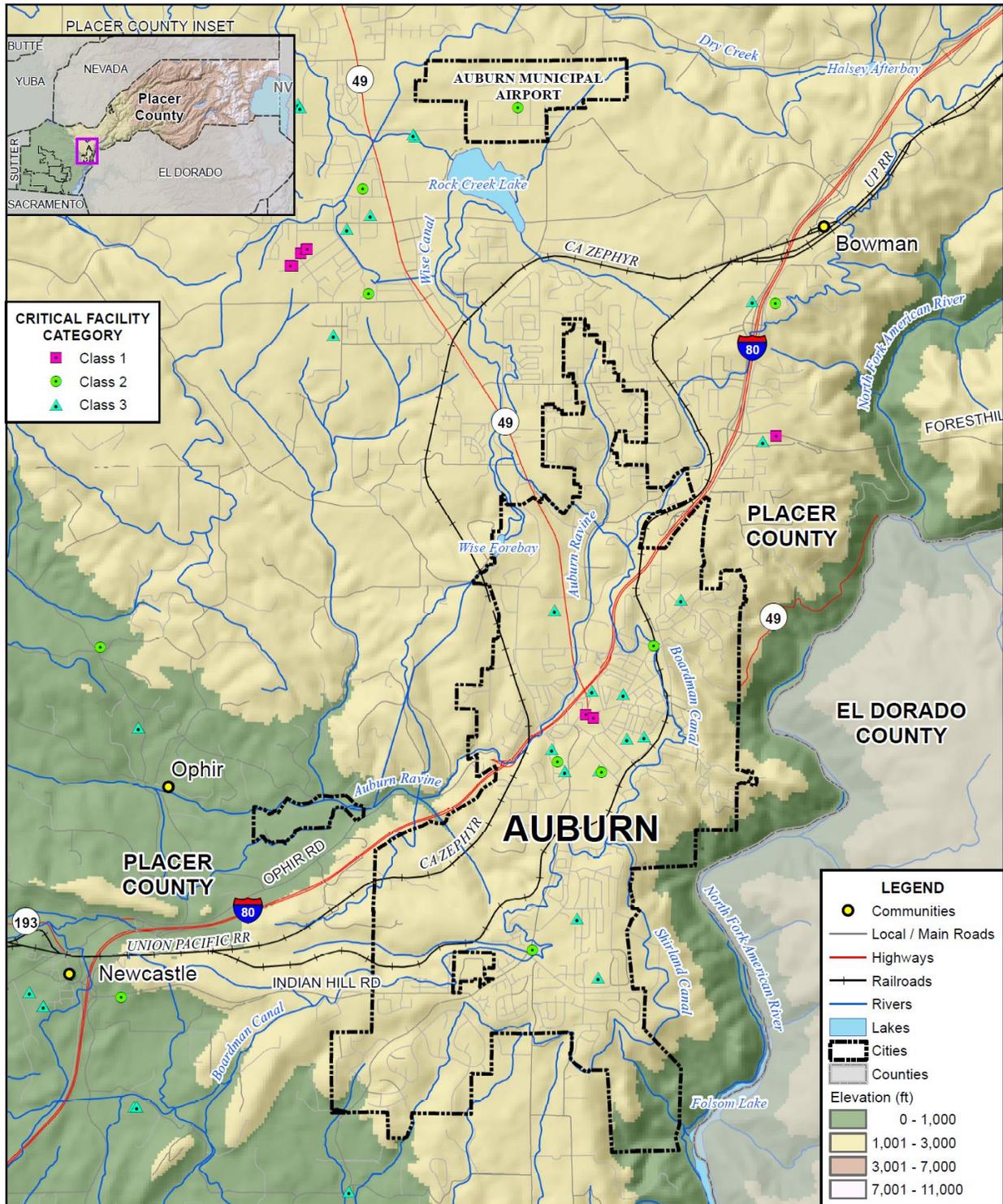
Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan.

An inventory of critical facilities in the City of Auburn from Placer County GIS is shown on Figure A-2 and detailed in Table A-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure A-2 City of Auburn – Critical Facilities



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table A-7 City of Auburn – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 1	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Airport	1
	Fire Station	3
	National/Coast Guard	1
	Police Station	1
Class 3	Fairground	1
	Hall	5
	School	5
Auburn Total		19

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City of Auburn has a variety of natural resources of value to the community:

- Sensitive plant communities: Oak Woodland, Riparian, and Stream habitat.
- No vernal pools are known to exist within the City limits.
- Several sensitive status species with the potential to occur: California red-legged frog, Foothill yellow-legged frog, Cooper’s Hawk, sharp-skinned hawk, golden eagle, bald eagle, northern harrier, Black-Shouldered Kite, prairie falcon, long-eared owl, Pacific fisher, and valley elderberry longhorn beetle.

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

The City of Auburn has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, information from a number of sources was reviewed. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table A-8 lists the historical buildings in the City.

Table A-8 City of Auburn – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Allen & Sandhorfer Blacksmith, Auburn Iron Works (P619)			X	8/16/1983	Auburn

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Auburn Grammar School, Auburn Civic Center Project (P693)			X	3/3/1988	Auburn
Auburn IOOF Hall (P803)			X	8/23/1994	Auburn
Auburn Public Library, Old Auburn Library (P838)			X	9/11/2000	Auburn
Buckner's Bar (P354)			X	11/19/1974	Auburn
Burns Home, Howell Home (P656)			X	7/2/1985	Auburn
Butcher Ranch (P357)			X	11/19/1974	Auburn
City of Auburn (404)				4/14/1948	Auburn
Clipper Gap (P359)		X	X	11/19/1974	Auburn
First Transcontinental Railroad-Auburn (780)		X		11/20/1962	Auburn
Grizzly Bear House (P355)			X	11/19/1974	Auburn
Liberty House (P356)			X	11/19/1974	Auburn
Masonic Temple, Masonic Hall (P821)			X	5/15/1996	Auburn
Mountain Quarries Bridge (N2227)	X			2/11/2004	Auburn
Old Auburn Historic District (N62)	X			12/29/1970	Auburn
Ophir (463)		X		8/30/1950	Auburn
Spring Garden School (P361)			X	11/19/1974	Auburn
Todd's Valley (P358)			X	11/19/1974	Auburn
U.S. Ranch (P360)			X	11/19/1974	Auburn

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/> retrieved on 12/6/2020

In addition to the registered sites, there are several assets within Auburn that define the community and represent the City's history. Some of the historical sites of importance to Auburn are listed below.

- Auburn Joss House Museum
- Bernhard Museum Complex
- Downtown Auburn
- Historic Old Town Auburn
- Placer High School
- Placer County Museum

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, changes in growth and development, both past and future, were examined in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Auburn General Plan Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Auburn has generally seen steady growth. Auburn has seen growth rates as shown in Table A-9.

Table A-9 City of Auburn – Population Changes Since 1950

Year	Population	Change	% Change
1950	4,653	–	–
1960	5,586	933	201%
1970	6,570	984	17.6%
1980	7,540	970	14.8%
1990	10,592	3,052	40.5%
2000	12,462	1,870	17.7%
2010 ¹	13,330	868	7.0%
2020 ²	14,594	1,264	9.5%

Source: ¹US Census Bureau, ²California Department of Finance

Special Populations and Disadvantaged Communities

Ethnicity

According to the 2012–2018 ACS, Auburn’s population was predominately white non-Hispanic, at 90 percent. Less than two percent of the population was Asian, less than one percent of the population was Black, less than one percent was Native, less than one percent was some other race, and less than four percent was more than one race.

Age of Population

Overall, the City of Auburn has an older population than Placer County as a whole, with a median age of 48 compared to 41.6 for all of Placer County. Individuals 20 to 34 years of age account for 16 percent of the city’s population, 35 to 54 years of age account for 26 percent of the population, 55 to 64 years of age make up 16 percent of the population, and seniors 65 and older account for 23 percent of the population. Nineteen years and under account for 20 percent of the population.

Vulnerable Populations and Assets

In 2020, the City of Auburn completed a Climate Change Vulnerability Assessment consistent with Government Code Section 65302(G), which assesses how the populations and assets in Auburn are vulnerable to different emergencies and hazardous conditions that may be created or made worse because of climate change. The primary categories assessed include populations, buildings and infrastructure, important economic assets, natural resources, and key community services. The assessment follows the recommended process in the updated California Adaptation Planning Guide, which is the state's guidance for how local communities should conduct climate adaptation planning efforts, including vulnerability assessments. As defined by the California Adaptation Planning Guide (2020), climate change vulnerability is considered the degree to which natural, built, and human systems are susceptible to harm from exposure or stresses associated with climate change and from the absence of adaptive capacity to adapt.

The Climate Change Vulnerability Assessment indicates that Auburn's populations and assets are most vulnerable to wildfires, extreme heat, and severe weather.

Populations in Auburn tend to be more vulnerable to extreme heat, human health hazards, and wildfire, which directly affect health outcomes. Due to financial limitations, mobility challenges, and lack of access to medical care, the most sensitive populations include households in poverty, seniors living alone, outdoor workers, and persons experiencing homelessness. The homes that vulnerable populations live in, especially those located on single access roads, are also highly vulnerable to direct damage from hazards such as landslides, severe weather, and wildfire, in addition to indirect damage from forestry pests and diseases that can weaken trees and cause them to fall on properties.

City-wide, the electricity transmission system is vulnerable to multiple hazards including severe weather, such as high winds that can trigger public safety power shutoffs, extreme heat that reduces the capacity and strains the system and wildfires that damage the system, ultimately disrupting energy service. An increase in forestry pests and diseases, droughts, extreme heat, and wildfire create higher vulnerabilities for the local and regional conifer forest ecosystem. This can in turn affect local economic activities in Auburn such as outdoor recreation activities and visitors that travel through Auburn to get to state and national parks and forests.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The Auburn Municipal Code provides detailed land use and development standards for development.

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the City since the last Plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table A-10 and Table A-11.

Table A-10 City of Auburn – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	2	5	3	0	0
Industrial	0	0	0	0	0
Residential	22	40	32	12	20
Unknown	0	0	0	0	0
Total	24	45	35	12	20

Source: City of Auburn Building Department

Table A-11 City of Auburn – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Wildfire Risk Area ¹	Other
Agricultural	0	0	0
Commercial	0	10	0
Industrial	0	0	0
Residential	2	136	0
Unknown	0	0	0
Total	2	146	0

Source: City of Auburn Building Department

¹Moderate or higher wildfire risk area

Future Development

The Sacramento Council on Governments (SACOG) modeled population projections for the City of Auburn and other areas of the region in 2012 for a Metropolitan Transportation Plan/Sustainable Communities Strategy report. This forecast uses a 2008 base year estimate with projections to 2020 and 2035 for population, housing units, households and employment. SACOG estimated the City population in 2020 and 2035 to be 14,099 and 16,560 respectively.

According to DOF estimates, as of 2019, the City of Auburn had a population of 14,392; this was a population growth of eight percent since 2010. This growth rate was significantly lower than Placer County’s growth, which was 14 percent from 2010 to 2019. In comparison to other cities located in south Placer County, Auburn has not experienced the same growth and has retained a small-town atmosphere.

SACOG provided population projections through 2040. Based on these numbers, the city is expected to grow by less than one percent between 2019 and 2040. The County as a whole is expected to have a 27 percent increase by 2040.

SACOG has determined that Auburn has a housing construction need of 310 units for the planning period 2021–2029. Of the total 310 units, 35 percent (or 109 units) should be affordable to lower-income households, 19 percent to moderate-income households, and 45 percent to above moderate-income households.

The 2013 to 2021 Housing Element identifies numerous areas within the City of Auburn that are in the planning stage or have been approved for development of new subdivisions. Table A-12 provides the number of lots, acreages, location, and status of residential subdivisions in the planning stages or approved by the City.

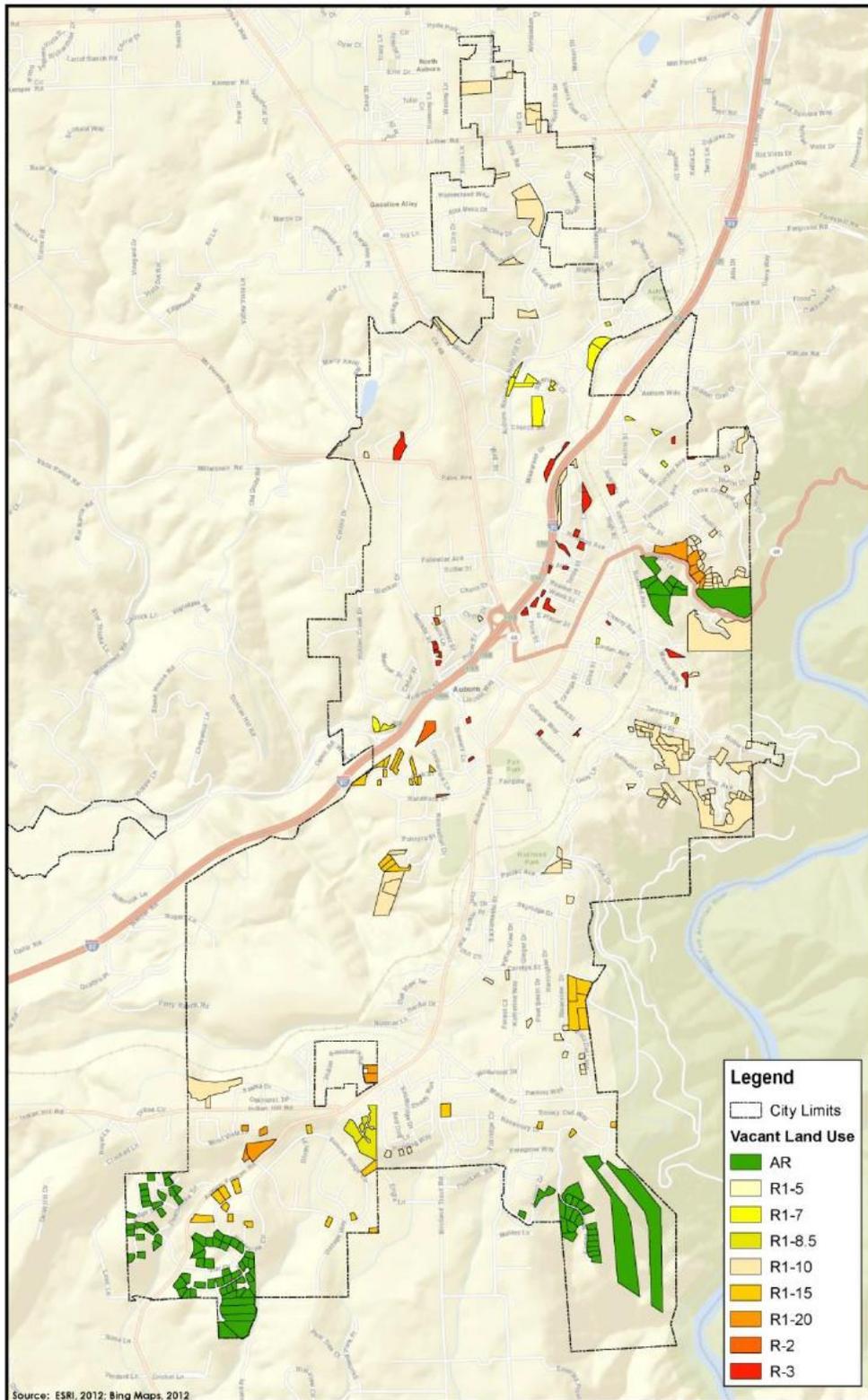
Table A-12 Auburn Residential Subdivision Status Listing

Subdivision	Lots/Units	Acres	Location	Status
Auburn Bluffs	29	9.6	East of Auburn Folsom Road at Indian Hill Road	Tentative map approved 1/15/2008
Auburn Bluffs Lot E (SUB 785)	20	15.5	East of Auburn Folsom Road, South of Sunrise Ridge CR	9 lots available
Baltimore Ravine Specific Plan	±1200-1300	±264	East of Interstate 80; west of Auburn Folsom Road; north of UPRR	Specific Plan approved 2/20014, land use and zoning approved for Phase 1 (270 units)
Canyon Creek (SUB 03-2)	24	11	406 Maidu Drive	Tentative map approved
Canyon Ridge Lane (SUB 06-2)	6	7.2	143 Borland Ave	Tentative map approved
Canyon Rim Estates (SUB 02-3)	23	120	Southern Terminus of Eagles Nest	16 lots available
Diamond Ridge (SUB 760)	47	26.7	South of Indian Hill Rd, West of Santa Barbara Subdivision	1 lot available
Granite Bay Vista (SUB 758)	80	80	West of Auburn Folsom Rd, Immediately North of City Limits	27 lots available
Knollwood Lot Split (LS 04-1)	3	2.6	471 Knollwood Drive	3 lots available
Monticelo (SUB 751)	63	24	Riverview Dr, North of Maidu Dr	7 lots available
Southridge VI (SUB 781)	48	17.7	South End of Southridge Dr	3 lots available
Sunny Creek (SUB 06-1)	13	±4	1161 Oakridge Way	Tentative map approved
The Outlook @ Indian Hill (SUB 02-2)	70	70	East of Auburn Folsom, Immediately North of City Limits	38 lots available
Vienna Woods (SUB 04-4)	24	±6	585 Dairy Road	Tentative map approved
View Crest Estates (SUB 02-4)	7	5	South of Indian Hill, East of Diamond Ridge Subdivision	2 lots available
Whitehawk Meadows	18	10.2	West of Auburn Folsom Rd, directly opposite entry to Vintage Oaks	Tentative map approved
Woodland Estates (SUB 782)	34	16	West end of High St and Clark St	14 lots available
Multi-Family				
Tuscan Pals Condos	8	0.62	133 Electric Street	Tentative map approved
Wall Street Condos	30	2.03	580 Wall Street	Tentative map approved

Source: City of Auburn, 2012-2021 Housing Element

Most of the vacant parcels scattered throughout the City are surrounded by existing development and could be classified as infill. However, due to the topography of the City vacant land could possibly have constraints that might include limited access, wetlands, native trees, and geologic constraints. Figure A-3 illustrates the locations of available vacant land in the City.

Figure A-3 Vacant Land Inventory



Source: City of Auburn 2013-2021 Housing Element

The future housing needs for the City of Auburn will be provided through a combination of development in the City's numerous infill sites as well as the land provided in the Baltimore Ravine Specific Plan (BRSP). The City of Auburn estimates that there are an additional 338 acres of undeveloped residentially zoned infill land available within the City which can provide at least 900 units. In addition, the BRSP, a master planned community located in south Auburn, adopted in 2011 which meets all of the "by-right" requirements identified in program I of the 2008 Housing Element, provides a total of 725 units on 277 acres, including a minimum of 72 units affordable to very low-, low-, and moderate- income families consistent with the SACOG compact.

The future housing needs for the City of Auburn will be provided through a combination of development in the City's numerous infill sites as well as the land provided in the Baltimore Ravine Specific Plan (BRSP). The City of Auburn has included 164.22 acres of undeveloped residentially zoned infill land available within the city, which can provide at least 570 units. In addition, the BRSP, a master-planned community located in south Auburn adopted in 2011, provides a total of 725 units on 277 acres, including a minimum of 72 units affordable to very low-, low-, and moderate-income families.

Historically, developers in the City of Auburn have built at densities below what the City's Zoning Ordinance allows. Calculation of the potential number of new dwelling units within each residential district was based on the average densities of projects constructed over the past 15 years. For purposes of calculating potential future single-family dwelling units on vacant land, the City assumes projects will, on average, be built out at 65 percent of the maximum permitted density allowed by the Zoning Ordinance.

The City evaluated the affordable higher-density residential developments that developed over the last 20 years. The resulting project densities, ranging between 10.4 and 30 units per acre with an average density of approximately 15.7 units per acre, are appropriate to meet the needs of lower-income households. The smallest parcel developed with affordable high-density residential was the Cherry Avenue project, where four units were constructed on a 0.33-acre site. The Valley Oaks and Mercy Senior Apartment projects included approval of density bonuses. The multifamily affordable housing projects constructed in the City include:

- Valley Oaks (1993–94) 60 senior assisted units 30 units/acre
- Cherry Avenue (1994–95) 4 assisted units 12 units/acre
- Palm Terrace Apartments (2003) 80 assisted units 10.4 units/acre
- Mercy Senior Apts (2013) 60 senior assisted units 20 units/acre

More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

In the immediate future, the City of Auburn has four areas that are being developed. One of these areas is at the municipal airport, while three are in the City. Auburn Municipal Airport future development includes:

- APN: 052-010-028 - Helicopter parking areas are recommended to be relocated to provide standard parking areas that have proper separation from fixed wing operations. Additionally, to meet the future demand for helicopter operations it's recommended to provide an additional helicopter parking spot.
- APN: 052-190-018 - East hangar area access, where additional hangar capacity can be accommodated, is limited by both a five-point taxiway intersection at its access point and non-standard clearances along

the taxiway entrance. Improved circulation in this area with FAA standard separations will enhance the safety of this area and allow for additional hangar capacity driven by increased demand

- APN: 052-190-018 - The GA terminal building is dated and overall appearance is declining. In order to meet the airport's future needs it's recommended to enhance and update the existing terminal building through the creation of a grand entrance to the Airport. The recommended GA terminal building would incorporate the on-airport restaurant and FBO. The terminal could serve as a source of pride and gateway to the City, County and region.

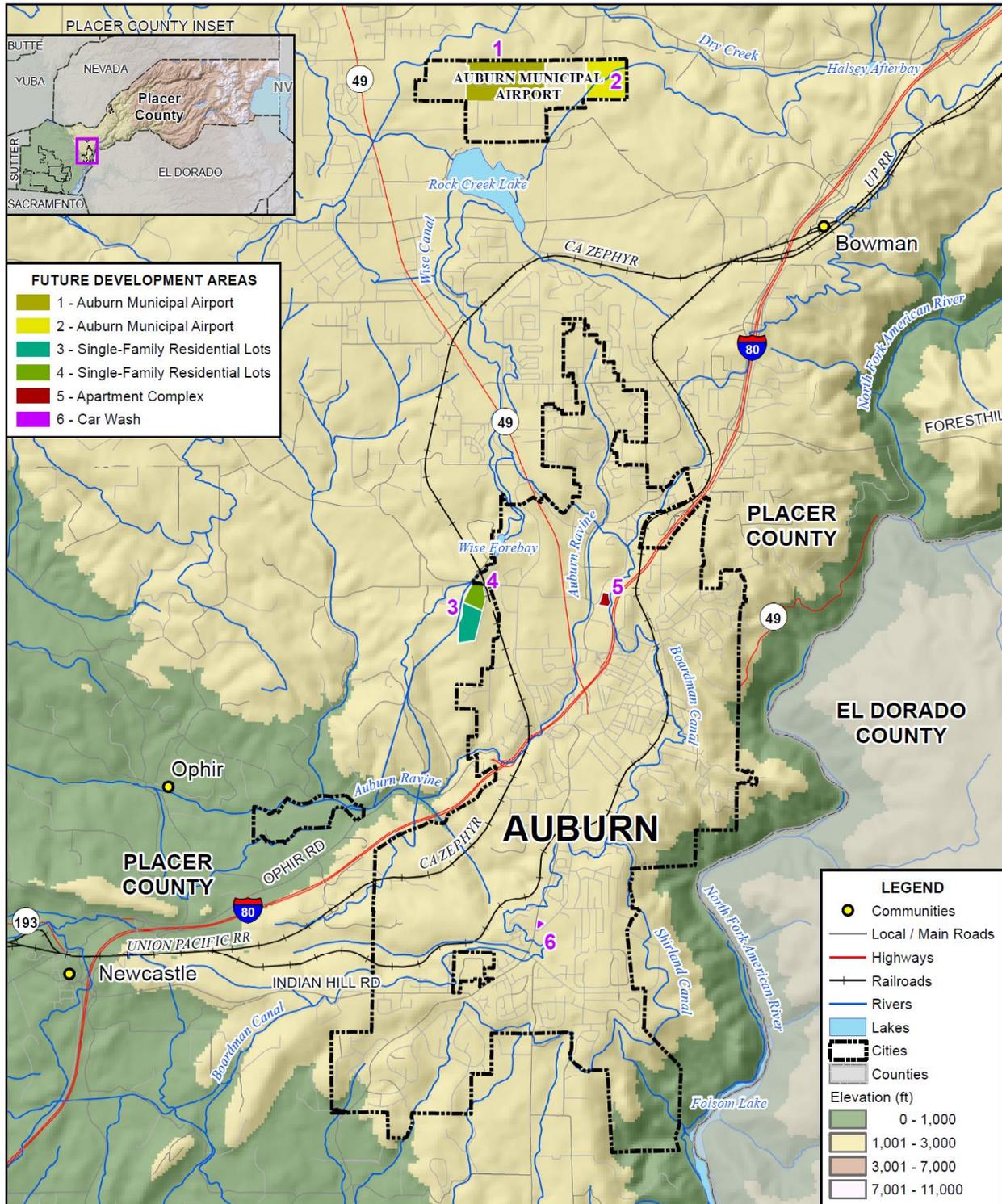
Auburn City future development includes the following three areas:

- Car Wash at 631 Auburn Folsom, APN 055-150-044, C-1 zoned - 2436 sf carwash with 2 open wash bays (1 RV, 1 regular), an automatic tunnel, and an equipment room. Project also includes parking and ADA path of travel. Located on the front /corner of the Maidu market parking lot.
- APN 001-020-055-000 Seven (7) Unit Apartment Complex The applicant requests approval, by resolution, of a Design Review Permit for the construction of a seven (7) unit apartment complex on a 0.5-acre lot located at 655 Mikkelsen Drive.
- APN 038-300-017-000 R-2 zoned - APN 038-300-019-000 Request to subdivide two parcels totaling approximately 27.9 acres, located at the south side of Mt. Vernon Road, west of the City of Auburn (975 and 1055 Collins Drive) into 65 single-family residential lots. The project also proposes the annexation of the two subdivision parcels, the adjacent 12.9-acre Auburn Cemetery District property and 4.5-acre Union Pacific Railroad property.

GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Auburn. Future development areas in the City were provided in mapped format by the City. 4 areas were provided. Using the GIS parcel spatial file for each of these areas, the 4 areas and 6 parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure A-4 shows the locations of future development areas the City is planning to develop. Table A-13 shows the parcels and acreages of each future development area in the City.

Figure A-4 City of Auburn – Future Development Areas



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table A-13 City of Auburn – Future Development Area Parcel and Acre Counts

Future Development / Map Number / Description / APN	Total Parcel Count	Improved Parcel Count	Total Acres
Apartment Complex	1	1	3.1
Auburn Municipal Airport	2	0	118.3
Car Wash	1	1	1.3
Single-Family Residential Lots	2	2	27.6
Grand Total	6	4	150.

Source: City of Auburn GIS

A.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table A-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing. Increases in wildfire intensity and strength is also occurring in California.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the City noted that climate change is of concern, no specific impacts of climate change could be recalled. The City and HMPC members noted that the strength of storms does seem to be increasing and the temperatures are getting hotter.

Changes to the global climate system are expected to affect future natural hazards in and around Auburn. Many natural hazards are expected to become more frequent and intense in coming years and decades, although some changes are already visible. According to state reports and the Placer County Sustainability Plan, Auburn can expect the following changes to climate-related hazards:

- Periods of both very high and very low precipitation are likely to become more common, which is expected to increase the frequency of both droughts and floods. More rapid melting of the Sierra snowpack is likely to increase the risk of spring flooding, while droughts may become more likely in the late summer and autumn.
- Higher temperatures are expected to cause an increase in extreme heat days. Historically, Auburn experiences an average of four extreme heat days each year, which is any day where temperatures exceed 102°F. These extreme heat days are projected to occur 23 to 32 times each year by around 2050, and 35 to 56 times annually by the end of the century.
- Severe weather events, such as intense storms and high winds are expected to become more frequent and intense. Auburn may experience an increase in hazardous events, such as floods and landslides as a result.
- Wildfires are expected to occur more frequently around Auburn due to hotter, drier conditions. While locations higher in the Sierras face the greatest risk, the areas immediately around Auburn are still projected to see an increase in wildfire activity. According to the Placer County Sustainability Plan,

wildfire activity across Placer County is expected to increase approximately 127 percent above historic levels by the end of the century.

- Pests and organisms that cause or spread disease may be active for a longer period of time due to warmer temperatures. Changes in temperature and precipitation patterns could cause new pests and diseases to be active in and around Auburn. Such pests and diseases may not only affect human health but could harm local ecosystems and agricultural activities.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the City and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire
- Human health hazards

Future Development

The City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development.

In 2020, the City of Auburn completed a Climate Change Vulnerability Assessment consistent with Government Code Section 65302(G), which assesses how the populations and assets in Auburn are vulnerable to different emergencies and hazardous conditions that may be created or made worse because of climate change. The primary categories assessed include populations, buildings and infrastructure, important economic assets, natural resources, and key community services. The assessment follows the recommended process in the updated California Adaptation Planning Guide, which is the state's guidance for how local communities should conduct climate adaptation planning efforts, including vulnerability assessments. As defined by the California Adaptation Planning Guide (2020), climate change vulnerability is considered the degree to which natural, built, and human systems are susceptible to harm from exposure or stresses associated with climate change and from the absence of adaptive capacity to adapt.

The Climate Change Vulnerability Assessment indicates that Auburn’s populations and assets are most vulnerable to wildfires, extreme heat, and severe weather.

Drought & Water Shortage

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table A-14.

Table A-14 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan.

The City had no past affect by the most recent drought occurring from 2014-2016.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users.

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the cost of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the City and Placer County are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Future Development

As the population in the area continues to grow, so will the demand for water. Ongoing planning will be needed by the City and water agencies to account for population growth and increased future water demands.

Earthquake

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. Auburn and the surrounding area are at lower risk from significant seismic and geologic hazards. Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. The closest identified active fault is the Cleveland Hills fault, situated approximately 36 miles northwesterly of Auburn. It was the source of the 1975 Oroville earthquake (Richter Magnitude: 5.7). Another potential earthquake source is the Midland Fault Zone to the west, where an 1892 earthquake centered between Vacaville and Winters caused minor damage in nearby Lincoln.

Additionally, Auburn may experience minor ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas Fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that damaged Sacramento in 1906) and the closer Hayward fault have the potential for experiencing major to great events. To the east in Nevada, the several faults associated with a series of earthquakes in 1954, especially the major (7.1 Richter magnitude) December 16, 1954 Fairview Peak event (about 100 miles east of Carson City), could cause minor ground shaking in Auburn.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.12 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where few earthquakes of significant

magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Placer County and the City fall within a low to moderate shake risk.

Past Occurrences

The City noted no past occurrences of earthquakes or that affected the City in any meaningful way.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. According to the City, there are 65 buildings that are known to be constructed of unreinforced masonry. Four previously unreinforced masonry buildings have been retrofitted.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Auburn is within the less hazardous Zone 3.

Earthquake vulnerability is primarily based on population and the built environment. Urban are the most vulnerable, while more rural and sparsely populated areas are less vulnerable.

Impacts from Earthquake

Impacts from earthquake in the City will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Earthquake Analysis

Due to the regional effects of an earthquake, a Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.11 of the Base Plan. While these runs were not done specific to the City, maps showing damage in the County show greater areas of damage near the more built out and populated cities in the County.

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of a major earthquake and the building codes in effect, development in the earthquake area will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional/Unlikely

Vulnerability–Low

Although ranked as a low significance hazard by the City, due to its significance in the County and in the State of California, flood hazard assessment for Auburn is included here.

Hazard Profile and Problem Description

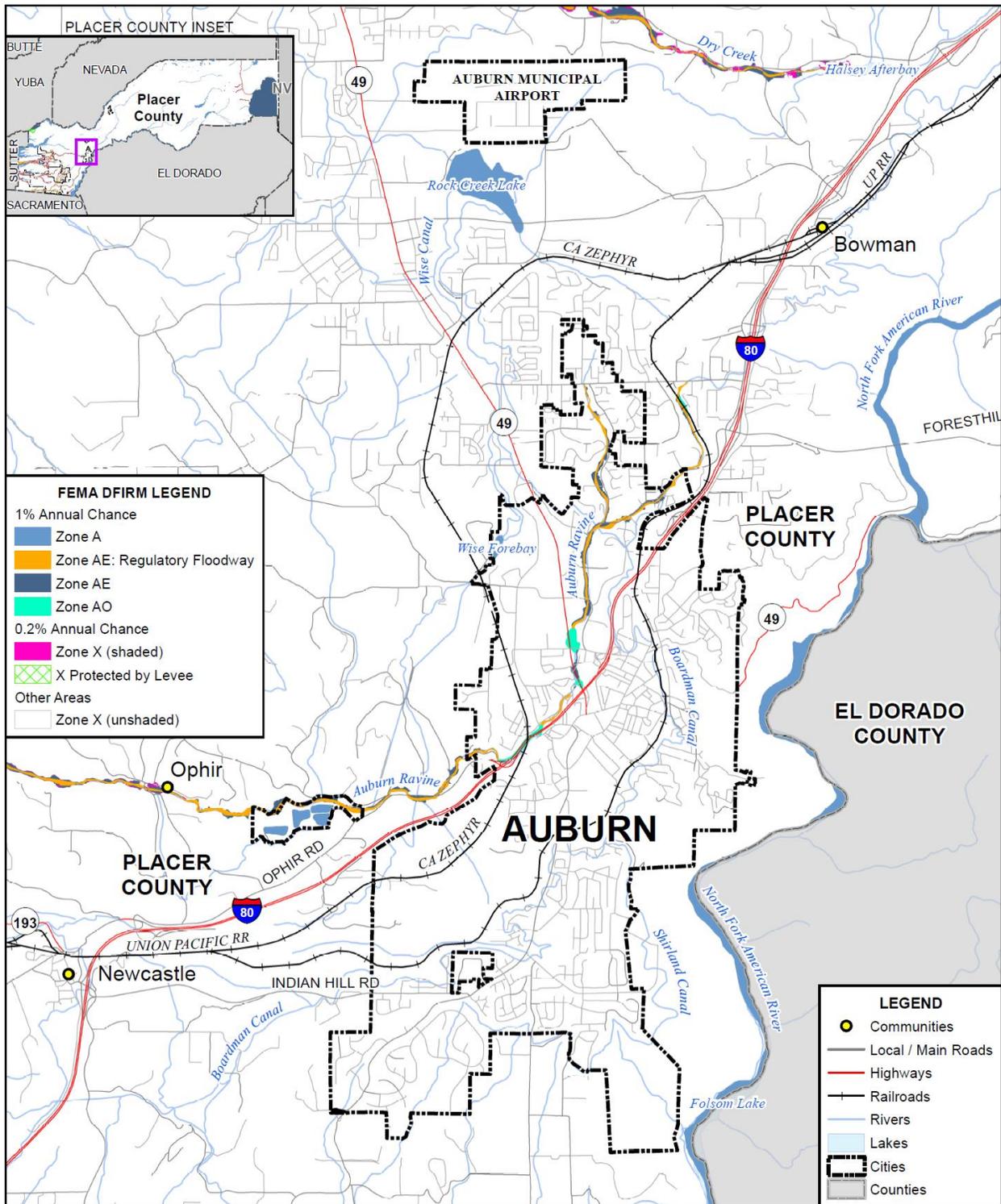
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Placer County and to a lesser extent, the City of Auburn. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.2.13 of the Base Plan, the Placer County Planning Area and the City of Auburn have been subject to historical flooding. Auburn is traversed by several stream systems and is at risk to the 1% flood. No areas of the City fall in the 0.2% annual chance flood zone.

Location and Extent

The City of Auburn has areas located in the 1% annual chance flood zone. This is seen in Figure A-5.

Figure A-5 City of Auburn – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table A-15 details the DFIRM mapped flood zones located within the City.

Table A-15 City of Auburn– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Auburn
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table A-16.

Table A-16 City of Auburn – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	88	2.0%	21	1.1%	67	2.6%
0.2% Annual Chance	0	0.00%	0	0.00%	0	0.00%
Other Areas	4,429	98.0%	1,900	98.9%	2,529	97.4%
Total	4,517	100.0%	1,922	100.0%	2,596	100.0%

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table A-17. These events also likely affected the City to some degree.

Table A-17 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Within the City of Auburn, much of the flood damage occurs as a result of localized stormwater flooding, with limited flood damage occurring in the 100-year and greater floodplains.

- December 2005/January 2006. Flooding occurred in December 2005/January 2006 as a result of heavy stormwater runoff caused by severe winter storms. Although actual damages were minimal, the storms impacted transit on public roads and caused some business closures due to limited access. Stormwater infrastructure also sustained limited damage.
- The City had no past occurrences of flood events affecting the City since 2016.

Vulnerability to and Impacts from Flood

Floods have been a part of the City’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. Areas with flood hazards are the natural drainage channels of the Auburn Ravine, Dutch Ravine, and Rock Creek, and the tunnel section of the Auburn Ravine under Old Town. Other flood hazard areas include the numerous under-sized bridges and culverts within the Auburn/Bowman Area.

This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove

stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

Based on the vulnerability of Auburn to the flood hazard, the sections that follow describes significant assets at risk in the City of Auburn. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Auburn. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table A-18 is a summary table for the City of Auburn. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. As previously mentioned, there are no areas of the City within the 0.2% annual chance flood. Table A-19 breaks down Table A-18 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the City.

Table A-18 City of Auburn – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	60	23	\$4,128,747	\$7,908,824	\$6,111,916	\$18,149,487
0.2% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0
Other Areas	6,430	5,157	\$644,368,386	\$1,541,085,558	\$902,211,255	\$3,087,665,199
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/ Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-19 City of Auburn – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Industrial	1	0	\$0	\$0	\$0	\$0
Miscellaneous	2	0	\$0	\$0	\$0	\$0
Zone A Total	3	0	\$0	\$0	\$0	\$0
Zone AE Floodway						
Commercial	2	0	\$0	\$0	\$0	
Miscellaneous	15	0	\$110,672	\$0	\$0	\$110,672
Natural / Open Space	2	0	\$0	\$0	\$0	\$0
Residential	10	10	\$821,894	\$1,888,820	\$944,409	\$3,655,123
Zone AE Floodway Total	29	10	\$932,566	\$1,888,820	\$944,409	\$3,765,795
Zone AE						
Commercial	3	1	\$61,577	\$140,328	\$140,328	\$342,233
Miscellaneous	6	0	\$58,419	\$0	\$0	\$58,419
Natural / Open Space	1	0	\$0	\$0	\$0	\$0
Residential	8	8	\$770,886	\$1,704,993	\$852,496	\$3,328,375
Zone AE Total	18	9	\$890,882	\$1,845,321	\$992,824	\$3,729,027
Zone AO						
Commercial	7	4	\$2,305,299	\$4,174,683	\$4,174,683	\$10,654,665
Miscellaneous	3	0	\$0	\$0	\$0	\$0
Zone AO Total	10	4	\$2,305,299	\$4,174,683	\$4,174,683	\$10,654,665
1% Annual Chance Flood Hazard Total	60	23	\$4,128,747	\$7,908,824	\$6,111,916	\$18,149,487
Other Areas						
Zone X (unshaded)						
Agricultural	4	3	\$67,279	\$44,949	\$44,949	\$157,177
Commercial	468	339	\$79,186,630	\$193,473,828	\$193,473,828	\$466,134,286
Industrial	46	26	\$5,706,494	\$11,762,352	\$17,643,528	\$35,112,374
Institutional	86	25	\$6,491,701	\$43,335,739	\$43,335,739	\$93,163,179
Miscellaneous	844	9	\$16,570,376	\$2,183,737	\$2,183,737	\$20,937,850
Natural / Open Space	131	10	\$365,302	\$774,045	\$774,045	\$1,913,392

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Residential	4,851	4,745	\$535,980,604	\$1,289,510,908	\$644,755,429	\$2,470,246,941
Zone X (unshaded) Total	6,430	5,157	\$644,368,386	\$1,541,085,558	\$902,211,255	\$3,087,665,199
Other Areas Total	6,430	5,157	\$644,368,386	\$1,541,085,558	\$902,211,255	\$3,087,665,199
Auburn Grand Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-20 summarizes Table A-19 above and shows City of Auburn loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table A-20 City of Auburn – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	60	23	\$7,908,824	\$6,111,916	\$14,020,740	\$2,804,148	0.005%
0.2% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0	0.00%
Grand Total	60	23	\$7,908,824	\$6,111,916	\$14,020,740	\$2,804,148	0.01%

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table A-19 and Table A-20, the City of Auburn has 23 parcels and \$14 million of structure and contents values or values in the 1% annual chance flood zones, with nothing in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.10 of the Base Plan, there is a 1% chance in any given year of a flood event causing

\$2.8 million in damage in the City of Auburn. The loss ratio of 0.005% and 0.0% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be minimal.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the City of Auburn as well as for the County as a whole. Table A-21 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table A-21 City of Auburn – Flooded Acres by Flood Zone

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	13	0.001%	0	0.00%	13	0.002%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	11	0.001%	0	0.00%	11	0.002%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	0	0.00%	0	0.00%	0	0.00%
Zone A Total	24	0.003%	0		24	0.003%
Zone AE Floodway						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	1	0.000%	1	0.000%	0	0.000%
Industrial	6	0.001%	0	0.00%	6	0.001%
Institutional	1	0.000%	1	0.001%	0	0.00%
Miscellaneous	13	0.001%	0	0.00%	13	0.002%
Natural / Open Space	2	0.000%	0	0.00%	2	0.000%
Residential	8	0.001%	8	0.004%	0	0.000%
Zone AE Floodway Total	31	0.003%	10	0.006%	21	0.003%
Zone AE						
Agricultural	0	0.00%	0	0.00%	0	
Commercial	2	0.000%	1	0.001%	1	0.000%
Industrial	2	0.000%	0	0.00%	2	0.000%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Institutional	1	0.000%	1	0.000%	0	0.00%
Miscellaneous	9	0.001%	0	0.00%	9	0.001%
Natural / Open Space	0	0.000%	0	0.00%	0	0.000%
Residential	6	0.001%	6	0.003%	0	0.000%
Zone AE Total	20	0.002%	8	0.004%	12	0.002%
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	4	0.000%	3	0.002%	1	0.000%
Industrial	0	0.000%	0	0.00%	0	0.000%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	9	0.001%	0	0.00%	9	0.001%
Natural / Open Space	0	0.000%	0	0.00%	0	0.000%
Residential	0	0.000%	0	0.000%	0	0.00%
Zone AO Total	13	0.001%	3	0.002%	10	0.001%
1% Annual Chance Flood Hazard Total	88	0.010%	21	0.012%	67	0.009%
Other Areas						
Zone X (unshaded)						
Agricultural	12	0.001%	1	0.001%	11	0.002%
Commercial	272	0.030%	158	0.088%	114	0.016%
Industrial	157	0.017%	19	0.010%	138	0.019%
Institutional	361	0.040%	73	0.041%	288	0.040%
Miscellaneous	1,542	0.172%	3	0.002%	1,539	0.214%
Natural / Open Space	351	0.039%	5	0.003%	346	0.048%
Residential	1,733	0.193%	1,641	0.911%	92	0.013%
Zone X (unshaded) Total	4,429	0.493%	1,900	1.055%	2,529	0.352%
Other Areas Total	4,429	0.493%	1,900	1.055%	2,529	0.352%
Auburn Grand Total						
Auburn Grand Total	4,517	0.502%	1,922	1.067%	2,596	0.361%

Source: FEMA 11/2/2018 DFIRM

Population at Risk

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Auburn – 2.19. According to this analysis, there is a total population of 44 and 0 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table A-22.

Table A-22 City of Auburn – Count of Improved Residential Parcels and Population by Flood Zone

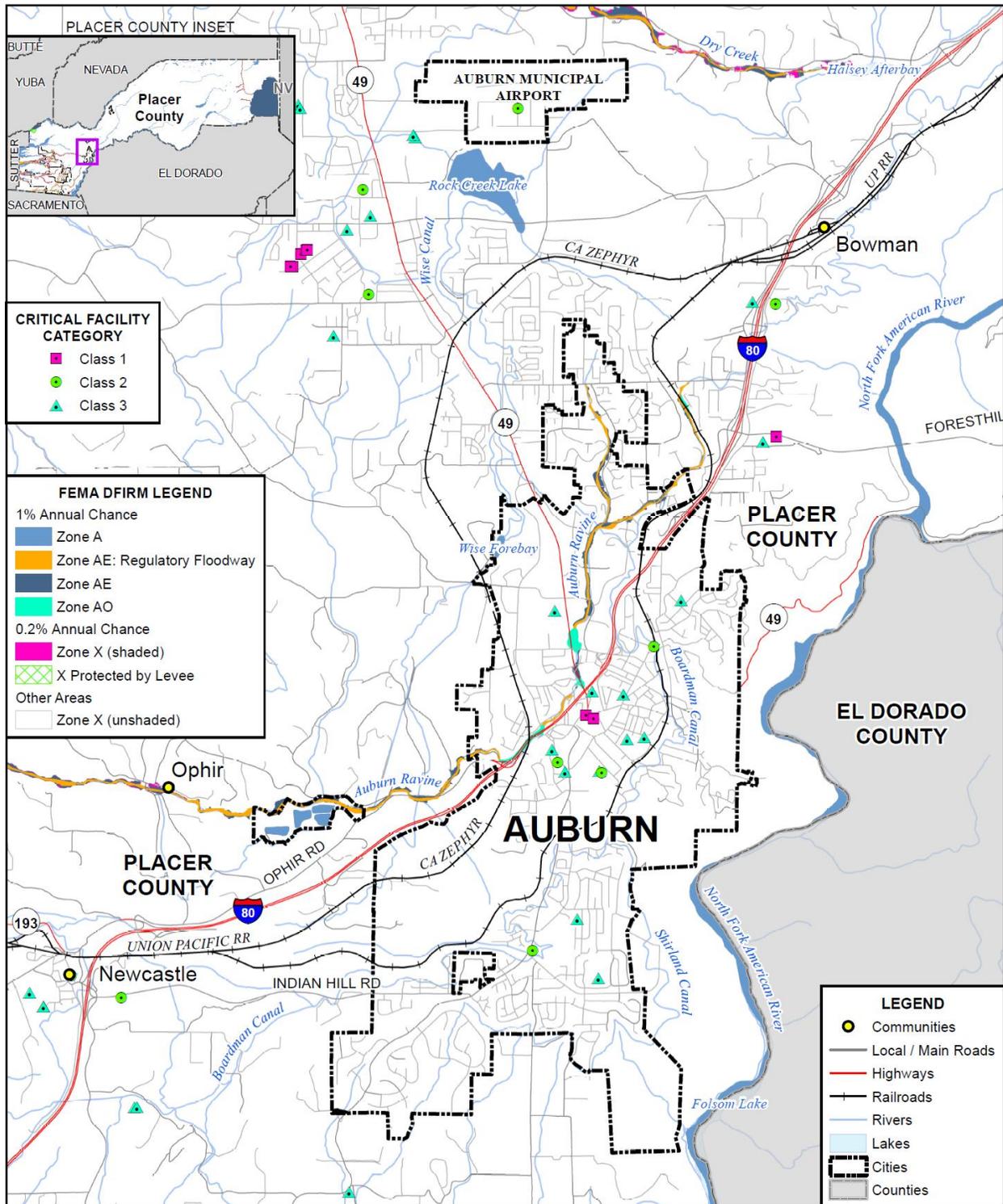
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Auburn	18	44	0	0

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

There are no critical facilities at risk in the City of Auburn in the flood zones, which can be seen on Figure A-6.

Figure A-6 City of Auburn – Critical Facilities and DFIRM Flood Zones



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Auburn joined the National Flood Insurance Program (NFIP) on December 23, 1983. The City does not participate in the CRS program. NFIP data indicates that as of August 21, 2020, there were 21 flood insurance policies in force in the City with \$5,998,200 of coverage. Of the 21 policies, 18 were residential (single-family homes) and 3 were nonresidential; 9 of the policies were in A zones; the remaining 12 were in B, C, and X zones.

There have been 24 historical claims for flood losses totaling \$607,083; all were located in B, C, or X zones. 23 of these were for pre-FIRM structures; 1 was for a post-FIRM structure. NFIP data further indicates that there are three repetitive loss (RL) buildings, with 2 RL buildings being insured. There have been a total of 12 RL losses, with 10 insured RL losses. 2 of the insured RL buildings has incurred 4 or more losses, making them Severe Repetitive Loss properties. All RL buildings are located outside of the 100- and 500-year floodplain in the B, C, or X zones. The RL properties are located in an older, built-out residential neighborhood with older infrastructure.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 23 improved parcels within the 1% annual chance flood zone, 12 (or 52.2 percent) of those parcels maintain flood insurance. This can be seen on Table A-23.

Table A-23 City of Auburn – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Auburn	23	12	52.2%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

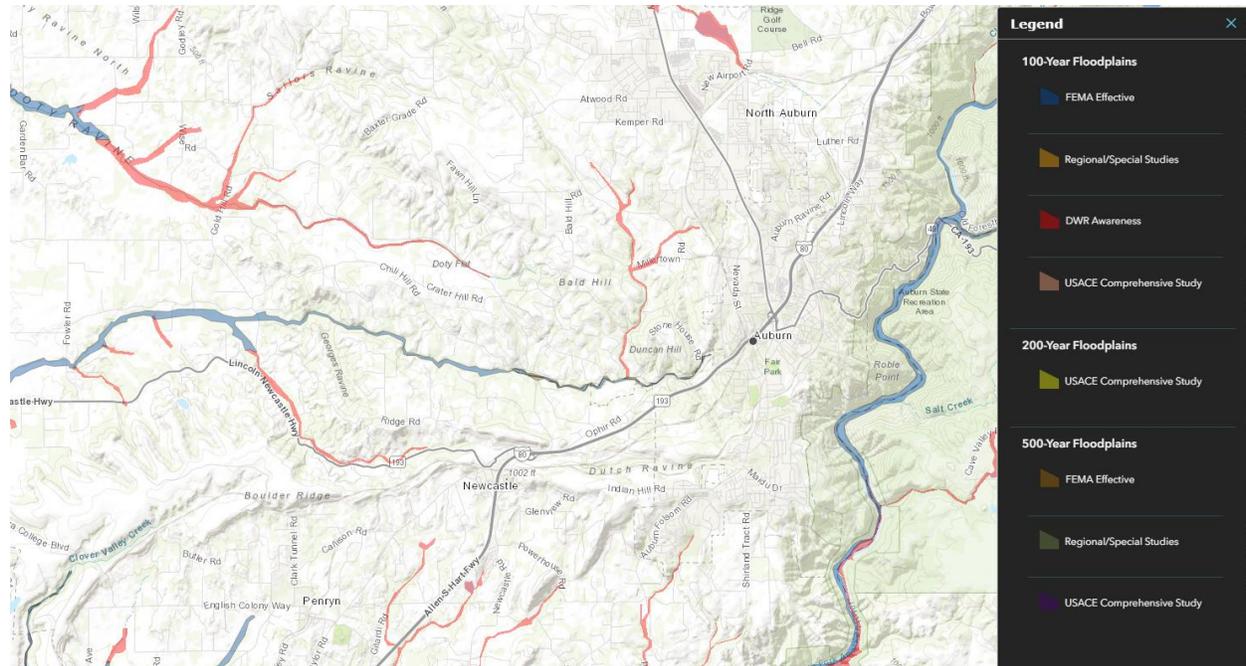
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Auburn is shown in Figure A-7.

Figure A-7 City of Auburn – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

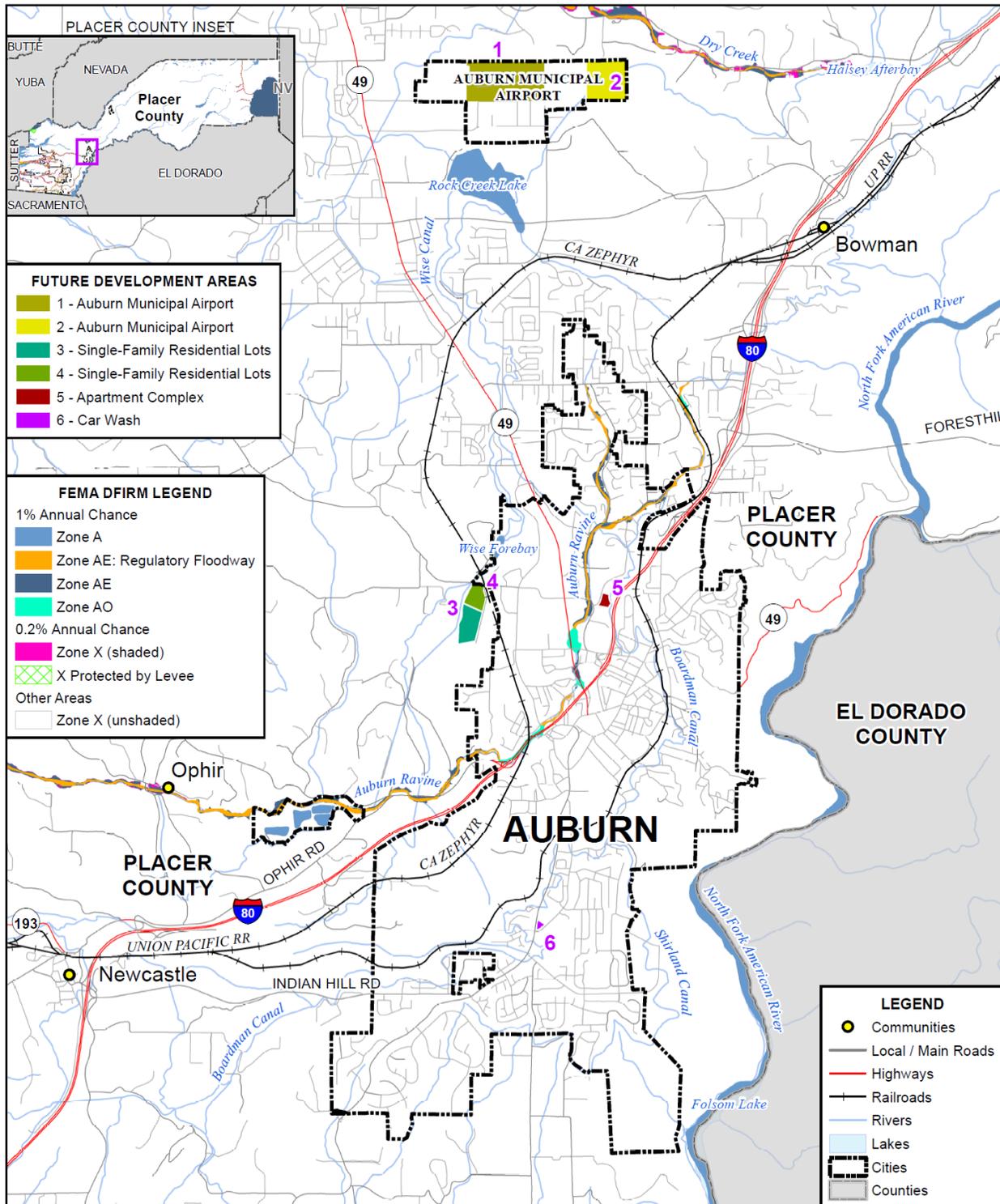
The City enforces the floodplain ordinance. If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance.

GIS Analysis

The City provided Future Development Areas were used as the basis for the inventory of future development areas for the City. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure A-8 shows the locations of

future development areas the City is planning to develop on the FEMA DFIRM. As shown on Figure A-8, no future development areas fall in DFIRM flood zones, as such no tabular analysis was performed.

Figure A-8 City of Auburn – Future Development Areas and DFIRM Flood Zones



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the Placer County Planning Area during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Auburn is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Within the City of Auburn, much of the flood damage occurs as a result of localized stormwater flooding, with limited flood damage occurring in the 100-year and greater floodplains. The City noted the following past occurrences of localized flooding:

December 2005/January 2006. Flooding occurred in December 2005/January 2006 as a result of heavy stormwater runoff caused by severe winter storms. Although actual damages were minimal, the storms impacted transit on public roads and caused some business closures due to limited access. Stormwater infrastructure also sustained limited damage.

No past occurrences of localized stormwater flooding damages affecting the City since 2016.

Vulnerability to Localized Flooding

Historically, much of the growth in the City and County has occurred adjacent to streams, resulting in damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Auburn are summarized in Table A-24

Table A-24 City of Auburn – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Auburn Ravine Rd.	X	X	X	X		X	X
Dairy Rd.	X	X	X	X	X	X	X
Auburn Folsom	X	X	X	X	X	X	X
Old Town	X			X			
Pine Street	X			X		X	
Foresthill Ave	X	X		X		X	
Brook-Shields	X	X		X		X	
Oakwood Dr.	X			X		X	
Nevada-Andrews St.	X			X		X	
Placer St.	X		X	X		X	X
E. Lincoln Way-Alta Vista School Area	X			X		X	
Upper Sacramento St.	X			X		X	
Sutton Place	X			X		X	
Agard Street	X			X		X	
Gold Street	X			X		X	

Source: City of Auburn

Impacts

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

Future development in the City will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Pandemic

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Center for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by the number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table A-25.

Table A-25 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

Impacts of COVID 19

The City of Auburn experienced impacts including but not limited to the public, schools, local businesses, and fiscally. The City saw interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. The City had a rise in hospitalizations and deaths, especially in the elderly population or those with pre-existing underlying conditions. Covid-19 forced multiple businesses to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and other necessary household items experienced interruptions in distribution due to a rapid increase in demand.

The pandemic did not affect the buildings, critical facilities, and infrastructure in the City. However, the pandemic had varying levels of impact on the citizens of the City and greater County. The full effects of the Covid-19 pandemic are still not clear as the effects of the pandemic are still occurring.

Vulnerability to Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the City. Pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic and often on preexisting conditions of those exposed.

Impacts

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food can also be interrupted. Prisons may need to release prisoners to comply with social distance standards.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

Extreme heat does occur on occasion resulting in the facilitation of “cooling centers” as set forth in the Placer County Heat Emergency Plan. The fairgrounds and Auburn-Placer Library located within the City are identified “cooling centers”.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

From late spring through fall, it is not unusual for temperatures to exceed 90°F and higher. The following highlights were taken from the Auburn Weather Station for the period of record from 1905 to 2014:

Record daily extremes include:

- May – 102°F (1910)
- June – 110°F (1925)
- July – 113°F (1972)
- August – 111°F (1978)
- September – 109°F (1950)
- October – 104°F (1928)

Average number of days in a month exceeding 90°F:

- April - .1 days
- May – 2.9 days
- June – 10.7 days
- July – 22.5 days
- August – 20.8 days
- September – 11.2 days
- October – 2.1 days

This equates to an average of 70.3 days annually in excess of 90°F.

The City of Auburn has no other specific events or past occurrences.

Vulnerability to Extreme Heat

The City experiences temperatures in excess of 90°F during the summer and fall months on a regular basis, sometimes exceeding 100°F. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen and the City may see an increase in dry fuels. Also, PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue.

Impacts

The elderly individuals below the poverty level, and other vulnerable populations are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average

age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS, winter snowstorms can include heavy snow, ice, and freezing conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Freezing temperatures and ice can also cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire City is at risk to cold weather and freeze events. Snow is rare in the City. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, snow amounts are limited and melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table A-26.

Table A-26 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The City noted that cold and freeze is a regional phenomenon; events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3. In the past the City of Auburn has experienced severe cold/freeze temperatures over several consecutive days. The following highlights were taken from the Auburn Weather Station for the period of record from 1905 to 2014.

Record daily extremes include:

- October – 26°F (1922)
- November – 20°F (1931)
- December – 16°F (1972)
- January – 17°F (1930)
- February – 21°F (1962)
- March – 20°F (1938)
- April – 25°F (1929)
- May – 25°F (1933)
- June – 30°F (1905)

Average number of days in a month falling below 32°F:

- October – 0.1 days
- November – 1.2 days
- December – 7.5 days
- January – 9.1 days
- February – 3.7 days
- March – 1.8 days
- April – .5 days

This equates to an average of 24 days annually below 32°F.

The City of Auburn has no other specific events or past occurrences.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The City experiences temperatures below 32 degrees periodically during the winter months. Snow occurs only occasionally in the City; most winter precipitation falls as rain in the City. During severe winter weather in Auburn, including freezing temperatures, roads can become difficult to navigate, especially in some of the more hilled areas of the City.

Freeze can cause injury or loss of life to residents of the City. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold.

Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Impact to such cold temperatures has resulted in damage to such infrastructure as domestic water pipes, irrigation systems, unprotected fire protection systems (fire sprinklers) and surface icing on streets and walkways. Transportation networks, communications, and utilities infrastructure are some of the most vulnerable physical assets to impacts of severe winter weather in the County.

Future Development

Future development built to code should be able to withstand issues associated with extreme cold and freeze events. Pipes at risk of freezing should be buried or insulated from freeze as new facilities are improved or added. Critical facilities and infrastructure should consider backup power sources to protect against power outages. Vulnerability to extreme cold will increase as the average age of the population in the City shifts and homelessness becomes more of an issue.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rare in the City and Placer County. Duration of severe storms in California, Placer County, and the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.2.3 of the Base Plan.

Past Occurrences

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This is the cause of many of the federal disaster declarations related to flooding, as shown in Table A-17 above. The City of Auburn has no other specific events or past occurrences.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause significant and localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

Impacts

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

Future Development

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.19 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. Placer County is designated as Tier 2 High mortality hazard on the watershed scale along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. No events of past tree mortality have affected the City.

Vulnerability to and Impacts from Tree Mortality

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality. These areas were shown on Section 4.3.18 of the Base Plan.

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

Wildfire

Likelihood of Future Occurrence–Likely

Vulnerability–High

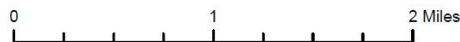
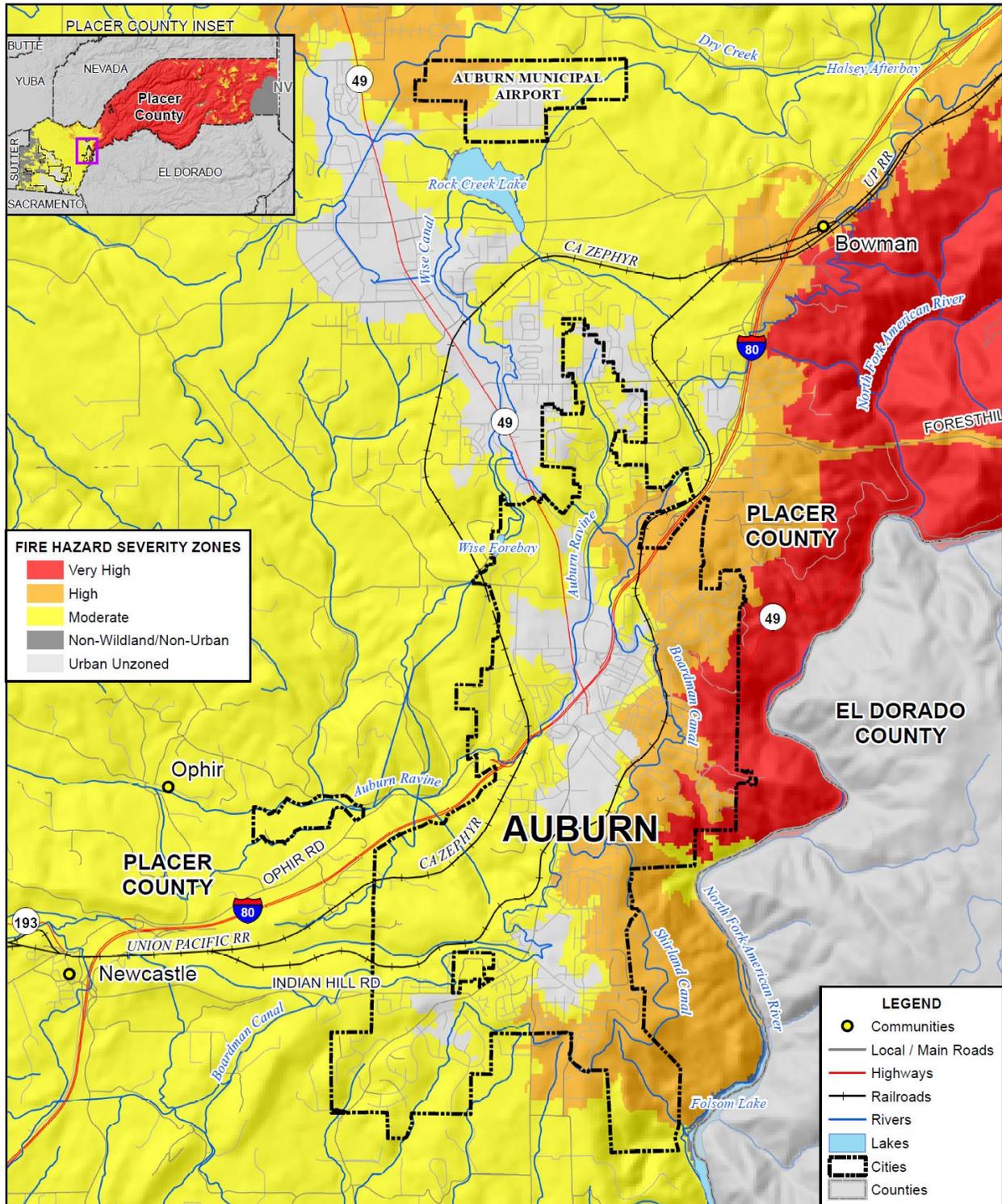
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Auburn. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Auburn were created. Figure A-9 shows the CAL FIRE FHSZ in the City. As shown on the maps, fire hazard severity zones within the City range from Urban Unzoned to very high.

Figure A-9 City of Auburn – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table A-27.

Table A-27 City of Auburn – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	214	4.7%	38	2.0%	176	6.8%
High	1,152	25.5%	570	29.6%	583	22.5%
Moderate	0	0.00%	0	0.00%	0	0.00%
Non-Wildland/non-Urban	2,406	53.3%	967	50.3%	1,439	55.4%
Urban Unzoned	745	16.5%	347	18.0%	398	15.3%
Total	4,517	100.0%	1,922	100.0%	2,596	100.0%

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table A-28.

Table A-28 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Fire Protection

Fire protection in the planning area is provided by the City of Auburn. The City of Auburn Fire Department participates in the Western Placer County Fire Chief’s Association Cooperative Response Agreement, where fire agencies have agreed to automatically support each other on incidents using the closest available resource concept. These agencies include the Placer County Fire Department, CAL FIRE, Newcastle Fire District, and Placer Hills Fire District. In addition, a Mutual Threat Zone has been established for wildland fires, which means that any wildland fire within or adjacent to the City of Auburn will initiate a full response from the City and CAL FIRE upon initial dispatch. Due to the risk associated with wildfire, the City of Auburn has a contractual agreement with CAL FIRE for additional wildfire resources, which include firefighting aircraft, hand crews, bulldozers, chief officers, and type three engines. Structural and wildfire protection outside the City limits is provided by the individual fire agencies or by CAL FIRE.

The Fire Department provides fire protection, emergency medical services, and disaster preparedness and response. Auburn has three fire stations at the following locations:

- Station No. 1 – Martin Park Fire Station, 485 High Street
- Station No. 2 – Gietzen Fire Station, 226 Sacramento Street
- Station No. 3 – Maidu Fire Station, 901 Auburn Folsom Road

Fire Responsibility Areas

In and around Auburn, different organizations all have some responsibility for wildfire protection in different areas. These responsibility areas are codified under state law into three categories: local responsibility areas (LRAs), state responsibility areas (SRAs), and federal responsibility areas (FRAs).

- LRAs are areas protected by local agencies, including city and county fire departments, local fire protection districts, and the California Department of Forestry and Fire Protection (CAL FIRE) when under contract to local governments. Most land in the City of Auburn is an LRA, except for open space areas near the American River that are part of FRAs. North Auburn is also an LRA.
- SRAs are areas where CAL FIRE has responsibility for wildfire protection. SRAs are generally unincorporated areas that are not federally owned, are undeveloped, and are covered by wildland vegetation or rangeland. Most of the unincorporated land around Auburn, excluding the developed areas of North Auburn, is an SRA.
- FRAs are areas that are managed by a federal agency, including the U.S. Forest Service, the U.S. Fish and Wildlife Service, and the Bureau of Land Management. The federally-owned open space along the American River, including land within the city limits of Auburn, is an FRA.

Past Fire Events

There is no record of historical fires within the Auburn city limits. However, some historical fires have occurred near the City. Notably, in 2009, the 49 Fire burned 343 acres near Highway 49 and Rock Creek Road near Auburn. Following is a list of historical fires that have occurred around the City dating back to 1975.

1975/1977 Sawmill Fire – The Sawmill Fire and another fire occurred in the area of Cape Horn and the Alpine Meadows subdivision, just three miles northeast of Colfax.

1990 Placer County Fire – This fire burned approximately 300 acres of grass, brush, and oaks in the area of Placer Canyon. The fire resulted in evacuations and destroyed several outbuildings.

2000 Heather Glen Fire – The Heather Glen Fire, caused by sparks from a lost trailer wheel along Interstate (I-) 80, destroyed one home and forced a neighborhood evacuation in Applegate. While only 10 acres in size, this fire resulted in \$350,000 in damage.

2000 American Fire – The American Fire occurred below the City of Auburn in what is now known as “China Bar” on the American River. The fire consumed approximately 200 acres and posed a threat to development in the southern portion of Auburn. No structure losses or structure damages were reported in this incident.

August 12-20, 2001, Narrow Gauge Fire – This fire near Colfax burned 30 acres and forced closure of I-80 for about an hour due to dense smoke. This fire, blamed on a catalytic converter, was quickly contained as California Department of Forestry air tankers were already in the area and able to respond quickly.

2002 Sierra Fire – Within the communities of Loomis and Granite Bay, approximately 595 acres of grass, brush, and oaks burned in the area of I-80, Barton Road, Wells Avenue, Morgan Place, Indian Springs, and Cavitt-Stallman Road. The fire destroyed six structures and threatened two schools.

2004 Stevens Fire – The Stevens Fire, located at Cape Horn/Iowa Hill near Colfax, was 100 percent contained at 934 acres.

September 2006 Ralston Fire – The Ralston Fire was a large wildfire in the area of the North Fork of the Middle Fork of the American River. Approximately 8,400 acres burned.

June-July 2008 American River Complex Fire – Several large wildfires resulted from a system of major lightning storms that impacted the entire Northern California region. In Placer County, approximately 10 wildfires resulted from the lightning storm, and four grew to major fires, which later were collectively labeled the American River Complex (ARC) fires. The ARC fires were in Tahoe National Forest in the North Fork American River watershed northeast of Foresthill, California. The fires consumed approximately 20,500 acres of forest land.

September 2008 Gladding Fire – The wind-driven fire started northeast of Lincoln and consumed approximately 960 acres, 6 residences, and 10 outbuildings.

September 2009 49 Fire – The wind-driven fire started about 2 pm near Highway 49 and Rock Creek Road near Auburn. The fire burned 343 acres before being contained. Sixty-three residences and three commercial buildings were destroyed, and another three residences and six commercial properties were severely damaged. The damages were concentrated in neighborhoods east and south of Dry Creek Road. Three people were injured in the wildfire. Most notable about this fire was its location in a well-developed area and the speed at which the fire consumed nearby structures.

2012 Robbers Fire – The Robbers Fire was a human-caused fire that was ignited on July 11, 2012. The fire was located northwest of Foresthill, near Shirrtail Canyon Road and Yankee Jims Road. The fire burned 2,650 acres, destroyed one residence and four outbuildings, and caused 12 injuries. 912 fire personnel were involved in the firefighting efforts. A 28-year-old Sacramento man was charged with unlawfully causing a fire. Firefighting costs and damages were estimated at \$12.4 million.

2013 American Fire – On August 10, 2013, the American Fire was ignited near Deadwood Ridge, northeast of Foresthill. Located in Tahoe National Forest, the American Fire burned in steep and hazardous terrain as well as timber fuels that had not burned in several decades. Consumption of heavy fuels contributed to heavy smoke in the surrounding areas. Approximately 540 Forest Service and Cal Fire personnel were assigned to the fire, which burned 27,440 acres.

2014 King Fire – Hazard Mitigation Planning Committee representatives from Placer Hills and Foresthill Fire Protection Districts noted damaging wildfires that occurred in the Foresthill and Applegate areas during the winter of 2014. Specific information on this can be found in their respective annexes to this plan. The

fire started in El Dorado County and crossed into Placer County. An estimated 97,717 acres burned, 12 residences were destroyed, along with 68 other minor structures. Twelve injuries occurred that can be attributed to the fire.

2014 Applegate Fire – A fire occurred on the east side of I-80 in the Applegate area of Placer County. The fire started on October 8, 2014, and its cause was unknown. The fire burned 459 acres before containment. Six residences and four outbuildings were destroyed. Two injuries were reported; however, no deaths were reported.

Since 2016 - wildfires and urban interface fires have occurred within or encroached into the City, especially in the heavily fueled areas to the east and south. In the last few years the City of Auburn has experienced multiple wildfires that threatened property, critical facilities, and life safety. Following is a list of noteworthy wildfires that occurred in or impinged the city limits.

2017 Stagecoach Fire- July 20th, 2017 a fire broke out on the Upper Stagecoach Trail in the Auburn State Recreation Area, between the City of Auburn and the American River. The fire burned approximately 10 acres and caused evacuations in the Auburn City limits.

2020 Lincoln Way Fire- August 17th, 2020 a vegetation fire started in the area of Lincoln Way and eastbound I-80 causing evacuations of the immediate area. Fire was contained just short of the Auburn Woods Condominiums. The fire totaled 2.2 acres with no structures lost or damaged.

2020 Perry Ranch Fire- August 26th, 2020 a vegetation fire started in the area of Perry Ranch Road and Rogers Lane. The fire was immediately threatening multiple homes as crews arrived at scene. The fire totaled 8 acres with no structures lost.

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and City, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Auburn is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels.

According to the Safety Element of Auburn’s General Plan, wildland and urban interface fires have occurred close to or encroached into the City, especially in the heavily fueled areas to the east and south. Urban structural fires have been due largely to human accidents, with the older buildings in the City business districts the most vulnerable.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

Based on the vulnerability of Auburn to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Auburn. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Auburn. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Auburn are shown in Table A-29, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table A-29 City of Auburn – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	110	44	\$6,991,388	\$12,939,355	\$6,469,675	\$26,400,418
High	2,248	1,840	\$191,122,318	\$434,796,230	\$224,123,577	\$850,042,125
Moderate	2,897	2,340	\$310,739,956	\$750,722,502	\$425,810,068	\$1,487,272,526

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Urban Unzoned	1,235	956	\$139,643,471	\$350,536,295	\$251,919,851	\$742,099,617
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table A-30 breaks out the Table A-29 by adding the property use details by fire hazard severity zone for the City.

Table A-30 City of Auburn – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	56	0	\$955,855	\$0	\$0	\$955,855
Natural / Open Space	8	0	\$0	\$0	\$0	\$0
Residential	46	44	\$6,035,533	\$12,939,355	\$6,469,675	\$25,444,563
Very High Total	110	44	\$6,991,388	\$12,939,355	\$6,469,675	\$26,400,418
High						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	35	16	\$4,358,159	\$5,509,361	\$5,509,361	\$15,376,881
Industrial	16	10	\$1,959,778	\$2,098,691	\$3,148,036	\$7,206,505
Institutional	16	4	\$400,737	\$3,649,909	\$3,649,909	\$7,700,555
Miscellaneous	321	0	\$5,219,590			\$5,219,590
Natural / Open Space	30	4	\$42,483	\$94,315	\$94,315	\$231,113
Residential	1,830	1,806	\$179,141,571	\$423,443,954	\$211,721,956	\$814,307,481
High Total	2,248	1,840	\$191,122,318	\$434,796,230	\$224,123,577	\$850,042,125
Moderate						
Agricultural	3	2	\$57,153	\$25,949	\$25,949	\$109,051
Commercial	170	108	\$23,834,567	\$71,431,161	\$71,431,161	\$166,696,889
Industrial	22	11	\$2,353,511	\$5,411,920	\$8,117,880	\$15,883,311
Institutional	26	8	\$3,294,068	\$17,423,419	\$17,423,419	\$38,140,906
Miscellaneous	319	3	\$9,635,231	\$1,067,391	\$1,067,391	\$11,770,013

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Natural / Open Space	78	3	\$112,499	\$125,867	\$125,867	\$364,233
Residential	2,279	2,205	\$271,452,927	\$655,236,795	\$327,618,401	\$1,254,308,123
Moderate Total	2,897	2,340	\$310,739,956	\$750,722,502	\$425,810,068	\$1,487,272,526
Urban Unzoned						
Agricultural	1	1	\$10,126	\$19,000	\$19,000	\$48,126
Commercial	275	220	\$53,360,780	\$120,848,317	\$120,848,317	\$295,057,414
Industrial	9	5	\$1,393,205	\$4,251,741	\$6,377,612	\$12,022,558
Institutional	44	13	\$2,796,896	\$22,262,411	\$22,262,411	\$47,321,718
Miscellaneous	174	6	\$928,791	\$1,116,346	\$1,116,346	\$3,161,483
Natural / Open Space	18	3	\$210,320	\$553,863	\$553,863	\$1,318,046
Residential	714	708	\$80,943,353	\$201,484,617	\$100,742,302	\$383,170,272
Urban Unzoned Total	1,235	956	\$139,643,471	\$350,536,295	\$251,919,851	\$742,099,617
Auburn Total	6,490	5,180	\$648,497,133	\$1,548,994,382	\$908,323,171	\$3,105,814,686

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the City of Auburn – 2.45. According to this analysis, there is a total population of 8,880 residents of Auburn at risk to moderate or higher FHSZs. This is shown in Table A-31.

Table A-31 City of Auburn – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

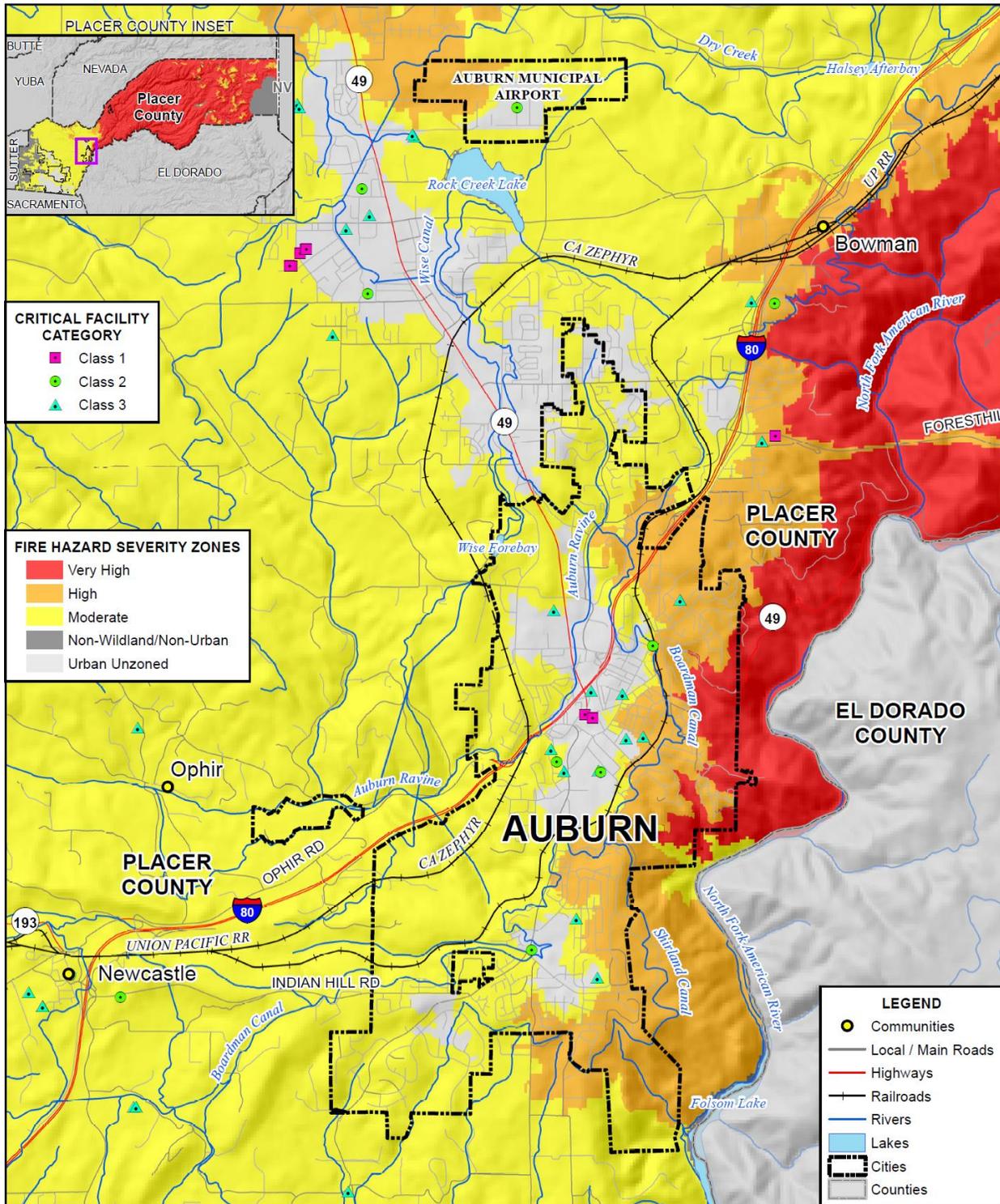
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Auburn	44	96	1,806	3,955	2,205	4,829

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Auburn in identified FHSZs. Critical facilities in a FHSZ in the City of Auburn are shown in Figure A-10 and detailed in Table A-32. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure A-10 City of Auburn – Critical Facilities in Fire Hazard Severity Zones



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhsz106_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhsz106_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table A-32 City of Auburn – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
High	Class 3	School	2
High Total			2
Moderate	Class 2	Fire Station	2
	Class 3	Hall	3
Moderate Total			5
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	1
		National/Coast Guard	1
		Police Station	1
	Class 3	Fairground	1
		Hall	2
		School	3
Urban Unzoned Total			12
Auburn Total			19

Source: CAL FIRE, Placer County

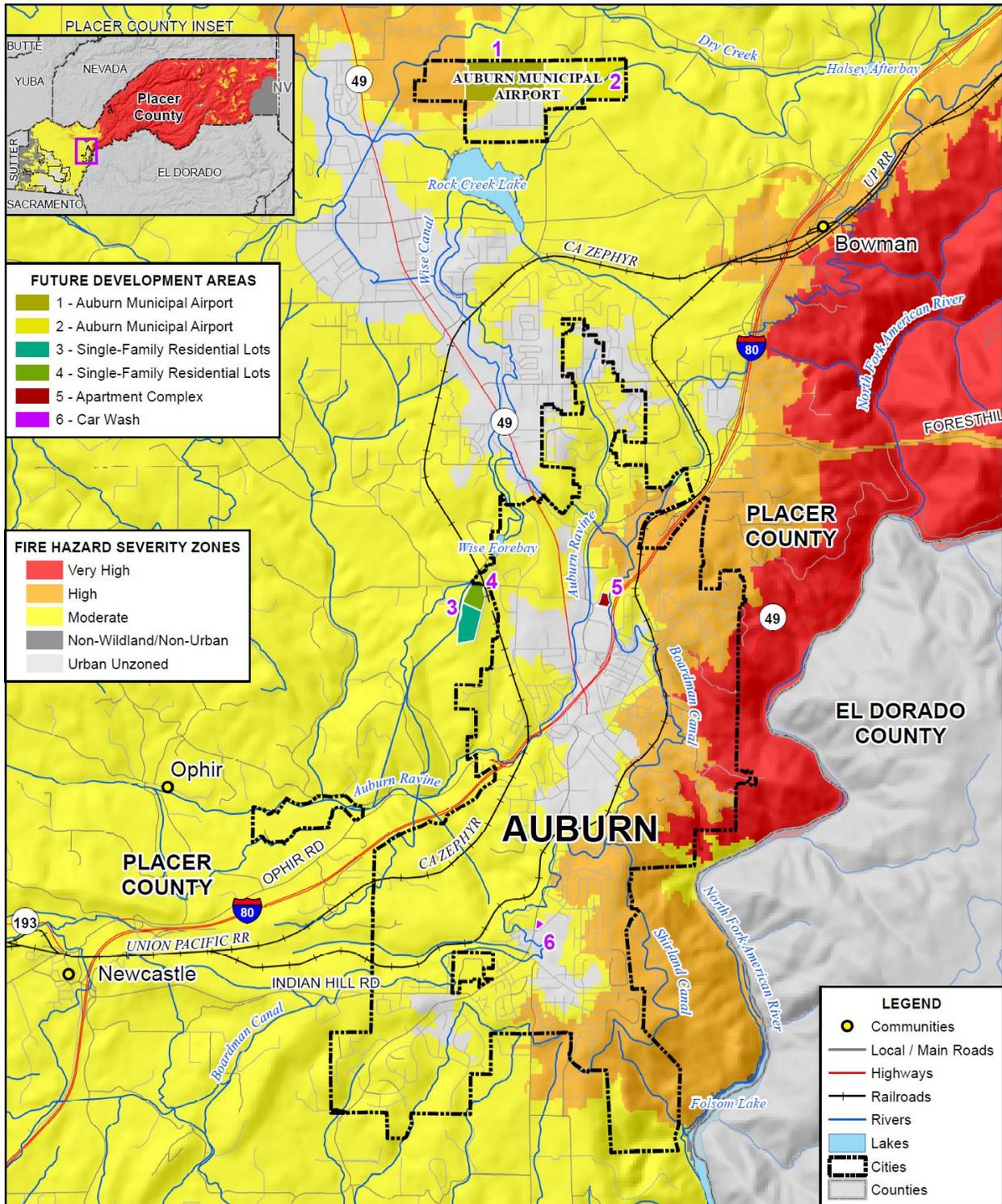
Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

GIS Analysis

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure A-11 shows the locations of future development areas the City is planning to develop on the FHSZs. Table A-32 shows the parcels and acreages of each future development area in the City in each FHSZ.

Figure A-11 City of Auburn – Future Development in FHSZs



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table A-33 City of Auburn – Future Development in FHSZs

Fire Hazard Severity Zone / Future Development / Map Number / Description / APN	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate			
Apartment Complex			
<i>7-Unit Apartment Complex at 655 Mikkelsen Drive</i>			
001-020-055-000	1	1	3.1
Apartment Complex Total	1	1	3.1
Auburn Municipal Airport			
<i>East Hangar Area Access and GA Terminal Building</i>			
052-190-018-000	1		40.0
Auburn Municipal Airport Total	1		40.0
Single-Family Residential Lots			
<i>Single-Family Residential Lots</i>			
038-300-017-000	1	1	17.2
<i>975 and 1055 Collins Drive</i>			
038-300-019-000	1	1	10.4
Single-Family Residential Lots Total	2	2	27.6
Moderate Total	4	3	70.6
Urban Unzoned			
Auburn Municipal Airport			
<i>Helicopter Parking Areas</i>			
052-010-028-000	1		78.4
Auburn Municipal Airport Total	1		78.4
Car Wash			
055-150-044-000	1	1	1.3
Car Wash Total	1	1	1.3
Urban Unzoned Total	2	1	79.7
Grand Total			
	6	4	150.3

Source: CAL FIRE, City of Auburn GIS

A.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

A.6.1. Regulatory Mitigation Capabilities

Table A-34 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Auburn.

Table A-34 City of Auburn Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	
Capital Improvements Plan	Y	
Economic Development Plan	Y	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program	Y	
Engineering Studies for Streams		
Community Wildfire Protection Plan	Y	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Included in EOP
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2013 CBC
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score: N/A
Fire department ISO rating:	Y	Rating: 3
Site plan review requirements	Y	Performed by each City department
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	
Subdivision ordinance	Y	
Floodplain ordinance	Y	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Fire Safe Standards in the WUI (Bates Bill, AB 337). Includes Class A Roofing Standards
Flood insurance rate maps	Y	
Elevation Certificates	Y	Integrated with GIS
Acquisition of land for open space and public recreation uses		

Erosion or sediment control program	Y
Other	
How can these capabilities be expanded and improved to reduce risk?	
The City shall continue to work to regularly to update any City strategic plans to ensure that Auburn maintains relative mitigation capabilities. Identifying the necessity to develop Emergency Preparedness Plans, including confirming evacuation and emergency vehicle access, land management, visible home and street signage, community training and education, and defensive infrastructure and resource needs in the very high fire hazard severity zones, flood zones, and landslide-prone areas.	

Source: City of Auburn

The City of Auburn General Plan Program, 1993

The City of Auburn General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Auburn Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards. Mitigation-related goals are presented below.

Safety Element Goals	
Goal 1	Protect the citizens and visitors of the Auburn area from loss of life while protecting property and watershed resources from unwanted fires through preplanning, education, fire defense improvements, and fire suppression.
Goal 2	Protect the lives and property of the citizens of the Auburn area from unacceptable risk resulting from flood hazards.
Goal 3	Minimize hazards to public health, safety, and welfare resulting from natural and man-made hazards.
Goal 4	Protect all residents from hazardous materials and the hazards associated with transport of such materials.
Goal 5	Maintain and enhance City emergency services.

City of Auburn Emergency Operations Plan

The City of Auburn Emergency Operations Plan (EOP) addresses the planned response for the City of Auburn to emergencies associated with disasters, technological incidents, or other dangerous conditions created by either man or nature. It provides an overview of operational concepts, identifies components of the City emergency management organization, and describes the overall responsibilities of local, state, and federal entities. The Emergency Operations Plan includes such plans as: Terrorism Contingency Plan, Airport Response Plan, Hazardous Materials Response Plan, Wildfire Response Plan, Community Wildfire Protection Plan, Greater Auburn Area Fire Safe Council Strategic Fire Safe Plan, I-80 Transportation Infrastructure Contingency Plan, Heat Emergency Plan, Wastewater Treatment Plant Emergency Response Plan, and Stormwater Pollution Prevention Plan (3 separate plans).

American River Canyon Shaded Fuel Break (2021)

The City of Auburn has been identified as a "Community at Risk" in the National Fire Plan. The community is considered a risk due to the proximity of residential, commercial, and recreational development within the Wildland Urban Interface and the designated Very High and High Fire Hazard Severity Zones.

This document is established as a collaborative guide in an effort to reduce damage caused by wildfire by identifying public agency resources allocated to enhancement and maintenance of the American River Canyon Shaded Fuel Break; a natural vegetation fuels reduction project. The American River Canyon Shaded Fuel Break is intended to provide a means of protection to the Auburn community from the disaster of wildfire, preserve our natural and cultural resources, enhance our watershed, support wildlife habitat, and maintain recreational opportunities to the pristine American River, Auburn State Recreation Area, and U.S. Bureau of Reclamation lands in and around the City of Auburn.

This plan is a collaborative effort between the U.S. Bureau of Reclamation, California State Parks, City of Auburn Fire Department, and Placer Land Trust holdings within the project area, to identify limited agency resources and priority areas to be enhanced and maintained on the American River Canyon Shaded Fuel Break. This plan is in addition to and supports the "Project Canyon Safe" program as developed by the Greater Auburn Area Fire Safe Council.

OTHER PLANS RELATED TO MITIGATION

A.6.2. Administrative/Technical Mitigation Capabilities

Table A-35 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Auburn.

Table A-35 City of Auburn's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	Auburn relies on grant funding projects
Mutual aid agreements	Y	coordination is effective
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y FT	Staff is adequate to enforce regulations
Floodplain Administrator	Y FT	

Emergency Manager	Y FT	
Community Planner	Y FT	
Civil Engineer	Y FT	
GIS Coordinator	N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Police Dispatch and Administrative Services, ESC
Hazard data and information	Y	
Grant writing	Y	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Ensure City facilities are capable of providing and sustaining essential services during times of emergencies and disasters. The City will continue to pursue grant opportunities to bolster staff and programs in areas deemed as inadequate.		

Source: City of Auburn

A.6.3. Fiscal Mitigation Capabilities

Table A-36 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-36 City of Auburn's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	
Other federal funding programs		
State funding programs		

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Other		
How can these capabilities be expanded and improved to reduce risk?		
Projects within the City often require grant funding to reach completion. Having dedicated staff to continually pursue funding opportunities for hazard mitigation would greatly improve on the City’s ability to obtain grants and accomplish projects.		

Source: City of Auburn

A.6.4. Mitigation Education, Outreach, and Partnerships

Table A-37 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table A-37 City of Auburn’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Numerous service clubs, Police volunteers, fire department volunteers, neighborhood watch
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	
Natural disaster or safety related school programs	Y	
StormReady certification	N	
Firewise Communities certification	Y	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City upholds many active partnerships and participates in a variety of strategic plans, educational and outreach programs addressing a variety of natural and man-made disasters. Development of the public-private partnerships would widen the City’s reach of education programs for disaster-related issue.		

Source: City of Auburn

A.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- The “Shaded Fuel Break” fuel modification project is implemented and continually evaluated as described in the 2015 Shaded Fuel Break Project, American River Canyon Implementation Program.

This program continues as of the writing of this Plan Update. The 2020/2021 Recommended Work Plan is the most recent version. Completed projects under this plan include the projects in Figure A-12.

Figure A-12 City of Auburn – Completed Fuels Projects near American River Canyon

Oversight Agency	Federal Land State Land Private Land	Area	Acres	Cost	Funding Source	Year
AFD	Federal	Robie to Overlook	40	\$288,206	SNC #567	2013/2014
AFD	Private	Marina	5	\$21,000	MFP	2013/2014
PRCD	Federal State Private	ASFB	250	\$1.99M	CAL FIRE Grant #17-FP-NEU-0090	2019/2020
AFD	Private	Tamaroo	12.2	\$52,000	MFP	2014, 2016, 2019
AFD	Private	Blackstone	9	\$62,200	MFP	2015, 2019
AFD	Private	Eagles Nest	9	\$49,500	MFP	2020
AFD	Federal Private	Olive Orchard/Aeolia	24	\$119,500	MFP, HOA, PLT	2014-2017, 2020
AFD	Private	Jordan Lane	8	\$40,000	MFP	2017
BOR	Federal	Jordan Lane	10	\$50,000	BOR	2017
AFD	Private	Jordan Lane	11	\$51,333	CA FSC	2020
BOR	Federal	Aeolia Heights	4	\$20,000	BOR	2014, 2017
AFD	Federal	Aeolia Heights	2	\$10,000	Auburn FSC	2020
AFD	Private	Gold Street	3	\$15,000	MFP	2017
AFD	Private	Virginia/Gold	20	\$92,437	MFP, CA FSC	2018-2020
AFD	Private	Riverview	14	\$24,000	HOA, CA FSC	2014, 2020

AFD: Auburn Fire Department

BOR: US Bureau of Reclamation

PRCD: Placer Resource Conservation District

PLT: Placer Land Trust

SNC: Sierra Nevada Conservancy

MFP: Placer County Middle Fork Project Fuels Reduction Program

FSC: California Fire Safe Council

HOA: Home Owners Association

- “Fire Plans for Development” are required for all new development within the City of Auburn. Such fire plans address the mitigation measures implemented to reduce potential damage and threat of wildfire. In addition, the fire plan describes the long term application and implementation of such measures that include responsibilities, funding, and evaluation.

- Annually, physical inspections are made by fire department personnel for defensible space and fuel modification on residences throughout the City of Auburn. Specific areas are concentrated on each year.
- Development and implementation of the Stormwater Treatment Plan continues.
- The Greater Auburn Area Fire Safe Council was enhanced/expanded to include surrounding fire districts and areas of wildfire concern.
- The Greater Auburn Area Fire Safe Council was instrumental in developing the Greater Auburn Area Fire Safe Plan.
- The Greater Auburn Area Fire Safe Council participated in the development of the Community Wildfire Protection Plan.
- The City of Auburn is signatory and participates in the Western Placer County Fire Chief's Automatic Response Agreement and Operations Plan for Placer County.
- Auburn Fire Department with several community stakeholders created the Wildfire Strategic Plan.
- Auburn Fire and CAL FIRE agreed to designate the City of Auburn as a mutual threat zone and will approve a standard CAL FIRE response to all reported vegetation fires and other fire types that pose a threat to the vegetation and surrounding communities.
- Several existing "open space" areas within the City of Auburn have been "fire planned" that includes fuel modification projects to reduce the exposure of wildfire.
- Prior to the storm season, physical inspections of waterways and the storm drain system are completed and then cleaned and cleared as necessary
- Prior to a storm warning, storm drains and waterways are inspected and cleaned as necessary
- Prior to a storm warning, Public Works crews prepare sandbags in preparation for possible flooding activities

A.7 Mitigation Strategy

A.7.1. Mitigation Goals and Objectives

The City of Auburn adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

A.7.2. NFIP Mitigation Strategy

The City of Auburn joined the National Flood Insurance Program (NFIP) on December 23,1981. As a participant of the NFIP, the City of Auburn has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Auburn will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Auburn actively participates with Placer County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Auburn as for Placer County since participation at the County level includes all local jurisdictions.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City's Municipal Code has a Flood Damage Prevention Section under the Zoning

Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Placer County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Auburn is not a current participant in the CRS program.

More information about the floodplain administration in the City of Auburn can be found in Table A-38.

Table A-38 City of Auburn Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	21 policies \$20,920 in premiums \$5,998,200 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	30 paid claims \$610,7000 in paid losses 2 substantial damage claims
How many structures are exposed to flood risk within the community?	23 improved parcels in the 1% annual chance flood zone, 0 in the 0.2% annual chance flood zone
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	0 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	None.
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, education, inspections
What are the barriers to running an effective NFIP program in the community, if any?	None
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 8/30/2004
Is a CAV or CAC scheduled or needed?	N
Regulation	
When did the community enter the NFIP?	12/31/1981
Are the FIRMs digital or paper?	Digital

NFIP Topic	Comments
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet.
Provide an explanation of the permitting process.	Permits are reviewed by building department to ensure that building is not in floodplain. If building is in the floodplain, the floodplain ordinance is enforced and those building standards are used.
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

A.7.3. Mitigation Actions

The planning team for the City of Auburn identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Wildfire

Though initially considered priorities for the City, the following are considered low priority hazards for mitigation action purposes:

- Earthquake
- Pandemic
- Severe Weather: Heavy Rains and Storms

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific

projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Auburn Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this LHMP Update, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Location of Project: Citywide

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Auburn in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 3. *Continue Annual Weed Abatement Ordinance*

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Severe Weather: Extreme Heat, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Fire hazards can come in the form of both wildfires and urban fires. California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The City of Auburn has a 62% probability of a hostile fire ignition in the High Fire Severity Zone or Very High Severity Zone by Cal Fire in compliance with the Bates Bill (California Government Code sections 51175-51188). In the event the hostile fire occurs during a weather event (Red Flag), the likelihood of devastating effects is likely. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural ignition sources, has created conditions for extensive wildfires within the City of Auburn.

Project Description: The City shall continue to enforce all adopted Weed Abatement Ordinances. Implementing the 5 “E’s” Engineering, Enforcement, Education, Emergency Response and Economic Incentive from the Auburn City Fire Wildland Urban Interface Strategic Plan, 2019.

Other Alternatives: Rely on property owners to take action and follow local ordinances.

Existing Planning Mechanisms through which Action will be Implemented: Work with the current property owner or land manager to implement and enforce weed abatement ordinances in the City. Apply for local, State, or Federal funding to implement these plans.

Responsible Office: City of Auburn (Fire, Planning, Public Works, and Police Departments)

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined and will depend on the scope and frequency of activities and events as well as volunteer participation.

Potential Funding: Local Budgets, Grant Funds

Benefits (avoided Losses): Reduced risk of loss of life, property, and the environment from catastrophic wildfire in developed within the City.

Schedule: Ongoing

Action 4. *Implement Wildland-Urban Interface Planning and Risk Mitigation Project*

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Severe Weather: Extreme Heat, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Fire hazards can come in the form of both wildfires and urban fires. California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The City of Auburn has a 62% probability of a hostile fire ignition in the High Fire Severity Zone or Very High Severity Zone by Cal Fire in compliance with the Bates Bill (California Government Code sections 51175-51188). In the event the hostile fire occurs during a weather event (Red Flag), the likelihood of devastating effects is likely. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural ignition sources, has created conditions for extensive wildfires within the City of Auburn.

Project Description: Create a Wildland-Urban Interface Fire Planning and a fire risk mitigation project assessment for the City of Auburn. The City desires to involve its public safety partners and stakeholders in developing collaborative emergency response plan for catastrophic wildfire, as well as develop a prioritized list of needed risk mitigation projects that may be undertaken with future funding to mitigate identified risk issues.

Other Alternatives: Continue current efforts to reduce wildfire risk in place.

Existing Planning Mechanisms through which Action will be Implemented: Work with the current stakeholders, consultant, and other departments as necessary to implement the development of the Wildland-Urban Interface Plan and Risk Mitigation Project for the City. Apply for local, State, or Federal funding to implement these plans.

Responsible Office: City of Auburn (Fire, Planning, Public Works Departments)

Priority (H, M, L): High

Cost Estimate: Costs to be determined and will depend on the scope and frequency of activities and events as well as stakeholder participation.

Potential Funding: Local Budgets, Grant Funds

Benefits (avoided Losses): Reduced risk of loss of life, property, and the environment from catastrophic wildfire in developed within the City.

Schedule: As soon as possible

Action 5. *Integrate community and ecological resiliency to climate change hazards, such as drought, extreme heat, flood, and vector-borne diseases.*

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Populations in Auburn tend to be more vulnerable to extreme heat, human health hazards, and wildfire, which directly affect health outcomes. Due to financial limitations, mobility challenges, and lack of access to medical care, the most sensitive populations include households in poverty, seniors living alone, outdoor workers, and persons experiencing homelessness. The homes that vulnerable populations live in, especially those located on single access roads, are also highly vulnerable to direct damage from hazards such as landslides, severe weather, and wildfire.

Project Description: Reduce health and economic risks associated with extreme heat and human health hazards. The City shall engage in partnerships and support local and regional interagency efforts to assess climate change impacts and to develop and implement strategies that increase resilience of vulnerable ecosystems.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanisms through which Action will be Implemented: The City works with regional, state, and federal plant and wildlife management agencies and organizations to protect vulnerable habitat and improve ecosystem connectivity. Ensure that there are safe places for community members to gather during hazardous events, including extreme temperatures. The City encourages projects that include landscaping to use plants that will continue to be viable in the area under long-term future climate conditions. Reduce health and economic risks associated with extreme heat and human health hazards.

Responsible Office: Citywide

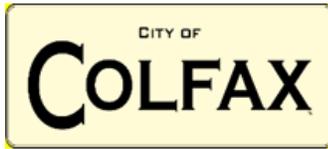
Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local Budgets, Grant Funds

Benefits (avoided Losses): Protect and increase residents' knowledge of climate change hazards, such as drought, extreme heat, and vector-borne diseases. Establish ecological resiliency within the City.

Schedule: Ongoing



Annex B City of Colfax

B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Colfax, a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Colfax, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

B.2 Planning Process

As described above, Colfax followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table B-1 City of Colfax – Planning Team

Name	Position/Title	How Participated
Wes Heathcock	City Manager	Provided past occurrence info, provided input on mitigation actions
Emmanuel Ursu	Planning Director	Attended meetings, reviewed the annex, updated the mitigation actions

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table B-2.

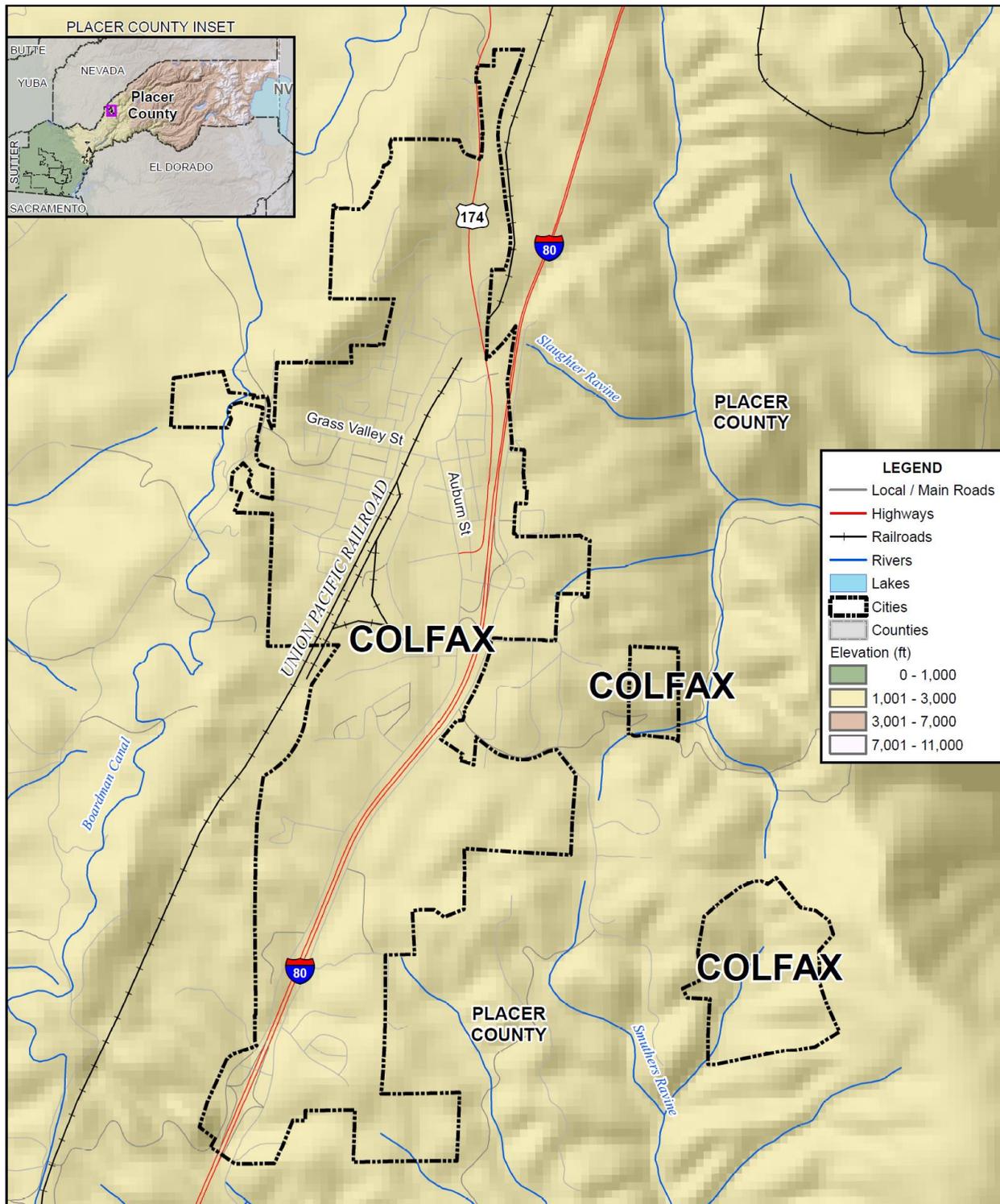
Table B-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	There was no related mitigation planning. The General Plan is being updated in 2021 and the LHMP will be incorporated into it.

B.3 Community Profile

The community profile for the City of Colfax is detailed in the following sections. Figure B-1 displays a City map and the location of Colfax within Placer County.

Figure B-1 City of Colfax



0 0.55 1.1 Miles



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

B.3.1. Geography and Climate

The City of Colfax is the northern-most incorporated city in Placer County, located in the Sierra Nevada Foothills at a general elevation of 2,400 feet above msl. The City covers an area of 1.3 square miles and straddles I-80. Colfax sits a few miles outside the Tahoe National Forest as I-80 begins its climb into the Sierras. The City of Colfax sits at approximately 2,425 feet above mean sea level.

Colfax average temperatures range from the low 80°F to low 90°F during the summer to the mid 30°F to low 40°F during the winter. Colfax receives an average of 45.59 inches of rain and 18.9 inches of snow annually.

B.3.2. History

Colfax was originally inhabited by the Maidu Indians. In 1849 during the frenetic days of the Gold Rush, southeast of present-day Colfax, Illinoistown (previously known as Alder Grove) rose as a major supply hub for the Sierra Foothill mining camps. In 1865, destiny doomed the thriving community when transcontinental railroad engineers bypassed it. Railroad construction Camp 20 became the town site of choice. Camp 20 was later renamed Colfax in honor of Schuyler Colfax, who visited the town in 1865 when he was Speaker of the House, assuring the construction crew that the government was committed to completing the transcontinental railroad. The town went on to become a major switching and maintenance station for the Central Pacific and Southern Pacific, and in 1876 a terminus for the Nevada County Narrow Gauge Railroad, serving the fruit orchards of the area and Nevada County gold mines. Colfax was incorporated as a city in 1910.

B.3.3. Economy

Colfax is the home several major employers: GKM Corporation, Winner Chevrolet, Placer Union High School District, Hills Flat Lumber, Crispin Cider, and Sierra Market. US Census estimates show economic characteristics for the City of Colfax. These are shown in Table B-3 and Table B-4. Mean household income in the City was \$57,734. Median household income in the City was \$70,575.

Table B-3 City of Colfax – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	20	2.1%
Construction	99	2.1%
Manufacturing	69	10.2%
Wholesale trade	57	7.1%
Retail trade	177	5.9%
Transportation and warehousing, and utilities	56	18.3%
Information	8	5.8%
Finance and insurance, and real estate and rental and leasing	91	0.8%

Industry	Estimated Employment	Percent
Professional, scientific, and management, and administrative and waste management services	70	9.4%
Educational services, and health care and social assistance	150	7.2%
Arts, entertainment, and recreation, and accommodation and food services	66	15.5%
Other services, except public administration	38	6.8%
Public administration	77	3.9%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table B-4 City of Colfax – Income and Benefits

Income Bracket	Percent
<\$10,000	5.8%
\$10,000 – \$14,999	13.6%
\$15,000 - \$24,9999	9.4%
\$25,000 – \$34,999	5.0%
\$35,000 – \$49,999	9.5%
\$50,000 – \$74,999	21.2%
\$75,000 – \$99,999	13.9%
\$100,000 – \$149,999	14.7%
\$150,000 – \$199,999	1.4%
\$200,000 or more	5.5%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

B.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the City of Colfax was 2,152.

B.4 Hazard Identification

Colfax’s identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Colfax (see Table B-5).

Table B-5 City of Colfax—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Significant	Likely	Critical	Medium	High
Earthquake	Significant	Occasional	Critical	Low	Low
Floods: 1%/0.2% annual chance	Limited	Unlikely	Negligible	Low	Medium
Floods: Localized Stormwater	Significant	Occasional	Limited	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Extensive	Likely	Critical	Medium	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Significant	Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Significant	Likely	Limited	Low	Medium
Severe Weather: Heavy Rains and Storms	Significant	Limited	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Significant	Likely	Critical	Medium	Low
Tree Mortality	Significant	Likely	Catastrophic	High	High
Wildfire	Significant	Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths. Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability. Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability. Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

B.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Colfax’s hazards and assess the City’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table B-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

B.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section B.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

B.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Colfax’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table B-6 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the City.

Table B-6 City of Colfax – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	118	70	\$12,126,301	\$21,608,886	\$21,608,886	\$55,344,073
Industrial	33	20	\$9,487,797	\$15,276,833	\$22,915,248	\$47,679,878
Institutional	13	9	\$1,039,080	\$5,047,655	\$5,047,655	\$11,134,390
Miscellaneous	166	3	\$2,860,671	\$20,892	\$20,892	\$2,902,455
Natural / Open Space	16	0	\$0	\$0	\$0	\$0
Residential	642	609	\$39,484,118	\$110,214,317	\$55,107,156	\$204,805,591
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387

Source: Placer County 2020 Parcel/Assessor's Data

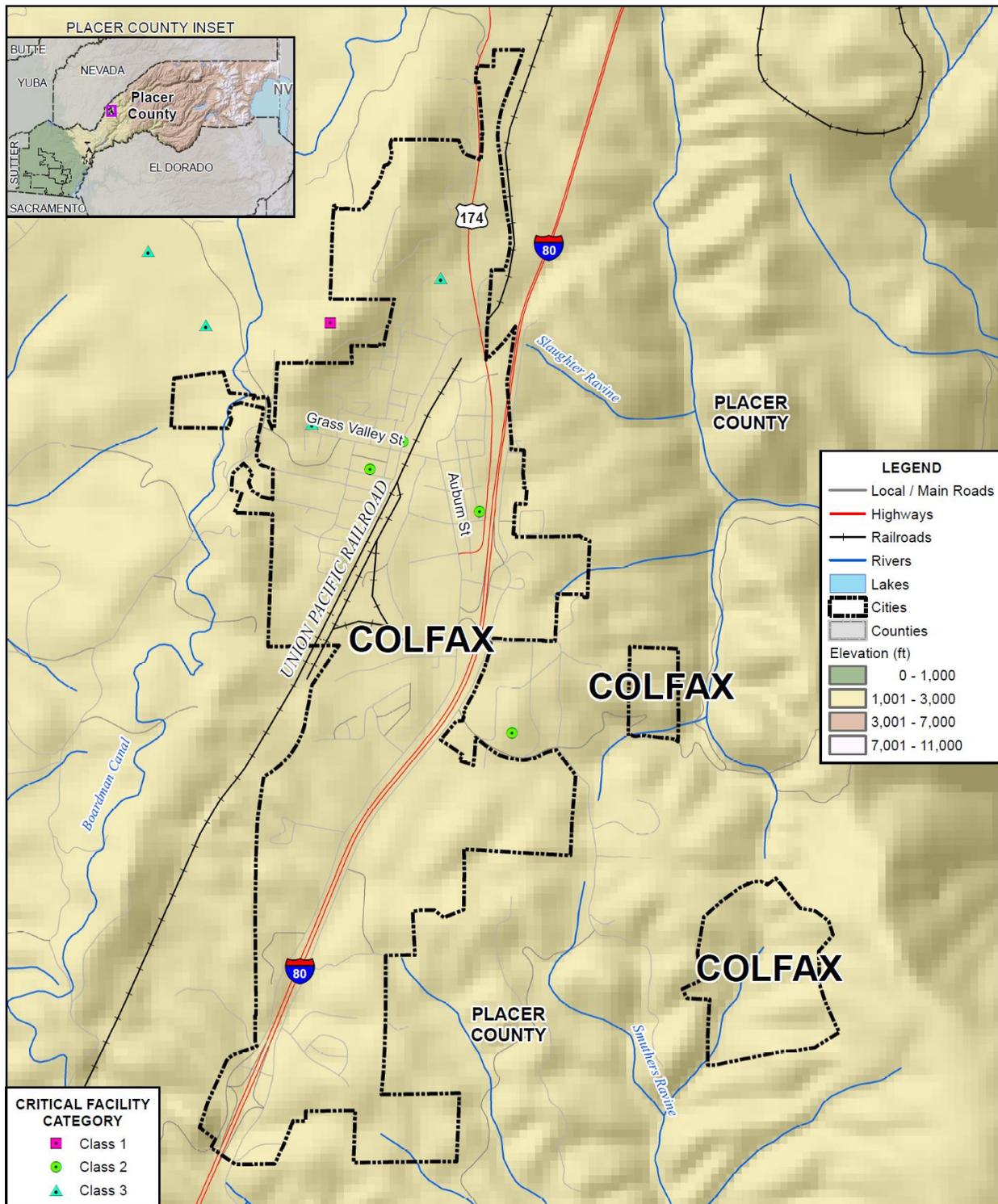
Critical Facilities and Infrastructure

Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan. An inventory of critical facilities in the City of Colfax from Placer County GIS is shown on Figure B-2 and detailed in Table B-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure B-2 City of Colfax – Critical Facilities



FOSTER MORRISON
CONSULTING

0 0.55 1.1 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table B-7 City of Colfax – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 2	Fire Station	2
Class 3	Police Station	1
	Hall	1
	Water Treatment Plant	1
Colfax Total		5

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City of Colfax has a variety of habitat types that include urban, annual grasslands, seasonal wetlands, riparian zones, and oak savannah woodlands. These environments support plant and wildlife that include protected and special status species listed in the Table B-8.

Table B-8 Threatened Species in the City of Colfax Planning Area

Common name	Scientific Name	Federal Status*	State Status
Birds			
Fringed myotis	<i>Myotis thysanodes</i>	SC	–
Long-eared myotis	<i>Myotis evotis</i>	SC	–
Long-legged myotis	<i>Myotis volans</i>	SC	–
Small-footed myotis	<i>Myotis ciliolabrum</i>	SC	–
Spotted bat	<i>Euderma maculatum</i>	SC	SSC
Yuma myotis bat	<i>Myotis yumanensis</i>	SC	SSC
Black swift	<i>Cypseloides niger</i>	SC, MNBMC	SSC
Vaux’s swift	<i>Chaetura vauxi</i>	–	SSC
Prairie falcon	<i>Falco mexicanus</i>	MNBNC	SSC
Lawrence’s goldfinch	<i>Carduelis lawrencei</i>	SC, MNBMC	–
Bank swallow	<i>Riparia</i>	–	T
Tricolored blackbird	<i>Agelaius tricolor</i>	SC, MNBMC	SSC
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC, MNBMC	SSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	E
Northern goshawk	<i>Accipiter gentilis</i>	SC	SSC
Insects			
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	T	–
Shirrtail Creek stonefly	<i>Megalentra sierra</i>	SC	–
Sagehen Creek goracean caddisfly	<i>Goracea oregano</i>	SC	–
Spiny rhyacophilan caddisfly	<i>Rhyacophila spinata</i>	SC	–

Common name	Scientific Name	Federal Status*	State Status
Amphibians			
Foothill yellow legged frog	<i>Rana boylei</i>	SC	SSC
California red-legged frog	<i>Rana aurora dratonii</i>	T	SSC
Northwestern pond turtle	<i>Clemmys marmorat marmorata</i>	SC	SSC
California horned lizard	<i>Phrynosoma coronatum frontale</i>	SC	SSC
*Status explanations			
Federal E – listed as endangered under the federal Endangered Species Act T – listed as threatened under the federal Endangered Species Act MNBMC – Fish and Wildlife Service: Migratory Nongame Birds of Management Concern SC = species of concern, formerly Category 2 candidate for federal listing – = no listing status		State E = listed as endangered under the California Endangered Species Act T = listed as threatened under the California Endangered Species Act SSC = species of special concern – = no listing status	

Source: City of Colfax Wastewater Treatment Plant Improvements Project Environmental Impact Report (2004)

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

The City of Colfax has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table B-9 lists the historical buildings in the City.

Table B-9 City of Colfax – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Colfax Freight Depot (N2076)	X			12/17/1999	Colfax
Colfax Passenger Depot (N2044)	X			1/15/1999	Colfax
First Transcontinental Railroad-Colfax (780)		X		11/20/1962	Colfax
Stevens Trail (N2181)	X			11/20/2002	Colfax

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/> retrieved on 12/6/2020

In addition to the registered sites, there are several assets within Colfax that define the community and represent the City’s history. Some of the historical sites of importance to Colfax are listed below.

- Neff House at 55 West Grass Valley St.
- The Colfax Hotel at Grass Valley St. and Railroad St.
- Chamber of Commerce Rail Car

- Perkins-Lobner Victorian on Railroad St.
- Colfax Fruit Sheds
- Lincoln Highway and Highway 40 routes went through the City
- Schuyler Colfax statue at Grass Valley St. and Railroad St.
- Northwestern Pacific Caboose, Number 28 at Main St. and Grass Valley St.
- Fire Bell Tower at the north end of the Colfax Freight Depot
- Hydraulic Monitor at the foot of the flagpole on North Main St.
- Judge Jacob Kuenzly home at Depot St. and Pleasant St.
- Masonic Building and IOOF Building on North Main St.
- Colfax Record Newspaper building at 25 W. Church St.
- Colfax City Hall at 33 South Main St.
- Colfax Theater at 49 South Main St.
- Building currently housing the Colfax Branch Library at South Main St. and Church St.
- All of the other buildings along the west side of North and South Main St.
- Colfax Cemetery on North Canyon Way
- Cape Horn railroad roadbed

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Colfax General Plan Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Colfax has generally seen growth that has been mostly steady, with population losses occurring in the late 1960s. Colfax has seen growth rates as shown in Table B-10.

Table B-10 City of Colfax – Population Changes Since 1950

Year	Population	Change	% Change
1950	820	–	–
1960	915	95	59.2%
1970	798	-117	-12.8%
1980	981	183	22.9%
1990	1,306	333	33.1%

Year	Population	Change	% Change
2000	1,597	291	14.5%
2010 ¹	1,963	364	22.9%
2020 ²	2,152	189	9.6%

Source: ¹US Census Bureau, ²California Department of Finance

Special Populations and Disadvantaged Communities

The City noted that there are certain groups of people in the City who would need extra assistance in times of disaster. The City noted that there are 300 persons with disabilities in Colfax representing 14.8% of the total population and there are 220 seniors (65 years or more) accounting for one-quarter of the total population. Thirty (30) seniors have a disability. Canyon View Apartments (at 205 Canyon Ct., Colfax) is a senior affordable-housing development with 67 units (including one manager’s unit).

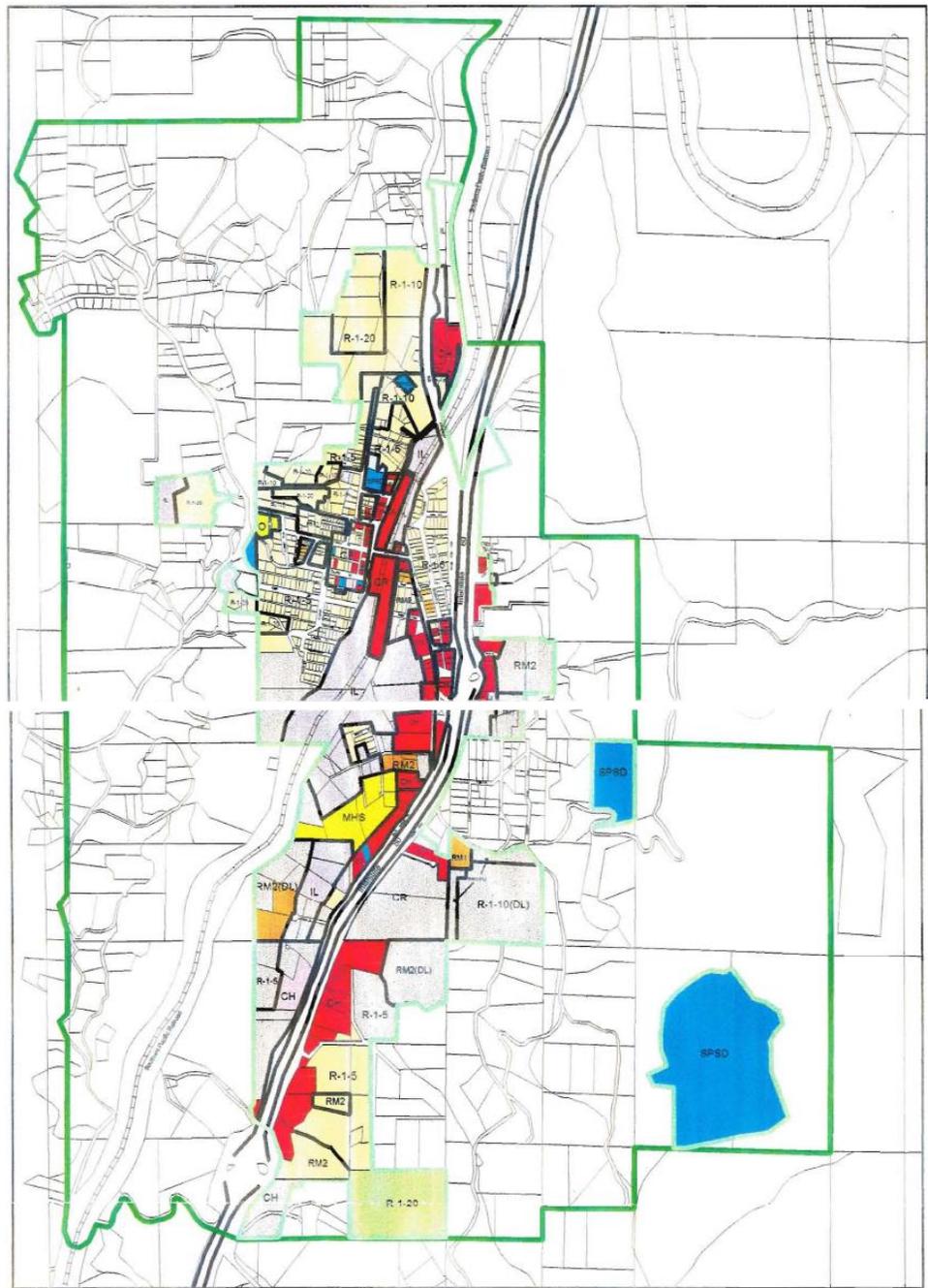
Persons with developmental disabilities include those with intellectual disabilities, cerebral palsy, epilepsy, and autism. There are 73 persons with a developmental disability in Colfax.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City’s land use designations are generally described below and mapped on the Land Use Diagram (Figure B-3). The Colfax Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Colfax. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use for the City of Colfax from the City of Colfax General Plan Land Use Element is shown on Figure B-3.

Figure B-3 City of Colfax – Land Use Diagram



- Existing Land Use**
- Agriculture
 - Commercial
 - Industrial
 - Park
 - School
 - Quasi Public
 - Residential
 - Mobile Home
 - Multiple Family Residential
 - Religious
 - Vacant

- Zoning Designations**
- A-1 Agricultural
 - SPSD Special Public Service District
 - CH Commercial Highway
 - CR Commercial Retail
 - IL Limited Industrial
 - DL Density Limitations
 - O Open Space

- R-1-5 Residential 5,000 Square Foot Maximum
- R-1-10 Residential 10,000 Square Foot Maximum
- R-1-20 Residential 20,000 Square Foot Maximum
- RM1 Multiple Family Residential
- RM2 Multiple Family Residential High Density

City of Colfax City Limits

City of Colfax Sphere of Influence

1000 0 1000 feet
scale

Produced for California State University, Chico
In Cooperation with the Geographic Information Center
Cartography by Kent Johanns



Source: City of Colfax 1998 General Plan Land Use Element

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table B-11 and Table B-12.

Table B-11 City of Colfax – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	23	46	30	26	27
Industrial	0	1	0	0	0
Residential	63	67	46	74	71
Unknown	0	0	0	0	0
Total	86	114	76	100	98

Source: City of Colfax Building Department

Table B-12 City of Colfax – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area ¹	Other
Agricultural	0	0	0	0
Commercial	0	0	152	0
Industrial	0	0	1	0
Residential	0	0	321	0
Unknown	0	0	0	0
Total	0	0	474	0

Source: City of Colfax Building Department

¹Moderate or higher wildfire risk area

Future Development

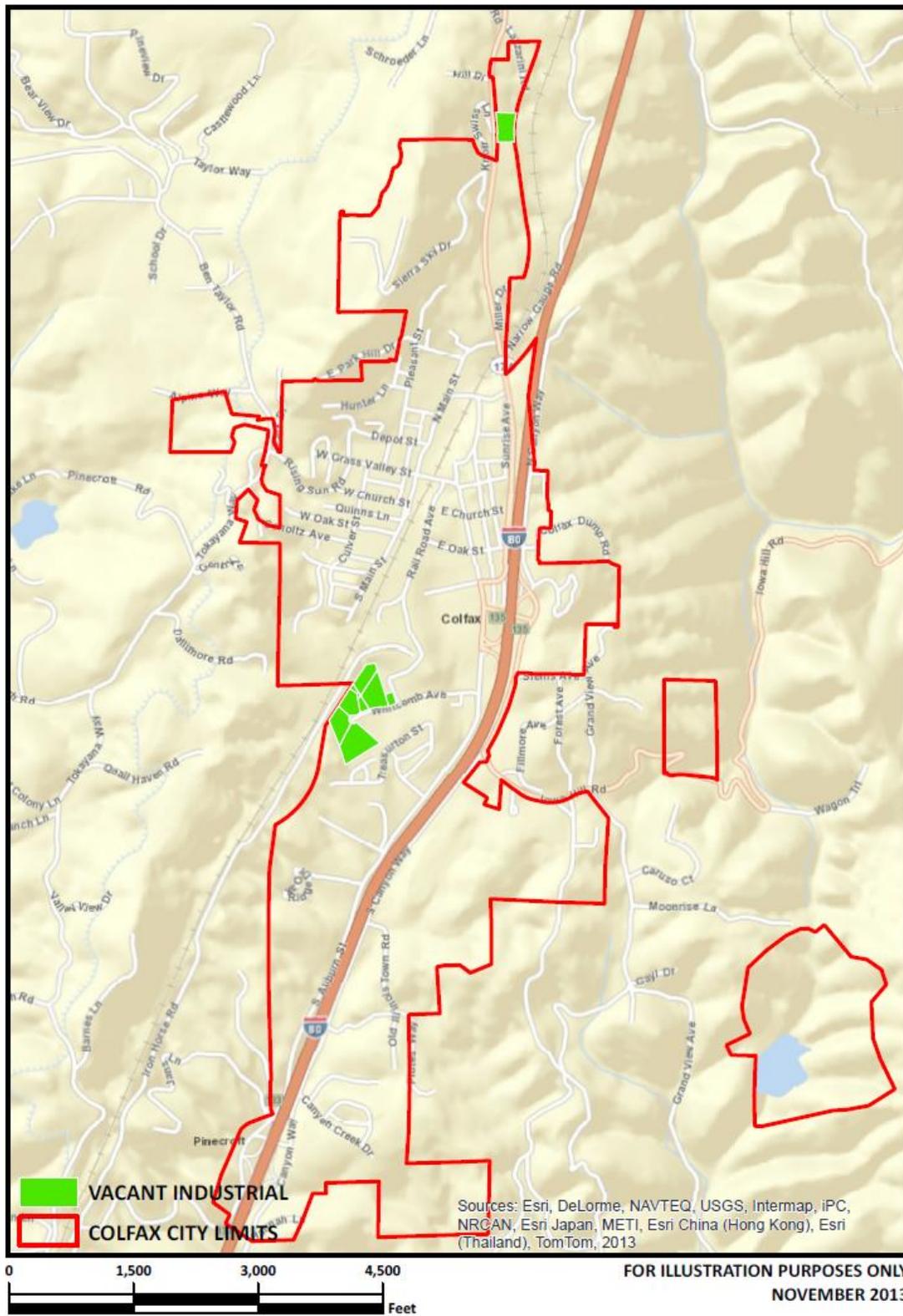
New development in Colfax continues to be slow. While there are a few areas for new development, the majority of the undeveloped land in the City is very sloped and therefore challenging to build. Development projects recently approved or under construction include the following:

- Village Oaks – 38-lot single-family lot subdivision adjacent to Pine Top Apartments on south side of Iowa Hill Road (APN: 101-170-029). Construction anticipated to commence in late 2021.
- Sierra Oaks- 34-lot single-family subdivision on Sierra Oaks Drive adjacent to the Village Oaks subdivision. Home construction underway with completion of all 33 homes anticipated by early 2022.
- Best Western Hotel – three-story 69-room hotel under construction on South Auburn Street (APN: 100-230-022, 023 and 024).
- Shadow Wood – 20-lot single-family small lot subdivision on 101 through 120 Shadow Wood Place. Project will be complete around the end of 2021. The Sacramento Council on Governments (SACOG) modeled population projections for the City of Colfax and other areas of the region in 2016 for a

Metropolitan Transportation Plan/Sustainable Communities Strategy report. This forecast uses a 2012 base year estimate with projections to 2020 and 2065 for population, housing units, households and employment. SACOG estimated the City population in 2020 and 2035 to be 2,078 and 2,297 respectively.

In the City's 2013-20121 Housing Element, maps of vacant residential and industrial lands were created. These are areas where future development could occur in the City. These are shown in Figure B-4 and Figure B-5.

Figure B-5 City of Colfax – Industrial Vacant Land Inventory Map



Source: 2013-2021 City of Colfax Housing Element

More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Colfax. Future development areas in the City were provided in mapped format by the City. 4 areas were provided. Using the GIS parcel spatial file for each of these areas, the 4 areas and 56 parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-6 shows the locations of future development areas the City is planning to develop. Table B-13 shows the parcels and acreages of each future development area in the City.

Figure B-6 City of Colfax – Future Development Areas

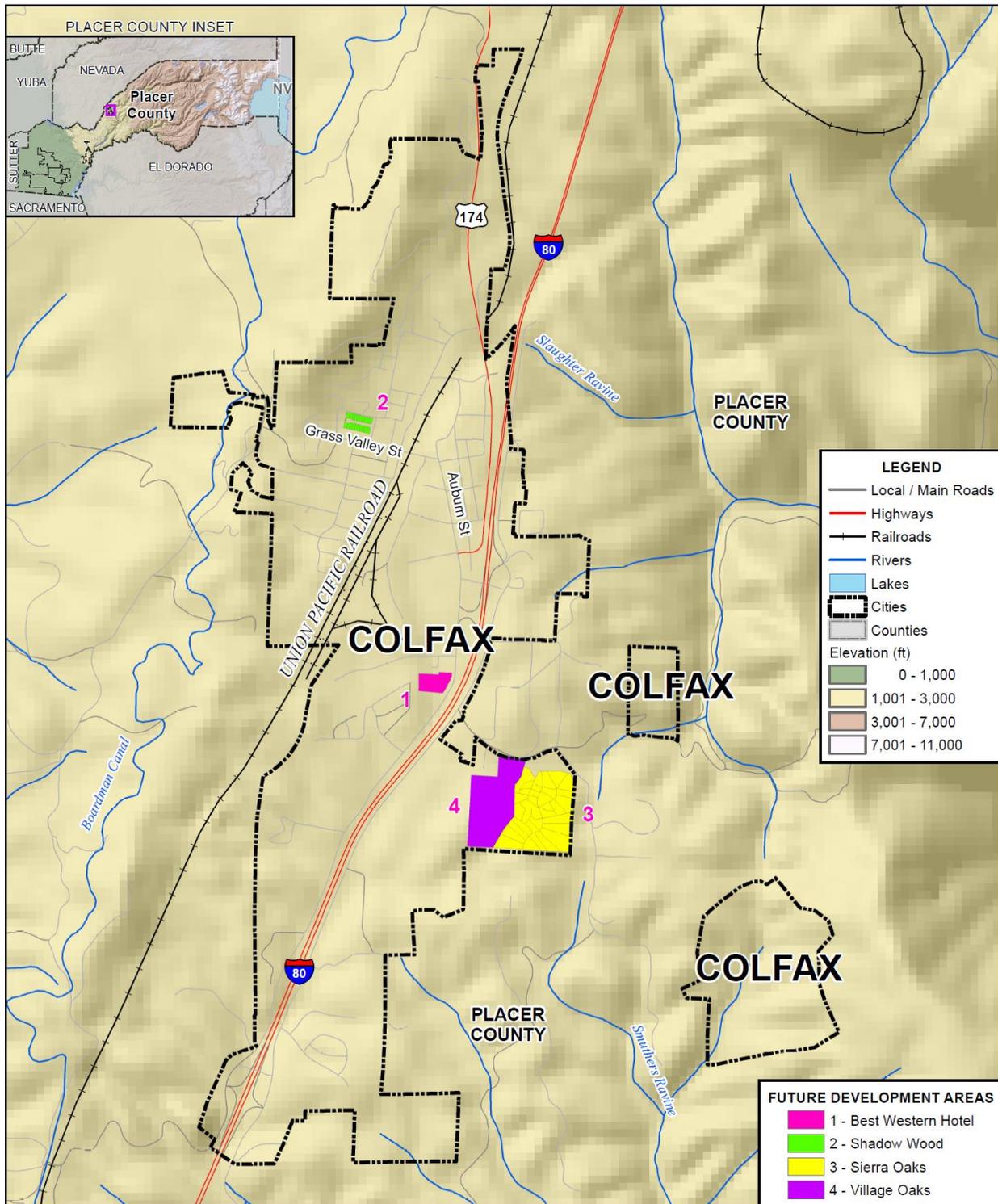


Table B-13 City of Colfax – Future Development Area Parcel and Acre Counts

Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Best Western Hotel	1	0	2
Shadow Wood	20	0	1
Sierra Oaks	34	10	19
Village Oaks	1	0	13
Grand Total	56	10	35

Source: City of Colfax

B.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table B-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table B-14.

Table B-14 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan. No losses or damage was reported as a result of the most recent drought (2014-2016).

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users.

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the planning area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

The impact of a drought on the City of Colfax is primarily one of water supply; however, the impact to natural resources in the area is also a concern. In addition, drought conditions contribute to increased wildfire risk. Domestic water for the City of Colfax is provided by the Placer County Water Agency. The source of water for the City of Colfax is the South Fork of the Yuba River and the Bear River. The water is conveyed from Lake Spaulding via the PG&E Drum Canal, into the Agency's Boardman Canal, and then in a pipe to the Colfax Water Treatment Plant. Near the City's ballpark, the Agency has an additional 1.0 million gallon reservoir.

A multiple year drought can severely compromise the water supply within the district and adversely impact natural resources. Most recently, after 2 years of below-average rainfall and very low snow-melt run off, Governor Brown, in 2014, declared a state of emergency for drought conditions statewide. The final California Department of Water Resources showed snowpack water content at only 5 percent of normal. With the unknowns of drought and globally changing climate conditions, the City continues to promote water conservation throughout the community.

Future Development

As the population in the area continues to grow, so will the demand for water. Ongoing planning will be needed by the City and water agencies to account for population growth and increased future water demands.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Low

Although ranked as a low significance hazard by the City, due to its significance in the County and in the State of California, the flood hazard assessment for Colfax is included here.

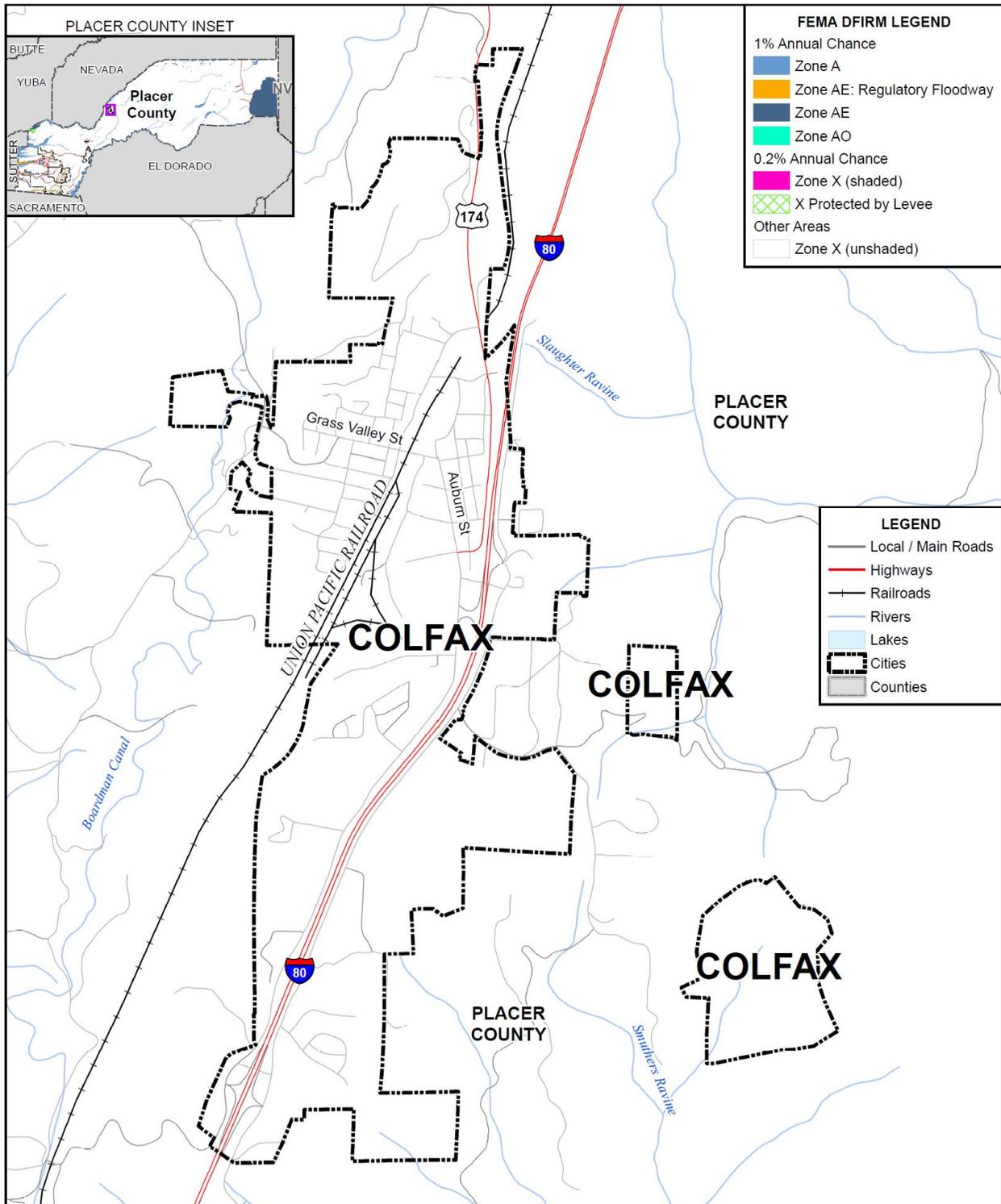
Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Placer County. Flooding generally is not a significant hazard to the City of Colfax, but limited localized stormwater flooding has occurred occasionally during heavy rainfalls and is discussed in the Flood: Localized Stormwater Flooding section below.

Location and Extent

The City of Colfax is located outside the 1% and 0.2% annual chance flood zones. This is seen in Figure B-7.

Figure B-7 City of Colfax – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table B-15 details the DFIRM mapped flood zones located within the City. As detailed below, Colfax is outside of any mapped FEMA flood hazard areas.

Table B-15 City of Colfax– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Colfax
A	1% annual chance flooding: No base flood elevations provided	
AE	1% annual chance flooding: Base flood elevations provided	
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table B-16. Again, this illustrates that the City falls outside FEMA flood hazard areas as all of the City falls within the X-unshaded Zone.

Table B-16 City of Colfax – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	0	0.00%	0	0.00%	0	0.00%
0.2% Annual Chance	0	0.00%	0	0.00%	0	0.00%
Other Areas	794	100.0%	347	100.0%	447	100.0%
Total	794	100.0%	347	100.0%	447	100.0%

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table B-17. These events may have affected the City to some degree.

Table B-17 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

The City noted no other past occurrences of flooding.

Vulnerability to and Impacts from Flood

During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County and the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

Based on the vulnerability of Colfax to the flood hazard, the sections that follow describes significant assets at risk in the City of Colfax. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Colfax does not have any FEMA floodplains and thus does not participate in the NFIP nor the CRS. As a result they do not track this information. Thus, there are no identified Repetitive Loss properties in the City.

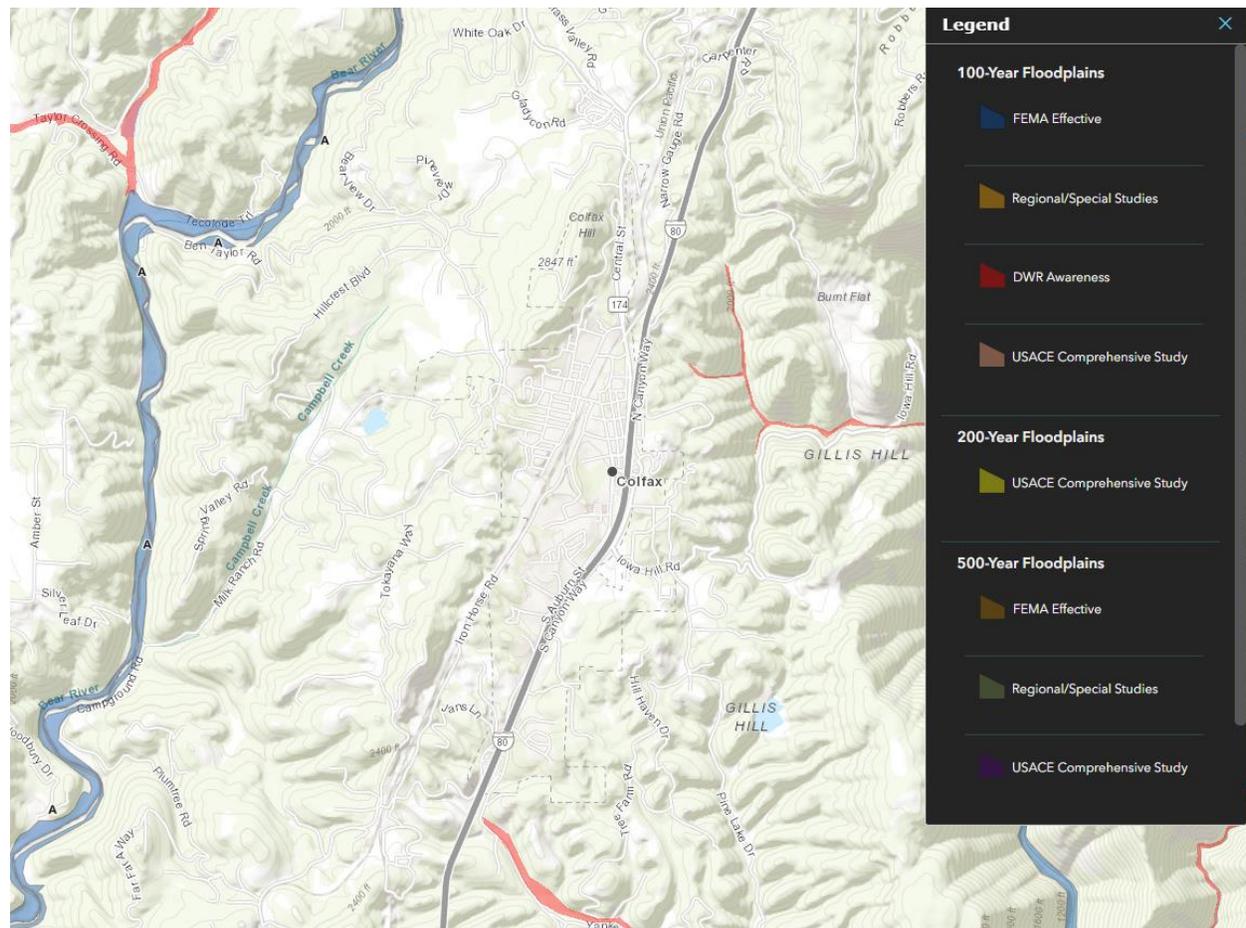
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Colfax is shown in Figure B-8. This map further illustrates the lack of a significant flood hazard in the City.

Figure B-8 City of Colfax – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

The City of Colfax does not have any FEMA flood hazard zones and thus future development will all occur outside the FEMA flood zones.

Pandemic

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur

when a new virus appears against which the human population has no immunity. It is important to realize that this LHMP Update does not examine pandemic contingency plans, but instead focuses on examining the risk of a normal hazard occurrence.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table B-18.

Table B-18 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

To limit the spread of COVID 19, stay-at-home orders were issued by the State of California and schools, churches, businesses and government offices were closed with only essential services allowed to continue in-person operation. Many functions transitioned to the internet and as the spread of the disease waxed and waned with multiple waves of new cases, restrictions were increased and then eased as hospitalizations and positivity rates declined. Colfax City Hall closed in March 2020 when the stay-at-home orders were issued

by California and administrative functions transitioned to the internet. Businesses activity dropped precipitously and sales tax revenue to the City dropped sharply with a 22% decrease in the second quarter of 2020 from the second quarter of 2019 and an 11% decrease in fiscal year 2020/2021 from fiscal year 2019/2020.

Vulnerability to and Impacts from Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the City. Pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic.

According to the American Community Survey, in 2018 the median household income in the City of Colfax was \$49,571, 34% lower than the state median and 20% lower than the median for Placer County. Approximately 68 % of households in Colfax are lower income. While the overall case rate in Colfax was low relative to other areas of the County likely in large part due to its small size and rural surroundings, lower income households statewide experienced higher rates of infection, hospitalization, and negative effects of COVID 19.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) an unemployment rose significantly. Supply chains for food can be interrupted.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by residents of the City, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

At least eight PSPS events affected the City of Colfax between October 14, 2018, and October 25, 2020. These events lasted between 11 hours (on September 25, 2019) to the longest power shut off that lasted almost 4 days (starting on October 26, 2019). In four events, power was shut off for more than 23 hours, in one event (starting on October 9, 2019) power was off for more than 61 hours and the longest event lasted three days, 18 hours and 27 minutes. These shut offs caused businesses, schools and government operations to temporarily stop. In response to the shut offs, PG&E installed a temporary micro grid to provide backup power generation for a small part of the community. Additional local generation capacity would reduce or eliminate the effects of the PSPS.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

Vulnerability to and Impacts from Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and early fall months. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen and the City may see an increase in dry fuels. Also, PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue, especially if power is shut off for an extended time. As detailed above, there were several extended power shutdowns in Colfax during time businesses were unable to operate.

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. As noted above, almost 68% of the residents of Colfax have lower incomes than the County median. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions and spread.

Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations and older structures that are not well insulated or have inefficient air conditioning systems. Vulnerability to extreme heat will increase as the average age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities.

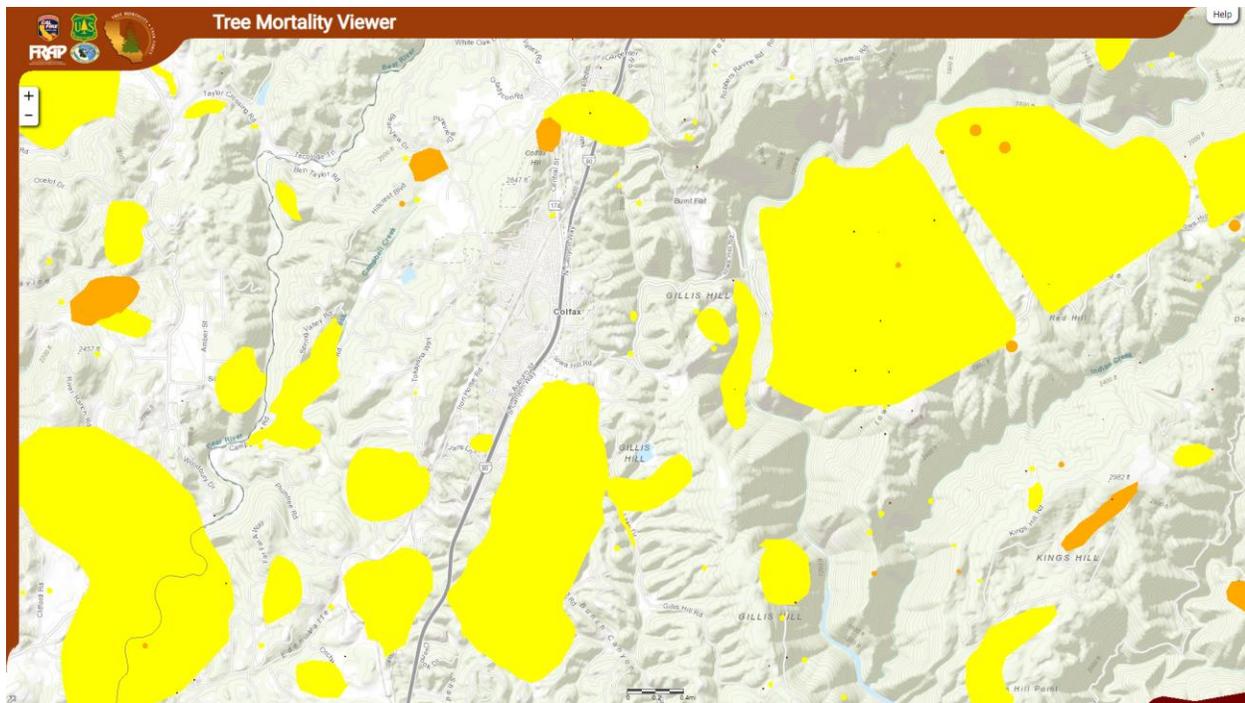
During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. CAL FIRE has mapped these areas, which are shown for the City of Colfax on Figure B-9. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 - 15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

Figure B-9 City of Colfax – Tree Mortality Areas



Source: CAL FIRE

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. Placer County is designated as Tier 2 High mortality hazard on the watershed scale along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

No direct damage has been reported in Colfax due to tree mortality although, removal of large dead trees can cost several thousand dollars and place an undue financial burden on residents, two-thirds of which have low incomes.

Vulnerability to and Impacts from Tree Mortality

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure. Also at issue is the costs associated with tree removal. Tree Mortality has significantly added to the green waste issue in affected areas.

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

The entire City of Colfax is in a very-high fire severity zone and tree mortality adds to the already high risk of wildfires in the community.

Future Development

Future development in wooded areas requires removal of undergrowth and of low hanging branches, careful selection of new vegetation that is fire resistant, and on-going maintenance.

Wildfire

Likelihood of Future Occurrence–Likely
Vulnerability–High

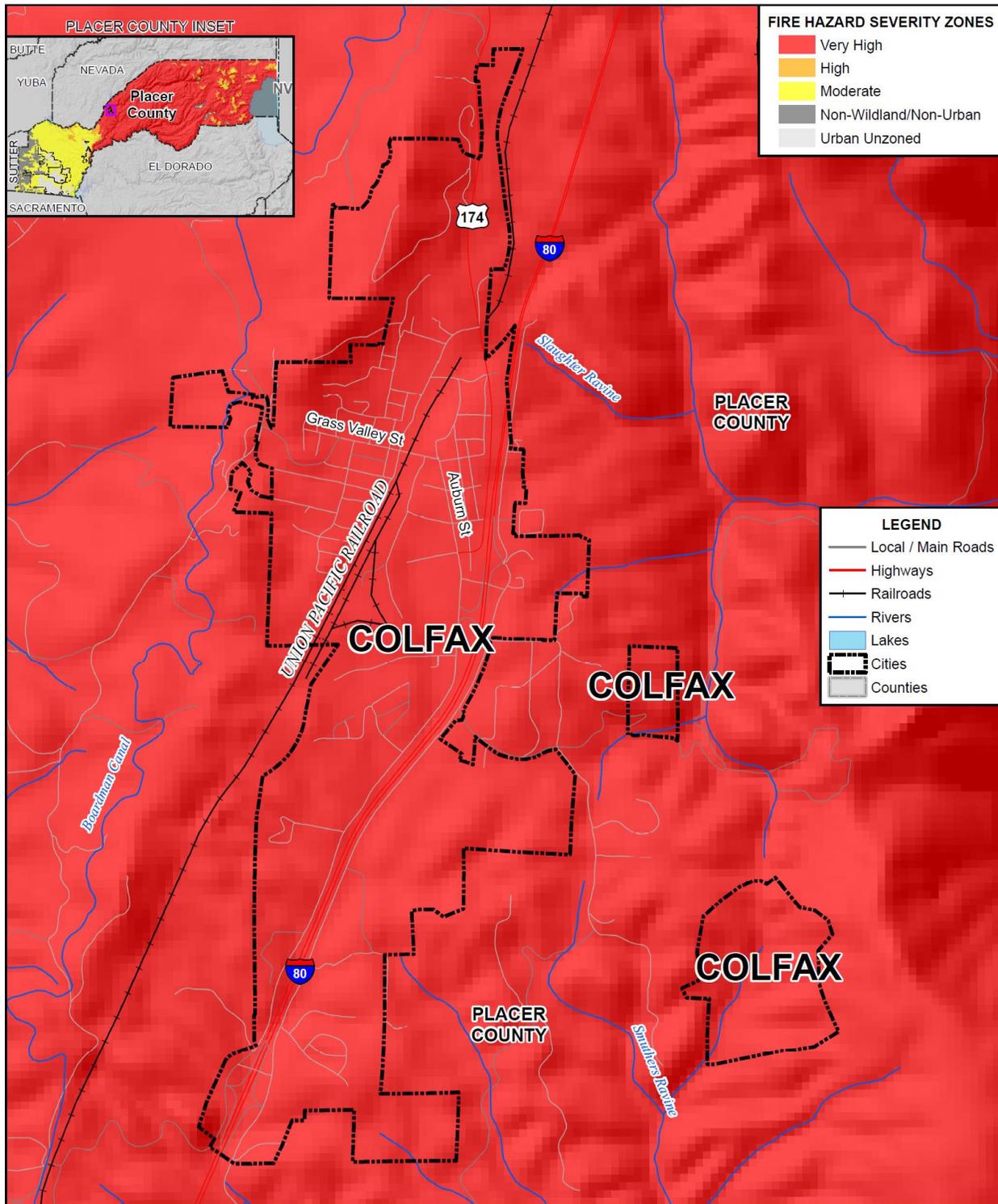
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Colfax. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Colfax were created. Figure B-10 shows the CAL FIRE FHSZ in the City. As shown on the maps, the entirety of the City falls in the Very High FHSZ.

Figure B-10 City of Colfax – Fire Hazard Severity Zones



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0 0.55 1.1 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table B-19.

Table B-19 City of Colfax – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	794	100.0%	347	100.0%	447	100.0%
High	0	0.00%	0	0.00%	0	0.00%
Moderate	0	0.00%	0	0.00%	0	0.00%
Non-Wildland/non-Urban	0	0.00%	0	0.00%	0	0.00%
Urban Unzoned	0	0.00%	0	0.00%	0	0.00%
Total	794	100.0%	347	100.0%	447	100.0%

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table B-20.

Table B-20 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The 2004 Stevens Fire threatened the City.

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and City, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Wildfire is a constant threat to the City of Colfax. The Safety Element of Colfax’s General Plan notes that Colfax and the surrounding area is designated as a “very high hazard area”, and wildland and wildland urban interface fires do occur relatively frequently. The Safety Element describes the following three factors that contribute to the wildfire hazard within the city and surrounding areas:

- A climatic pattern with long dry summers, clear skies with maximum solar radiation, high daytime summer temperatures, and extremely low relative humidity.
- Vegetation communities which often have adapted to this seasonal drought by becoming fire tolerant (e.g., chaparral), and have high fuel loading.
- Human settlement patterns which often are interspersed with areas of heavy vegetation/fuel accumulations along canyons, slopes, and foothill areas.

Much of Colfax is characterized by steep topography, narrow windy streets, and heavily vegetated hillsides. These areas present greater challenges for evacuation and access with fire-fighting apparatus. In the downtown, historic structures lack fire suppression systems and many buildings have connecting attics without fire walls to slow the spread of fire.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

Based on the vulnerability of Colfax to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Colfax. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Colfax. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in

fire hazard severity zones. Summary analysis results for Colfax are shown in Table B-21, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table B-21 City of Colfax – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table B-22 breaks out the Table B-21 by adding the property use details by fire hazard severity zone for the City. As shown in both of these tables, all of the City falls within the very high FHSZ.

Table B-22 City of Colfax – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	118	70	\$12,126,301	\$21,608,886	\$21,608,886	\$55,344,073
Industrial	33	20	\$9,487,797	\$15,276,833	\$22,915,248	\$47,679,878
Institutional	13	9	\$1,039,080	\$5,047,655	\$5,047,655	\$11,134,390
Miscellaneous	166	3	\$2,860,671	\$20,892	\$20,892	\$2,902,455
Natural / Open Space	16	0	\$0	\$0	\$0	\$0
Residential	642	609	\$39,484,118	\$110,214,317	\$55,107,156	\$204,805,591
Very High Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387
Colfax Total	988	711	\$64,997,967	\$152,168,583	\$104,699,837	\$321,866,387

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the City of Colfax – 2.45. According to this analysis, there is a total population of 1,401 residents of Colfax at risk to moderate or higher FHSZs. This is shown in Table B-23. It should be noted that this calculation is based on US Census Bureau averages for the City, in effect all 2,152 residents of the City would fall in the Very High FHSZ.

Table B-23 City of Colfax – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

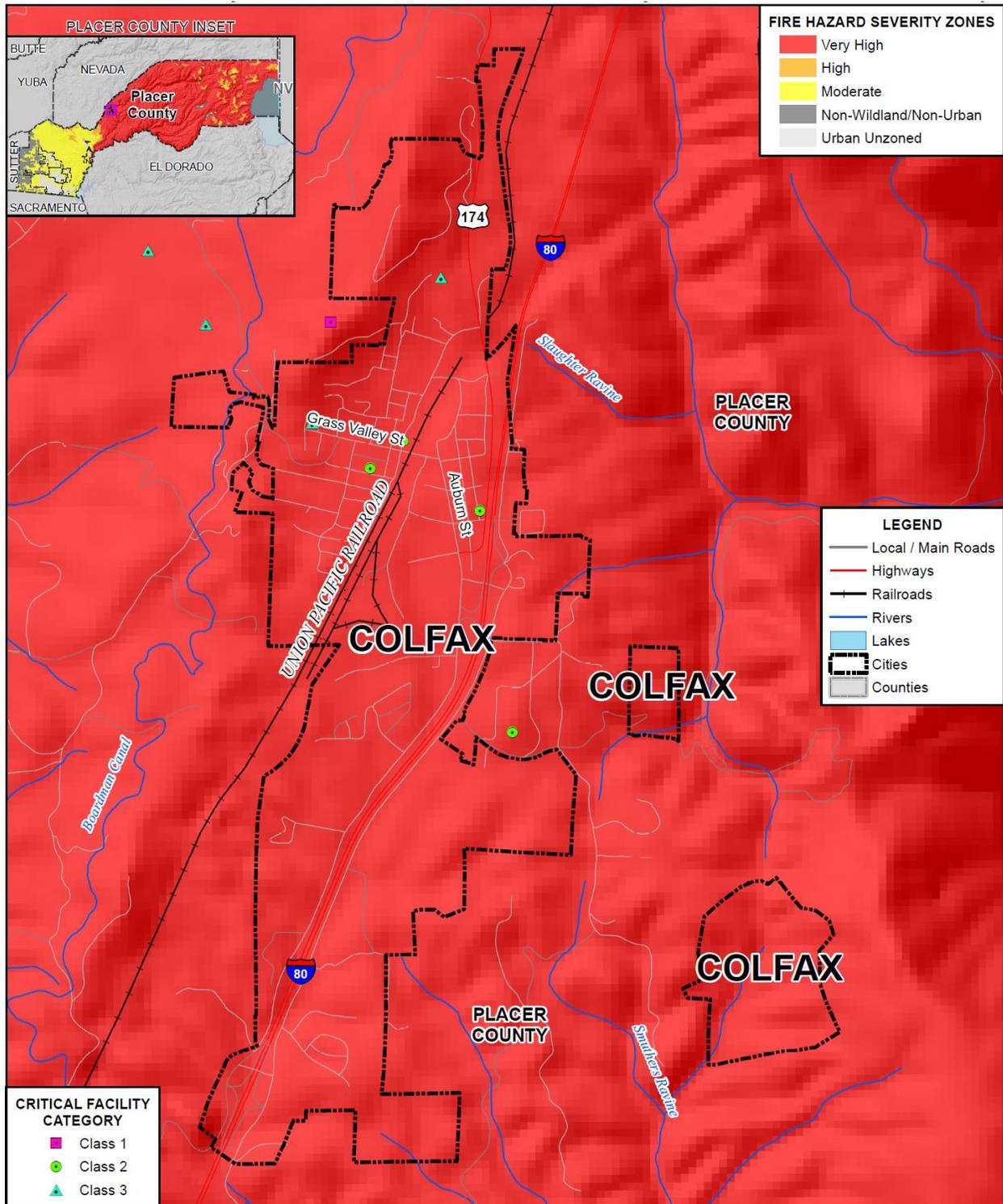
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Colfax	609	1,401	0	0	0	0

Source: Placer County 2020 Parcel/Assessor’s Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Colfax in identified FHSZs. Critical facilities in a FHSZ in the City of Colfax are shown in Figure B-11 and detailed in Table B-24. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure B-11 City of Colfax – Critical Facilities in Fire Hazard Severity Zones



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Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table B-24 City of Colfax – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
Very High	Class 2	Fire Station	2
		Police Station	1
	Class 3	Hall	1
		Water Treatment Plant	1
Very High Total			5
Colfax Total			5

Source: CAL FIRE, Placer County

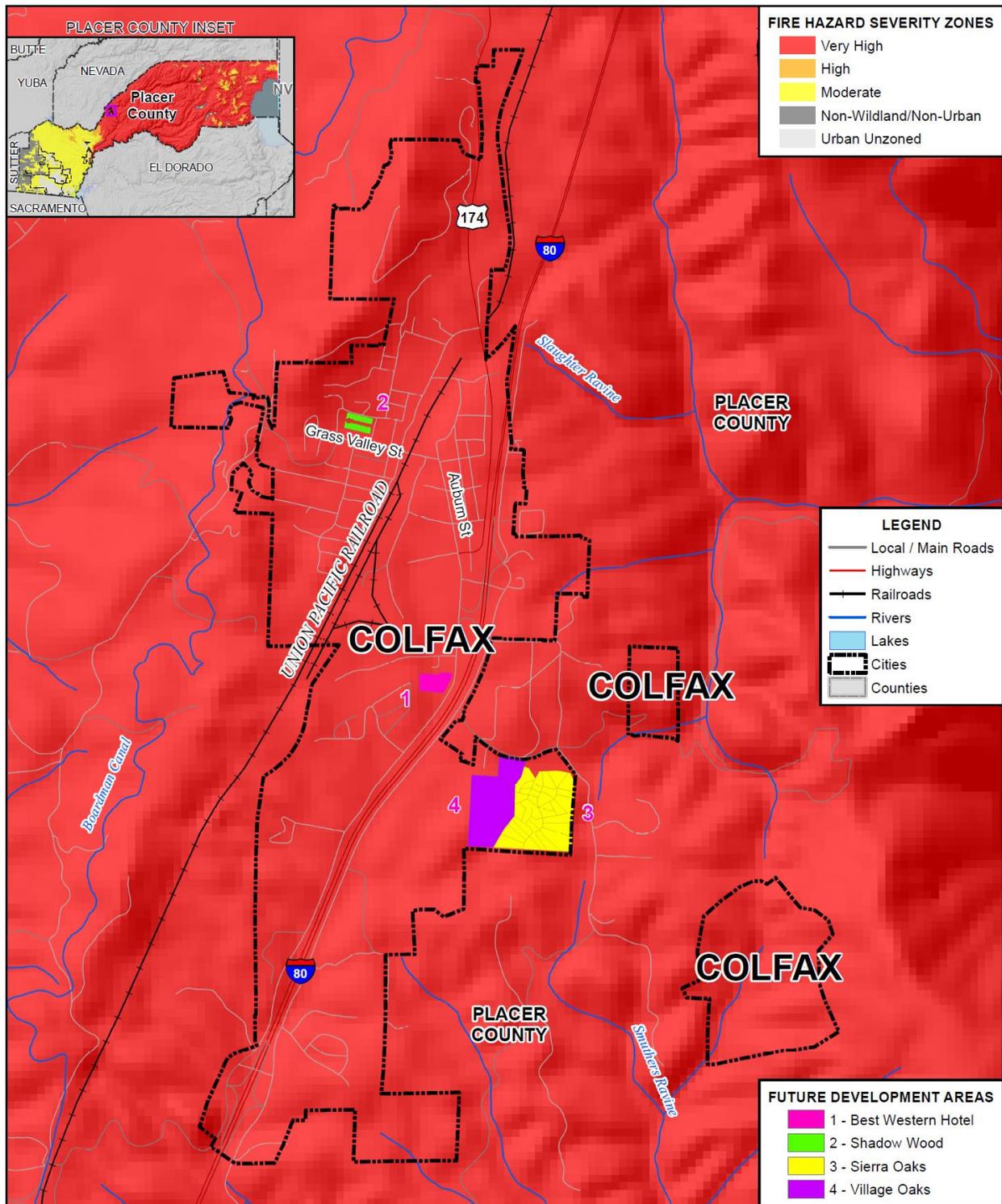
Future Development

Since the whole of the City is located in a very high fire severity zone, all future development in the City is at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk. The City could consider amendments to the building codes to reflect the local conditions associated with the very-high fire severity zone.

GIS Analysis

The City provided future development areas were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure B-12 shows the locations of future development areas the City is planning to develop on the FHSZs. Table B-25 shows the parcels and acreages of each future development area in the City in each FHSZ.

Figure B-12 City of Colfax – Future Development Areas and FHSZs



FOSTER MORRISON
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0 0.55 1.1 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table B-25 City of Colfax – Future Development Area Parcel and Acre Counts by FHSZ

Fire Hazard Severity Zone Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Very High			
Best Western Hotel	1	0	2
Shadow Wood	20	0	1
Sierra Oaks	34	10	19
Village Oaks	1	0	13
Grand Total	56	10	35

Source: City of Colfax

B.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

B.6.1. Regulatory Mitigation Capabilities

Table B-26 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Colfax.

Table B-26 City of Colfax Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y/ 2020	Housing Element was updated in 2021 and a comprehensive update of the General Plan was initiated in 2019 and is anticipated to be completed in 2022. The General plan addresses hazards in the safety element. Mitigation actions are included in many elements. The General Plan is used to implement mitigation actions.
Capital Improvements Plan	Y	
Economic Development Plan	Y	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program	Y	Terrence Lowell and Associates
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	Y	Y, it is a WUI (Wildland Urban Interface) plan, Y

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2019 CBC
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 5
Site plan review requirements	Y	Design Guidelines in Zoning Ord
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Updated in 2012. It is effective and adequately enforced.
Subdivision ordinance	Y	
Floodplain ordinance	N	No 100- or 500-year floodplain in the City.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Hillside development guidelines. They are dated and could be improved to account for fire related concerns.
Flood insurance rate maps	N/A	
Elevation Certificates		
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	Y	Terrence Lowell and Associates
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City's Hillside development guidelines are dated, have graphics that are difficult to read and do not acknowledge the City's fire risk. They should be updated to provide better guidance for hillside development in very-high fire severity zones. The plans can be consolidated into a simple, easy to understand pamphlet for property owners, business owners and developers.		

Source: City of Colfax

The City of Colfax General Plan Program, 2020

The City of Colfax General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The current General Plan is considered outdated. It is anticipated that this process will be completed by 2016. The most substantive changes in this document will be the Land Use, Circulation and Natural Resources Elements. Minor changes will be made to bring the document into internal consistency to the Safety, Community Design, and Economic Development Elements. No changes are anticipated to the Noise Element.

The current Safety Element, for the most part, provides accurate and current information and focuses on safety issues to be considered in planning for the present and future development of the Colfax Planning Area. Identified hazards include fire, geologic/seismic, erosion, flooding, and hazardous materials. Mitigation-related goals, policies, and actions are presented below.

Goal 7.9.1:	To protect the community of Colfax from injury, loss of life, and property damage resulting from natural catastrophes and any hazardous conditions.
Policy 7.9.1.1:	Require a review of all potential hazards in areas to be developed.
7.9.1.A	Actions: Make information relating to potential hazards on site specific areas in the City available to all City agencies and related City leadership and planners.

Goal 7.9.2:	To effectively minimize risks associated with seismic hazards by regulating the design and siting of new development in the City of Colfax.
Policy 7.9.2.1	Avoid placement of critical structures, public facilities, and high-occupancy structures in areas prone to ground failure during an earthquake.
Policy 7.9.2.2	Establish acceptable seismic safety standards so that all new buildings shall be constructed to resist the stresses and ground shaking produced during earthquakes.
Policy 7.9.2.3	Require a review of all potential geological hazards, including seismic hazards, for all developments in identified hazardous areas.
7.9.2.A	Action: Record information on potential geologic and seismic hazards with parcel or subdivision maps.
7.9.2.B	Action: Review Building Code requirements to determine the adequacy of standards necessary to protect against all seismic hazards and to assure that the Code is current with the latest technological advances.
7.9.2.C	Action: Develop programs in cooperation with other public agencies to increase public awareness of seismic hazards and to assure that the Code is current with the latest technological advances.

Geological Hazards

Goal 7.9.3	New development proposed within areas of potential geological hazards shall not be endangered by, nor contribute to, the hazardous conditions on the site or an adjoining properties.
Policy 7.9.3.1:	Adequate mitigation shall be required on sites with landslide potential, or erodible soils to protect against injury and property damage and to assure a level of development which will not accelerate runoff or degrade water quality.
Policy 7.9.3.2	Replanting of vegetation following development shall be required on all slopes prone to erosion and/or instability. Drought resistant plant types shall be used for landscaping on post development slopes where excess water might induce land slippage or soil erosion.
Policy 7.9.3.3	Encourage clustering of development away from areas considered geologically unstable.
7.9.3.A	Actions: Adopt and enforce a comprehensive Grading and Erosion Control Ordinance, requiring control of existing erosion problems, as well as the installation of erosion, sediment, and runoff control measures in new developments.
7.9.3.B	Actions: Adopt regulations relative to zoning and subdivision ordinances which regulate land alterations, road construction or structural development on slopes of 15 percent or greater.

Wastewater Treatment

Goal 7.9.4	To insure the adequate wastewater collection, treatment and safe disposal.
Policy 7.9.41	The City shall limit development if the limits of the Wastewater Treatment Plan (WWTP) are reached.
Policy 7.9.4.2	The City shall promote efficient water use and reduced wastewater system demand by:
A.	Require water-conserving design and equipment in new construction;
B.	Encouraging retrofitting with water-conserving devices;
C.	Design wastewater systems to minimize inflow and infiltration to the extent economically feasible.
Policy 7.9.4.3	The City shall encourage pre-treatment of commercial and industrial wastes prior to their entering community collection and treatment systems.
7.9.4.4	The city shall permit on-site sewage treatment and disposal on parcels where all current regulations can be met and where parcels have the area, soils, and other characteristics that permit such disposal facilities without threatening surface or groundwater quality or posing any other health hazards.
7.9.4.A	Actions: The City shall proceed with the design, financing and construction of capital improvements of the current wastewater treatment system to meet future growth and development demands.
7.9.4.B	Actions: City staff shall monitor and report quarterly to the City Council on the current inflow levels of the WWTP.
7.9.4.C	Actions: The city shall continue to evaluate and collect development fees to cover the maintenance and improvements required in the wastewater system.

Fire Hazard Safety

Goal 7.9.5	To protect the public from wildland and urban fire hazards and reduce the risks of wildfires and structural conflagrations by mitigating or minimizing use and development in high fire hazard areas, and by maximizing fire prevention measures and citizen awareness of fire hazards.
Policy 7.9.5.1	All new development shall be constructed, at a minimum, to the fire safety standards contained in the California Fire and Building Codes.
Policy 7.9.5.2	Require all new developments, including single family dwellings on existing parcels of record, to provide adequate access for fire protection.
Policy 7.9.5.3	Amend City Ordinances to include specific road standards developed in conjunction with Colfax Fire Department.
7.9.5.A	Action: Enforce the existing City Ordinance regarding weed abatement on lots and larger properties within city-limits.
7.9.5.B	Action: Adopt an ordinance for the provision of fire-resistant materials and landscaping, and the use of early warning systems such as sprinklers with alarms for all new developments.
7.9.5.C	Action: To the maximum extent feasible conduct-periodic inspections of vacant properties to ensure that dry weeds and other combustible fuels are not permitted to accumulate.

City of Colfax Emergency Operations Plan

The City of Colfax Emergency Operations Plan (EOP) Plan addresses the planned response for the City to emergencies associated with disasters, technological incidents, or other dangerous conditions created by either man or nature. It provides an overview of operational concepts, identifies components of the City emergency management organization, and describes the overall responsibilities of local, state, and federal entities.

B.6.2. Administrative/Technical Mitigation Capabilities

Table B-27 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Colfax.

Table B-27 City of Colfax's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	City Council sits as PC when needed
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Storm draining clearing, tree trimming for defensible space (fire danger)
Mutual aid agreements	Y	Cal Fire and other fire agencies
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y, P/T	The CBO is a part-time contract position.
Floodplain Administrator	N	
Emergency Manager	Y	City Manager serves as the City's Emergency Manager
Community Planner	Y P/T	The Planning Director is a part-time contract position.
Civil Engineer	Y P/T	The City's Engineer is a part-time contract position.
GIS Coordinator	N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	City is part of the Everbridge program through Placer Sheriff Dept. and Placer Alert (cell phone register to receive alerts)
Hazard data and information		
Grant writing	Y	
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Routine EOC exercises will help train City's in-house and contract staff prepare for emergency response.		

Source: City of Colfax

B.6.3. Fiscal Mitigation Capabilities

Table B-28 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table B-28 City of Colfax’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee	Y	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	
Other federal funding programs		
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City will seek to use Cal OES, FEMA, CA DWR, and other funding streams.		

Source: City of Colfax

B.6.4. Mitigation Education, Outreach, and Partnerships

Table B-29 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table B-29 City of Colfax’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	ALTA CERT (through Alta Fire dept), Red Cross

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	Y	CSOs thru Placer County Sheriff
StormReady certification	N	
Firewise Communities certification	N	City participates in the Placer Sierra Fire Safe Council
Public-private partnership initiatives addressing disaster-related issues	Y	Haz Mat transport training with UPRR and residents
Other		
How can these capabilities be expanded and improved to reduce risk?		
Firewise community certification could be promoted and used to leverage residents' efforts to reduce the fuel loads and the threat of wildfire.		

Source: City of Colfax

The City contracts with the Placer County Sherriff's Department to provide police services. The 24 hour per day service includes patrol, detectives, evidence, juvenile services, dispatch center, traffic enforcement and traffic accident investigation. Other specialized units that are available upon need include: S.W.A.T, Dive/Rescue Team, Explosive Ordinance Detail, K-9/Narcotic Detection, Air Operations, Bike Patrol, Mounted Patrol, Reserve Details, D.U.I., and Targeted Enforcement and Search and Rescue Operations.

The City contracts with the California Department of Forestry to provide fire safety services. The 24 hour per day service includes a paid part-time Fire Chief, fire marshal services, dispatch and staffing. The Department maintains active volunteer program with 17 members. The City maintains two volunteer staffed fire stations.

The City also utilizes the new county-wide Wide Area Rapid Notification (WARN) system. WARN is a regional system that can be used by all Placer County law agencies as well as fire departments, the Office of Education and the Office of Emergency Services. WARN utilizes a list of telephone numbers and addresses from the phone company. Officials can pinpoint a geographic area, then type in a message that a computer automated voice will read to residents. The system is used for a variety of purposes including missing persons, fire evacuations, snow days and more.

B.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- The City has increased enforcement of its weed abatement ordinance since 2002.
- The Colfax Lions Club is ensuring that all homes within the city have adequate address signs.
- The Wastewater Treatment Plant has been upgraded, which will lessen the potential of a contamination event. Ongoing improvements to the Colfax Water Treatment Plant will improve water quality and serve an additional 231 more housing units.

B.7 Mitigation Strategy

B.7.1. Mitigation Goals and Objectives

The City of Colfax adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

B.7.2. NFIP Mitigation Strategy

The City of Colfax does not have any FEMA floodplains and thus does not participate in the NFIP nor the CRS.

B.7.3. Mitigation Actions

The planning team for the City of Colfax identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought & Water Shortage
- Pandemic
- Severe Weather: Extreme Heat
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows,

Pandemic, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Colfax in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Colfax Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 3. Continue Annual Weed Abatement Ordinance

Hazards Addressed: Wildfire, Drought and Water Shortage, Extreme Heat, High Winds

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City of Colfax is classified as a “Very High Fire Hazard Severity Zone” Local Responsibility Area (LRA) by CDF in compliance with the Bates Bill (California Government Code sections 51175-51188). The city is surrounded by State Responsibility Area (SRA) rated as high fire hazard. Wildfire is a perennial threat to the city.

Project Description: There are several vacant parcels, and some developed properties, which have excessive growth of grass and other potential ladder fuels each year. If left untreated these fuels increase the fire hazard within the city limits. Further, one large parcel near the Interstate 80 exit is used by CDF as a staging area during fire season and this lot needs to be available for use.

Other Alternatives: Continue to rely on property owners to act without prompting, which has not worked historically

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- General Plan 2020. The Safety Element recognizes that Colfax and the surrounding area are designated as a “very high hazard area” with regard to wildland and urban-wildland fires. Flooding is not

recognized as a hazard to the City as no portions are located within the 100-year floodplain. The Safety Element notes that the State’s listing of active faults does not include any showing surface rupture in the City of Colfax, but relatively little fault mapping has been completed in the region.

- In 2004, the City updated its Hillside Development Guidelines to address wildfire issues, particularly vegetation management and restrictions when building on slopes.
- The City has increased enforcement of its weed abatement ordinance in 2002.
- The Colfax Lions Club is ensuring that all homes within the city have adequate address signs.

Responsible Office/Partners: City Manager; Placer Sierra Fire Safe Council

Cost Estimate: Inspect all parcels in the City to determine which ones need treatment—\$4,000. To reduce costs, some of this could be done by the Volunteer Fire Department. Re-inspect— \$2,000. To reduce costs, some of this could be done by the Volunteer Fire Department. For those parcels which do not comply, the City must perform the work at \$500 to \$1,000 per parcel. Technically, this cost is recovered by tax liens on the property but in reality, the City has to carry the cost for some time, and the likelihood of recovery is low.

Benefits (Losses Avoided): The direct benefit would be to the 2000 residents of Colfax City and their business community. Plus Colfax High School enrolls 1000 students plus faculty and the Colfax Elementary School enrolls 380 students plus faculty. The City is also home to the largest publisher of medical forms in Northern California. Protecting the residents, students, businesses, and workforce in this community from wildfire is the greatest benefit from this project.

Potential Funding: Grants, City General Fund

Timeline: Annually in the Spring before fire season is declared, assuming funding is available.

Project Priority: Very High

Action 4. Colfax Schools Evacuation Site Shaded Fuel Break

Hazards Addressed: Wildfire, Drought and Water Shortage, Extreme Heat, High Winds, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City of Colfax encompasses 1.3 square miles. Wildfire is a constant threat. The Safety Element of Colfax’s General Plan notes that Colfax and the surrounding area are designated as a “very high fire hazard area”, and wildland and urban-wildland interface fires do occur relatively frequent, with a significant interface fire (the “Narrow Gauge Fire”) burning close to the edge of town in 2001. The 2001 Ponderosa Fire and the 2004 Stevens Fire also threatened the city.

The Colfax Elementary School and Colfax High School are located in a feasible location for an evacuation site but a Shade Fuel Break needs to be in place in the event of a wildfire coming out of the Bear River drainage to the West of their location.

Project Description: The mitigation goals of this project are to put a 200’ wide Shade Fuel Break on the ridge line to the west of the Colfax High and Elementary Schools to help protect this area from a wildfire approaching from the surrounding unincorporated areas.

Wildfire is the largest hazard this community faces. If a wildfire rages through this community unchecked the ability for Colfax City and areas within its sphere of influence to rebuild and survive are slim. It is not only an issue of if but when this community and its population will be threatened by wildfire. Wildfire has knocked at the door 3 times in the past 7 years. As the brush continues to grow the likelihood of a wildfire succeeding in opening that door continues to grow. This project will at least start the process to giving this community and its population a fighting chance.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- General Plan, 1998 The Safety Element recognizes that Colfax and the surrounding area are designated as a “very high hazard area” with regard to wildland and urban-wildland fires.
- The City upgraded its building code to the 1997 Universal Building Code in 2003.
- In 2004, the City updated its Hillside Development Guidelines to address wildfire issues, particularly vegetation management and restrictions when building on slopes.
- The City has increased enforcement of its weed abatement ordinance in 2002. •
- The Colfax Lions Club is ensuring that all homes within the city have adequate address signs.

Responsible Office/Partners: City of Colfax and Placer County

Project Priority: Very High

Cost Estimate: \$400,000

Benefits (Losses Avoided): The following sections show the value of property and key inventories at risk within the City of Colfax. Utilizing Placer County assessor data, the following information was obtained for the City of Colfax.

Property Type	# of units	Value
Residential	701 Units	\$90,073,829
Commercial	119 Units	\$24,574,567
Industrial	26 Units	\$16,714,795
Total	850 Units	\$131,363,191

2004 Certified Roll Values Property Type Units Net Value

Potential Funding: Grants

Timeline: Complete assessment and plan, and identify sources of funding, by no later than the next update of this plan, due in 2020

Action 5. Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District

Hazards Addressed: Wildfire, Drought and Water Shortage, Extreme Heat, High Winds, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Much of the historic downtown of Colfax was built over a century ago. While most of the individual buildings do not qualify for classification as historic, due to past interior remodeling, etc., the aggregate of the Historic District is essential to the character and even the survival of the City. These buildings do not have interior sprinklers or even smoke alarms or emergency lighting. Some buildings share attic space, which could easily spread a fire from one business to another, as happened in historic Nevada City, CA a couple of years ago.

Project Description: This project will evaluate the historic downtown business buildings to see what fire prevention measures are advisable, what are feasible to accomplish, and identify sources of funding.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- General Plan, 1998 The Safety Element recognizes that Colfax and the surrounding area are designated as a “very high hazard area” with regard to wildland and urban-wildland fires. Flooding is not recognized as a hazard to the City as no portions are located within the 100-year floodplain. The Safety Element notes that the State’s listing of active faults does not include any showing surface rupture in the City of Colfax, but relatively little fault mapping has been completed in the region.
- In December 2016, the City amended the Municipal Code via Ordinance 531 to adopt by reference the California Construction Code and all future triennial updates of the California Construction Code.
- In 2004, the City updated its Hillside Development Guidelines to address wildfire issues, particularly vegetation management and restrictions when building on slopes.
- The Colfax Lions Club is ensuring that all homes within the city have adequate address signs.

Responsible Office/Partners: City Manager

Cost Estimate: TBD

Benefits (Losses Avoided): While the Assessor Roll book puts a value of \$24.6 million of all 119 businesses in Colfax (which includes businesses outside of the Historic District), the buildings in the Historic Downtown are actually irreplaceable. If any of these buildings is lost to fire, the character of the Historic District would be lessened or even lost. This would negatively impact the ability of the City to survive since the Historic District is one of its major attractions for tourists and visitors and their dollars.

Potential Funding: Grants

Timeline: Complete assessment and plan, and identify sources of funding, by no later than 2022.

Project Priority: Very High

Action 6. Drought and Water Shortage Mitigation

Hazards Addressed: Climate Change, Drought, lack of potable water

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Since the year 2000 there have been several multi-year droughts across California, including in 2007 to 2009 and 2012 to 2017. As the climate warms, water supplies continue to dwindle while demand increases. The issue that has become obvious is with the lack of water, both businesses and residents have to be better prepared to live with less and better prepared on how to do more with less.

Project Description: Establish city-wide water conservation policies and best management practices that incorporate the City, residents, businesses, and those who utilize groundwater. Establish a retrofit water supply program, continue to enforce the water efficient landscape requirements and promote groundwater recharge efforts.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Manager and Public Works Departments establishing policies within their department on how to conserve water use.

Responsible Agency/ Department/Partners: City of Colfax, Placer County Water District, City Administration, Public Works, and Planning Departments

Cost Estimate: Annual cost to keep current and up to date, \$40,000

Benefits (Losses Avoided): Preserving water for human and agricultural use during drought conditions.

Potential Funding: Grants, partnership with water purveyor, General fund

Timeline: 1 to 2 years to get project partners in place to sustain the drought program

Project Priority (H, M, L): M



Annex C City of Lincoln

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Lincoln, a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Lincoln, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

C.2 Planning Process

As described above, Lincoln followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table C-1 City of Lincoln – Planning Team

Name	Position/Title	How Participated
Steve Prosser	Community Development Director	Annex Update information
Roland Neufeld	Senior Engineer	Annex Update information
Ray Leftwich	City Engineer	Mitigation Action Worksheets
Tolan Dworak	Battalion Chief	Wildfire data and hazard mitigation planning

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table C-2.

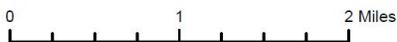
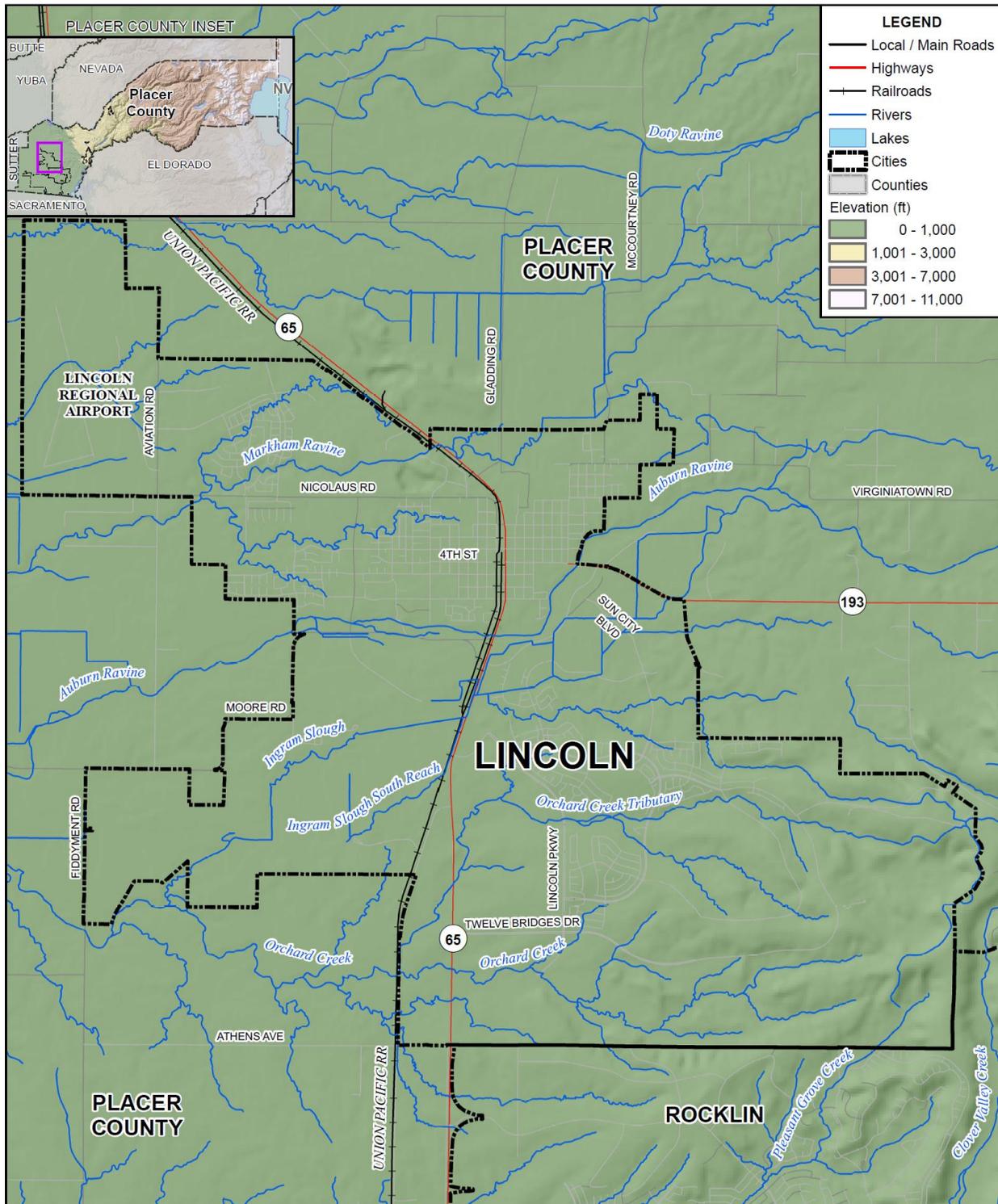
Table C-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Safety Element of the General Plan	The LHMP was incorporated by reference into the Safety Element of the General Plan in Compliance with AB 2140.

C.3 Community Profile

The community profile for the City of Lincoln is detailed in the following sections. Figure C-1 displays a City map and the location of Lincoln within Placer County.

Figure C-1 City of Lincoln



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

C.3.1. Geography and Climate

The City of Lincoln is one of five cities in Placer County and is located on the eastern edge of the Sacramento Valley floor at the base of the Sierra Nevada foothills. The City is located just east of State Route 65 (SR 65), which connects to Interstate 80 (I-80) approximately ten miles east of the City and south of SR 193. Lincoln encompasses 19.3 square miles and is at a general elevation of 164 feet above sea level. The City is traversed by a number of waterways, including Markham Ravine, Auburn Ravine, Ingram Slough, Orchard and Rock Creek, Raccoon Creek and Doty Ravine.

Average temperatures range from the high 80°F to high 90°F during the summer to the mid 30°F to high 50°F during the winter. Lincoln receives an average of 22.3 inches of rain and 0.2 inches of snow annually.

C.3.2. History

The City of Lincoln was named after Charles Lincoln Wilson, a real estate magnate who is largely credited with bringing the railroad to the area in 1861. The City was incorporated in 1890. Lincoln is the home of one of the County’s oldest businesses, the Gladding McBean terra cotta clay manufacturing plant, which was established in 1875 when rich clay deposits of the Ione Formation were discovered nearby.

C.3.3. Economy

US Census estimates show economic characteristics for the City of Lincoln. These are shown in Table C-3 and Table C-4. Mean household income in the City was \$107,734. Median household income in the City was \$88,734.

Table C-3 City of Lincoln – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	76	0.4%
Construction	1,202	6.2%
Manufacturing	1,309	6.8%
Wholesale trade	357	1.8%
Retail trade	2,726	14.1%
Transportation and warehousing, and utilities	975	5.0%
Information	318	1.6%
Finance and insurance, and real estate and rental and leasing	1,642	8.5%
Professional, scientific, and management, and administrative and waste management services	2,356	12.2%
Educational services, and health care and social assistance	4,082	21.1%
Arts, entertainment, and recreation, and accommodation and food services	2,004	10.4%
Other services, except public administration	782	4.0%
Public administration	1,516	7.8%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table C-4 City of Lincoln – Income and Benefits

Income Bracket	Percent
<\$10,000	3.2%
\$10,000 – \$14,999	3.5%
\$15,000 - \$24,9999	6.2%
\$25,000 – \$34,999	5.9%
\$35,000 – \$49,999	8.3%
\$50,000 – \$74,999	15.5%
\$75,000 – \$99,999	14.2%
\$100,000 – \$149,999	22.3%
\$150,000 – \$199,999	10.1%
\$200,000 or more	10.9%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Major employers in the City include:

- Entrussed, LLC
- Gulfstream California
- Robb-Jack Corporation
- Gladding McBean
- Gc Products, Inc.
- Far West Equipment Rentals
- Sierra Pacific Industries
- SF Bay Coffee Co
- TransPak

C.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the City of Lincoln was 49,317.

C.4 Hazard Identification

Lincoln identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Lincoln (see Table C-5).

Table C-5 City of Lincoln—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Negligible	Medium	-
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Limited	High	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Negligible	Medium	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Occasional	Critical	Medium	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Limited	Low	Low
Tree Mortality	Significant	Highly Likely	Limited	Low	High
Wildfire	Significant	Highly Likely	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths. Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability. Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability. Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

C.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Lincoln’s hazards and assess the City’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table C-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

C.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section C.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

C.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Lincoln’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table C-6 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the City.

Table C-6 City of Lincoln – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	21	5	\$9,384,647	\$375,206	\$375,206	\$10,135,059
Commercial	288	203	\$143,376,538	\$266,254,988	\$266,254,988	\$675,886,514
Industrial	122	58	\$64,845,215	\$161,152,269	\$241,728,402	\$467,725,886
Institutional	89	28	\$7,685,637	\$75,184,622	\$75,184,622	\$158,054,881
Miscellaneous	854	9	\$66,676,662	\$4,863,897	\$4,863,897	\$76,404,456
Natural / Open Space	835	11	\$19,940,971	\$6,661,582	\$6,661,582	\$33,264,135
Residential	19,612	18,392	\$2,119,293,054	\$5,929,988,881	\$2,964,994,442	\$11,014,276,377
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308

Source: Placer County 2020 Parcel/Assessor's Data

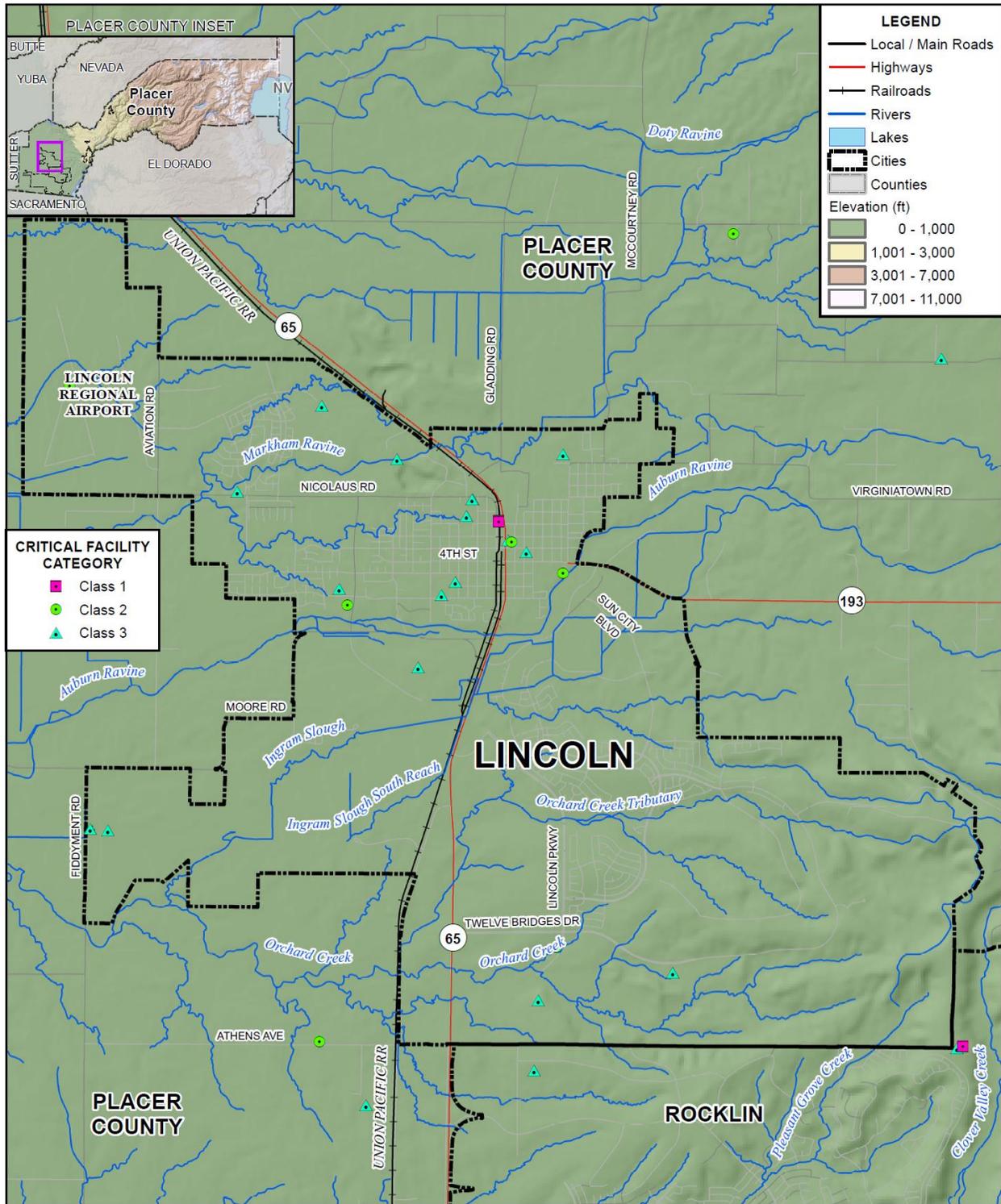
Critical Facilities and Infrastructure

Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan. An inventory of critical facilities in the City of Lincoln from Placer County GIS is shown on Figure C-2 and detailed in Table C-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure C-2 City of Lincoln – Critical Facilities



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-7 City of Lincoln – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 1	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Airport	1
	Fire Station	3
	Police Station	1
Class 3	Hall	3
	Hazardous Materials Facility	1
	School	12
	Water Treatment Plant	1
Lincoln Total		24

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City of Lincoln has a variety of natural resources of value to the community as identified in the Background Report to the General Plan, 2006:

- Two sensitive biological resources: Northern Hardpan Vernal Pools occurring in the western portion of the City and Foothill Riparian Woodland found along several of the larger watercourses (e.g., Auburn Ravine and Markham Ravine);
- Five special status plant species known to occur: the California Linderiella, Dwarf Downingia, Ahart’s Dwarf Rush, Big-Scale Balsamroot, and Bogg’s Lake Hedge-hyssop;
- One special status animal species known to occur: the Vernal Pool Fairy Shrimp;
- Twenty-four special status plant species with the potential to occur; and
- Fifty-five special status animal species with the potential to occur.

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

The City of Lincoln has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table C-8 lists the historical buildings in the City.

Table C-8 City of Lincoln – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Lincoln Public Library (N1660)	X			12/10/1990	Lincoln
Woman’s Club of Lincoln (N2134)	X			5/30/2001	Lincoln

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/>

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Lincoln General Plan Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Lincoln has generally seen moderate to large growth. Lincoln has seen growth rates as shown in Table C-9.

Table C-9 City of Lincoln – Population Changes Since 1950

Year	Population	Change	% Change
1950	2,410	–	–
1960	3,197	787	32.7%
1970	3,176	-21	-0.7%
1980	4,132	956	30.1%
1990	7,248	4,016	75.4%
2000	11,205	3,957	54.6%
2010 ¹	42,819	31,604	282.1%
2020 ²	49,317	6,498	15.2%

Source: ¹US Census Bureau, ²California Department of Finance

Special Populations and Disadvantaged Communities

The City noted groups of special populations in the City that may need additional help during a disaster.

Senior Populations: Approximately 27 percent of the Lincoln population is seniors aged 65 and older. A majority of the senior population is located within Sun City Lincoln Hills, which is an active adult community. Sun City is age restricted to require that at least one resident of each dwelling unit be 55 years of age or older, and no one under 45 years of age may be a resident in any dwelling unit. As of 2020, this community had approximately 11,100 residents and a total of 6,783 homes, including 6,703 single-family units and 80 condominiums.

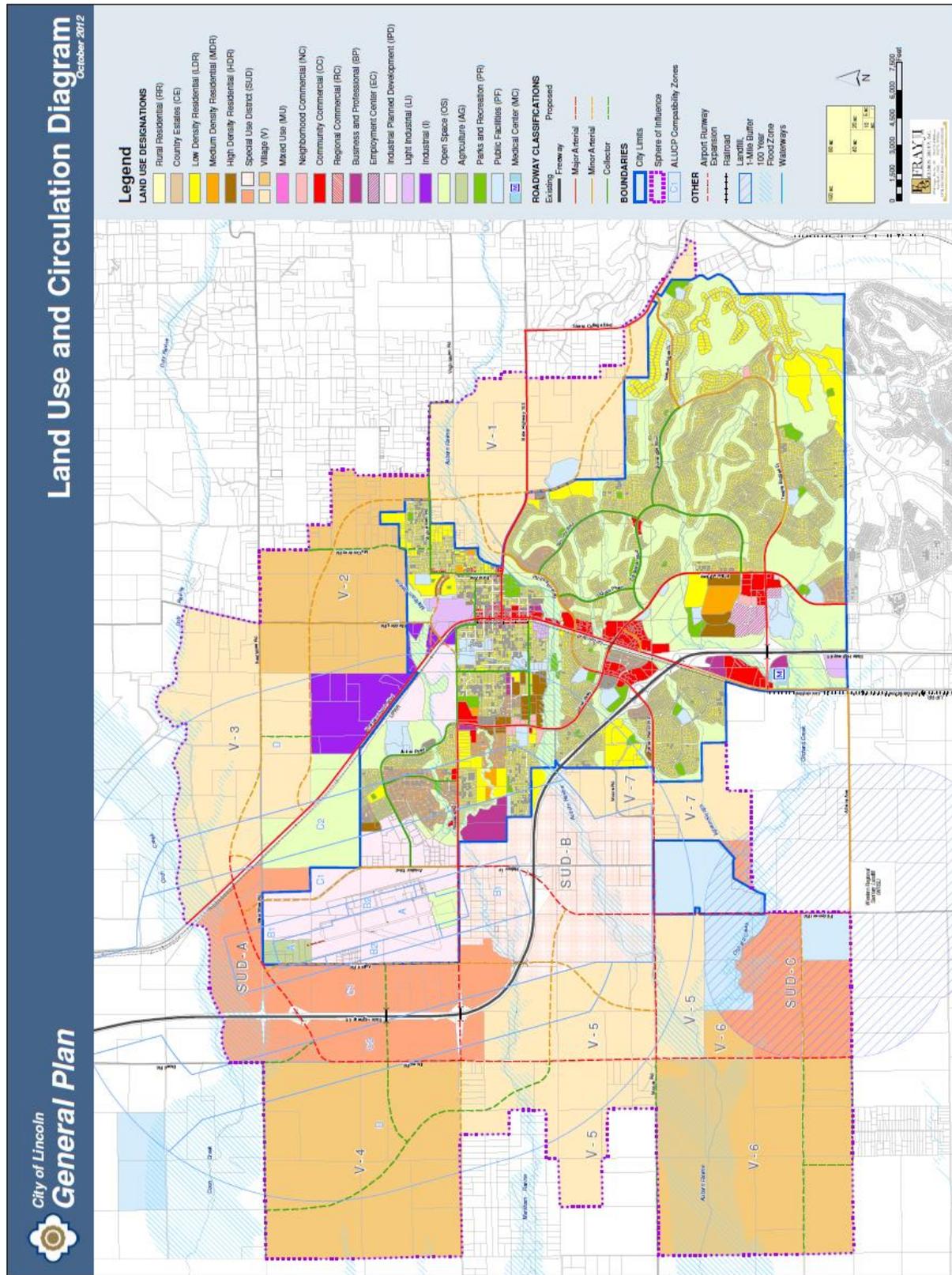
Poverty: Approximately 7 percent of the city’s population 18 to 64 years of age earned an income below the poverty level. Additionally, for Lincoln’s female-headed households, approximately 14 percent live below the poverty level. Many of these citizens reside primarily in the area of 1st – 3rd street.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City’s land use designations are generally described below and mapped on the Land Use Diagram (Figure C-3). The Lincoln Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Lincoln. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use for the City of Lincoln from the City of Lincoln General Plan Land Use Element is shown on Figure C-3.

Figure C-3 City of Lincoln – Land Use Diagram



Source: City of Lincoln General Plan 2012 Land Use Element

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table C-10 and Table C-11.

Table C-10 City of Lincoln – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	146	132	119	115	122
Industrial	0	0	0	0	0
Residential	188	227	45	65	613
Unknown	0	0	0	0	0
Total	334	359	164	180	735

Source: City of Lincoln Building Department

Table C-11 City of Lincoln – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area ¹	Other
Agricultural	0	0	0	
Commercial	0	0	0	
Industrial	0	0	0	
Residential	0	0	0	
Unknown	0	0	0	
Total	0	0	0	

Source: City of Lincoln Building Department

¹Moderate or higher wildfire risk area

Future Development

The City of Lincoln 2013-2021 Housing Element Background Report contained an estimate for future population of the City. SACOG projected continued population growth through 2035. Expected population of the City in 2035 is 92,350. These projections were done in 2007 and have not been updated to reflect the economic slowdown and recent decline in population growth. Development in the City is expected to continue. The City provided the zoning map, shown above in Figure C-3, and made note that development is occurring in Village 1, 5, and 7.

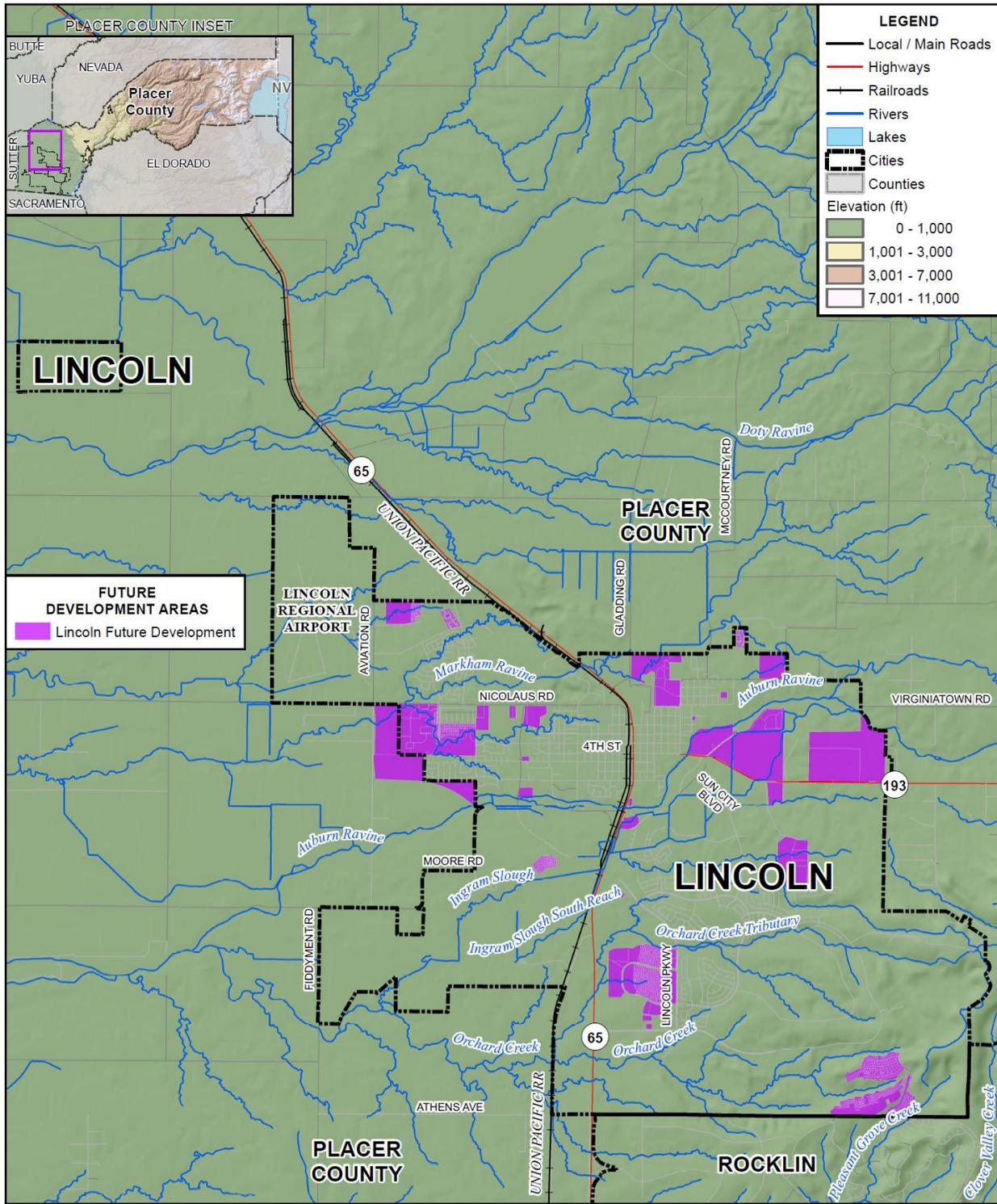
More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Lincoln. Future development areas in the City were provided in mapped format by the Lincoln.

Using the GIS parcel spatial file for each of these areas, the 35 areas associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-4 shows the locations of future development areas the City is planning to develop. Table C-12 shows the parcels and acreages of each future development area in the City.

Figure C-4 City of Lincoln – Future Development Areas



FOSTER MORRISON CONSULTING

COUNTY OF Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-12 City of Lincoln – Future Development Parcels and Acreages

Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
219 E 8th Street	1	1	0.8
871 Sterling Parkway	1	1	0.9
Auburn Ravine Center	1	0	1.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	67	0	12.3
East 10th Street Time Extension	1	0	2.4
Education Foundation	78	0	28.6
Esplanade at Turkey Creek	12	1	262.5
Ferrari Pavilion	1	0	11.4
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	150	0	196.7
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	198	0	18.8
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	14	0	106.0
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	3	0	184.0
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	386	86	58.3
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4

Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Ventana	152	18	47.3
Grand Total	1,565	212	1,718.4

Source: City of Lincoln GIS

C.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table C-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased

average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Placer County and the City, the HMPC noted that each year it seems to get a bit warmer each year.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the City noted that climate change is of concern, no specific impacts of climate change could be recalled. The City and HMPC members noted that the strength and intensity of storms does seem to be increasing and the temperatures are getting hotter. It is believed that climate change has contributed to the loss and degradation of City infrastructure such as greenery in the parks and medians, and other common areas.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the City and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

The City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table C-13.

Table C-13 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan.

In the most recent drought starting in 2014, mandatory conservation measures were followed; grass, trees, and other greenery in parks, medians and other common areas maintained by the City were significantly degraded. No wells failures were reported. The City was able to mitigate some of the local impacts associated with drought through an increase in the use of reclaimed water. In fact, the recent drought was the precipitous for the City to further develop their reclaimed water use program throughout the City.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The City relies on surface water for its water supply, but does have backup wells it can use.

The City has been developing their new Urban Water Master Plan which is currently in draft form. This plan mirrors the County’s Urban Water Master Plan with respect to conservation measures. The plan also confirms that, even during periods of extended drought, the City has sufficient water resources for the near future.

Impacts

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the planning area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

While the City will continue to experience drought conditions from time to time, water supply issues are not an immediate concern, while short term impacts include a degradation of natural resources including those within City parks and common areas.

Future Development

As the population in the area continues to grow, so will the demand for water. Water shortages in the future may be worsened by drought, as the City relies on surface water for its water source. Increased planning will be needed to account for population growth and increased water demands. The City does also have access to wells as a backup water supply.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. Lincoln and the surrounding area are at lower risk from significant seismic and geologic hazards. Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. Several active faults are located within the vicinity of Placer County and the City of Lincoln. The Cleveland Hills Fault is the closest active fault to the City, located over 40 miles north. The nearest mapped fault trace to the City is the Willow Fault. The northwest-southeast trending pre-Quaternary Willows fault zone is located approximately 15 miles southwest of Lincoln; however, it is considered inactive for planning purposes.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.12 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Placer County and the City fall within a low shake risk.

Past Occurrences

Throughout recorded history, no major earthquakes have been recorded within the Placer County Planning Area. The greatest ground shaking in the immediate area occurred on April 21, 1892. The epicenter was between Winters and Vacaville in Yolo County. No fatalities occurred in the City and only minor structural damages resulted from the earthquake. No other earthquake events have affected the City in any notable way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The City noted some seismically vulnerable buildings within their downtown area.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Lincoln is within the less hazardous Zone 3. However, the City of Lincoln General Plan Background Reported noted that located 70 miles west of the City, the San Francisco Bay Area is located within Zone 4 and is at the highest risk of experiencing maximum magnitudes and damage from an earthquake.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable.

Impacts from earthquake in the City will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Earthquake Analysis

Due to the regional effects of an earthquake, a Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.11 of the Base Plan. While these runs were not done specific to the City, maps showing damage in the County show greater areas of damage near the cities in the County. This is because earthquake damages are generally related to the level of development, with more developed areas seeing more damages.

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur. The City enforces the state building code and recently adopted the 2019 code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Placer County and the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

Lincoln is traversed by several stream systems that collect and convey storm runoff to the west towards the Cross Canal collection system, ultimately discharging into the Sacramento River near its confluence with the Feather River in Sutter County. The primary stream systems in the City include: Auburn Ravine (including Orchard Creek and Ingram Slough tributaries); Markham Ravine (including Clay Creek and Markham Ravine South, and Markham Ravine Central tributaries); and Racoon Creek.

The City of Lincoln is at risk to both the 100-year flood as well as to localized stormwater flooding.

Location and Extent

According to the Safety Element of Lincoln's 2012 General Plan, rainy season floods most commonly occur from November through April. Periods of prolonged, heavy rainfall create large runoff volumes and high peak stream flows. Flooding is more severe when previous rainfall has saturated the ground surface and subsurface. This is due to clay nature of the soils as well as the prevalence of an impermeable subsurface throughout most of the Lincoln area, which can result in some areas of standing water and localized flooding. Other localized flooding hazards are caused by obstacles to natural drainage flows, such as the railroad and highway bridges along SR 65 at the Auburn Ravine. During periods of high runoff, these structures tend to act as barriers, causing water to back up east of the highway into natural depressions and south between the railroad tracks and SR 65.

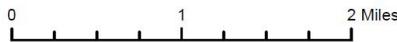
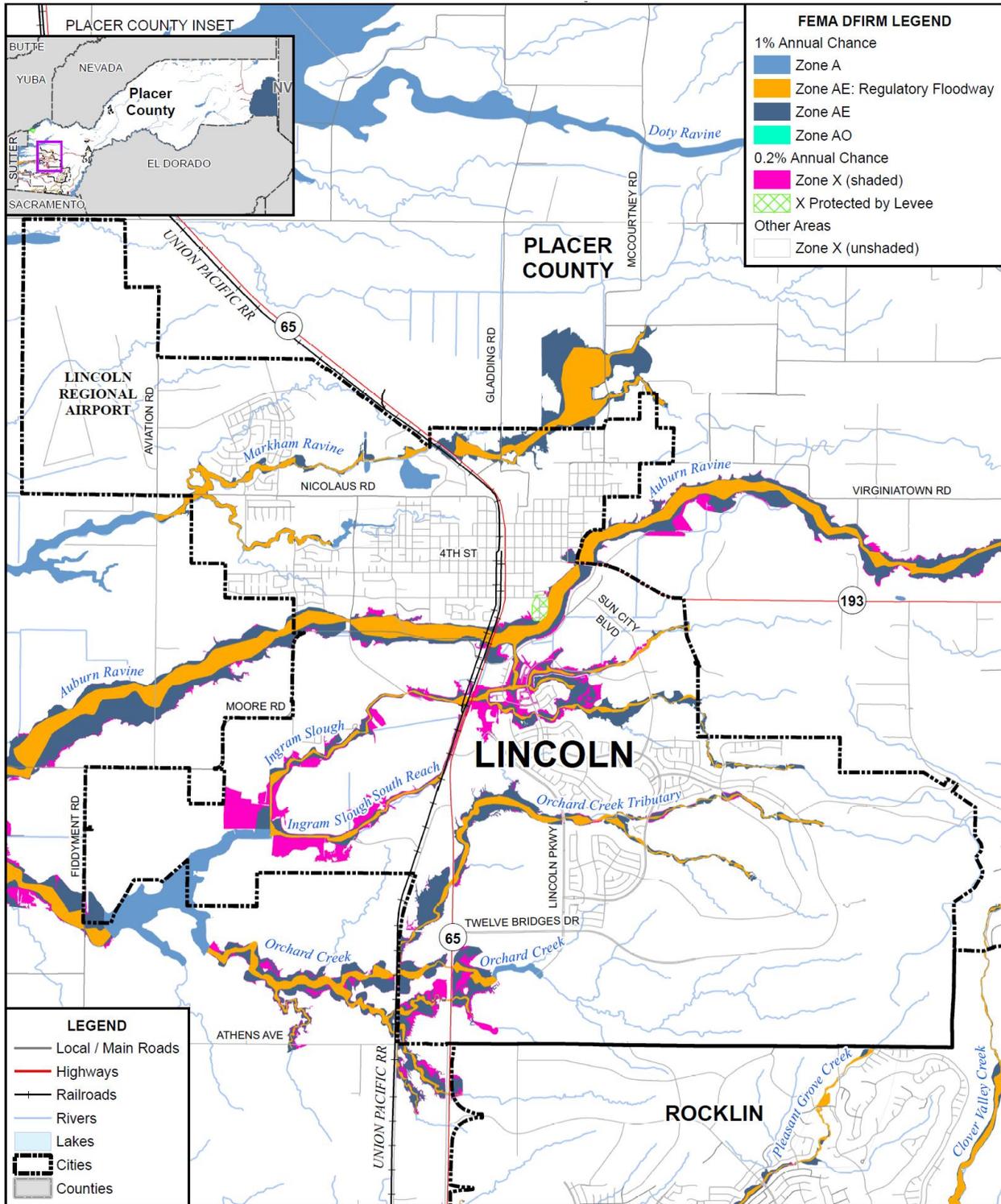
Cloudburst storms, sometimes lasting as long as three hours, can occur any time from the late fall to early spring, and may occur as an extremely severe sequence within a general winter rainstorm. These are high intensity storms that can produce peak flows equal or somewhat greater than those of general rainstorms in parts of the City. Flooding from cloudburst is characterized by high peak flow, short duration of flood flow, and a small volume of runoff.

A general lack of curbs and gutters in parts of the City and locally inadequate or incomplete storm drains results in standing water that is both a nuisance and a potential hazard. Areas with the most significant flood hazards are the natural drainage channels of Auburn and Markham Ravines and their tributaries and localized areas due to inadequate surface flow. The City of Lincoln 2012 General Plan Background Report identifies the locations of flooding in the City:

- Auburn Ravine
- Markum Ravine
- Coon Creek

The City of Lincoln has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure C-5.

Figure C-5 City of Lincoln – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-14 details the DFIRM mapped flood zones located within the City.

Table C-14 City of Lincoln– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Lincoln
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	X
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table C-15.

Table C-15 City of Lincoln – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	1,282	8.4%	118	2.3%	1,164	11.5%
0.2% Annual Chance	336	2.2%	47	0.9%	289	2.8%
Other Areas	13,648	89.4%	4,940	96.8%	8,708	85.7%
Total	15,267	100.0%	5,106	100.0%	10,161	100.0%

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table C-16. These events also likely affected the City to some degree.

Table C-16 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

The City of Lincoln 2012 General Plan Background Report includes the following flood history for the City of Lincoln:

Auburn Ravine: The City has recorded several flooding events in the recent past involving structures along the Auburn Ravine corridor and its tributaries in the City of Lincoln. In 1986, 1995, and 1997, the Auburn Ravine bridge structures at State Route 65 and State Route 193 were overtopped. The existing bridge at the Joiner Parkway crossing of Auburn Ravine did not flood in these events and would not be expected to flood in an event less than the 500-year. Downstream from the City of Lincoln, flooding was also noted at the Moore Road and Nelson Lane crossings. Several smaller private crossings overtop frequently. Along the south bank of Auburn Ravine, west of State Route 65, Moore Road parallels the creek and is known to flood often. This road was abandoned with the South Lincoln Master Drainage Plan (SLMP) improvements east of Joiner Parkway, and culvert improvements were made west of Joiner Parkway to improve conveyance capacity. Flooding of the roadway is still expected west of Joiner Parkway as a result of flood stages in Auburn Ravine greater than the 10-year event.

In 1995, 2.63 inches of rain fell in the City of Lincoln, causing riverine and localized flooding. Several shops were flooded, and many roads were washed out.

The New Year’s Eve event of 2005/2006 did not result in overtopping of any of the main bridge structures along the ravine (SR 193, SR 65, and Joiner Parkway). Moore Road along the south bank was flooded both east and west of Joiner Parkway. The Moore Road and Nelson Lane crossings were reported as overtopped. The biggest incident occurred at the east end of Moore Road. Prior to 9 a.m. Saturday, an American Medical Response paramedics crew requested assistance there. The Auburn Ravine overflowed its banks in the area and flooded across Moore Road, stranding the ambulance, preventing it from getting back to Joiner Parkway. Nobody was in the ambulance. Two paramedics were just parked on the dead-end section of Moore Road waiting for any calls. The floodwaters then rose too high before the paramedics drove out. When they tried, the ambulance stalled in the high water. The storm was estimated to be a 10-year event for Auburn Ravine and a lesser event in the tributaries.

Events in December of 2016 caused high water in the Auburn Ravine area. The Auburn River gaging station is shown on Figure C-6.

Figure C-6 City of Lincoln – Flooding Lincoln Gaging Station on December 10, 2016



Source: Friends of Auburn Ravine

Flooding also occurred in January and February of 2019. The photo of the Union Pacific Railroad Bridge in Lincoln shown on Figure C-7 shows how high flows combined with waterborne debris can endanger bridges that do not have enough height, nor enough width of span, to avoid serious risk to their structural integrity.

Figure C-7 City of Lincoln – Flooding at Railroad Bridge on January 17, 2019



Source: Friends of Auburn Ravine

In **Orchard Creek**, flooding of Fiddymment Road is expected in greater than the 5-year event. Flooding of private drives and agricultural fields is also noted in the SLMP floodplain analysis. Flooding at the Fiddymment Road crossing was not reported in the New Year's Eve 2005/2006 event.

At **Ingram Slough**, significant flooding of the field areas on each side of the slough was noted prior to the construction of the SLMP improvements. Also, reports from local residents indicated that in 1986 and 1995, flows from Auburn Ravine overtopped the southern bank and flowed via overland release into Ingram Slough. The SLMP designed for this issue included constructing a control weir at the south bank of Auburn Ravine, upstream of State Route 65, and an interconnection channel to convey the spillway flows safely to Ingram Slough. Downstream improvements in the SLMP increase conveyance capacity to accommodate the combined flows from Ingram Slough and the Auburn Ravine spills. Flooding has not been experienced in the Slough since the construction of the SLMP improvements began in 1988.

Markham Ravine: Flooding within Markham Ravine is known to occur mostly in the rural areas of the City, where culvert and bridge crossings do not provide adequate capacity. East of State Route 65, flooding occurs at Gladding Road and McCourtney Roads annually. West of State Route 65, flooding has occurred at the low areas of Nicolaus Road (not at the bridge location). At Nelson Lane flooding is expected annually.

The SR 65 Bridge is expected to overtop in storm events greater than the 10-year, and the Union Pacific Railroad Bridge is only expected to be overtopped in a 50-year or greater event. These estimates were supported by the New Year's Eve 2005/2006 event. Other private crossings of the Ravine are expected to overtop annually.

At the north tributary, Clay Creek, shallow flooding in the remaining natural areas of the creek is still expected. The developed areas of the Creek are protected from flooding in the 100-year event. At the southern tributary, 100-year protection is provided from Joiner Park, downstream to the City Limits. Shallow flooding beyond the stream banks is expected in flood events, in the natural stream areas downstream of Joiner Parkway. Upstream of Joiner Park, the existing channel and storm drain systems may not provide 100-year protection to the existing residential areas in the 5th-8th Street Corridor between H Street and Q Street.

Raccoon Creek: Very little is known about the flooding conditions of Raccoon Creek at this time. No detailed study of the watershed hydrology has been performed since the "Cross Canal Watershed Study" was performed by CH2MHILL in 1988. As part of an effort on the North Lincoln Master Drainage Plan (NLMDP), shed boundaries for the Raccoon Creek watershed were verified. Many issues with the watershed assumptions of the Cross Canal Study of 1988 were found. It was recommended that the City try to obtain County participation in producing a rectified hydrology study for the watershed, as part of the NLMDP efforts.

Vulnerability to and Impacts from Flood

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what

to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

The City noted that they currently have 13 structures in the 1% annual chance flood zone. Two of these structures are located on Main Street, Lincoln Boulevard downtown in the Auburn Ravine floodplain and 11 other structures located near the Auburn Ravine Bridge in the same floodplain. The City is currently in process of raising and extending the Auburn Ravine Bridge which will remove 11 of these 13 properties out of the floodplain.

Assets at Risk

Based on the vulnerability of Lincoln to the flood hazard, the sections that follow describes significant assets at risk in the City of Lincoln. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Lincoln. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table C-17 is a summary table for the City of Lincoln. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table C-18 breaks down Table C-17 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the City.

Table C-17 City of Lincoln – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	126	12	\$8,276,991	\$13,364,910	\$18,493,118	\$40,135,019
0.2% Annual Chance Flood Hazard	191	110	\$23,320,645	\$43,414,916	\$25,929,214	\$92,664,775
Other Areas	21,504	18,584	\$2,399,605,088	\$6,387,701,619	\$3,515,640,807	\$12,302,947,514
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-18 City of Lincoln – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Industrial	1	0	\$0	\$0	\$0	\$0
Natural / Open Space	3	0	\$0	\$0	\$0	\$0
Residential	1	0	\$0	\$0	\$0	\$0
Zone A Total	5	0	\$0	\$0	\$0	\$0
Zone AE Floodway						
Agricultural	2	1	\$382,440	\$10,612	\$10,612	\$403,664
Commercial	1	1	\$275,557	\$241,112	\$241,112	\$757,781
Industrial	1	1	\$3,772,268	\$9,618,335	\$14,427,502	\$27,818,105
Miscellaneous	12	0	\$19,682	\$0	\$0	\$19,682
Natural / Open Space	48	0	\$1,331,309	\$0	\$0	\$1,331,309
Residential	1	0	\$0	\$0	\$0	\$0
Zone AE Floodway Total	65	3	\$5,781,256	\$9,870,059	\$14,679,226	\$30,330,541
Zone AE						
Agricultural	4	1	\$434,183	\$57,932	\$57,932	\$550,047
Commercial	6	2	\$937,372	\$1,556,884	\$1,556,884	\$4,051,140
Industrial	4	2	\$610,116	\$1,213,121	\$1,819,682	\$3,642,919
Miscellaneous	14	0	\$223,080	\$0	\$0	\$223,080
Natural / Open Space	24	1	\$134,743	\$91,874	\$91,874	\$318,491
Residential	4	3	\$156,241	\$575,040	\$287,520	\$1,018,801
Zone AE Total	56	9	\$2,495,735	\$3,494,851	\$3,813,892	\$9,804,478
1% Annual Chance Flood Hazard Total	126	12	\$8,276,991	\$13,364,910	\$18,493,118	\$40,135,019
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Commercial	9	5	\$8,329,697	\$8,102,407	\$8,102,407	\$24,534,511
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	11	1	\$95,196	\$341,100	\$341,100	\$777,396
Natural / Open Space	29	0	\$251,127	\$0	\$0	\$251,127

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Residential	90	56	\$11,029,159	\$25,854,354	\$12,927,181	\$49,810,694
Zone X (shaded) Total	140	62	\$19,705,179	\$34,297,861	\$21,370,688	\$75,373,728
X Protected by Levee						
Miscellaneous	3	0	\$58,700	\$0	\$0	\$58,700
Residential	48	48	\$3,556,766	\$9,117,055	\$4,558,526	\$17,232,347
X Protected by Levee Total	51	48	\$3,615,466	\$9,117,055	\$4,558,526	\$17,291,047
0.2% Annual Chance Flood Hazard Total	191	110	\$23,320,645	\$43,414,916	\$25,929,214	\$92,664,775
Other Areas						
Zone X (unshaded)						
Agricultural	15	3	\$8,568,024	\$306,662	\$306,662	\$9,181,348
Commercial	272	195	\$133,833,912	\$256,354,585	\$256,354,585	\$646,543,082
Industrial	116	55	\$60,462,831	\$150,320,813	\$225,481,218	\$436,264,862
Institutional	88	28	\$7,685,637	\$75,184,622	\$75,184,622	\$158,054,881
Miscellaneous	814	8	\$66,280,004	\$4,522,797	\$4,522,797	\$75,325,598
Natural / Open Space	731	10	\$18,223,792	\$6,569,708	\$6,569,708	\$31,363,208
Residential	19,468	18,285	\$2,104,550,888	\$5,894,442,432	\$2,947,221,215	\$10,946,214,535
Zone X (unshaded) Total	21,504	18,584	\$2,399,605,088	\$6,387,701,619	\$3,515,640,807	\$12,302,947,514
Other Areas Total	21,504	18,584	\$2,399,605,088	\$6,387,701,619	\$3,515,640,807	\$12,302,947,514
Lincoln Grand Total						
Lincoln Grand Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-19 summarizes Table C-18 above and shows City of Lincoln loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table C-19 City of Lincoln – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	126	12	\$13,364,910	\$18,493,118	\$31,858,028	\$6,371,606	0.011%
0.2% Annual Chance Flood Hazard	191	110	\$43,414,916	\$25,929,214	\$69,344,130	\$13,868,826	0.024%
Grand Total	317	122	\$56,779,826	\$44,422,332	\$101,202,158	\$20,240,432	0.04%

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor’s Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table C-18 and Table C-19, the City of Lincoln has 12 parcels and \$31.8 million of structure and contents values or values in the 1% annual chance flood zone, and 110 improved parcels and \$69.3 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.10 of the Base Plan, there is a 1% chance in any given year of a flood event causing \$6.4 million in damage and a 0.2% chance in any given year of a flood event causing \$13.9 million in damage in the City of Lincoln. The loss ratio of 0.011% and 0.024% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be minor and the City would be able to recover.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the City of Lincoln as well as for the County as a whole. Table C-20 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table C-20 City of Lincoln – Flooded Acres by Flood Zone

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	29	0.003%	24	0.013%	6	0.001%
Institutional	1	0.000%	0	0.00%	1	0.000%
Miscellaneous	60	0.007%	0	0.00%	60	0.008%
Natural / Open Space	6	0.001%	0	0.00%	6	0.001%
Residential	17	0.002%	0	0.000%	17	0.002%
Zone A Total	113	0.013%	24	0.013%	88	0.012%
Zone AE Floodway						
Agricultural	61	0.007%	16	0.009%	45	0.006%
Commercial	3	0.000%	2	0.001%	1	0.000%
Industrial	7	0.001%	6	0.003%	1	0.000%
Institutional	0	0.000%	0	0.00%	0	0.000%
Miscellaneous	112	0.012%	0	0.00%	112	0.016%
Natural / Open Space	357	0.040%	10	0.006%	347	0.048%
Residential	20	0.002%	4	0.002%	16	0.002%
Zone AE Floodway Total	560	0.062%	38	0.021%	522	0.073%
Zone AE						
Agricultural	34	0.004%	11	0.006%	23	0.003%
Commercial	37	0.004%	1	0.001%	36	0.005%
Industrial	13	0.001%	7	0.004%	5	0.001%
Institutional	3	0.000%	0	0.00%	3	0.000%
Miscellaneous	111	0.012%	0	0.000%	111	0.015%
Natural / Open Space	374	0.042%	28	0.015%	347	0.048%
Residential	36	0.004%	9	0.005%	27	0.004%
Zone AE Total	609	0.068%	56	0.031%	553	0.077%
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.00%	0	0.00%	0	0.00%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Residential	0	0.00%	0	0.00%	0	0.00%
Zone AO Total	0	0.00%	0	0.00%	0	0.00%
1% Annual Chance Flood Hazard Total	1,282	0.143%	118	0.066%	1,164	0.162%
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	13	0.001%	6	0.003%	8	0.001%
Commercial	20	0.002%	14	0.008%	6	0.001%
Industrial	2	0.000%	0	0.000%	2	0.000%
Institutional	11	0.001%	0	0.00%	11	0.001%
Miscellaneous	121	0.013%	0	0.000%	120	0.017%
Natural / Open Space	124	0.014%	6	0.003%	118	0.016%
Residential	34	0.004%	14	0.008%	20	0.003%
Zone X (shaded) Total	324	0.036%	39	0.022%	285	0.040%
X Protected by Levee						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	4	0.000%	0	0.00%	4	0.001%
Natural / Open Space	0	0.000%	0	0.00%	0	0.000%
Residential	8	0.001%	8	0.005%	0	0.00%
X Protected by Levee Total	13	0.001%	8	0.005%	4	0.001%
0.2% Annual Chance Flood Hazard Total	336	0.037%	47	0.026%	289	0.040%
Other Areas						
Zone X (unshaded)						
Agricultural	685	0.076%	160	0.089%	525	0.073%
Commercial	383	0.043%	186	0.103%	198	0.027%
Industrial	929	0.103%	380	0.211%	549	0.076%
Institutional	990	0.110%	60	0.033%	930	0.129%
Miscellaneous	3,595	0.400%	14	0.008%	3,581	0.498%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Natural / Open Space	2,591	0.288%	544	0.302%	2,047	0.285%
Residential	4,475	0.498%	3,596	1.997%	878	0.122%
Zone X (unshaded) Total	13,648	1.518%	4,940	2.743%	8,708	1.211%
Other Areas Total	13,648	1.518%	4,940	2.743%	8,708	1.211%
Lincoln Total	15,267	1.698%	5,106	2.835%	10,161	1.413%

Source: FEMA 11/2/2018 DFIRM

Population at Risk

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Lincoln – 2.57. According to this analysis, there is a total population of 8 and 267 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table C-21.

Table C-21 City of Lincoln – Count of Improved Residential Parcels and Population by Flood Zone

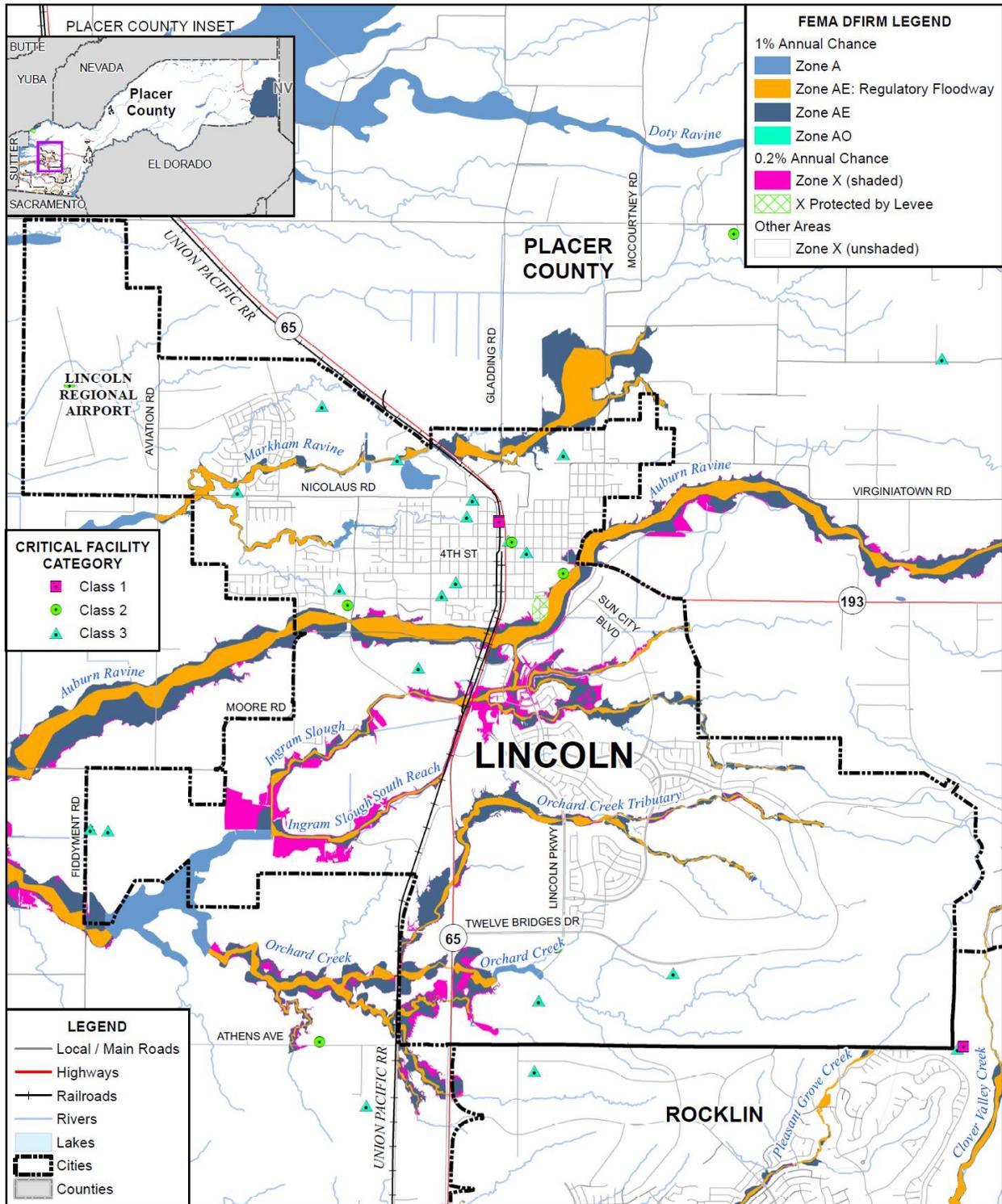
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Lincoln	3	8	104	267

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/ Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Lincoln in identified DFIRM flood zones. Critical facilities in a FHSZ in the City of Lincoln are shown in Figure C-12 and detailed in Table C-33. As shown, no critical facilities fall in any mapped DFIRM flood zone. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure C-8 City of Lincoln – Critical Facilities in DFIRM Flood Zones



FOSTER MORRISON
CONSULTING



COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-22 City of Lincoln – Critical Facilities by DFIRM Flood Zone

Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Other Areas			
Zone X (unshaded)	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Airport	1
		Fire Station	3
		Police Station	1
	Class 3	Hall	3
		Hazardous Materials Facility	1
		School	12
		Water Treatment Plant	1
	Zone X (unshaded) Total		
Other Areas Total			24
Lincoln Total			24

Source: CAL FIRE, Placer County

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Lincoln joined the National Flood Insurance Program (NFIP) on February 3, 1983. The City does not participate in the Community Rating System (CRS). NFIP Insurance data indicates that as of August 21, 2020, there were 80 flood insurance policies in force in the City with \$27,429,600 of coverage. Of the 80 policies, 77 were residential and 3 were nonresidential; 2 of the policies was in A zones (the remaining 78 were in B, C, and X zones). There have been 8 historical claims for flood losses totaling \$65,571; 2 were in A zones and 6 were standard policies located in B, C or X zones. NFIP data further indicates that there are two repetitive loss (RL) buildings in the community. There are no severe repetitive loss (SRL) building in the City. There have been a total of 5 RL losses. One of the RL buildings is located in the A zone. It is zoned Business Professional and has an office use. The site has development restrictions in place; the building cannot be enlarged, and any outdoor uses have to comply with the City’s floodplain requirements. The other RL building is located outside of the 100- and 500-year floodplain in the B, C, or X zones, with most of its damage occurring as a result of heavy rains. This building is zoned commercial and is in commercial use. There has been 1 substantial damage claim in the City since 1978.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 12 improved parcels within the 1% annual chance flood zone, none of those parcels maintain flood insurance. This can be seen on Table C-23.

Table C-23 City of Lincoln – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Lincoln	12	0	0.0%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

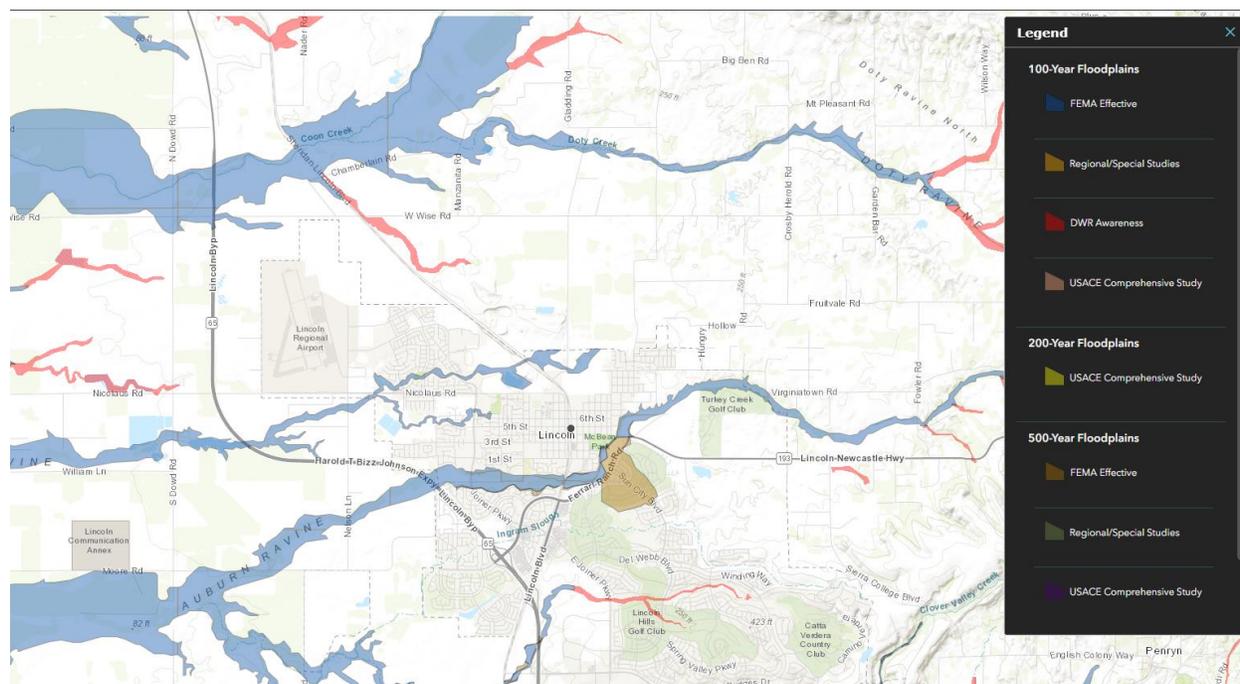
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Lincoln is shown in Figure C-9.

Figure C-9 City of Lincoln – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

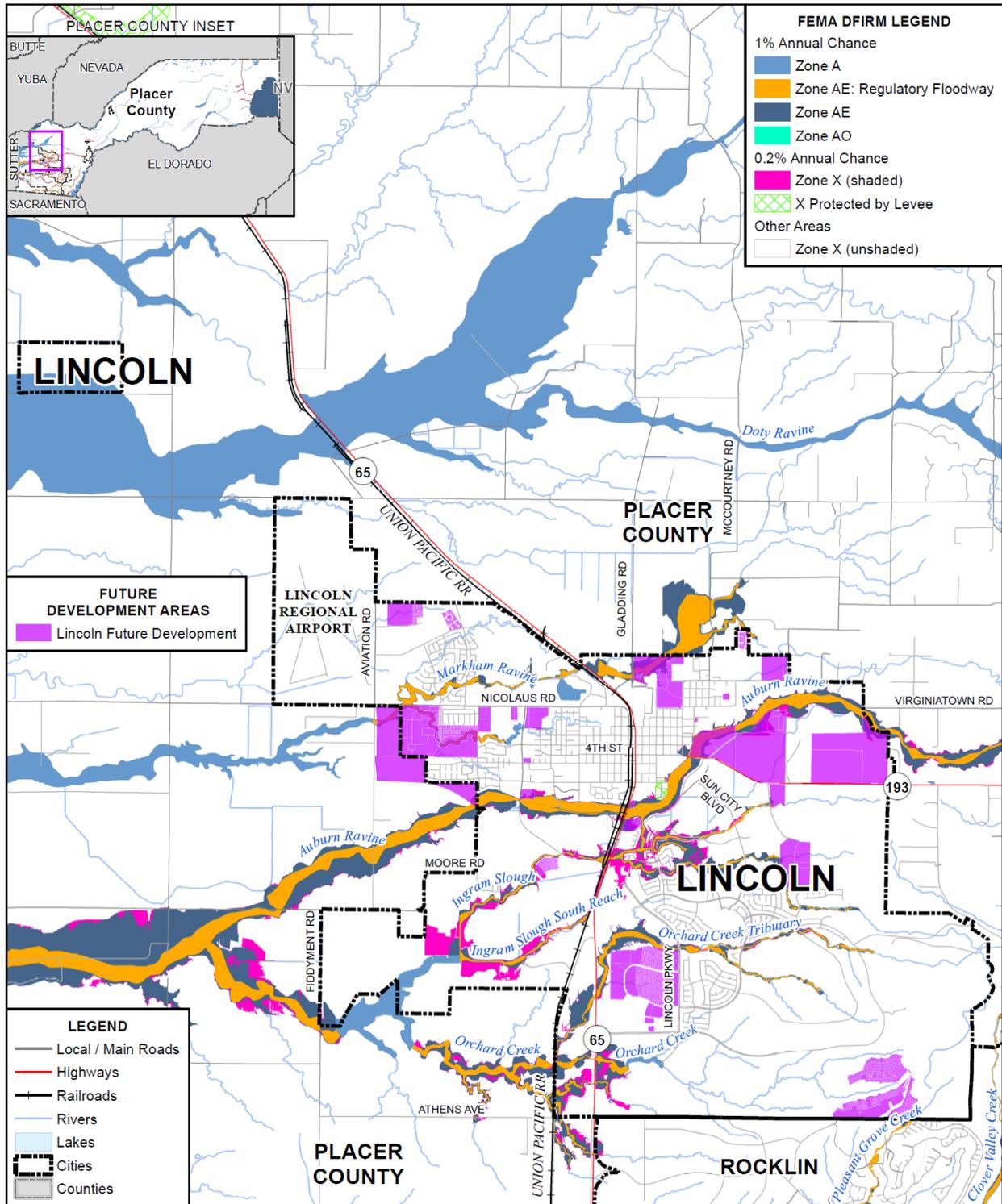
The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

The City noted that development may occur in the flood zone, so long as it is built to the standards of both the 2019 state building code and the floodplain ordinance.

GIS Analysis

The City provided 35 Future Development Areas were used as the basis for the inventory of future development areas for the City. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-8 shows the locations of future development areas the City is planning to develop on the FEMA DFIRM. Table C-24 shows the parcels and acreages of each future development area in the City in each FEMA DFIRM.

Figure C-10 City of Lincoln – Future Development Areas in DFIRM Flood Zones



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-24 City of Lincoln – Future Development Parcels and Acres in FEMA DFIRM Flood Zones

Flood Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
1% Annual Chance Flood Hazard			
Zone AE			
Esplanade at Turkey Creek	2	0	12.7
Meadowlands	1	0	0.7
Zone AE Total	3	0	13.4
Zone AE Floodway			
Cypress Meadows	1	0	1.3
Independence at Lincoln	3	0	35.7
Meadowlands	1	0	45.1
Ventana	1	0	1.9
Zone AE Floodway Total	6	0	84.0
1% Annual Chance Flood Hazard Total	9	0	97.5
0.2% Annual Chance Flood Hazard			
Zone X (shaded)			
Auburn Ravine Center	1	0	1.9
Esplanade at Turkey Creek	1	0	1.8
Ferrari Pavilion	1	0	11.4
Lincoln Crossing Village 11	38	0	3.1
Zone X (shaded) Total	41	0	18.3
0.2% Annual Chance Flood Hazard Total	41	0	18.3
Other Areas			
Zone X (unshaded)			
219 E 8th Street	1	1	0.8
871 Sterling Parkway	1	1	0.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	66	0	11.0
East 10th Street Time Extension	1	0	2.4
Education Foundation	78		28.6
Esplanade at Turkey Creek	9	1	248.0
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	147	0	161.0
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1

Flood Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	160	0	15.7
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	12	0	60.2
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	3	0	184.0
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	386	86	58.3
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4
Ventana	151	18	45.4
Zone X (unshaded) Total	1,515	212	1,602.7
Other Areas Total	1,515	212	1,602.7
Grand Total	1,565	212	1,718.4

Source: City of Lincoln GIS, FEMA 11/2/2018 DFIRM

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Lincoln is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

The City noted the following past occurrences of localized flooding:

- December 2005/January 2006 – Heavy rains that fell over a period of time caused localized flooding in the City. Among them were Gladding Road from Highway 65 to Wise Road, Moore Road both east and west of Joiner Parkway, Nelson Road from Moore Road to Nicolaus Road, and Industrial Way from Twelve Bridges Drive north to its junction with Highway 65. There also was some localized flooding, as noted by City Public Works. The 700 block of I Street experienced some pooling of water and there was a little pooling on Third Street.
- In December of 2014, heavy rain fell in Lincoln. Localized flooding of many streets resulted from the flooding. Some of these streets closed until they drained. Schools released students early due to the street closures.
- In January, February and March of 2019, heavy rain fell in Lincoln. Localized flooding of several streets resulted from the rainfall. Some of these streets closed until they drained.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the City and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Lincoln are summarized in Table C-25.

Table C-25 City of Lincoln – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Gladding Road	X	X		X			
Moore Road	X	X		X			
McCourtney Road	X	X		X			

Source: City of Lincoln

Impacts

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability,

collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

Future development in the City will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Pandemic

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. It is important to realize that this LHMP Update does not examine pandemic contingency plans, but instead focuses on examining the risk of a normal hazard occurrence.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table C-26.

Table C-26 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

During both occurrences, maintaining adequate police and fire staffing, became a significant concern due to the City’s lack of staff and the mandatory quarantine requirements upon a positive test on an employee. The City implemented action plans including PPE’s and prioritizing of calls for service to minimize potential work exposure for non-emergency operations. Non-safety personnel were encouraged to work from home as public access to staff was significantly restricted. Additionally, the mandatory stay at home orders along with business closures significantly impacted the local economy increasing the stress on the residential population from loss of wages and isolation from others overburdening the city’s public assistance resources.

Vulnerability to Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat pandemic flu. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of pandemic flu by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the City. Pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic.

Impacts

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) an unemployment rose

significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause Public Safety Power Shutdown (PSPS) events, creating significant issues in the City. However, PSPS events in the City have been declining with PG&E’s refined system for shutting power off in high wildfire risk areas.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

There were three PSPS heat related events where the City opened cooling centers for those in need. Additionally, the City waived permit requirements for portable generators during PSPS events so that individual power needs could be satisfied.

Vulnerability to and Impacts from Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue, especially if severe heat events result in power outages or PSPS events.

Impacts

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS, winter snowstorms can include heavy snow, ice, and freezing conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Freezing temperatures and ice can also cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire City is at risk to cold weather and freeze events. Snow events are rare in the City. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, snow amounts are limited and melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table C-27.

Table C-27 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The City noted that cold and freeze is a regional phenomenon; events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The City experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the City. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Future Development

Future development built to code should be able to withstand issues associated with extreme cold and freeze events. Pipes at risk of freezing should be buried or insulated from freeze as new facilities are improved or added. Vulnerability to extreme cold will increase as the average age of the population in the City shifts and homelessness becomes more of an issue.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

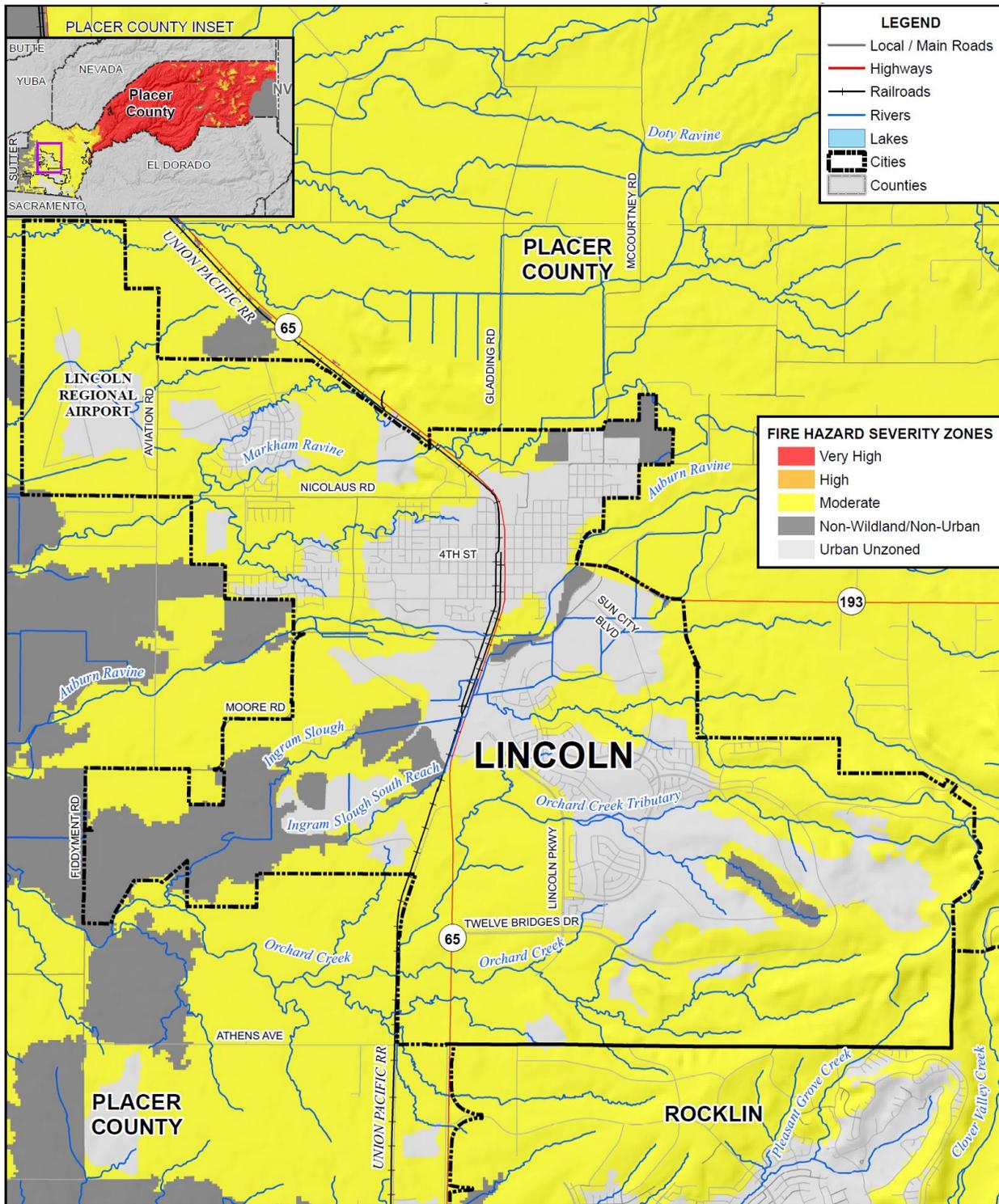
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Lincoln. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Lincoln were created. Figure C-11 shows the CAL FIRE FHSZ in the City. As shown on the maps, fire hazard severity zones within the City range from Urban Unzoned to Moderate.

Figure C-11 City of Lincoln – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhsz06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhsz06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Lincoln has a significant amount of dry range grass that is susceptible to wildland fires that can move quickly if accompanied by a stiff breeze. In addition, there is a great potential for wildland fires in the more open hillside areas in the eastern part of the City.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table C-28.

Table C-28 City of Lincoln – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	0	0.00%	0	0.00%	0	0.00%
Moderate	9,879	64.7%	2,581	50.6%	7,297	71.8%
Non-Wildland/non-Urban	1,113	7.3%	105	2.0%	1,008	9.9%
Urban Unzoned	4,275	28.0%	2,420	47.4%	1,855	18.3%
Total	15,267	100.0%	5,106	100.0%	10,161	100.0%

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table C-29.

Table C-29 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and City, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to

quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Lincoln is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. The rural areas along the City's jurisdictional boundary that are adjacent to new development are vulnerable to a large wildfire, but the City maintains a proactive fuel reduction program with fire breaks and the grazing of sheep to reduce fuel loads.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

Based on the vulnerability of Lincoln to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Lincoln. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Lincoln. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Lincoln are shown in Table C-30, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table C-30 City of Lincoln – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Moderate	10,035	8,008	\$1,183,203,408	\$3,019,599,769	\$1,651,154,114	\$5,853,957,291
Non-Wildland/Non-Urban	985	638	\$107,063,552	\$204,238,966	\$122,079,620	\$433,382,138
Urban Unzoned	10,801	10,060	\$1,140,935,764	\$3,220,642,710	\$1,786,829,405	\$6,148,407,879
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table C-31 breaks out the Table C-30 by adding the property use details by fire hazard severity zone for the City.

Table C-31 City of Lincoln – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Moderate						
Agricultural	21	5	\$9,384,647	\$375,206	\$375,206	\$10,135,059
Commercial	82	40	\$64,972,304	\$81,641,175	\$81,641,175	\$228,254,654
Industrial	86	28	\$42,918,733	\$85,561,083	\$128,341,624	\$256,821,440
Institutional	26	5	\$3,063,030	\$23,464,785	\$23,464,785	\$49,992,600
Miscellaneous	477	5	\$48,330,079	\$3,866,298	\$3,866,298	\$56,062,675
Natural / Open Space	434	2	\$8,724,125	\$2,238,831	\$2,238,831	\$13,201,787
Residential	8,909	7,923	\$1,005,810,490	\$2,822,452,391	\$1,411,226,195	\$5,239,489,076
Moderate Total	10,035	8,008	\$1,183,203,408	\$3,019,599,769	\$1,651,154,114	\$5,853,957,291
Non-Wildland/Non-Urban						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	15	8	\$20,137,100	\$39,920,258	\$39,920,258	\$99,977,616
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	39	0	\$12,765,869	\$0	\$0	\$12,765,869
Natural / Open Space	119	0	\$367,515	\$0	\$0	\$367,515
Residential	811	630	\$73,793,068	\$164,318,708	\$82,159,362	\$320,271,138
Non-Wildland/Non-Urban Total	985	638	\$107,063,552	\$204,238,966	\$122,079,620	\$433,382,138

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Urban Unzoned						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	191	155	\$58,267,134	\$144,693,555	\$144,693,555	\$347,654,244
Industrial	36	30	\$21,926,482	\$75,591,186	\$113,386,778	\$210,904,446
Institutional	62	23	\$4,622,607	\$51,719,837	\$51,719,837	\$108,062,281
Miscellaneous	338	4	\$5,580,714	\$997,599	\$997,599	\$7,575,912
Natural / Open Space	282	9	\$10,849,331	\$4,422,751	\$4,422,751	\$19,694,833
Residential	9,892	9,839	\$1,039,689,496	\$2,943,217,782	\$1,471,608,885	\$5,454,516,163
Urban Unzoned Total	10,801	10,060	\$1,140,935,764	\$3,220,642,710	\$1,786,829,405	\$6,148,407,879
Lincoln Total	21,821	18,706	\$2,431,202,724	\$6,444,481,445	\$3,560,063,139	\$12,435,747,308

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the City of Lincoln – 2.57. According to this analysis, there is a total population of 20,362 residents of Lincoln at risk to moderate or higher FHSZs. This is shown in Table C-32.

Table C-32 City of Lincoln – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

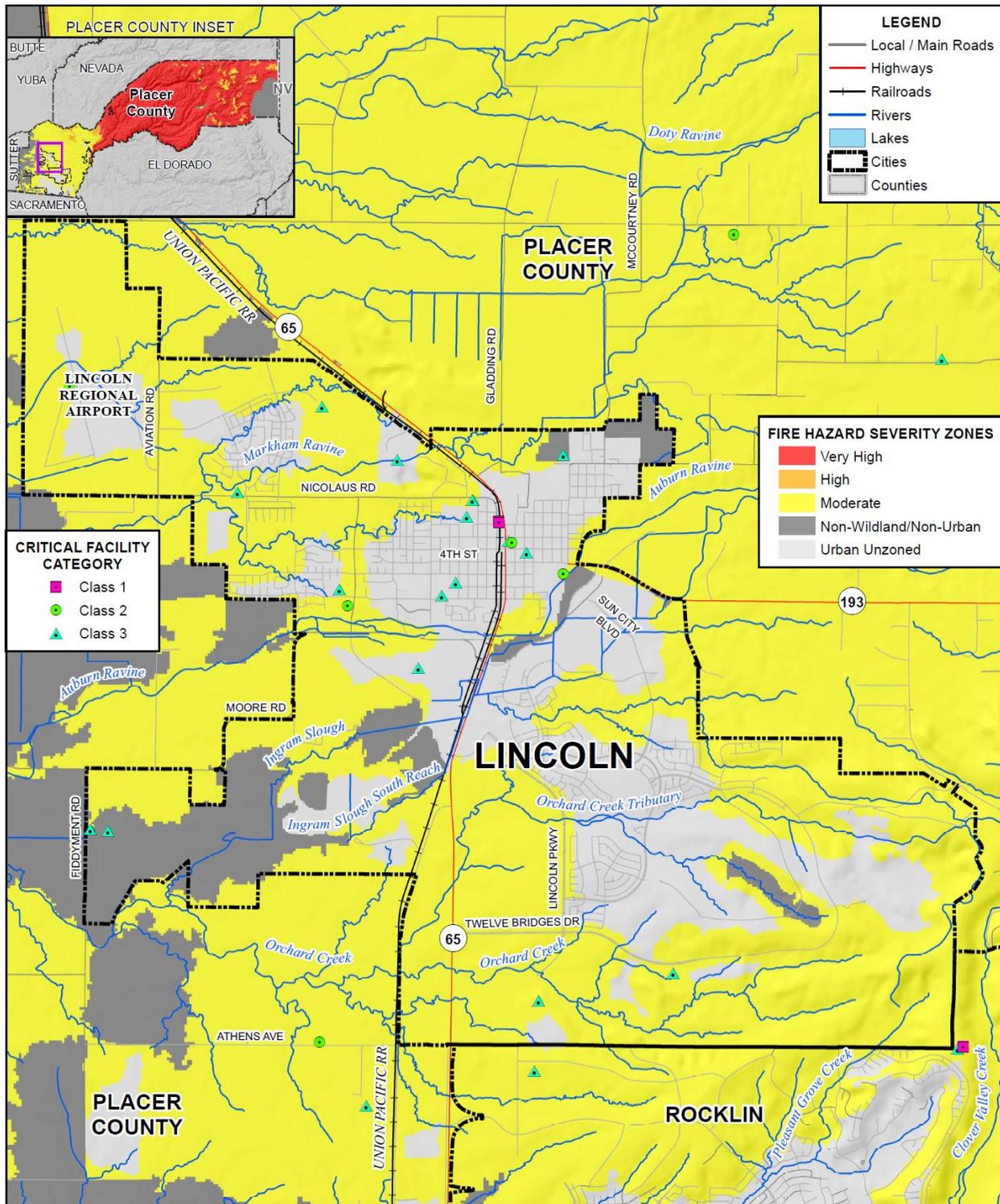
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Lincoln	0	0	0	0	7,923	20,362

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Lincoln in identified FHSZs. Critical facilities in a FHSZ in the City of Lincoln are shown in Figure C-12 and detailed in Table C-33. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure C-12 City of Lincoln – Critical Facilities in Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-33 City of Lincoln – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
Moderate	Class 2	Airport	1
	Class 3	Fire Station	2
		School	6
Moderate Total			9
Non-Wildland/Non-Urban	Class 3	Hall	1
		School	1
		Water Treatment Plant	1
Non-Wildland/Non-Urban Total			3
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	1
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
School		5	
Urban Unzoned Total			12
Lincoln Total			24

Source: CAL FIRE, Placer County

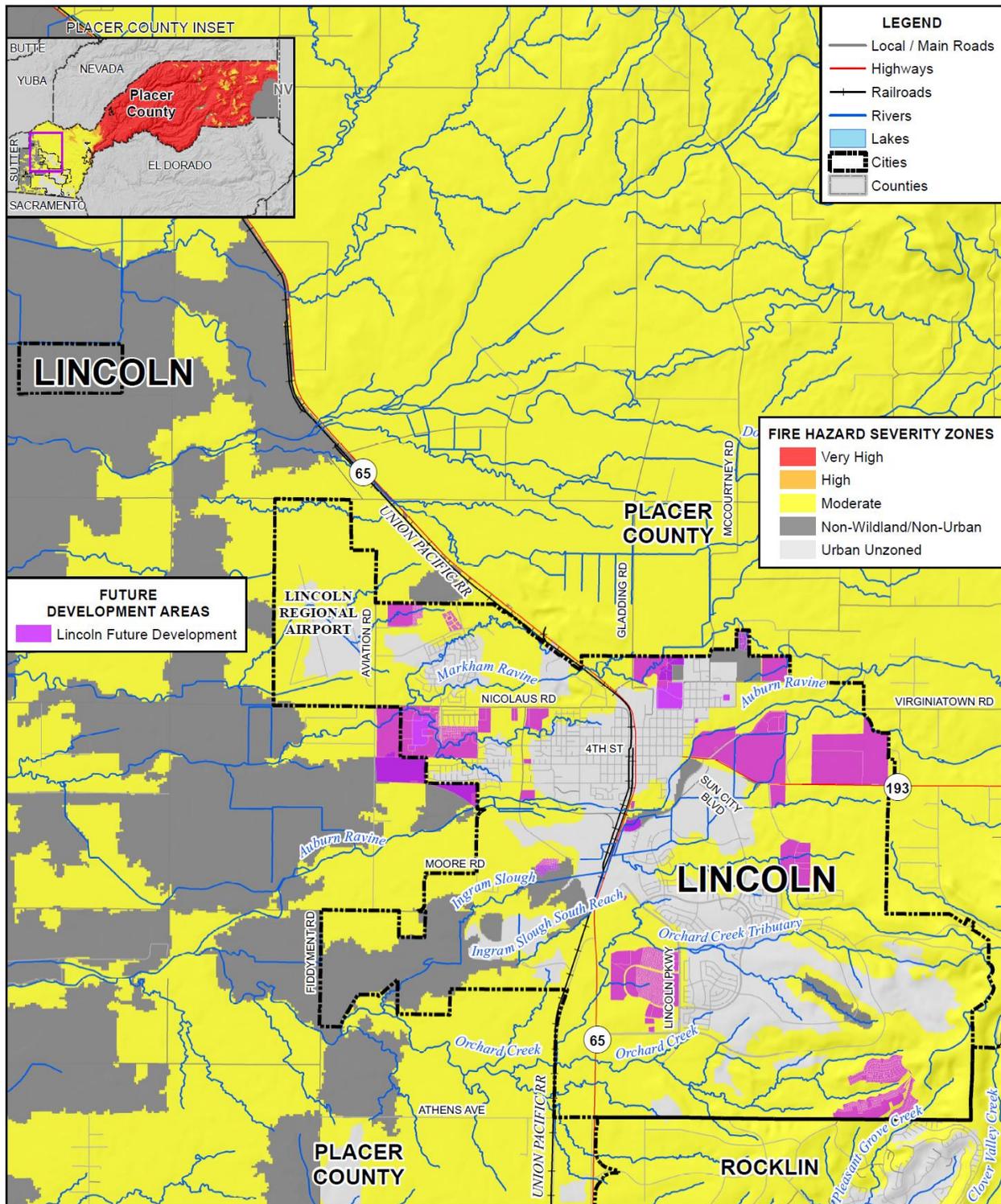
Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

GIS Analysis

The City provided 35 future development areas that were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure C-13 shows the locations of future development areas the City is planning to develop on the FHSZs. Table C-34 shows the parcels and acreages of each future development area in the City in each FHSZ.

Figure C-13 City of Lincoln – Future Development Areas in FHSZs



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table C-34 City of Lincoln – Future Development Acres and Parcels in FHSZs

Fire Hazard Severity Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate			
871 Sterling Parkway	1	1	0.9
Auburn Ravine Center	1	0	1.9
Carefield Lincoln	3	0	14.7
Cypress Meadows	3	0	0.4
Education Foundation	78	0	28.6
Esplanade at Turkey Creek	12	1	262.5
Fullerton Ranch	2	0	19.0
Greyson at Twelve Bridges	2	0	29.6
Hidden Hills	4	2	84.8
Independence at Lincoln	149	0	175.1
Joiner Ranch	2	0	25.3
La Quinta	1	0	3.1
Lakeside 6 Phase 2	53	40	10.9
Lakeside 6 Phase 7 & 8	93	0	47.2
Lincoln Crossing Village 11	82	0	7.1
Lincoln Meadows	1	0	39.7
Lincoln Place	2	2	5.1
Magnolia Village	1	0	2.4
Meadowlands	2	0	51.3
Piamonte at Twelve Bridges	108	30	39.9
Riverwalk Villas	1	0	8.6
Special Use District B Northeast Quadrant	1	0	73.5
Terra Cotta Village Phase 2	1	0	2.0
The Waterfront	2	1	19.4
Tramonte at Twelve Bridges	98	30	34.6
Turkey Creek Estates	2	0	249.2
Twelve Bridges Village 10	121	0	77.2
Twelve Bridges Village 2	385	86	56.7
Twelve Bridges Village 27	1	0	29.3
Twelve Bridges Village 3	1	0	18.1
Twelve Bridges Village 4	1	0	26.4
Ventana	152	18	47.3

Fire Hazard Severity Zone / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate Total	1,366	211	1,491.8
Non-Wildland/Non-Urban			
Cypress Meadows	64	0	11.9
Ferrari Pavilion	1	0	11.4
Lincoln Crossing Village 11	115	0	10.1
Meadowlands	5	0	17.1
Special Use District B Northeast Quadrant	2	0	110.5
Non-Wildland/Non-Urban Total	187	0	161.1
Urban Unzoned			
219 E 8th Street	1	1	0.8
East 10th Street Time Extension	1	0	2.4
Independence at Lincoln	1	0	21.6
Lincoln Crossing Village 11	1	0	1.6
Meadowlands	7	0	37.5
Twelve Bridges Village 2	1	0	1.6
Urban Unzoned Total	12	1	65.5
Grand Total			
Grand Total	1,565	212	1,718.4

Source: City of Lincoln GIS, CAL FIRE

C.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

C.6.1. Regulatory Mitigation Capabilities

Table C-35 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Lincoln.

Table C-35 City of Lincoln Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	
Capital Improvements Plan	Y	
Economic Development Plan	Y	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	Y	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections		
	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2019 CBC
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	
Land Use Planning and Ordinances		
	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	
Subdivision ordinance	Y	
Floodplain ordinance	Y	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	
Elevation Certificates	Y	
Acquisition of land for open space and public recreation uses	Y	
Erosion or sediment control program	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional personnel. Continual updates to address new and priority issues affecting community		

Source: City of Lincoln

The City of Lincoln General Plan, 2008

The City of Lincoln General Plan serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The general plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Lincoln Planning Area. Identified hazards include geologic/seismic, air quality, human-made, flooding, fires, public safety, and noise. Applicable mitigation-related goals, policies, and actions are presented below in Table C-36.

Table C-36 Lincoln General Plan Mitigation Related Goals and Policies

Goal/Policy Number	Explanation
General	
General - Goal HS-1:	To minimize the danger of natural and Human-Made hazards and to protect residents and visitors from the dangers of earthquake, fire, flood other natural disasters, and man-made dangers.
Policy HS-1.1:	Engineering Analysis of Potential Hazards: The City shall require engineering analysis of new development proposals in areas with possible soil instability, flooding, earthquake faults, or other hazards, and to prohibit development in high danger areas.
Geologic	
Geologic and Seismic Hazards Goal HS-2:	To minimize exposure of persons and property to damage resulting from geologic and seismic hazards.
Policy HS-2.1:	Seismic Safety of Structures: The City shall require that new structures intended for human occupancy are designed and constructed to minimize risk to the safety of occupants due to ground shaking.
Policy HS-2.2:	Limit Hillside Development: To limit development in areas with severe slopes.
Policy HS-2.3:	Development in Areas Subject to Geologic Hazards: The City shall discourage incompatible land uses from being located in areas subject to geologic or seismic hazards
Policy HS-2.4:	California Building Standard Code: The City shall continue to require that alterations to existing buildings and all new buildings be built according to the seismic requirements of the California Building Standard Code.
Flood	
Flood Hazards Goal HS- 6:	To minimize the risk of life and property of the City's residents from flood hazards.
Policy HS-6.1:	Flood Protection: The City shall ensure that adequate flood protection is provided throughout the community.
Policy HS-6.2:	Drainage and Flood Control Facilities: The City will continue to cooperate and coordinate efforts with the Placer County Flood Control and Water Conservation District for the construction, operation, and maintenance of drainage and flood control facilities and where feasible provide for their joint use. This includes cooperation with Placer County, cities within Placer County, and Sutter County and special districts to provide regional flood control protection.
Policy HS-6.3:	Master Drainage Plans: The City shall require master drainage plans as a condition of approval for large development projects.

Goal/Policy Number	Explanation
Policy HS-6.4:	New Residential Construction: The City shall require new residential construction to have its lowest habitable floor elevated above the base flood level elevation, determined by FEMA standards
Policy HS-6.5:	Stream Channels: The City shall prohibit development along stream channels that would reduce the stream capacity, increase erosion, or cause deterioration of the channel.
Policy HS-6.6:	Flood Insurance Program: The City shall continue to participate in the National Flood Insurance Program.
Urban and Wildland Fire Hazards	
Goal HS-7	To minimize the risk of life and property to from urban and wildland fires.
Policy HS-7.1:	Enforce Code/Ordinances: The City shall enforce the City building code, fire code, and ordinances in regard to fire safety and fire protection.
Policy HS-7.2:	Educate Residents of Fire Hazards: The City shall educate residents of urban and wildland fire hazards and safety measures.
Policy HS-7.3:	Wildland Fire Management Plans: The City shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads.
Policy HS-7.4:	Buffer Zones for Fire Protection: The City shall require new development to incorporate additional greenbelts, fuel breaks, fuel reduction and buffer zones around communities to minimize potential fire losses.
Policy HS-7.5:	Weed Abatement: The City shall maintain a weed abatement program to ensure clearing of dry brush areas. Weed abatement activities shall be conducted in a manner consistent with all applicable environmental regulations.
Emergency Response	
Goal HS-9	To ensure the maintenance of the Emergency Response Plan in order to maintain its effectiveness in preparing and responding to a natural or human-made disaster.
Policy HS-9.1	Emergency Response Plan: The City shall ensure that the Emergency Response Plan meets current federal, state, and local emergency requirements.
Policy HS-9.2	Coordinate Emergency Response Services with Local Agencies: The City shall continue to coordinate emergency response services with Placer County, other cities within Placer County, special districts, service agencies, voluntary organizations, and state and federal agencies.
Policy HS-9.3	Educate Public on Emergency Response: The City shall conduct training programs for staff in disaster preparedness.
Policy HS-9.4	Coordinate with Placer County: The City will strive to work with other local agencies including Placer County and cities within the County to develop coordinated geographical information systems (GIS) planning for emergency response services.
Policy HS-9.5	Siting of Critical Emergency Responses: The City shall ensure that the siting of critical emergency response facilities such as hospitals, fire stations, police offices, substations, emergency operations centers, and other emergency service facilities and utilities have minimal exposure to flooding, seismic and geological effects, fire, and explosions.

General Plan, Appendix H: Drainage and Surface Water Impacts and Constraints

As part of the General Plan Update process, Lincoln performed a detailed review of the proposed land use scenario as well as an impact analysis of the development expansion areas to the local and regional drainage

systems. Appendix H of the General Plan contains a list of drainage related constraint issues, identifies hydraulically sensitive areas, and provides proposed guidelines for developing within and around those areas.

South Lincoln Master Drainage Plan/North Lincoln Master Drainage Plan

Regional master plans identify the needs of a watershed or portion thereof and formulate plans, programs, and policies for effective stormwater management. The plans coordinate facilities and policies, and help assure that all effects of watershed changes are identified, including especially the cumulative effects of many small-scale changes. These plans play an important role in a developing region by providing critical information and criteria for the coordinated planning and design of development projects in the watershed. In addition, appropriate on-site flood control facilities may be required, and offsite facilities are identified for which developers may be charged shares.

City of Lincoln Water Management Plan (2017)

The City of Lincoln commissioned a Water Master Plan (WMP) in October of 2014 in order to analyze the City’s water supply reliability and water management efforts. Accordingly, this WMP is a thorough assessment of the City’s organizational structure, water demand, water supplies, water governance, and infrastructure. The WMP culminates in a set of recommended actions that advance the detailed analysis provided in the document.

C.6.2. Administrative/Technical Mitigation Capabilities

Table C-37 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Lincoln.

Table C-37 City of Lincoln’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	
Mutual aid agreements	Y	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	
Floodplain Administrator	Y	
Emergency Manager	Y	
Community Planner	Y	

Civil Engineer	Y
GIS Coordinator	Y
Other	
Technical	
Warning systems/services (Reverse 911, outdoor warning signals)	Y
Hazard data and information	N
Grant writing	Y
Hazus analysis	N
Other	
How can these capabilities be expanded and improved to reduce risk?	
Utilize GIS resources as the department grows for better data collection and analysis	

Source: City of Lincoln

C.6.3. Fiscal Mitigation Capabilities

Table C-38 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table C-38 City of Lincoln’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	
Other federal funding programs	N	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Annual review and update of fees to ensure adequate funding to improve City’s resources to reduce risk		

Source: City of Lincoln

C.6.4. Mitigation Education, Outreach, and Partnerships

Table C-39 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table C-39 City of Lincoln’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Limited
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase public outreach and community participation through existing service organizations		

Source: City of Lincoln

The City of Lincoln works cooperatively with the State Regional Board, the Central Valley Regional Water Quality Control Board, the Placer County Flood Control and Water Conservation District, and the neighboring jurisdictions of Rocklin, Roseville, Auburn, and Placer County.

C.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- Public awareness and information programs specific to emergency preparedness that include: e-mail bulletins, fire prevention events, police department events, police Community Services Officer conducts neighborhood meetings, writes newspaper articles, and sends mailings with reminders on weed abatement for fire safety;
- Implementation of the City's stormwater management program with public outreach (e-mail bulletins, newspaper articles, posters, and elementary school activities), regular inspections, and enforcement activities;
- Adoption of new building code requirements with stricter fire construction standards;
- New specific plans/planned developments are required to prepare wildfire management plans to identify responsibilities, funding, and ongoing methods to reduce potential damage and threat of wildfires;

- Enforcement of existing wildfire management plans and assisting private Homeowner Associations (HOAs) with their fuel reduction programs; and,
- Implementation of fuel reduction methods identified in open space management plans for existing open spaces.

C.7 Mitigation Strategy

C.7.1. Mitigation Goals and Objectives

The City of Lincoln adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

C.7.2. NFIP Mitigation Strategy

The City of Lincoln joined the NFIP on February 3, 1982. As a participant of the National Flood Insurance Program (NFIP), the City of Lincoln has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Lincoln will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Lincoln actively participates with the County of Placer to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Lincoln as for Placer County since participation at the County level includes all local jurisdictions. An elected official of the City of Lincoln is a designated representative on the Placer County Flood Control District Board.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City has a Flood Damage Prevention Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Placer County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The City of Lincoln Planning and Engineering Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about their stormwater management program and up-to-date information related to the maintenance of the City's drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate

insurance rating, and promote the awareness of flood insurance. The City of Lincoln is not a current participant in the CRS program.

More information about the floodplain administration in the City of Lincoln can be found in Table C-40.

Table C-40 City of Lincoln Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	80 policies in force \$38,864 in premiums \$27,429,600 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	8 claims \$65,572 in paid losses 1 substantial damage claims
How many structures are exposed to flood risk within the community?	12 in 1% flood zone 110 in 0.2% flood zone
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	2 RL properties 1SRL property
Describe any areas of flood risk with limited NFIP policy coverage	Unknown
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	CFM on staff
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit Review and Outreach
What are the barriers to running an effective NFIP program in the community, if any?	Money and time
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 6/26/2009
Is a CAV or CAC scheduled or needed?	Y
Regulation	
When did the community enter the NFIP?	February 3, 1983
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Y
Provide an explanation of the permitting process.	Permit applicants must adhere to Floodplain Regulations as stated in the Lincoln Municipal Code
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A

NFIP Topic	Comments
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

C.7.3. Mitigation Actions

The planning team for the City of Lincoln identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Lincoln Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Lincoln in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 3. Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The present bridge structure crossing Lincoln Boulevard is antiquated and does not pass the 100-year storm event. In fact flooding of the roadway has occurred in storm events smaller than the 10-year. This is a major entryway to the City, and road closures at this location represent a serious risk to health, safety, and emergency services. Replacement of the bridge structure will involve adding capacity and raising roadway elevations to meet current design standards

Project Description: Remove existing bridge and replaced with taller, wider bridge to mitigate flooding issues.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department

Cost Estimate: \$15M

Benefits (Losses Avoided): The main benefit would be for the safety and welfare of the citizens of the City of Lincoln. Lincoln Boulevard is one of three entry and exit points to the downtown area of the City. All three entry and exit points are projected to flood in the 100-year event, which results in isolation of the

downtown areas. Auburn Ravine also bisects the historical areas of the City from the newly developing South Lincoln Master Plan area. Roadway closures at this location would prevent emergency services from being able to provide service across this waterway.

Potential Funding: Highway Bridge Program funds and local funds

Timeline: Ongoing – not likely before 2025.

Project Priority (H, M, L): High

Action 4. McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing McBean Park Drive bridge at Auburn Ravine does not meet City requirements for freeboard in the 100-year design storm event. A new bridge span of 110 feet located in the overbank areas would provide additional conveyance capacity, but roadway elevations at McBean Park Drive/SR-193 would also need to be raised.

Project Description: Remove existing bridge and replace with taller, wider bridge to mitigate flooding hazard.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: \$16.5M

Benefits (Losses Avoided): This project is necessary for health and safety issues relating to emergency service accessibility during a major flood event. This is also one of three major access points to the historical downtown Lincoln area and new areas of future growth.

Potential Funding: Highway Bridge Program and local funds

Timeline: 2015-2024

Project Priority (H, M, L): High

Action 5. Lakeview Farms Regional Volumetric Mitigation Facility

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Newly developing areas of the Markham Ravine and Racoon Creek watersheds, which are a part of the current general plan, and which have not previously been studied for potential peak flow and volumetric impacts will require the development of mitigation facilities.

Project Description: Phase 1 of this project would bring the Lakeview Farms Volumetric Storage Facility into operation. The project includes grading a 150 acre basin along with the installation of weir structures and piping that would allow the City to channel waters of Racoon Creek into the storage basin during heavy rain events and then pump the water out after the storm event has passed.

Other Alternatives: Require project by project mitigation or no action which would result in downstream impacts.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: \$3.3M (Phase 1)

Benefits (Losses Avoided): Reduces the potential for development impact at known flooding areas downstream of the City at Sutter County and the Cross Canal areas.

Potential Funding: Combination of City and Development Fees.

Timeline: 2016-2023

Project Priority (H, M, L): High

Action 6. *Gladding Parkway, Lincoln Boulevard and McCourtney Road – Stream Restoration and Culvert Improvement*

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Gladding Parkway, Lincoln Boulevard and McCourtney Road require additional storm drain infrastructure to decrease the prevalence of flooding.

Project Description: Project improvements include new culverts at Gladding Road at Markham Ravine, raising roadway elevations at the north/south stretch of Gladding Road and local storm drainage improvements for Gladding Parkway, Lincoln Boulevard and McCourtney Road.

Other Alternatives: Required by adapted master plan

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$2,025,000

Benefits (Losses Avoided): This project is necessary for health and safety issues relating to emergency service accessibility during a major flood event.

Potential Funding: Combination of City and development fees

Timeline: Ongoing

Project Priority (H, M, L): High

Action 7. "O" Street Drainage Improvements

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Modifications to the south tributary of Markham Ravine channel as it meanders through the City will be necessary to reduce flooding potential in the adjacent subdivisions.

Project Description: The project will lower the invert of the south tributary of Markham Ravine channel to provide additional capacity to reduce flood elevations by zero to three feet.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$533,500

Benefits (Losses Avoided): An analysis of the existing storm drainage systems in the area shows that there is a potential of structural flooding and roadway flooding in a 100-year event.

Potential Funding: Combination of City and development fees.

Timeline: Ongoing improvements as new development permits.

Project Priority (H, M, L): Medium

Action 8. 7th Street Drainage Improvements

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant surface flooding is known to occur in the area.

Project Description: An additional Storm drainage trunk pipeline is planned for 7th Street to extend storm drain service along this corridor and to relieve other existing systems which ultimately pick up this drainage area. The proposed system would bring the storm drainage protection to City Standards.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$1,010,000

Benefits (Losses Avoided): Many of the roadways along this corridor flood during normal rainfall events, and access to the high school and residences is restricted. Several residents have complained that they fear the flood waters and have witnessed encroachment of floodwater in their yards, which may encroach into their structures in larger storms.

Potential Funding: Combination of City and development fees, grants

Timeline: Construct as funds available.

Project Priority (H, M, L): Medium

Action 9. Auburn Ravine at McBean Park Drive/State Route 193 Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant sediment and debris accumulate at the “chevron” style piers and abutments.

Project Description: Removal of accumulated sediment and debris at piers and abutments to allow for full bridge capacity for flood protection.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$110,000

Benefits (Losses Avoided): Improvements would reduce flood frequency upstream of SR 193 and increase flood protection back to the intended installation of the bridge structure.

Potential Funding: Local funds.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 10. Auburn Ravine at Lincoln Boulevard (formerly State Route 65) Bridge

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Significant sediment and debris accumulate at the invert and abutments of the bridge. The accumulation of sediment in this location also results in a significant sediment accumulation issue upstream.

Project Description: Removal of accumulated sediment and debris at piers and abutments to allow for full bridge capacity for flood protection.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$110,000

Benefits (Losses Avoided): Improvements would reduce flood frequency upstream of SR 193 and increase flood protection back to the intended installation of the bridge structure.

Potential Funding: Local funds.

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 11. Ingram Slough – Orchard Creek Return Channel

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: This project is located east of the Lincoln Crossings Development at the Nader Property which is at risk of flood inundation.

Project Description: The Construction of the channel would provide a gravity release for the new channels constructed through the Lincoln Crossings development and reduces floodplain elevations and floodplain inundation areas.

Other Alternatives: No action would result in a large shallow overspill area with limited development potential.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department.

Cost Estimate: \$1,725,000

Benefits (Losses Avoided): The construction of the channel would bring 100-year flood elevations within Ingram Slough at the Lincoln Crossing development to City Standard Freeboard requirements; however, the interim operation would not be expected to cause any structural damages.

Potential Funding: Combination of City and development fees.

Timeline: Dependent on Nader Ranch/Village 7 development

Project Priority (H, M, L): Medium

Action 12. Markham Ravine – Updated FEMA Analysis and Mapping

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Existing FEMA mapping for the Markham Ravine watershed requires updating to improve accuracy of maps.

Project Description: Detailed mapping and analysis will be performed for the Markham Ravine watershed. Evaluation and updating of existing FEMA mapping will be accomplished.

Other Alternatives: Required by master plan

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: FEMA/Placer County Flood Control and Conservation District/ City of Lincoln Engineering Department

Cost Estimate: Staff time

Benefits (Losses Avoided): Precise definition of 100-year flood allows for construction to be set at required criteria. Verification of base flood data will help to determine if any flood protection deficiencies exist in this system.

Potential Funding: Development Fees

Timeline: 2019-2022

Project Priority (H, M, L): Medium

Action 13. *Markham Ravine Drainage Improvements – Union Pacific Railroad & Lincoln Boulevard (formerly State Route 65) Crossings*

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Existing UPRR and Lincoln Boulevard crossings at Markham Ravine structures do not provide 100-year flood protection.

Project Description: Modification of the existing UPRR and Lincoln Boulevard crossings at Markham Ravine will be necessary to provide 100-year protection at these structures.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Engineering Department.

Cost Estimate: \$500,000

Benefits (Losses Avoided): The main benefit would be the safety and welfare of the citizens of the City of Lincoln. Lincoln Boulevard north of Lincoln is one of three entry and exit points to the downtown area of the City. All three are projected to flood in the 100-year event, which results in isolation of the downtown areas.

Potential Funding: Development Fees

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 14. *Auburn Ravine Stream Restoration Projects (Analysis and Repairs)*

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Auburn Ravine is one of the three major watercourses in the City. The previously defined streambed may have been altered by improper encroachment into the floodplain, which changed sediment loading conditions, or acts of nature, resulting in changes to the flow regimes. This task will analyze and recommend specific areas of improvement.

Project Description: This task will analyze and recommend specific areas of improvement along Auburn Ravine.

Other Alternatives: Leaving stream unrepaired results in erosion potential, and the potential of additional deposition downstream of the City, which reduces conveyance capacity.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: \$500,000

Benefits (Losses Avoided): Creek restoration improvements to include restoring the channel's cross section for maximum flow, efficient transportation of sediment, and restoration of the ecosystem

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 15. Markham Ravine Streambed Restoration Projects (Analysis Only)

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing streambed of Markham Ravine must be evaluated to determine what is necessary to restore the creek section to optimum capacity for flow of water and sediment transport.

Project Description: This task will analyze and recommend specific areas of improvement along Markham Ravine.

Other Alternatives: This stream is extremely sensitive to the large amounts of attenuation currently present. Changes in the sediment loading of this system could reduce the storage capacity of the system and result in significant increases to peak flow rates and flooding potential.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: \$100,000

Benefits (Losses Avoided): Determination can be made of deficiencies

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 16. *Raccoon Creek Streambed Restoration Projects (Analysis Only)*

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The existing streambed of Raccoon Creek must be evaluated to determine what is necessary to restore the creek section to optimum capacity for flow of water and sediment transport.

Project Description: This task will analyze and recommend specific areas of improvement along Raccoon Creek.

Other Alternatives: Leaving stream unrepaired results in erosion potential, and the potential of additional deposition downstream, which reduces conveyance capacity.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: City of Lincoln Public Services Department

Cost Estimate: \$100,000

Benefits (Losses Avoided): Determination can be made of deficiencies

Potential Funding: Combination of City and development fees, grants.

Timeline: As funding becomes available

Project Priority (H, M, L): Low

Action 17. *Fire Prevention and Fuels Management Plan*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City of Lincoln has adopted a General Plan that will carry the City's growth and planning into the year 2050. The new General Plan calls for a balance of development and open space with the recommendation of maintaining 40 percent open space. This presents some significant maintenance and fire suppression challenges. Additionally, it increases the fire prevention workload to monitor and provide for abatement. Access, abatement, fuels management, and staffing to address the increased incidents are just some of the problems forecasted in order to implement the new General Plan policies.

Project Description: Creation of a Fire Prevention and Fuels Management Plan

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently the City of Lincoln has several fuels management plans in place for specific areas within the existing boundaries. Bringing forth a comprehensive plan to ensure continuity within the City's jurisdiction would aid in planning (Community Wildfire Preparedness Plan). Additionally, a funding mechanism would have to be developed in order to provide for adequate abatement and fuels modification which the Public Services and Fire Departments have not been able to provide.

Responsible Agency/ Department/Partners: City of Lincoln Community Development, Public Services and Fire Departments

Cost Estimate: Unknown, but would have to rely on new staff or consultant services due to limited fire department staffing.

Benefits (Losses Avoided): Responses to such areas would be quicker with proper access. Incidents could be reduced in magnitude under normal environmental conditions (not including high fire danger weather events) by reducing fuel load. A comprehensive citywide plan would provide greater public safety without loss of desirable open space features. A comprehensive plan would provide higher protection for housing, commercial, and recreational components that border such areas. Several different fuels management plans could be consolidated into a citywide plan

Potential Funding: Grants, development, cooperation with other jurisdictions that have developed plans of this type.

Timeline: Continuous as the General Plan is implemented and the City of Lincoln realizes additional growth and development.

Project Priority (H, M, L): High



Annex D Town of Loomis

D.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Town of Loomis, a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the Town. This Annex provides additional information specific to Loomis, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

D.2 Planning Process

As described above, Loomis followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the Town formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table D-1. Additional details on Plan participation and Town representatives are included in Appendix A.

Table D-1 Town of Loomis – Planning Team

Name	Position/Title	How Participated
Mary Beth Van Voorhis	Planning Director	Reviewed LHMP planning process and contributed to updated details
David Strock	Director of Public Works	Reviewed LHMP planning process and contributed to updated details
Carol Parker	Administrative Analyst	Reviewed LHMP planning process and contributed to updated details
Sean Burke	Building Official	Reviewed LHMP planning process and contributed to updated details
Merrill Buck	Town Engineer-Consultant	Reviewed LHMP planning process and contributed to updated details
Sean Rabé	Town Manager	Reviewed LHMP planning process and contributed to updated details
Brad Donohue	Special Project Coordinator-Consultant	Reviewed LHMP planning process and contributed to updated details

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the Town integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the Town incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table D-2.

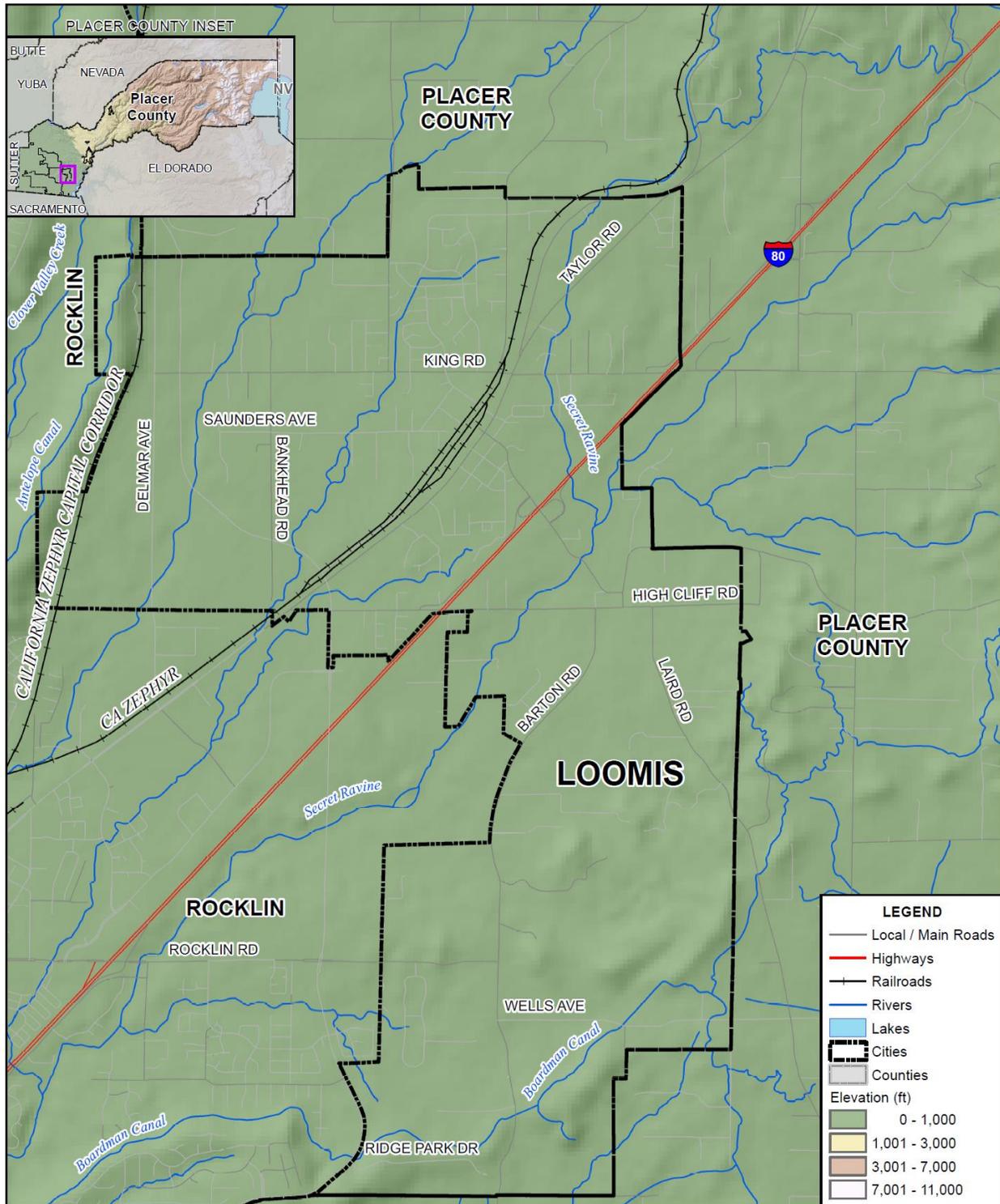
Table D-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	The City had no related planning mechanisms since 2016.

D.3 Community Profile

The community profile for the Town of Loomis is detailed in the following sections. Figure D-1 displays a Town map and the location of Loomis within Placer County.

Figure D-1 Town of Loomis



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

D.3.1. Geography and Climate

Loomis is a small, semi-rural community located in rapidly urbanizing western Placer County in California’s Central Valley. The Town is located approximately 25 miles northeast of the City of Sacramento, along Interstate 80. Loomis is in the western portion of the Loomis Basin, an 80-square mile area of the Placer County foothills. The town ranges in elevation from approximately 399 to 625 feet above msl and covers an area of about 7.3 square miles. Stream drainages in the area include Antelope Creek and Secret Ravine.

Interstate 80, traversing northeast through the center of Town, divides Loomis into two distinct areas. The area north of I-80 contains all the community’s existing retail, office and industrial development, as well as higher density residential development, bounded by larger semi-rural residential lots. The area south of I-80 is almost exclusively rural and residential in character.

Loomis’ average temperatures range from the mid 80°F to mid 90°F during the summer to the mid 30°F to high 40°F during the winter. Loomis receives an average of 36.51 inches of rain annually and only an occasional dusting of snow in the winter.

D.3.2. History

As early as 1825, trappers and hunters following the American River came into the Loomis basin. Like the beginnings of many cities in Placer County, Loomis began as a mining town, but soon became a booming center of the fruit-growing industry, supporting many packinghouses. During the 1850s miners worked along Secret Ravine and farmers and ranchers began to move into the Loomis area. The Town was established in 1850, but not incorporated until 1984. The Central Pacific Railroad was constructed through Loomis in 1864. By 1872 the transcontinental link was completed and helped to expand the market for fruits, which were being produced on a commercial scale. For several years, fruit from the Loomis area was world renowned for its quality. Eventually disease destroyed many orchards established in the late 1800s and fruit production declined significantly. Today it is a very small part of the town’s economy.

D.3.3. Economy

US Census estimates show economic characteristics for the Town of Loomis. These are shown in Table D-3 and Table D-4. Mean household income in the Town was \$121,508. Median household income in the Town was \$83,162.

Table D-3 Town of Loomis – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	0	0.0%
Construction	392	12.8%
Manufacturing	235	7.7%
Wholesale trade	41	1.3%
Retail trade	502	16.4%

Industry	Estimated Employment	Percent
Transportation and warehousing, and utilities	165	5.4%
Information	20	0.7%
Finance and insurance, and real estate and rental and leasing	117	3.8%
Professional, scientific, and management, and administrative and waste management services	309	10.1%
Educational services, and health care and social assistance	855	27.9%
Arts, entertainment, and recreation, and accommodation and food services	78	2.5%
Other services, except public administration	173	5.7%
Public administration	174	5.7%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table D-4 Town of Loomis – Income and Benefits

Income Bracket	Percent
<\$10,000	6.3%
\$10,000 – \$14,999	0.6%
\$15,000 - \$24,999	5.5%
\$25,000 – \$34,999	5.8%
\$35,000 – \$49,999	5.6%
\$50,000 – \$74,999	25.4%
\$75,000 – \$99,999	7.6%
\$100,000 – \$149,999	23.3%
\$150,000 – \$199,999	7.5%
\$200,000 or more	12.3%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

D.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the Town of Loomis was 6,888.

D.4 Hazard Identification

Loomis’s identified the hazards that affect the Town and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Loomis (see Table D-5).

Table D-5 Town of Loomis—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Occasionally	Negligible	Medium	High
Earthquake	Significant	Occasional	Limited	High	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Extensive	Likely	Critical	Medium	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Negligible	Low	High
Severe Weather: Freeze and Snow	Limited	Occasional	Negligible	Low	Medium
Severe Weather: Heavy Rains and Storms	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Significant	Likely	Limited	Medium	Low
Tree Mortality	Significant	Likely	Limited	Low	High
Wildfire	Significant	Likely	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths. Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability. Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability. Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

D.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Loomis’s hazards and assess the Town’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the Town is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the Town (as identified in the Significance column of Table D-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

D.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section D.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the Town and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

D.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Loomis’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table D-6 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the Town.

Table D-6 Town of Loomis – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	1	1	\$13,875	\$109,235	\$109,235	\$232,345
Commercial	132	86	\$42,718,862	\$51,275,670	\$51,275,670	\$145,270,202
Industrial	132	114	\$19,276,129	\$54,492,331	\$81,738,498	\$155,506,958
Institutional	30	16	\$2,596,293	\$15,229,453	\$15,229,453	\$33,055,199
Miscellaneous	284	10	\$28,153,573	\$7,523,815	\$7,523,815	\$43,201,203
Natural / Open Space	26	4	\$1,681,942	\$2,385,381	\$2,385,381	\$6,452,704
Residential	2,390	2,321	\$315,108,683	\$687,552,151	\$343,776,063	\$1,346,436,897
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Source: Placer County 2020 Parcel/Assessor's Data

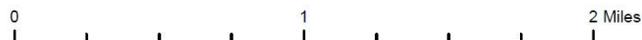
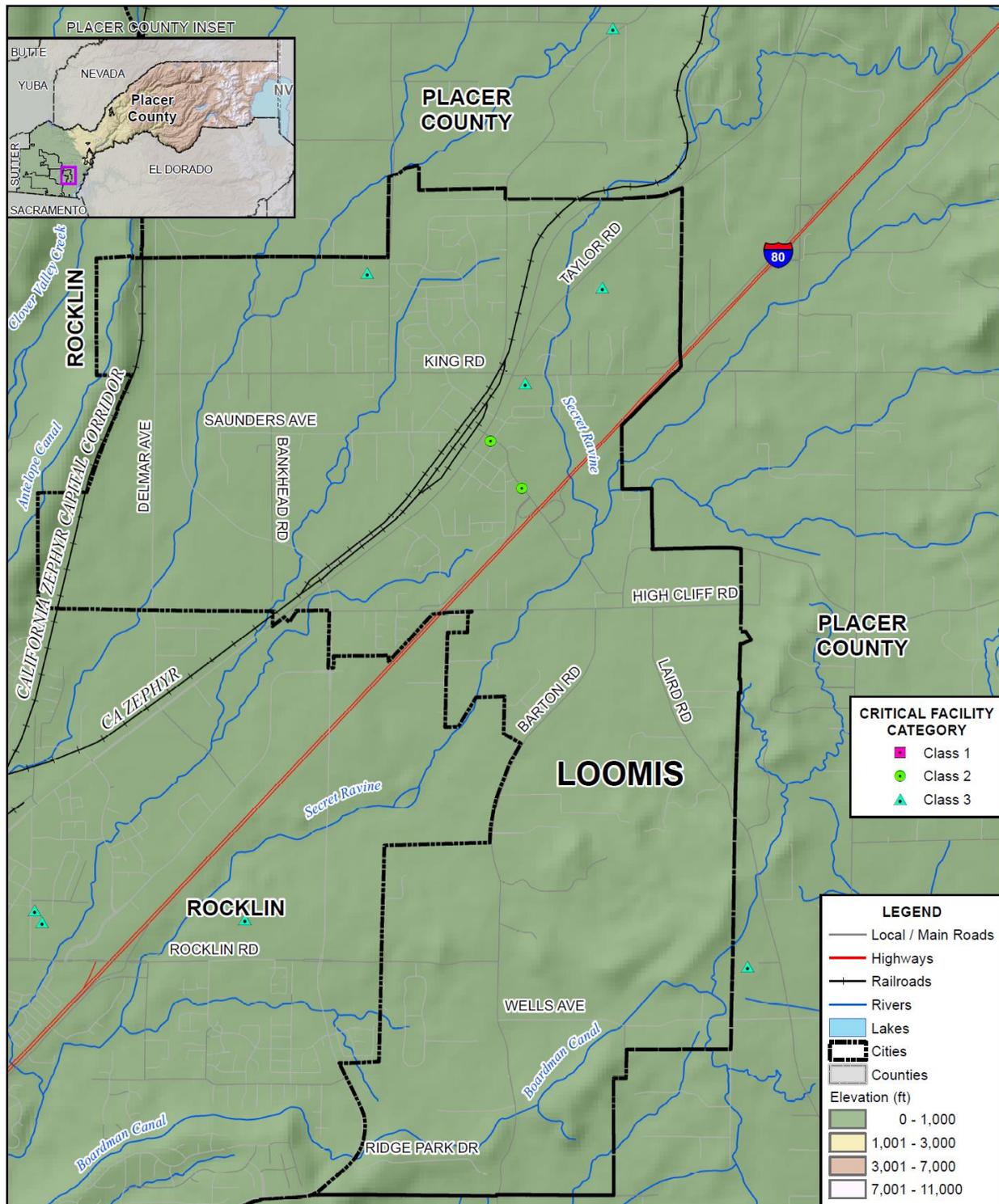
Critical Facilities and Infrastructure

Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan. An inventory of critical facilities in the Town of Loomis from Placer County GIS is shown on Figure D-2 and detailed in Table D-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure D-2 Town of Loomis – Critical Facilities



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-7 Town of Loomis – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 2	Fire Station	1
	Police Station	1
Class 3	School	3
Loomis Total		5

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The Town of Loomis has a variety of natural resources of value to the community:

- Three sensitive plant communities: Oak Woodland and Savannah, Riparian and Stream habitat, and Wetlands.
- No vernal pools within the Town limits, but several just outside.
- One special status animal species known to occur: the Valley Elderberry longhorn Beetle.
- One special status animal species with the potential to occur based on habitat and behavioral patterns: Cooper’s Hawk, Black-Shouldered Kite, and Western Pond Turtle.

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

Historic and Cultural Resources

The Town of Loomis does not have any registered federal historic sites.

Although Loomis does not have any sites on the National Register, there are several assets within Loomis that define the community and represent the Town’s history. Some of the historical sites of importance to Loomis are listed below.

- Blue Goose (American Fruit Co.) - 3550 Taylor Road
- High Hand- Loomis Fruit Growers Assoc – 3750 Taylor Road
- New Town Hall of Loomis- was Bank of Loomis -3665 Horseshoe Bar Road
- Bradley House- on Barton Road
- Barton Rd. below Wells- Wells Fargo Stage stop- partial cobblestone wall
- Main Drug- built 1912 – 3685 Taylor Road
- Nelthorpes – 3650 Taylor Road
- Loomis ACE Hardware in the Christiansen’s Building which was Law Brothers – Taylor Road
- Red’s Bistro was the Horseshoe Bar Grill which was many different stores- 3645 Taylor Road
- Congregational Church/Koininia on Magnolia Street
- Loomis Mutual Supply Company at 5827 Horseshoe Bar- Flooring USA and Creative Nails building.

- Most structures on Taylor Road between Walnut St. and Horseshoe Bar- all rebuilt shortly after 1915 fire.
- Nute/Barton Road house was built in 1891.
- Crossley/Turner cabin/barn- still upright

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the Town of Loomis General Plan 2013-2021 Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Loomis has generally seen slow and steady growth, with the exception of the 1980s which saw large growth. Loomis has seen growth rates as shown in Table D-8.

Table D-8 Town of Loomis – Population Changes Since 1970

Year	Population	Change	% Change
1970	1,108	–	–
1980	1,284	176	15.9%
1990	5,705	4,421	344.3%
2000	6,260	555	9.7%
2010 ¹	6,430	170	2.7%
2020 ²	6,888	458	7.1%

Source: ¹US Census Bureau, ²California Department of Finance

Special Populations and Disadvantaged Communities

The 2021-2029 Town of Loomis Housing Element noted that according to the 2014–2018 ACS, approximately 16.3 percent of the population (1,103 persons) are senior residents (65 years or older). Additionally, in 2018, there were 715 senior-headed households in Loomis, as shown in Table 14. This accounts for approximately 27.4 percent of the total households in Loomis, a 29.3 percent increase from 2010 (553 households, 23.4 percent). Loomis has a slightly smaller proportion of senior households compared to that of Placer County (32.4 percent). Senior households on a fixed or limited income might need more affordable housing options. In Loomis, 11.8 percent of seniors are living below the poverty level.

In 2018, 637 persons (9.5 percent of the total population) in Loomis had a disability. Of these residents, 22.6 percent (144 persons) had hearing difficulty, 9.4 percent (60 persons) had vision difficulty, 29.2 percent (186 persons) had cognitive difficulty, 58.1 percent (370 persons) had ambulatory difficulty, 34.1 percent (217 persons) had difficulty with self-care, and 55.9 percent (356 persons) had difficulty living independently. A single person may have more than one difficulty.

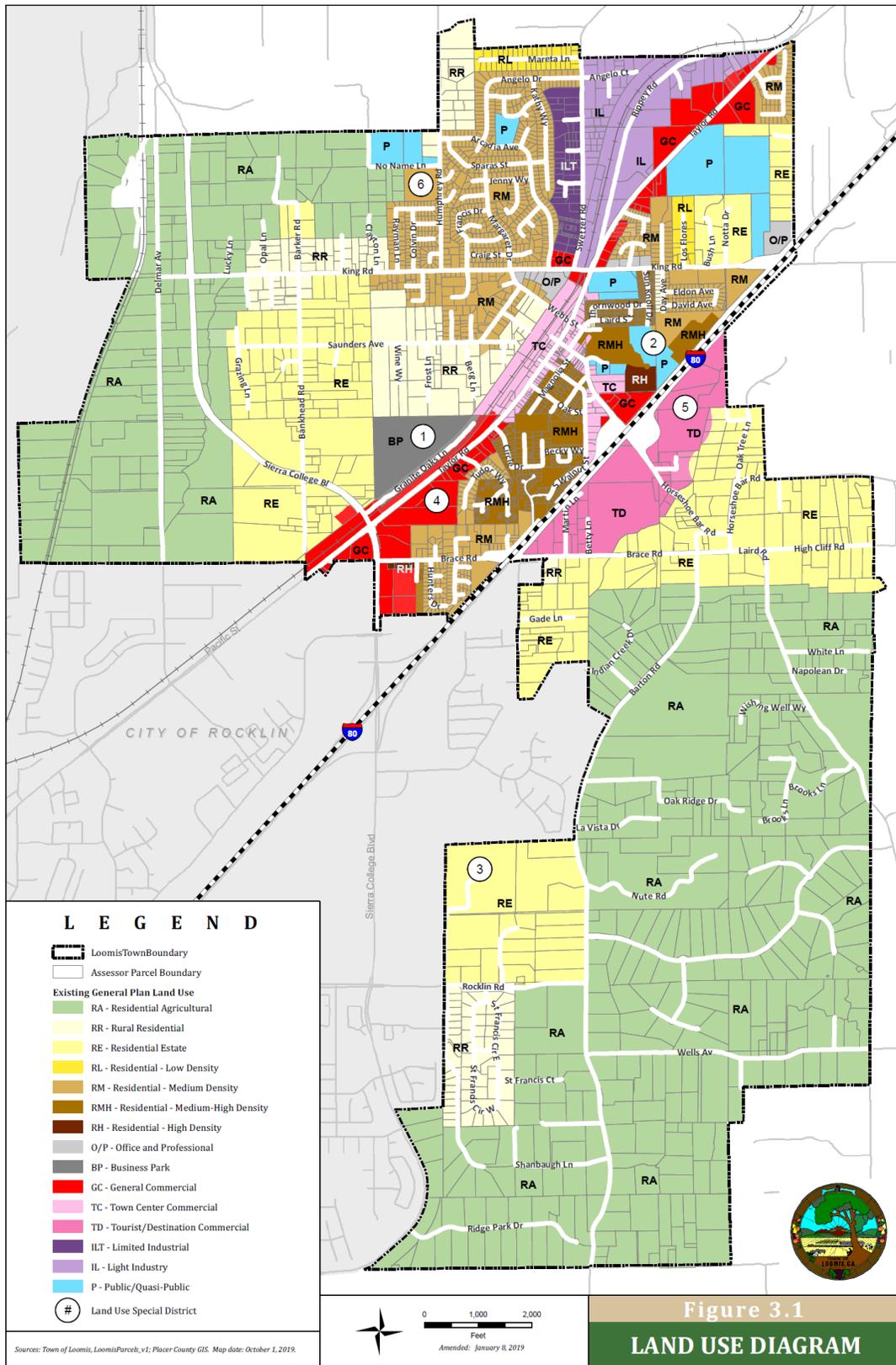
It is estimated that there is only one homeless individual on any given day in Loomis. The single homeless individual counted in the Town of Loomis identified as male and reported having been in Loomis for five years or more.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The Town's land use designations are generally described below and mapped on the Land Use Diagram (Figure D-3). The Loomis Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Loomis. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use for the Town of Loomis from the Town of Loomis General Plan Land Use Element is shown on Figure D-3.

Figure D-3 Town of Loomis – Land Use Diagram



Source: Town of Loomis Planning Department – retrieved on 5/6/2021

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the Town since the last plan. Some of this has occurred in hazard prone areas. The Town Building Department tracked total building permits issued since 2016 for the Town. These are tracked by total development, property use type, and hazard risk area. These are shown in Table D-9 and Table D-10.

Table D-9 Town of Loomis – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	4	3	2	3	3
Commercial	1	1	0	1	0
Industrial	0	1	0	0	0
Residential	21	14	10	5	6
Unknown	0	0	0	0	0
Total	26	19	12	9	9

Source: Town of Loomis Building Department

Table D-10 Town of Loomis – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area ¹	Other
Agricultural	0	0	12	0
Commercial	0	0	0	0
Industrial	0	0	0	0
Residential	0	0	51	0
Unknown	0	0	0	0
Total	0	0	63	0

Source: Town of Loomis Building Department

¹Moderate or higher wildfire risk area

Future Development

The Sacramento Council on Governments (SACOG) modeled population projections for the Town of Loomis and other areas of the region in 2012 for a Metropolitan Transportation Plan/Sustainable Communities Strategy report. This forecast uses a 2008 base year estimate with projections to 2020 and 2035 for population, housing units, households and employment. SACOG estimated the Town population in 2020 and 2035 to be 6,443 and 8,463 respectively. Future housing units in the City are shown in Figure D-4.

Figure D-4 Future Populations in the Town of Loomis

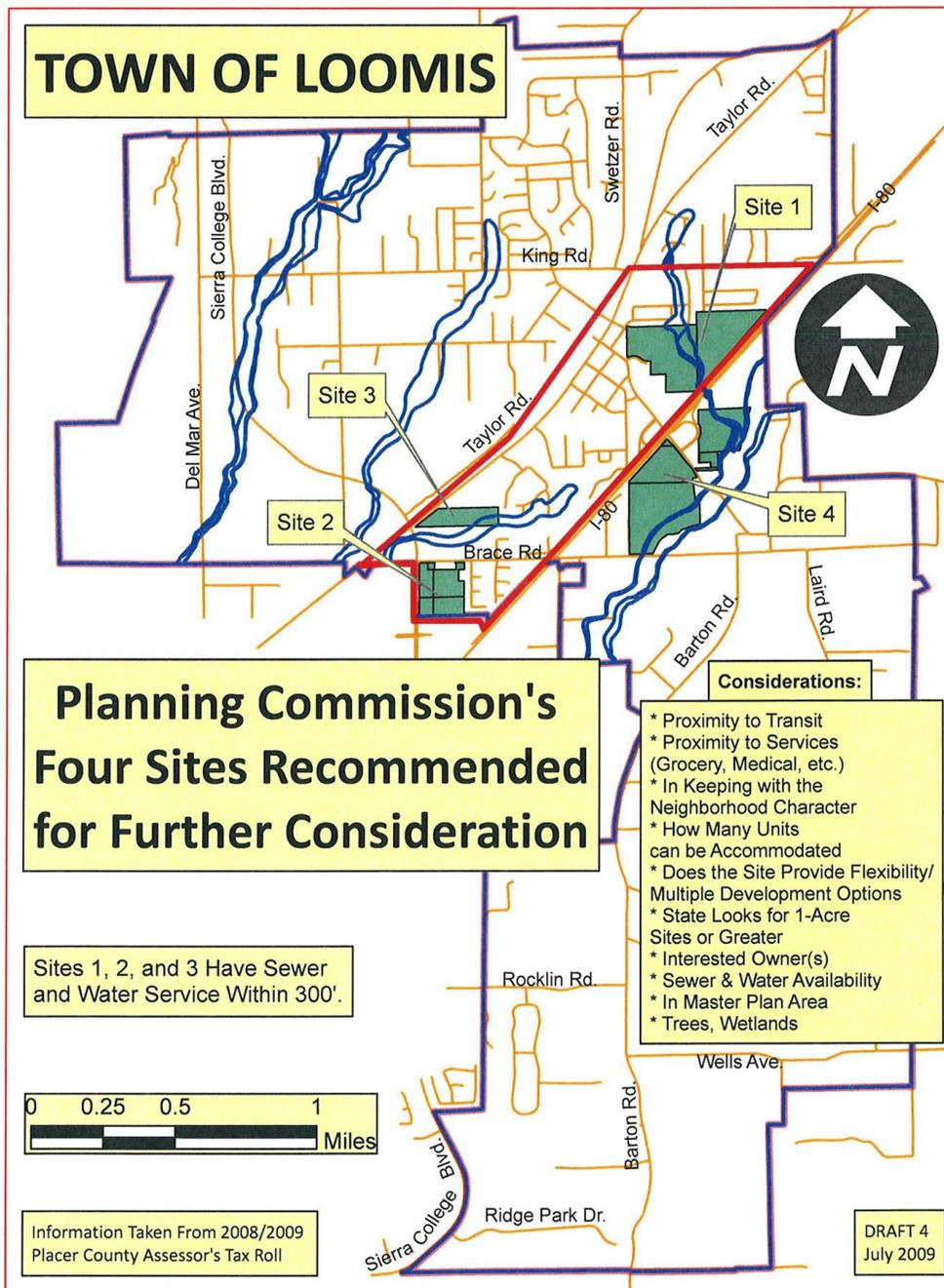
Draft as of June 2019

2020 Metropolitan Transportation Plan/Sustainable Communities Strategy Update Review of 2035 and 2040 Draft Preferred Scenario	Existing Conditions		2020 MTP/SCS Preferred Scenario TOTAL		2020 MTP/SCS Preferred Scenario TOTAL		Build Out Estimate		2020 MTP/SCS Preferred Scenario GROWTH		2020 MTP/SCS Preferred Scenario GROWTH	
	Total in Year 2016		Total in Year 2035		Total in Year 2040		Total at Build Out		Growth from 2016 to 2035		Growth from 2016 to 2040	
	Jobs	Housing Units	Jobs	Housing Units	Jobs	Housing Units	Jobs	Housing Units	Jobs	Housing Units	Jobs	Housing Units
Jurisdiction/Community Type												
Loomis												
Center and Corridor Communities (Town Center area)	470	150	730	550	790	550	1,290	700	250	400	320	400
Established Communities	2,730	1,470	3,130	1,520	3,230	1,540	4,040	1,950	400	50	500	70
Rural Residential Communities	410	850	490	910	510	940	780	1,320	80	60	100	90
Jurisdiction Total	3,610	2,470	4,350	2,980	4,530	3,030	6,110	3,970	730	510	920	560

Source: Sacramento Area Council of Governments - Draft as of June 2019. 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy Update - Review of 2035 and 2040 Draft Preferred Scenario.

The Town of Loomis has identified sites in the Town that may be considered for future development. These areas are shown on Figure D-5.

Figure D-5 Town of Loomis Future Development Areas



Source: Loomis Planning Commission

More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

In the immediate future, the Town has three areas that are planned:

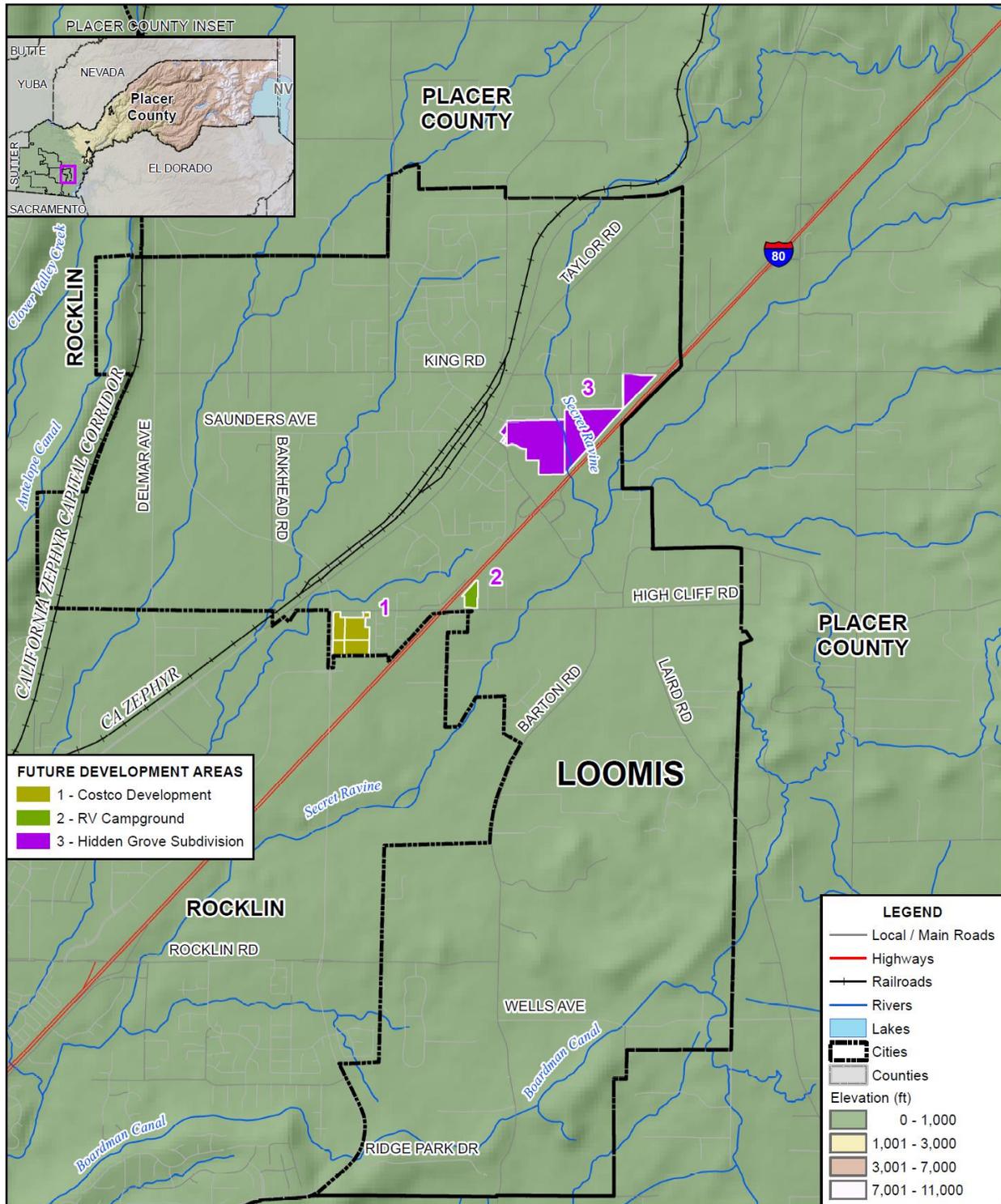
- Costco Development

- RV Campground (37 campsites on a minimum of 1,800 sq.ft. each for weekend, full time, and part-time RV travelers)
- Hidden Grove Subdivision

GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the Town of Loomis. Future development areas in the Town were provided in mapped format by the Town. 3 areas were provided. Using the GIS parcel spatial file for each of these areas, the 3 areas and 14 parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure D-6 shows the locations of future development areas the Town is planning to develop. Table D-11 shows the parcels and acreages of each future development area in the Town.

Figure D-6 Town of Loomis – Future Development Areas



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-11 Town of Loomis – Future Development Area Parcel and Acre Counts

Future Development / Map Number / Description / APN	Total Parcel Count	Improved Parcel Count	Total Acres
Costco Development	4	0	16.5
RV Campground	1	1	3.4
Hidden Grove Subdivision	9	4	58.2
Grand Total	14	5	78.2

Source: Town of Loomis GIS

D.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table D-5 as high or medium significance hazards. Impacts of past events and vulnerability of the Town to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the Town to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Placer County and the Town, the HMPC noted that each year it seems to get a bit warmer each year.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the Town, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the Town noted that climate change is of concern, no specific impacts of climate change could be recalled. The Town and HMPC members noted that the strength of storms does seem to be increasing and the temperatures are getting hotter. The Town also noted that Public Safety Power Shutoff events have increased – which could be related to climate change.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the Town and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Increased duration of high temperatures

- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

The Town could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the Town and County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Drought & Water Shortage

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the Town, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the Town and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table D-12.

Table D-12 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the Town are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the Town, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users.

The vulnerability of the Town to drought is Town-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the planning area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Water sources for the Town is the Placer County Water District, (PCWD) and Private groundwater wells. The Town also noted that drought causes increase fire hazards around the City, impacts to outdoor activities, dead and fallen trees. The City noted it has no emergency reserve to deal with drought impacts.

Future Development

As the population in the area continues to grow, so will the demand for water. Ongoing planning will be needed by the Town and water agencies to account for population growth and increased future water demands.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the Town is at risk to earthquake. Loomis and the surrounding area at lower risk from significant seismic and geologic hazards. Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.12 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The Town is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show the Town falls within a low shake risk.

Past Occurrences

The Town noted no past occurrences of earthquakes or that affected the Town in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. A number of the buildings in Loomis' downtown are URM. The HMPC was not certain of how many there are or if there are others outside of the downtown area.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The Town of Loomis is within the less hazardous Zone 3.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable.

Impacts from earthquake in the Town will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Among the most significant effect of an earthquake would likely be to the transportation system in the Town. Local bridges may be susceptible earthquakes. The railroad and freeway may also be affected by earthquakes. Many of the buildings in Loomis are only one and two stories, and may be impacted to a lesser extent. Damage to critical facilities and infrastructure are always a concern during earthquake events.

Earthquake Analysis

Due to the regional effects of an earthquake, a Hazus earthquake analysis was performed on a countywide basis. This can be found in Section 4.3.11 of the Base Plan. While these runs were not done specific to the Town, maps showing damage in the County show greater areas of damage near the cities in the County. This is because more built out urban are the generally the most vulnerable, while more rural and sparsely populated areas are less vulnerable to an earthquake event.

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur. The Town enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the Town is subject to these building codes.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

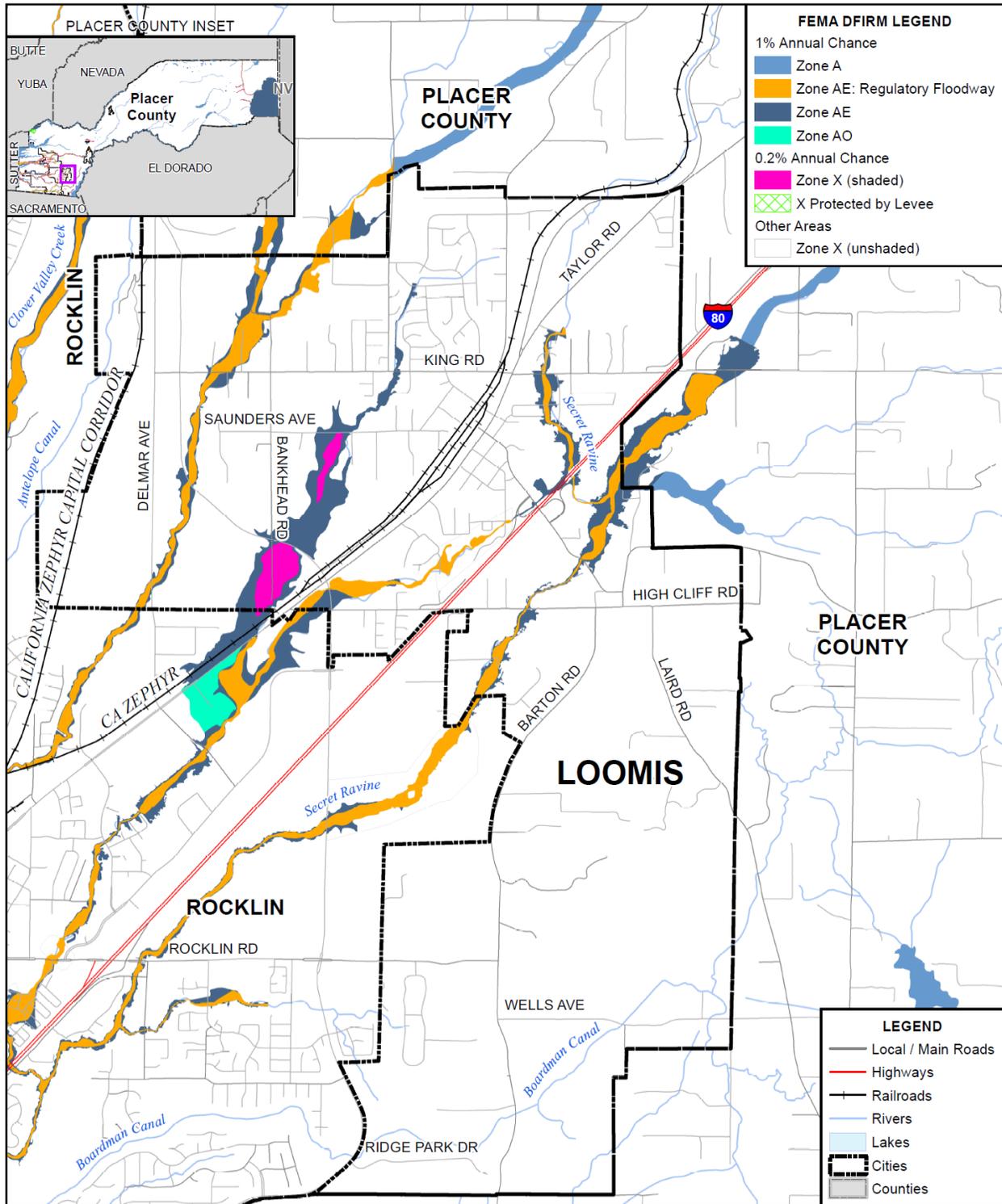
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the Town, and have caused damages in the past. Flooding is a significant problem in Placer County and the Town. Historically, the Town has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

As previously described in Section 4.2.13 of the Base Plan, the Placer County Planning Area and the Town of Loomis have been subject to historical flooding. Loomis is traversed by several stream systems and is at risk to the 1% and 0.2% flood.

Location and Extent

The Safety Element of Loomis' General Plan notes that flooding has been a minor hazard because of the Town's relatively elevated location compared to downstream localities. However, the DFIRM does identify portions of Loomis that could be inundated in the event of 100- and 500-year floods from several creeks that flow through the Town (Antelope Creek, Secret Ravine, and Sucker Ravine and their tributaries). The Town of Loomis has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure D-7.

Figure D-7 Town of Loomis – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-13 details the DFIRM mapped flood zones located within the Town.

Table D-13 Town of Loomis– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in Town of Loomis
A	1% annual chance flooding: No base flood elevations provided	
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the Town vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the Town tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the Town tends to have a shorter speed of onset, due to the amount of water that flows through the Town.

Geographical flood extents for the Town from the FEMA DFIRMs are shown in Table D-14.

Table D-14 Town of Loomis – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	224	4.9%	155	4.8%	69	5.2%
0.2% Annual Chance	26	0.6%	23	0.7%	3	0.2%
Other Areas	4,310	94.5%	3,068	94.5%	1,243	94.5%
Total	4,561	100.0%	3,246	100.0%	1,315	100.0%

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table D-15. These events also likely affected the Town to some degree.

Table D-15 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the Town’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts

Assets at Risk

Based on the vulnerability of Loomis to the flood hazard, the sections that follow describes significant assets at risk in the Town of Loomis. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of flooding within the Town of Loomis. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table D-16 is a summary table for the Town of Loomis. Parcel counts, values, estimated contents, and total values in the Town are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table D-17 breaks down Table D-16 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the Town.

Table D-16 Town of Loomis – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	117	98	\$12,400,680	\$30,205,234	\$21,027,153	\$63,633,067
0.2% Annual Chance Flood Hazard	13	12	\$1,492,271	\$2,725,467	\$1,362,734	\$5,580,472
Other Areas	2,865	2,442	\$395,656,406	\$785,637,335	\$479,648,228	\$1,660,941,969
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table D-17 Town of Loomis – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone AE Floodway						
Commercial	2	1	\$18,447	\$64,664	\$64,664	\$147,775
Miscellaneous	6	0	\$162,305	\$0	\$0	\$162,305
Natural / Open Space	3	0	\$0	\$0	\$0	\$0
Residential	33	33	\$3,417,101	\$7,161,302	\$3,580,652	\$14,159,055
Zone AE Floodway Total	44	34	\$3,597,853	\$7,225,966	\$3,645,316	\$14,469,135
Zone AE						

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Commercial	4	2	\$3,203,607	\$11,784,409	\$11,784,409	\$26,772,425
Institutional	1	0	\$0	\$0	\$0	\$0
Miscellaneous	6	0	\$68,628	\$0	\$0	\$68,628
Residential	62	62	\$5,530,592	\$11,194,859	\$5,597,428	\$22,322,879
Zone AE Total	73	64	\$8,802,827	\$22,979,268	\$17,381,837	\$49,163,932
1% Annual Chance Flood Hazard Total	117	98	\$12,400,680	\$30,205,234	\$21,027,153	\$63,633,067
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Miscellaneous	1	0	\$61,420	\$0	\$0	\$61,420
Residential	12	12	\$1,430,851	\$2,725,467	\$1,362,734	\$5,519,052
Zone X (shaded) Total	13	12	\$1,492,271	\$2,725,467	\$1,362,734	\$5,580,472
0.2% Annual Chance Flood Hazard Total	13	12	\$1,492,271	\$2,725,467	\$1,362,734	\$5,580,472
Other Areas						
Zone X (unshaded)						
Agricultural	1	1	\$13,875	\$109,235	\$109,235	\$232,345
Commercial	126	83	\$39,496,808	\$39,426,597	\$39,426,597	\$118,350,002
Industrial	132	114	\$19,276,129	\$54,492,331	\$81,738,498	\$155,506,958
Institutional	29	16	\$2,596,293	\$15,229,453	\$15,229,453	\$33,055,199
Miscellaneous	271	10	\$27,861,220	\$7,523,815	\$7,523,815	\$42,908,850
Natural / Open Space	23	4	\$1,681,942	\$2,385,381	\$2,385,381	\$6,452,704
Residential	2,283	2,214	\$304,730,139	\$666,470,523	\$333,235,249	\$1,304,435,911
Zone X (unshaded) Total	2,865	2,442	\$395,656,406	\$785,637,335	\$479,648,228	\$1,660,941,969
Other Areas Total	2,865	2,442	\$395,656,406	\$785,637,335	\$479,648,228	\$1,660,941,969
Loomis Grand Total						
Loomis Grand Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table D-18 summarizes Table D-17 above and shows Town of Loomis loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table D-18 Town of Loomis – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	117	98	\$30,205,234	\$21,027,153	\$51,232,387	\$10,246,477	0.017%
0.2% Annual Chance Flood Hazard	13	12	\$2,725,467	\$1,362,734	\$4,088,201	\$817,640	0.001%
Grand Total	130	110	\$32,930,701	\$22,389,887	\$55,320,588	\$11,064,117	0.02%

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table D-17 and Table D-18, the Town of Loomis has 98 parcels and \$51.2 million of structure and contents values or values in the 1% annual chance flood zone, and 12 improved parcels and \$4.1 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.10 of the Base Plan, there is a 1% chance in any given year of a flood event causing \$10.2 million in damage and a 0.2% chance in any given year of a flood event causing \$0.8 million in damage in the Town of Loomis. The loss ratio of 0.017% and 0.001% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be limited and the Town would be able to recover quickly.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the Town in comparison to total area within the Town limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the Town of Loomis as well as for the County as a whole. Table D-19 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the Town.

Table D-19 Town of Loomis – Flooded Acres by Flood Zone

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.00%	0	0.00%	0	0.00%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	1	0.000%	1	0.001%	0	0.00%
Zone A Total	1	0.000%	1	0.001%	0	0.00%
Zone AE Floodway						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	10	0.001%	2	0.001%	7	0.001%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	2	0.000%	0	0.000%	2	0.000%
Miscellaneous	10	0.001%	0	0.00%	10	0.001%
Natural / Open Space	8	0.001%	1	0.001%	7	0.001%
Residential	61	0.007%	57	0.032%	4	0.001%
Zone AE Floodway Total	91	0.010%	61	0.034%	30	0.004%
Zone AE						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	15	0.002%	6	0.003%	9	0.001%
Industrial	1	0.000%	1	0.000%	0	0.00%
Institutional	2	0.000%	0	0.000%	2	0.000%
Miscellaneous	21	0.002%	0		21	0.003%
Natural / Open Space	1	0.000%	1	0.000%	0	0.000%
Residential	93	0.010%	86	0.048%	7	0.001%
Zone AE Total	132	0.015%	93	0.052%	39	0.005%
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.00%	0	0.00%	0	0.00%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	0	0.00%	0	0.00%	0	0.00%
Zone AO Total	0	0.00%	0	0.00%	0	0.00%
1% Annual Chance Flood Hazard Total	224	0.025%	155	0.086%	69	0.010%
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	1	0.000%	1	0.000%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	1	0.000%	0	0.00%	1	0.000%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	25	0.003%	23	0.013%	2	0.000%
Zone X (shaded) Total	26	0.003%	23	0.013%	3	0.000%
0.2% Annual Chance Flood Hazard Total	26	0.003%	23	0.013%	3	0.000%
Other Areas						
Zone X (unshaded)						
Agricultural	6	0.001%	6	0.003%	0	
Commercial	231	0.026%	88	0.049%	143	0.020%
Industrial	113	0.013%	84	0.047%	29	0.004%
Institutional	143	0.016%	63	0.035%	80	0.011%
Miscellaneous	848	0.094%	42	0.023%	806	0.112%
Natural / Open Space	132	0.015%	63	0.035%	69	0.010%
Residential	2,837	0.316%	2,722	1.512%	115	0.016%
Zone X (unshaded) Total	4,310	0.479%	3,068	1.704%	1,243	0.173%
Other Areas Total	4,310	0.479%	3,068	1.704%	1,243	0.173%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Loomis Grand Total	4,561	0.507%	3,246	1.803%	1,315	0.183%

Source: FEMA 11/2/2018 DFIRM

Population at Risk

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Loomis – 2.60. According to this analysis, there is a total population of 247 and 31 residents of the Town at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table D-20.

Table D-20 Town of Loomis – Count of Improved Residential Parcels and Population by Flood Zone

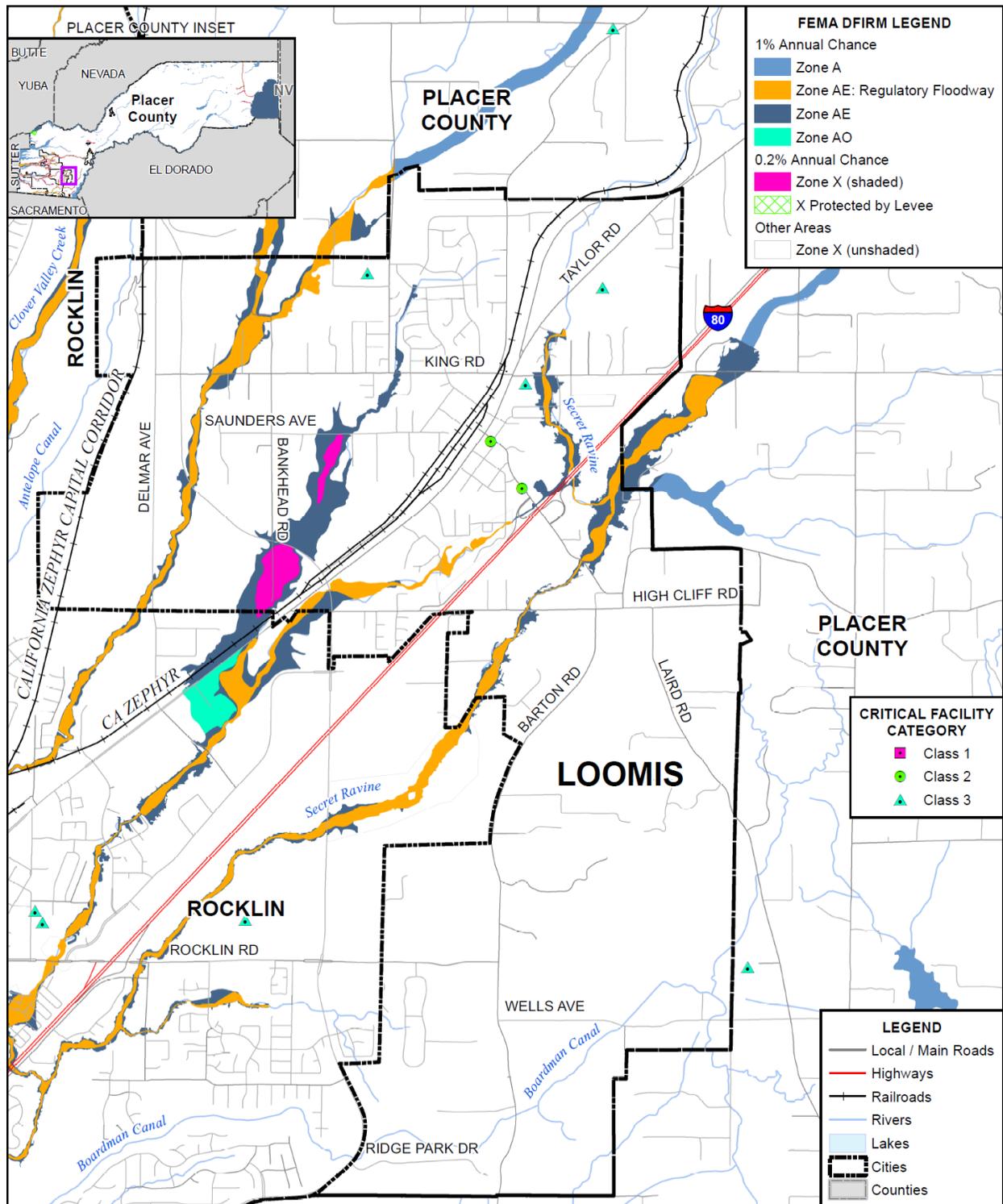
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Loomis	95	247	12	31

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Loomis in identified DFIRM flood zones. Critical facilities in a FHSZ in the City of Loomis are shown in Figure D-12 and detailed in Table D-30. As shown, no critical facilities fall in any mapped DFIRM flood zone. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure D-8 Town of Loomis – Critical Facilities in DFIRM Flood Zones



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-21 Town of Loomis – Critical Facilities by DFIRM Flood Zone

Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Other Areas			
Zone X (unshaded)	Class 2	Fire Station	1
		Police Station	1
	Class 3	School	3
Zone X (unshaded) Total			5
Other Areas Total			5
Loomis Total			5

Source: CAL FIRE, Placer County

Insurance Coverage, Claims Paid, and Repetitive Losses

The Town of Loomis joined the National Flood Insurance Program (NFIP) on December 29, 1986. The Town does not participate in CRS. NFIP Insurance data indicates that as of August 12, 2020, there were 58 flood insurance policies in force in the Town with \$15,738,400 of coverage. Of the 58 policies, 55 were residential and 3 were nonresidential; 39 of the policies were in A zones (the remaining 19 were in B, C, and X zones). There have been 14 historical claims for flood losses totaling \$365,985; 10 of these were for policies located in the A zones and 4 were associated with standard policies located in B, C, or X zones. NFIP data further indicates that there are 3 repetitive loss (RL) buildings. No severe repetitive loss (SRL) properties exist in the Town.

Based on this analysis of insurance coverage, the Town has values at risk to the 1% annual chance and greater floods. Of the 98 improved parcels within the 1% annual chance flood zone, only 39 (or 33.9 percent) of those parcels maintain flood insurance. This can be seen on Table D-22.

Table D-22 Town of Loomis – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
Town of Loomis	98	39	33.9%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data

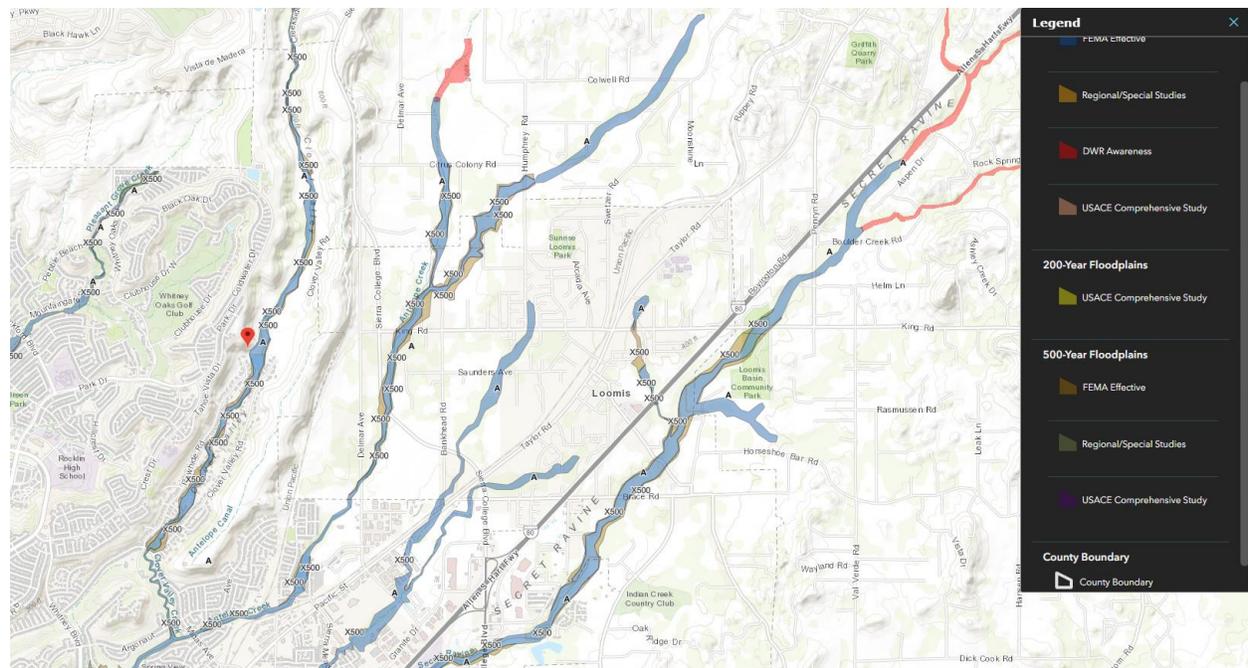
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA’s 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the Town than that provided in the FEMA DFIRMs. The BAM map for Loomis is shown in Figure D-9.

Figure D-9 Town of Loomis – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain

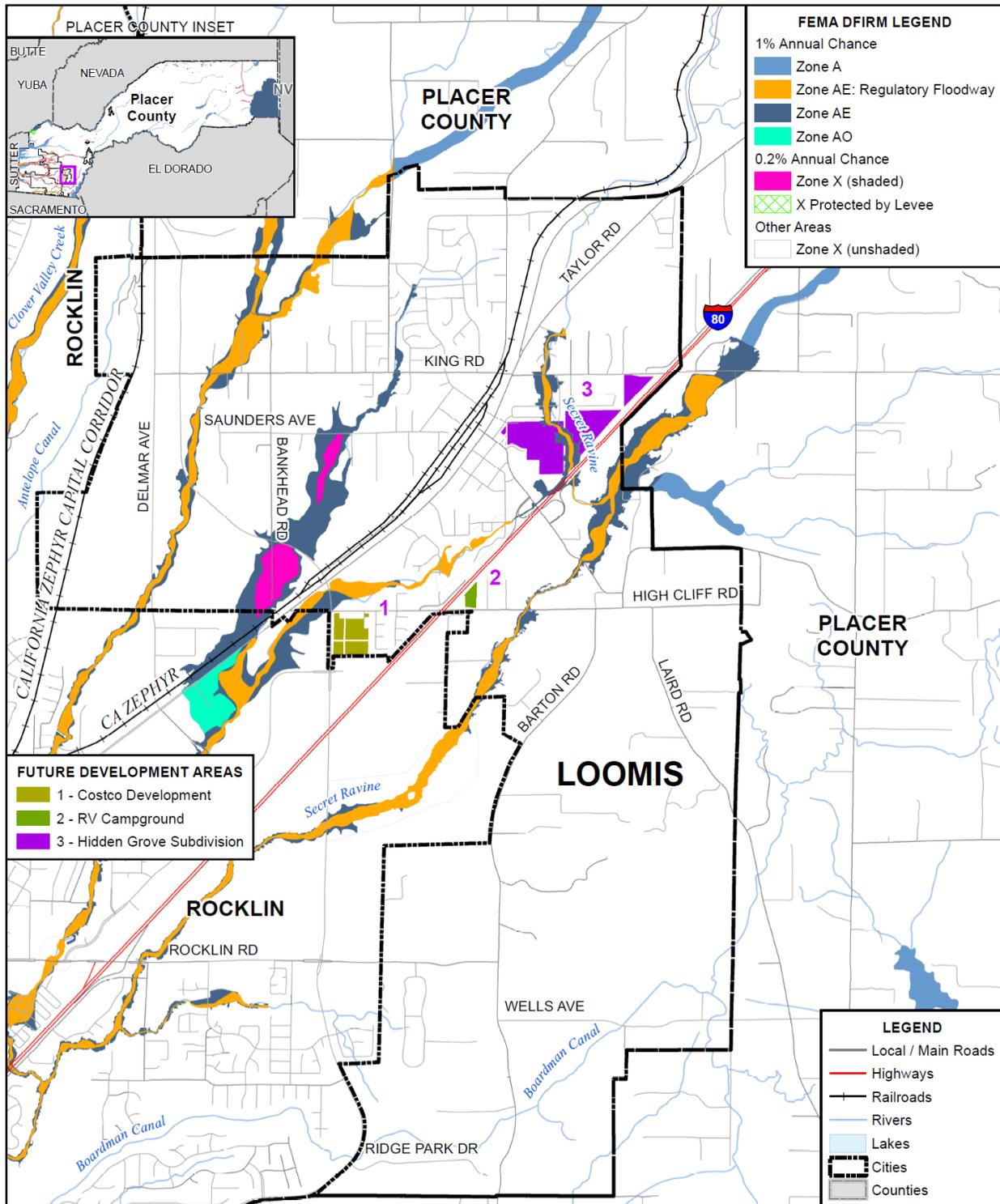
management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

Development in the floodplain is discouraged and required to obtain approval from FEMA for modifications in the floodplain.

GIS Analysis

The Town provided Future Development Areas were used as the basis for the inventory of future development areas for the Town. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure D-10 shows the locations of future development areas the Town is planning to develop on the FEMA DFIRM. As shown on Figure D-10, no future development areas fall in DFIRM flood zones, as such no tabular analysis was performed.

Figure D-10 Town of Loomis – Future Development Areas in DFIRM Flood Zones



0 1 2 Miles



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The Town of Loomis is subject to localized flooding throughout the Town. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the Town vary by location. Flood durations in the Town tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the Town tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Local drainage problems exist because of outdated, inadequately-sized culverts and bridges that impede high water flows, including culverts under Interstate 80; the Horseshoe Bar Road crossing over Secret Ravine; the railroad and Taylor Road crossing of Sucker Ravine; and crossings of Antelope Creek and its tributaries.

Past Occurrences

The Town noted the following past occurrences of localized flooding:

In the 1995 floods, local flooding did cause damage to the floors of a few buildings. The 2005 New Year's Eve flooding created significant problems in various areas of the Town. A small, localized flooding event in November 2020 occurred due to a blockage in canal running under Arcadia street. A small amount of damage (under \$25,000) was reported.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the Town and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

The Town tracks localized flooding areas. Affected localized flood areas identified by the Town of Loomis are summarized in Table D-23.

Table D-23 Town of Loomis – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Bank erosion on King Rd at Antelope Creek			Yes				
Various minor flood area		Sink holes					

Source: Town of Loomis

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

Future development in the Town will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The Town will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Pandemic

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the Town, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu and the current COVID-19 pandemic. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table D-24.

Table D-24 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

The HMPC noted that in terms of impacts to the Town, a few smaller businesses closed and a small decrease in sales tax revenue occurred. Those impacts were relatively minor, however.

Vulnerability to and Impacts from Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the Town. Pandemic can have varying levels of impact to the citizens of the Town and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) and unemployment rose significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

The Town's biggest vulnerabilities from COVID-19 is the potential impact to staff – particularly Public Works. If one of the Public Works employees got sick, the department would need to potentially quarantine the entire department. This actually happened twice in 2020/2021. Other vulnerabilities are the ongoing economic impact to the Town with a loss of sales tax revenue.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the Town could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the Town. If the median age of Town residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the Town occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Town falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the Town.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the Town. All portions of the Town are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rare in the Town and Placer County. Duration of severe storms in California, Placer County, and the Town can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.2.3 of the Base Plan.

Past Occurrences

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the Town. This is the cause of many of the federal disaster declarations related to flooding.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the Town. These events can cause significant and localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the Town, but also can cause damage, with lightning occasionally igniting wildfires.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

Future Development

Building codes in the Town ensure that new development is built to current building standards, which should reduce the risk to future development in the Town from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal.

Wildfire

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

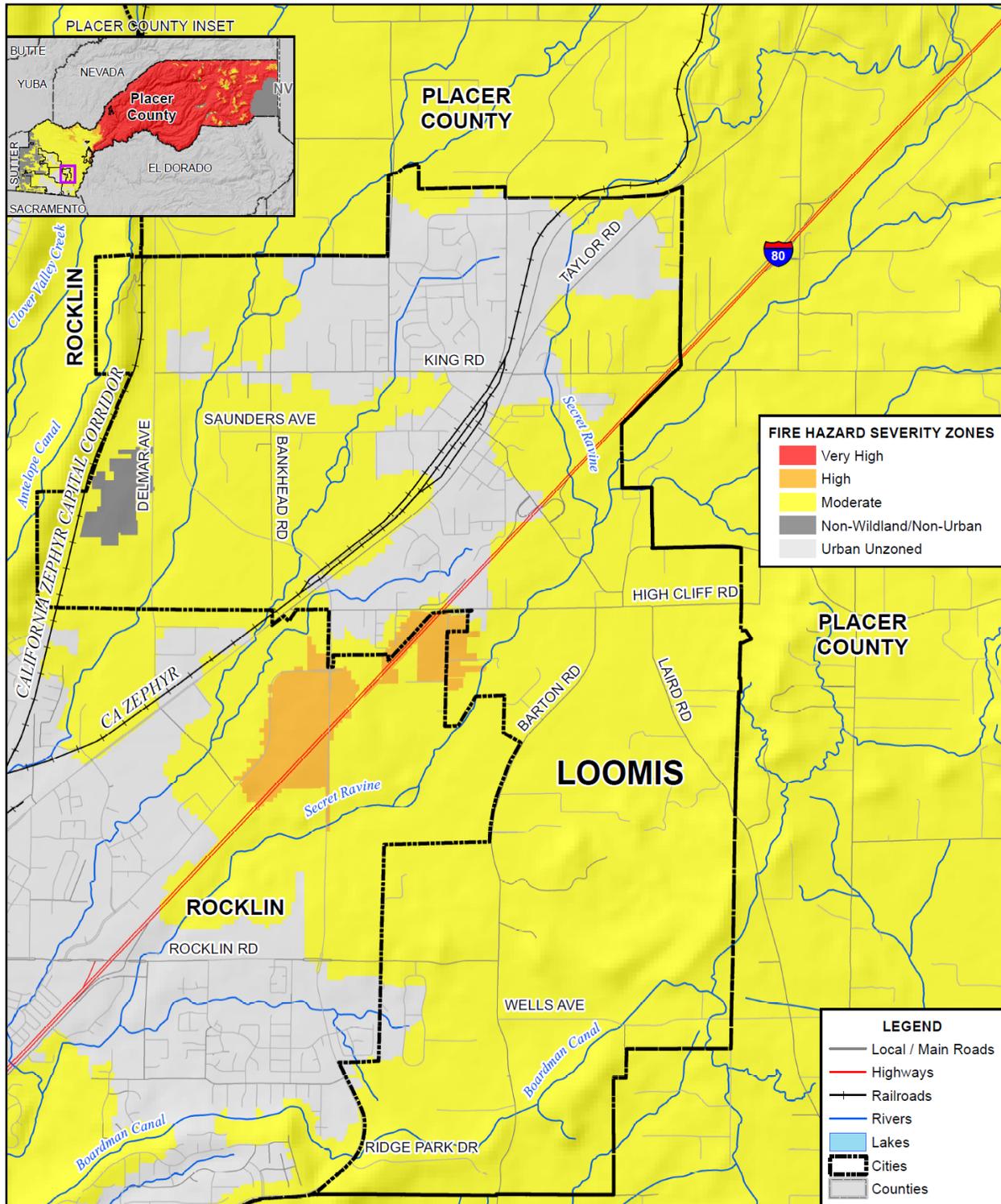
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the Town of Loomis. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in Public Safety Power Shutoff (PSPS) events in the Town. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the Town. CAL FIRE has estimated that the risk varies across the Town and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the Town of Loomis were created. Figure D-11 shows the CAL FIRE FHSZ in the Town. As shown on the maps, fire hazard severity zones within the Town range from urban unzoned to high.

Figure D-11 Town of Loomis – Fire Hazard Severity Zone



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table D-25.

Table D-25 Town of Loomis – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	24	0.5%	19	0.6%	5	0.4%
Moderate	3,472	76.1%	2,538	78.2%	934	71.0%
Non-Wildland/non-Urban	46	1.0%	30	0.9%	16	1.2%
Urban Unzoned	1,019	22.3%	660	20.3%	359	27.3%
Total	4,561	100.0%	3,246	100.0%	1,315	100.0%

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table D-26.

Table D-26 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Although small grass fires are common in the planning area, they have historically been limited in size by prompt emergency response. In 2002 the town was impacted by the Sierra Fire which burned 900 acres, including six structures. More than 100 homes were evacuated and over 1,000 homes were threatened in both Loomis and Granite Bay. The structural fire hazard, caused largely by human activities, is greatest in areas containing older buildings that do not meet current building codes.

Though not directly affected by any of the recent wildfires, the Town has been significantly impacted by poor air quality due to nearby fires like the Napa and Santa Rosa fires.

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and Town, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that

can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and Town, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Loomis is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and open lands. The natural fuels available in or near the Town vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. The HMPC noted that the biggest areas of concerns are on the south side of the freeway and the areas on both side of Sierra College Blvd., north of Taylor Road.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the Town. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Town by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the Town; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. There is one senior center in Town that would be negatively impacted with a PSPS. The stoplight-controlled intersections did not have batteries for backup, but those have been resolved. Future PSPS concerns are the potential impacts to different business sectors: loss of product at grocery stores; loss of product at restaurants; and the inability for businesses to operate. The Town noted only one PSPS event, and that only lasted for a few hours.

In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Based on the vulnerability of the Town of Loomis to the wildfire hazard, the sections that follow describes significant assets at risk in the Town.

Assets at Risk

Based on the vulnerability of Loomis to the wildfire hazard, the sections that follow describes significant assets at risk in the Town of Loomis. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the Town of Loomis. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Loomis are shown in Table D-27, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table D-27 Town of Loomis – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High	37	27	\$2,940,043	\$7,221,400	\$3,610,697	\$13,772,140
Moderate	1,288	1,074	\$234,388,266	\$454,276,302	\$250,620,297	\$939,284,865
Non-Wildland/Non-Urban	7	6	\$894,956	\$1,176,959	\$855,411	\$2,927,326
Urban Unzoned	1,663	1,445	\$171,326,092	\$355,893,375	\$246,951,710	\$774,171,177
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table D-28 breaks out the Table D-27 by adding the property use details by fire hazard severity zone for the Town.

Table D-28 Town of Loomis – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	1	0	\$97,619	\$0	\$0	\$97,619
Natural / Open Space	2	0	\$0	\$0	\$0	\$0
Residential	34	27	\$2,842,424	\$7,221,400	\$3,610,697	\$13,674,521

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High Total	37	27	\$2,940,043	\$7,221,400	\$3,610,697	\$13,772,140
Moderate						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	44	23	\$21,685,242	\$21,081,075	\$21,081,075	\$63,847,392
Industrial	11	5	\$1,933,145	\$2,555,099	\$3,832,649	\$8,320,893
Institutional	13	10	\$1,228,118	\$10,901,166	\$10,901,166	\$23,030,450
Miscellaneous	166	9	\$25,220,677	\$7,486,467	\$7,486,467	\$40,193,611
Natural / Open Space	9	4	\$1,681,942	\$2,385,381	\$2,385,381	\$6,452,704
Residential	1,045	1,023	\$182,639,142	\$409,867,114	\$204,933,559	\$797,439,815
Moderate Total	1,288	1,074	\$234,388,266	\$454,276,302	\$250,620,297	\$939,284,865
Non-Wildland/Non-Urban						
Agricultural	1	1	\$13,875	\$109,235	\$109,235	\$232,345
Commercial	3	2	\$629,518	\$424,629	\$424,629	\$1,478,776
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	0	0	\$0	\$0	\$0	\$0
Natural / Open Space	0	0	\$0	\$0	\$0	\$0
Residential	3	3	\$251,563	\$643,095	\$321,547	\$1,216,205
Non-Wildland/Non-Urban Total	7	6	\$894,956	\$1,176,959	\$855,411	\$2,927,326
Urban Unzoned						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	85	61	\$20,404,102	\$29,769,966	\$29,769,966	\$79,944,034
Industrial	121	109	\$17,342,984	\$51,937,232	\$77,905,849	\$147,186,065
Institutional	17	6	\$1,368,175	\$4,328,287	\$4,328,287	\$10,024,749
Miscellaneous	117	1	\$2,835,277	\$37,348	\$37,348	\$2,909,973
Natural / Open Space	15	0	\$0	\$0	\$0	\$0
Residential	1,308	1,268	\$129,375,554	\$269,820,542	\$134,910,260	\$534,106,356
Urban Unzoned Total	1,663	1,445	\$171,326,092	\$355,893,375	\$246,951,710	\$774,171,177
Loomis Total	2,995	2,552	\$409,549,357	\$818,568,036	\$502,038,115	\$1,730,155,508

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the Town of Loomis – 2.60. According to this analysis, there is a total population of 78 residents of Loomis at risk to moderate or higher FHSZs. This is shown in Table D-29.

Table D-29 Town of Loomis – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

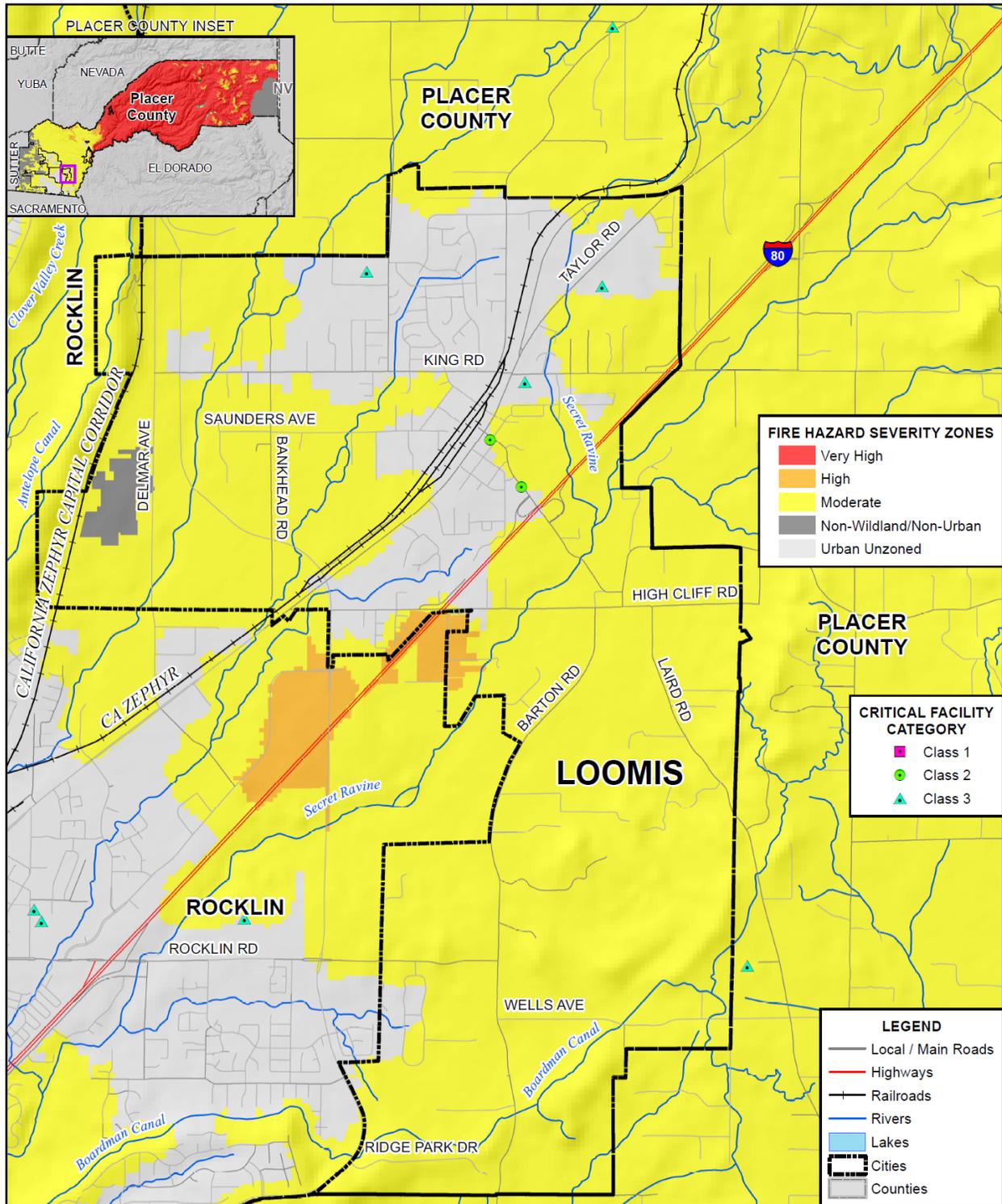
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Loomis	0	0	27	70	3	8

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Loomis in identified FHSZs. Critical facilities in a FHSZ in the Town of Loomis are shown in Figure D-12 and detailed in Table D-30. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure D-12 Town of Loomis – Critical Facilities in Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-30 Town of Loomis – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
Moderate	Class 2	Police Station	1
Moderate Total			1
Urban Unzoned	Class 2	Fire Station	1
	Class 3	School	3
Urban Unzoned Total			4
Loomis Total			5

Source: CAL FIRE, Placer County

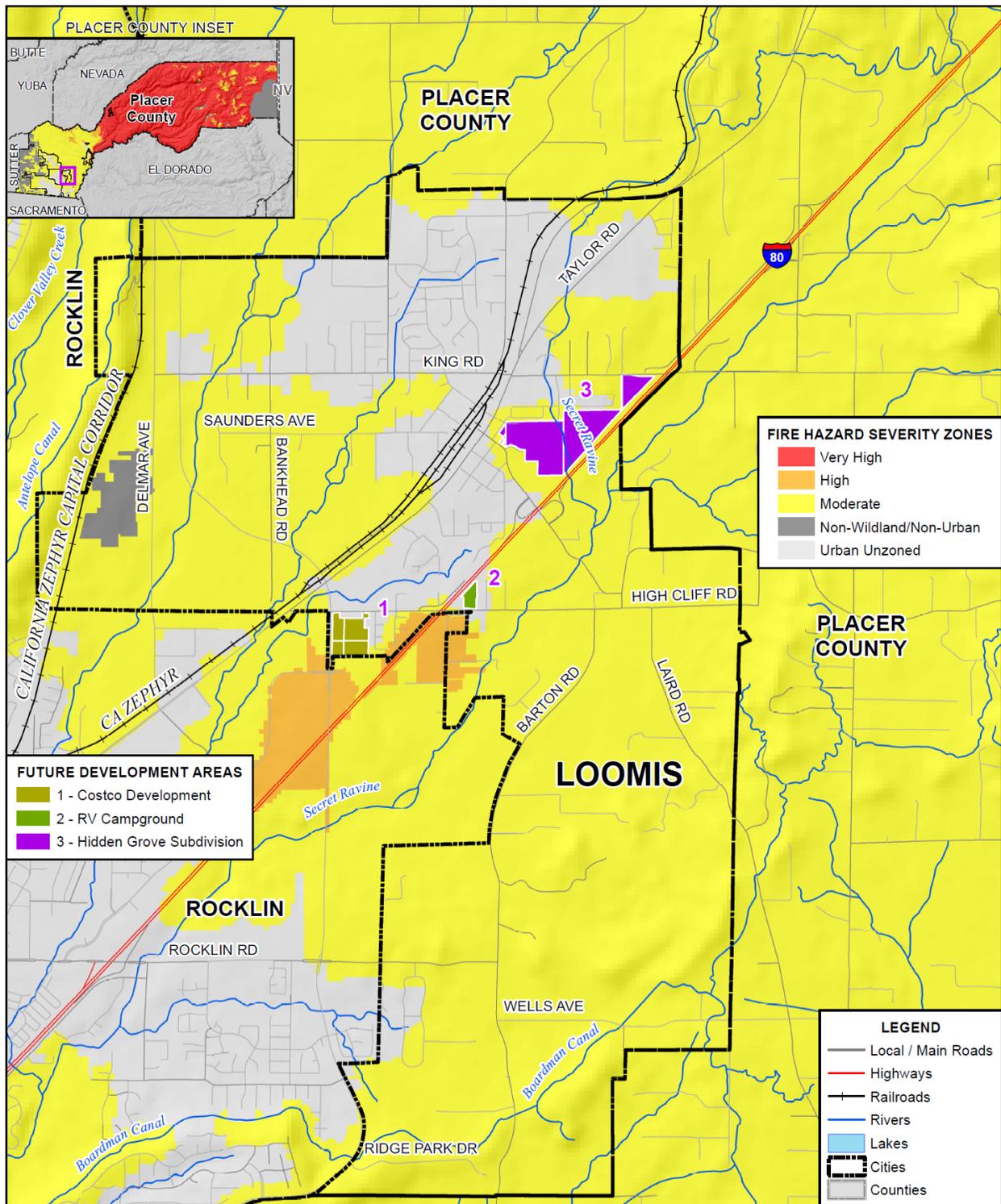
Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the Town would place additional values at risk to wildfire. Town building codes are in effect and should continue to be updated as appropriate to reduce this risk. With the enforcement of the California Building and Fire Codes, will help to minimize the risk to wildfire.

GIS Analysis

The Town provided future development areas were used as the basis for the inventory of future development areas for the Town. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure D-13 shows the locations of future development areas the Town is planning to develop on the FHSZs. Table D-31 shows the parcels and acreages of each future development area in the Town in each FHSZ.

Figure D-13 Town of Loomis – Future Development in FHSZs



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table D-31 Town of Loomis – Future Development in FHSZ

Fire Hazard Severity Zone / Future Development / Map Number / Description / APN	Total Parcel Count	Improved Parcel Count	Total Acres
Moderate			
Costco Development			
<i>Commercial Development</i>			
045-042-037-000	1	0	2
045-042-036-000	1	0	4
Costco Development Total	2	0	7
Hidden Grove Subdivision			
<i>Residential Development</i>			
044-094-004-000	1	1	0
044-094-005-000	1	1	0
044-094-010-000	1	1	0
044-094-006-000	1	0	0
044-094-001-000	1	1	1
043-080-015-000	1	0	22
043-080-007-000	1	0	0
043-080-008-000	1	0	7
043-080-044-000	1	0	28
Hidden Grove Subdivision Total	9	4	58
Moderate Total	11	4	65
Urban Unzoned			
Costco Development			
<i>Commercial Development</i>			
045-042-035-000	1	0	4
045-042-034-000	1	0	6
Costco Development Total	2	0	10
RV Campground			
044-150-047-000	1	1	3
RV Campground Total	1	1	3
Urban Unzoned Total	3	1	13
Grand Total	14	5	78

Source: Town of Loomis GIS

D.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections:

regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

D.6.1. Regulatory Mitigation Capabilities

Table D-32 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Town of Loomis.

Table D-32 Town of Loomis Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	
Capital Improvements Plan	Y	The Public Works Department looks for opportunities to improve/correct hazards that are within or adjacent to CIPs.
Economic Development Plan	N	The Town is working with Planning and the Chamber of Commerce to develop a plan
Local Emergency Operations Plan	Y	Works with and receives correspondence from the County's Emergency Operation Division
Continuity of Operations Plan	N	
Transportation Plan	Y	
Stormwater Management Plan/Program	Y	Works with County Storm Management group/committee on updates and program changes and enhancements
Engineering Studies for Streams	Y	Currently updating our RMA permit with Ca. Fish and Wildlife.
Community Wildfire Protection Plan	Y	Work with the South Placer Fire Protection District, which provides fire protection services to the Town
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2019 California Building Codes (Building, Electrical, Plumbing, Mechanical and Fire)
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score
Fire department ISO rating:	NA	Rating: N/A - Loomis does not operate its fire department
Site plan review requirements	Y	

Land Use Planning and Ordinances		Is the ordinance an effective measure for reducing hazard impacts?
	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Ordinances are effective and adequately administered and enforced.
Subdivision ordinance	Y	Ordinances are effective and adequately administered and enforced.
Floodplain ordinance	Y	Ordinances are effective and adequately administered and enforced.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Ordinances are effective and adequately administered and enforced.
Flood insurance rate maps	Y	Ordinances are effective and adequately administered and enforced.
Elevation Certificates	Y	Ordinances are effective and adequately administered and enforced.
Acquisition of land for open space and public recreation uses	Y	Ordinances are effective and adequately administered and enforced.
Erosion or sediment control program	Y	Ordinances are effective and adequately administered and enforced.
Other		
How can these capabilities be expanded and improved to reduce risk?		
While currently in the process of the Town's 2020-2040 General Plan Update, matters of fire fuel prevention Town wide has been a topic of discussion. The Town is looking at ways to increase its capabilities for fire/fuel prevention.		

Source: Town of Loomis

As indicated above, the Town has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

As indicated above, the Town has several programs, plans, policies, codes and ordinances in place and/or that they follow. The General Plan for the Town of Loomis is the most comprehensive. The following section provides an overview of the General Plan and identifies specific policies related to hazard mitigation that are included in the plan.

The Town of Loomis General Plan Program, 2020

The Town of Loomis General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the Town is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The general plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Loomis Planning Area. Identified hazards include fire, geologic/seismic, flooding, and hazardous materials. Mitigation-related issues, goals, policies, and actions are presented below.

Issues	
Issue 1:	The rural nature of the community and presence of large open space parcels increases the Town's risk of wildland and fire hazards at the urban edge.
Issue 2:	A number of properties along local creeks have been flooded during winter storms, despite flood preventative measures.

Goals	
Goal 1:	To reduce the risks associated with wildland and urban edge fires in the Town's rural areas.
Goal 2:	To reduce the risks associated with wildland and urban edge fires in the Town's rural areas.
Goal 3:	To reduce the potential for and damage resulting from storm flooding hazards within the community.
Goal 4:	To reduce the risks associated with potential seismic activity, including groundshaking, liquefaction, and landslides.

Policies	
Policy 1:	Loomis shall enforce building codes and other Town ordinances having an effect upon fire hazards and fire protection. The Town shall maintain adequate street widths and turning radii to accommodate fire protection equipment. New development shall ensure adequate water pressure and volume for firefighting.
Policy 2:	Engineering analysis of new development proposals shall be required in areas with possible soil instability, flooding, earthquake faults, or other hazards, and prohibit development in high danger areas.
Policy 3:	Loomis shall comply with Placer County's Emergency Response Plan, as well as revise the Town Emergency Plan to address Town-specific issues.
Policy 4:	No new structures or additions to existing structures shall be permitted in areas identified by the federal Flood Insurance Rate Maps (FIRMs) or the Town Engineer as being subject to inundation in a 100-year or more frequent flood event. Exceptions may be granted for public facilities and utilities. New development shall also be prohibited in the future 100-year flood zone, based on buildout conditions as determined by FEMA and FIRM maps. Development will be required to adhere to Placer County Flood Control District policies and the Dry Creek Watershed Control Plan.
Policy 5:	New development near stream channels shall be designed so that reduced stream capacity, stream bank erosion, or adverse impacts on habitat values are avoided.
Policy 6:	Further channelization and/or banking of creeks or streams within the planning area shall be discouraged, unless no other alternative is available to minimize flood risk. Setbacks from flood sources shall be the preferred method of avoiding impacts.
Policy 7:	Site-specific recommendations of the Town's Drainage Master Plan, upon completion, shall be applied to individual development projects as appropriate.
Policy 8:	Loomis shall cooperate with Federal, State, and local authorities to ensure that loss due to seismic activity and other natural and man-made disasters is minimized.
Policy 9:	Loomis shall encourage compliance with State requirements for unreinforced masonry buildings and seismic safety.
Policy 10:	Loomis shall continue to train and equip Town personnel to cope with emergency disaster situations, including hazardous material incidents.
Policy 11:	A Street Address Ordinance shall be adopted to assist effective emergency response by requiring adequate street address identification.

Policies	
Policy 12:	Application materials for residential subdivisions proposed within or near oak woodlands shall include Wildland fire protection plans showing how vegetation clearance will be maintained around structures while preserving oak trees.

D.6.2. Administrative/Technical Mitigation Capabilities

Table D-33 identifies the Town department(s) responsible for activities related to mitigation and loss prevention in Loomis.

Table D-33 Town of Loomis's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Sidewalk to remove tripping hazards. Brush mowing for fire prevention and provide better line of sight. Pole hole repair program, vehicle and bike safety Street sign replacement program-retro reflectivity Street stripping program Programs to help reduce vehicular speeding
Mutual aid agreements	Y	PCSO has mutual aid agreements with all County law enforcement agencies; South Placer Fire has mutual aid agreements with all fire agencies.
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	Consultant
Floodplain Administrator	Y	Certified Floodplain Manager, Consultant
Emergency Manager	Y	Town Manager
Community Planner	Y	Consultant
Civil Engineer	Y	Full time engineer.
GIS Coordinator	Y	Consultant
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	The Town relies on the County Sheriff's agency and Fire District to perform these services.
Hazard data and information	Y	
Grant writing	Y	Town Staff
Hazus analysis	N	
Other		

How can these capabilities be expanded and improved to reduce risk?
Being a small Town with limited revenue, the ability to obtain outside funding would help provide the resources to implement programs and sustain ongoing efforts.

Source: Town of Loomis

D.6.3. Fiscal Mitigation Capabilities

Table D-34 identifies financial tools or resources that the Town could potentially use to help fund mitigation activities.

Table D-34 Town of Loomis’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Grant funding and General Fund
Authority to levy taxes for specific purposes	Y	Town Council can authorize the process in levying taxes through a ballot vote and or Prop 218 process.
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Town can institute new development fees as necessary
Storm water utility fee	Y	Town Council can authorize the process in levying taxes through a ballot vote and or Prop 218 process.
Incur debt through general obligation bonds and/or special tax bonds	Y	Town Council can authorize the process in levying taxes through a ballot vote and or Prop 218 process.
Incur debt through private activities	Y	Town Council can authorize the process in levying taxes through a ballot vote and or Prop 218 process.
Community Development Block Grant	Y	Town can (and has) apply for CDBG grants
Other federal funding programs	Y	Town continually seeks out funding programs
State funding programs	Y	Town continually seeks out funding programs
Other		
How can these capabilities be expanded and improved to reduce risk?		
The Town can and will continue to pursue funding opportunities for hazard mitigation projects.		

Source: Town of Loomis

D.6.4. Mitigation Education, Outreach, and Partnerships

Table D-35 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table D-35 Town of Loomis’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	The Town will work with local citizen groups (senior citizen groups, schools, service clubs, for example) to provide information
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	The Town will continue to partner with several agencies for public education (Recology, PCWA, SPMUD, PCSO, SPFD) for public education
Natural disaster or safety related school programs	Y	These types of programs are run by the school districts and our service providers (Sheriff and Fire District)
StormReady certification	N	
Firewise Communities certification	Y	This is being considered under the 2020-2040 General Plan Update process.
Public-private partnership initiatives addressing disaster-related issues	N	The Town will continue to partner with our private partners to provide this information
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City may look at StormReady certification. The City will look for other ways to partner with State, regional, County, and local entities on mitigation outreach.		

Source: Town of Loomis

Town of Loomis Code Enforcement works with the Loomis Fire Department to notify and remind residents and businesses within Loomis to provide the required fire protection buffer zone. The Town and Fire Department mail out letters to all that are in violation. Within this letter sections 7.04.010 – 7.04.190 of the Loomis Code are referenced.

D.6.5. Other Mitigation Efforts

The Town has many other completed or ongoing mitigation projects/efforts that include the following:

- In 2000-2001 the Town replaced all old street signs with new larger and more reflective signs. The Town’s construction standard was also changed so that all new developments within town are built to this standard. By increasing the size of lettering and requiring them to be made with a high intensity background will help emergency responders.
- The Town’s Maintenance Department evaluates and then focuses efforts on the creeks and channels that have the highest probability to cause flooding.
- The Town has recently completed several improvements to Taylor Road which may mitigate potential flooding/ponding on that street.
- Enhancing capacity in the Town’s storm drain system with enhanced maintenance of the drainage swales.

D.7 Mitigation Strategy

D.7.1. Mitigation Goals and Objectives

The Town of Loomis adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

D.7.2. NFIP Mitigation Strategy

The Town of Loomis joined the National Flood Insurance Program (NFIP) on December 29, 1986. As a participant of the NFIP, the Town of Loomis has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the Town. The Town of Loomis will continue to comply with the requirements of the NFIP in the future.

In addition, the Town of Loomis actively participates with the County of Placer to address local NFIP issues through a regional approach. Many of the program activities are the same for the Town of Loomis as for Placer County since participation at the County level includes all local jurisdictions. An elected official of the Town of Loomis is a designated representative on the Placer County Flood Control District Board.

The Town's regulatory activities apply to existing and new development areas of the Town; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The Town has a Flood Damage Prevention Ordinance that regulates construction in the floodplain. The Town intends to continue to implement the ordinance and participate at the regional level with Placer County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The Town of Loomis is not a current participant in the CRS program.

More information about the floodplain administration in the Town of Loomis can be found in Table D-36.

Table D-36 Town of Loomis Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	58 policies \$58,651 in premiums \$15,738,400 in coverage

NFIP Topic	Comments
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	14 losses \$365,984.69 in losses paid 2 substantial damage claims
How many structures are exposed to flood risk within the community?	117 structures in 1% flood zone 13 structures in 0.2% flood zone
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	3 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	None
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Not currently
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, GIS, and inspections
What are the barriers to running an effective NFIP program in the community, if any?	Proper funding.
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 8/17/2011
Is a CAV or CAC scheduled or needed?	N
Regulation	
When did the community enter the NFIP?	December 29, 1986
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet the standard
Provide an explanation of the permitting process.	Through application and Planning and Engineering approval
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

D.7.3. Mitigation Actions

The planning team for the Town of Loomis identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Pandemic
- Severe Weather: Heavy Rains and Storms
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: Town of Loomis Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Town and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The Town will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: Town of Loomis in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 3. *Renewal Of Town of Loomis RMA permit*

Hazards Addressed: Climate Change, Flood, Localized Flood, Heavy Rain and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: To be able to maintain and perform simple maintenance on the various drainage channels, the Town needs to have a Routine Maintenance Agreement (RMA) permit form Ca. Fish and Wildlife.

Project Description: Permit will allow Town Staff and contractors to perform maintenance activities to provide proper drainage flow.

Other Alternatives: N/A

Existing Planning Mechanism(s) through which Action Will Be Implemented: N/A

Responsible Agency/ Department/Partners: Town of Loomis Department of Public Works

Cost Estimate: \$50,000

Benefits (Losses Avoided): Potentially avoid flooding issues through scheduled maintenance

Potential Funding: General Fund

Timeline: 2 to 3 months

Project Priority (H, M, L): H

Action 4. *Climate Change Mitigation*

Hazards Addressed: Climate Change and all hazards exacerbated by Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: With the noticeable change of weather patterns, it has become more noticeable that our community needs to be more prepared in regard to differing weather patterns, such as longer dry and heat seasons and on the opposite longer wet and cooling seasons. If this trend is becoming our new normal, the challenge will be to educate the local population on how to be prepared.

Project Description: Establish an educational awareness outreach programs on how to educate the residential and business community about extreme temperature changes and the dangers that are posed to a community when they do not protect themselves or the community around them.

Other Alternatives: Work with other jurisdictions to promote Best Management Practices regarding preparedness for extreme weather changes.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Using the Town's residential and commercial data base to correspond to the residents and businesses with educational information regarding climate change hazards, also to communicate who to correspond if help or assistance is needed.

Responsible Agency/ Department/Partners: Town of Loomis, Placer County Fire District, Placer County Sheriff's Department

Cost Estimate: Annual outreach and materials, \$20,000

Benefits (Losses Avoided): If individuals are prepared, there will be less draw down on first responders.

Potential Funding: Grants, General Fund

Timeline: 1 to 2 years

Project Priority (H, M, L): H

Action 5. Drought and Water Shortage Mitigation

Hazards Addressed: Climate Change, Drought, lack of potable water

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During the last decade areas in California have witnessed and suffered through the lack of potable water due to long periods of drought. The issue that has become obvious is with the lack of water, both businesses and residents have to be better prepared to live with less and better prepared on how to do more with less.

Project Description: Establish Town wide water conservation polices and best management practices that incorporate Town, residents, businesses, and those who utilize groundwater. Establish a retro fit water supply program, Encourage drought resistant landscaping, promote groundwater recharging efforts.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Manager and Public Works Departments establishing polices with in their department on how to conserve water use.

Responsible Agency/ Department/Partners: Town of Loomis, Placer County Water District, Town Administration, Public Works, and Planning Departments

Cost Estimate: Annual cost to keep current and up to date, \$50,000

Benefits (Losses Avoided): Preserving water for human and vegetation (food crops) during drought conditions.

Potential Funding: Grants, partnership with water purveyor, General fund

Timeline: 1 to 2 years to get project partners in place to sustain the drought program

Project Priority (H, M, L): H

Action 6. Earthquake Mitigation and Preparedness

Hazards Addressed: Earthquakes

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Earthquakes come without notice, the damage that can occur can be severe, collapse of buildings, liquefaction and landslides, loss of essential infrastructure, property damage and death.

Project Description: Establish programs that can assist residents and businesses on how to prepare for, during, and post-earthquake.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Establish a safety committee that can provide strategies, draft policy for Town Council to adopt to equip staff and community on next steps in a seismic event. Provide outreach materials to community on how to prepare for during an earthquake, what to do and what not to do. Establish simulated earthquake drills through an emergency operation center (EOC) scenario.

Create action plan for failed utilities.

Work with the building department to review building inventory in Town that may be vulnerable to earthquake damage such as unreinforced masonry structures, public and private buildings that were built prior to earthquake standards. Review facilities that have generators and elevators that they are properly braced. Map on GIS those structures that are at risk during a seismic event.

Create programs to distribute earthquake hardware items such as hot water heater straps, gas and water keys/wrenches to shut off hose gas and water lines to home.

Responsible Agency/ Department/Partners: Town of Loomis, Loomis Public Works, Building, Planning and Administrative Departments Placer County Fire District, Placer County Sheriff Department, Local utility companies,

Cost Estimate: Annual \$25,000

Benefits (Losses Avoided): First is to save lives, second is hopefully minimize property damage

Potential Funding: Grant programs, utility companies' contribution to the Earthquake awareness program and outreach, local businesses, General fund

Timeline: 5 to 10 years

Project Priority (H, M, L): H

Action 7. Pandemic/Epidemic Mitigation

Hazards Addressed: Pandemic, Virus outbreaks, Flu strains, food contamination

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Recently the COVID 19 outbreak brought an awareness to the community that protocols, policies and a greater community awareness needs to be in place for future virus outbreaks that may rise to the level of Pandemic or epidemic status.

Project Description: Provide a community outreach program that can assist in what to do and not what to do in a pandemic/epidemic outbreak. Provide hot lines for residents and businesses to help navigate through the various changes that take place during an outbreak. Provide local updates vis local website, mailers and local CCTV events. Stockpile and provide personal protective equipment (PPE) and sanitary cleaning supplies.

Other Alternatives: Continue with public information activities currently in place

Existing Planning Mechanism(s) through which Action Will Be Implemented: Continue to review and update local outreach materials and outreach efforts.

Responsible Agency/ Department/Partners: Town of Loomis working with County and State Health Department/

Local health providers and vendor for PPE

Cost Estimate: Annual costs are determined by the outbreak event, annual cost for stockpiling PPE in the range of \$2000 to \$3000

Benefits (Losses Avoided): Being prepared will help save lives and keep community informed and educated on what to do.

Potential Funding: Local contributions from businesses and health organizations, Grant opportunities, General fund

Timeline: Ongoing

Project Priority (H, M, L): H

Action 8. Severe Weather - Heavy Rains Mitigation

Hazards Addressed: Climate Change, Flooding, Landslides, erosion,

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: With Climate Change prolonged heavy rains can be anticipated. When such severe weather is encountered, the public and businesses are fronted with flooding, landslides and severe erosion activity. Drainage channels to move the water to larger bodies of water are compromised, private and public properties are susceptible severe damage and total loss, lives can also be compromised. Utilities are also compromised with power outages.

Project Description: Conduct weather risk analysis of drainage channels, hillside embankments that may be vulnerable to landslide, liquefaction, or erosion. Identify at risk members of the Loomis population who may need assistance during severe weather and heavy rain events. Provide outreach to the community through the Town website, mailers and updates at public meetings on how to respond to such events.

Other Alternatives: Continue with Public outreach efforts to inform residents and public

Existing Planning Mechanism(s) through which Action Will Be Implemented: Outreach efforts will be administered through the Town of Loomis’s Administrative Department.

Responsible Agency/ Department/Partners: Town of Loomis City Manager’s Office, Loomis Public Works, Placer County Fire District, County Sheriff, local utility companies

Cost Estimate: General fund,

Benefits (Losses Avoided): Having an educational and outreach process in place will help preserve lives and property.

Potential Funding: Grant funding and local funds

Timeline: Ongoing, continued work on public awareness

Project Priority (H, M, L): M

Action 9. Tree Mortality Mitigation

Hazards Addressed: Falling trees, Tree Mortality, Wildfires

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Dead and diseased trees left unattended can become fuel for wildfires, when within the right of Way, they can become a hazard to the public who live and travel in the path of the ailing or dead trees. Dying or dead tree can largely be contributed to Climate Change.

Project Description: Survey the Town’s tree population around Town, evaluate the current health of trees that make the Right of Way vulnerable to potential life-threatening conditions during inclement weather events and also public and private property damage. The survey process would include evaluating the trees, tagging, and posting on the GIS system.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amend existing or establish new tree ordinances that have provisions to enforce landowners to maintain the tree population on their property, remove dying or dead trees so as not to produce a hazard. Public works to provide an inventory of street and park trees and the health of those trees and an action plan to maintain or remove trees.

Responsible Agency/ Department/Partners: Town of Loomis Public Works and Planning Departments.

Cost Estimate: Annual costs to maintain public trees, \$25,000 to \$30,000, cost to outreach and educate private landowners on tree mortality, \$10,000.

Benefits (Losses Avoided): Remove dying or diseased trees will assist in trees not causing damage and or harm to the public or property damage. It will also assist in not providing fuel for wildfires.

Potential Funding: Local funding, General fund, parks grant

Timeline: Ongoing

Project Priority (H, M, L): M

Action 10. Wildfire Mitigation

Hazards Addressed: Tree Mortality, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Wildfires have increased over the years due to lack of forest management, weather conditions, unmaintained utilities. Wildfires have been the cause of huge loss of property and loss of life.

Project Description: The project would include identifying wildfire hazard areas. It would include establishing local policies and a comprehensive plan to provide safety for those who reside in potential wildfire areas. Require fire resistance construction in proposed high fire risk areas and amend local building codes to reflect those enhancements. Policies that promote defensible space programs to reduce fire risk around structures, create program to remove and replace flammable vegetation with less flammable vegetation.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Revise zoning maps to reflect high risk areas. Revise building codes to reflect fire resistant building materials in high risk fire areas.

Responsible Agency/ Department/Partners: Town of Loomis's Planning and Building Department, Placer County Fire District.

Cost Estimate: With in annual operation Budget, annual outreach material - \$5,000

Benefits (Losses Avoided): Preservation of Life and property

Potential Funding: Local funding, grant opportunities, general fund

Timeline: 1 to 2 years to get project running, ongoing after that start up period

Project Priority (H, M, L): High



Annex E City of Rocklin

E.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Rocklin, a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to Rocklin, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

E.2 Planning Process

As described above, Rocklin followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table E-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table E-1 City of Rocklin – Planning Team

Name	Position/Title	How Participated
Justin Nartker	Director of Public Services	Attended meetings, reviewed annex, provided past occurrences, filled out capability tables
Reginald Williams	Fire Chief	Attended meetings and reviewed annex
Shawn Watkins	Deputy Fire Chief	Attended meetings and reviewed annex
Jamie Sartain	Environmental Services Technician	Attended meetings reviewed annex, provided past occurrence info, filled out capability tables
David Mohlenbrok	Director of Community Development	Provided past occurrence info and coordinated responses from Community Development Department
Joshua Little	GIS Analyst II	Provided and reviewed GIS information and maps.
Ed Crouse	City Engineer	Reviewed Section E.7.2

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table E-2.

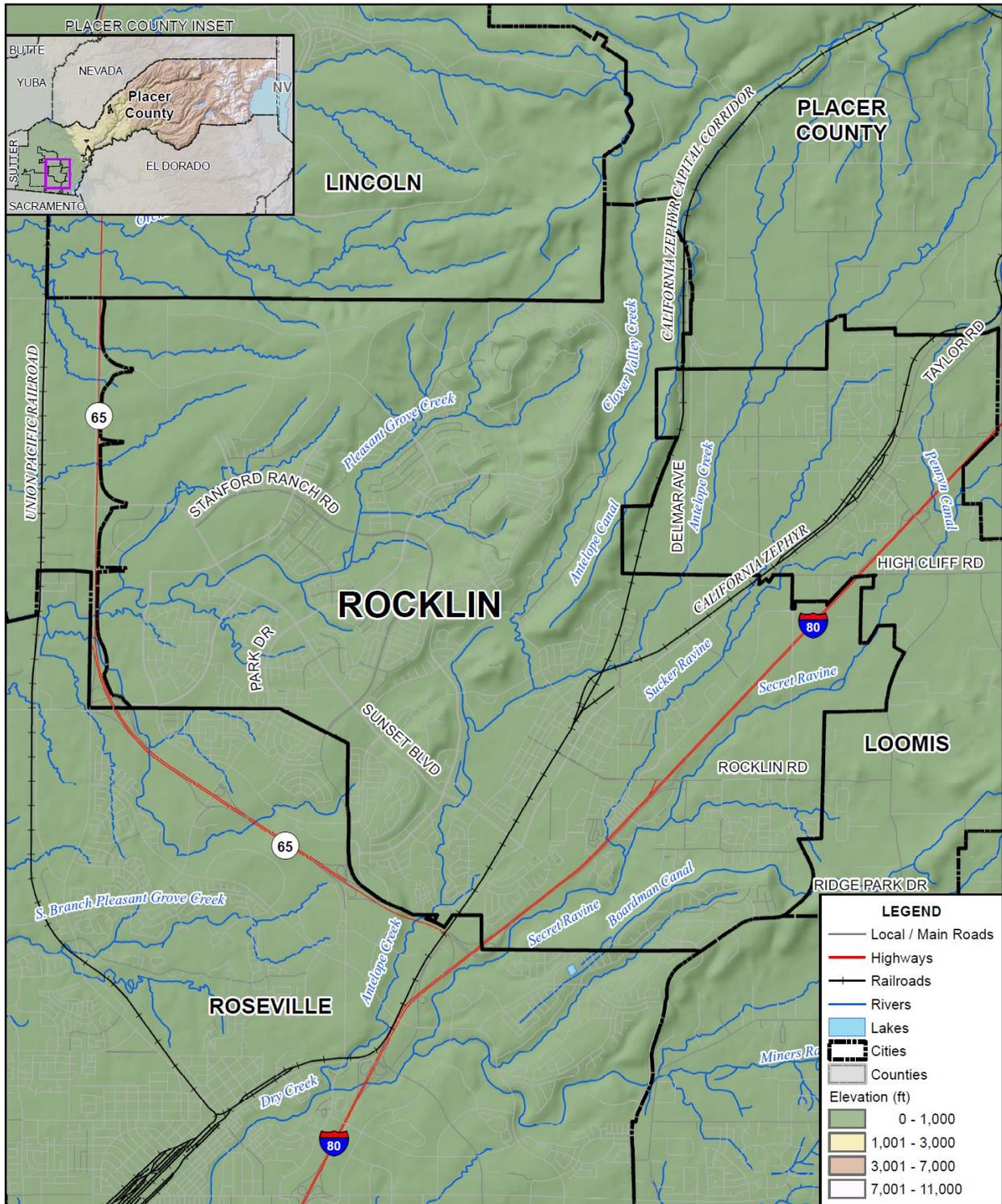
Table E-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
2016 LHMP adopted by Resolution 2016-250	The City of Rocklin General Plan was amended to include the LHMP by resolution on November 8, 2016.
Regional Planning Efforts	Although not specifically part of City activities, implementation of regional planning efforts and associated projects, such as flood planning efforts and projects since 2016 provide a direct benefit to the City of Rocklin.

E.3 Community Profile

The community profile for the City of Rocklin is detailed in the following sections. Figure E-1 displays a City map and the location of Rocklin within Placer County.

Figure E-1 City of Rocklin



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

E.3.1. Geography and Climate

The City of Rocklin is located in the rolling hills of southwestern Placer County at an elevation range of 150 to 525 feet above sea level. Rocklin encompasses 20 square miles in area and is situated at the junction of I-80 and Highway 65, 21 miles northeast of Sacramento and 80 miles northeast of San Francisco. The City is on the fringe of the California’s Central Valley, with productive agricultural lands to the west and Folsom Lake State Recreation Area and the Sierra Nevada Range to the east. Bordering Rocklin are the cities of Lincoln to the north, Roseville to the south, and Loomis to the east.

The climate in Rocklin is similar to other cities in the Central Valley region, with hot, dry summers and moderately wet winters. The average high temperature in July is 98°F and the average low temperature in January is 37°F. Average annual rainfall is 21 inches, with 96 percent of that total (19.7 inches) typically falling in the months of October-April.

E.3.2. History

Rocklin began as a railroad town with the Central Pacific moving to the area in 1864. In 1866, a major locomotive terminal was established in Rocklin because of its location at the “bottom of the hill.” Additionally, the town was a major granite producer for the Sacramento Valley. In 1893, Rocklin officially incorporated with a population of 1,050. The town bustled with granite production and the commercial fruit industries until about 1908 when the Central Pacific decided to move the railroad roundhouse terminal to Roseville.

With soils generally of poor quality, commercial agriculture activities were difficult to support with the exception of livestock grazing. The J.P. Whitney family, a major landholder in the Rocklin from the late 1850s to 1949, raised sheep and conducted other ranching activities. Ranching occurred well into the 1950s and 1960s in the Rocklin area when increased urbanization and expansion of suburban communities from Sacramento to the northeast, along I-80, led to growth of the housing market. Beginning in the 1980s, the low cost of land attracted industry to the region and the expansion of commercial and residential development in south Placer County began.

E.3.3. Economy

US Census estimates show economic characteristics for the City of Rocklin. These are shown in Table E-3 and Table E-4. Mean household income in the City was \$117,257. Median household income in the City was \$98,566.

Table E-3 City of Rocklin – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	0	0.0%
Construction	1,706	5.5%
Manufacturing	1,635	5.3%
Wholesale trade	598	1.9%

Industry	Estimated Employment	Percent
Retail trade	3,985	12.8%
Transportation and warehousing, and utilities	1,210	3.9%
Information	710	2.3%
Finance and insurance, and real estate and rental and leasing	2,771	8.9%
Professional, scientific, and management, and administrative and waste management services	4,741	15.3%
Educational services, and health care and social assistance	7,487	24.1%
Arts, entertainment, and recreation, and accommodation and food services	3,244	10.5%
Other services, except public administration	1,020	3.3%
Public administration	1,909	6.2%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table E-4 City of Rocklin – Income and Benefits

Income Bracket	Percent
<\$10,000	3.4%
\$10,000 – \$14,999	2.7%
\$15,000 - \$24,9999	4.4%
\$25,000 – \$34,999	4.9%
\$35,000 – \$49,999	7.7%
\$50,000 – \$74,999	12.3%
\$75,000 – \$99,999	15.3%
\$100,000 – \$149,999	22.7%
\$150,000 – \$199,999	12.4%
\$200,000 or more	12.3%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Large Employers in the City include:

- Sierra Joint Community College District
- Rocklin Unified School District
- American Healthcare Administrative Services Inc.,
- S.E. Scher Corporation
- Wal-Mart Stores Inc.
- Chevron Corporation
- United Natural Foods West Inc.
- Ace Hardware Corporation

E.3.4. Population

The California Department of Finance estimated the January 1, 2020 total population for the City of Rocklin was 70,350.

E.4 Hazard Identification

Rocklin's identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to Rocklin (see Table E-5).

Table E-5 City of Rocklin—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Unlikely	Limited	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Negligible	Medium	High
Earthquake	Significant	Occasional	Limited	Low	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Likely	Negligible	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Critical	High	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Significant	Occasional	Negligible	Low	Low
Tree Mortality	Significant	Highly Likely	Limited	Low	High
Wildfire	Significant	Highly Likely	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths. Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability. Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability. Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid.				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

E.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Rocklin’s hazards and assess the City’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City (as identified in the Significance column of Table E-5) and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

E.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section E.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

E.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Rocklin’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Placer County Assessor’s Office is based on the 2020 Assessor’s data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table E-6 shows the 2020 Assessor’s values and content replacement values (e.g., the values at risk) broken down by property type for the City.

Table E-6 City of Rocklin – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	5	0	\$2,215,610	\$0	\$0	\$2,215,610
Commercial	695	484	\$438,468,211	\$886,632,133	\$886,632,133	\$2,211,732,477
Industrial	198	154	\$89,054,206	\$195,266,485	\$292,899,733	\$577,220,424
Institutional	86	41	\$44,602,355	\$219,584,059	\$219,584,059	\$483,770,473
Miscellaneous	1,071	20	\$54,243,557	\$7,292,129	\$7,292,129	\$68,827,815
Natural / Open Space	640	5	\$2,868,359	\$9,089,248	\$9,089,248	\$21,046,855
Residential	20,962	20,305	\$2,474,254,814	\$6,849,309,220	\$3,424,654,733	\$12,748,218,767
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421

Source: Placer County 2020 Parcel/Assessor's Data

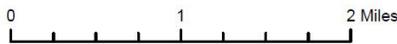
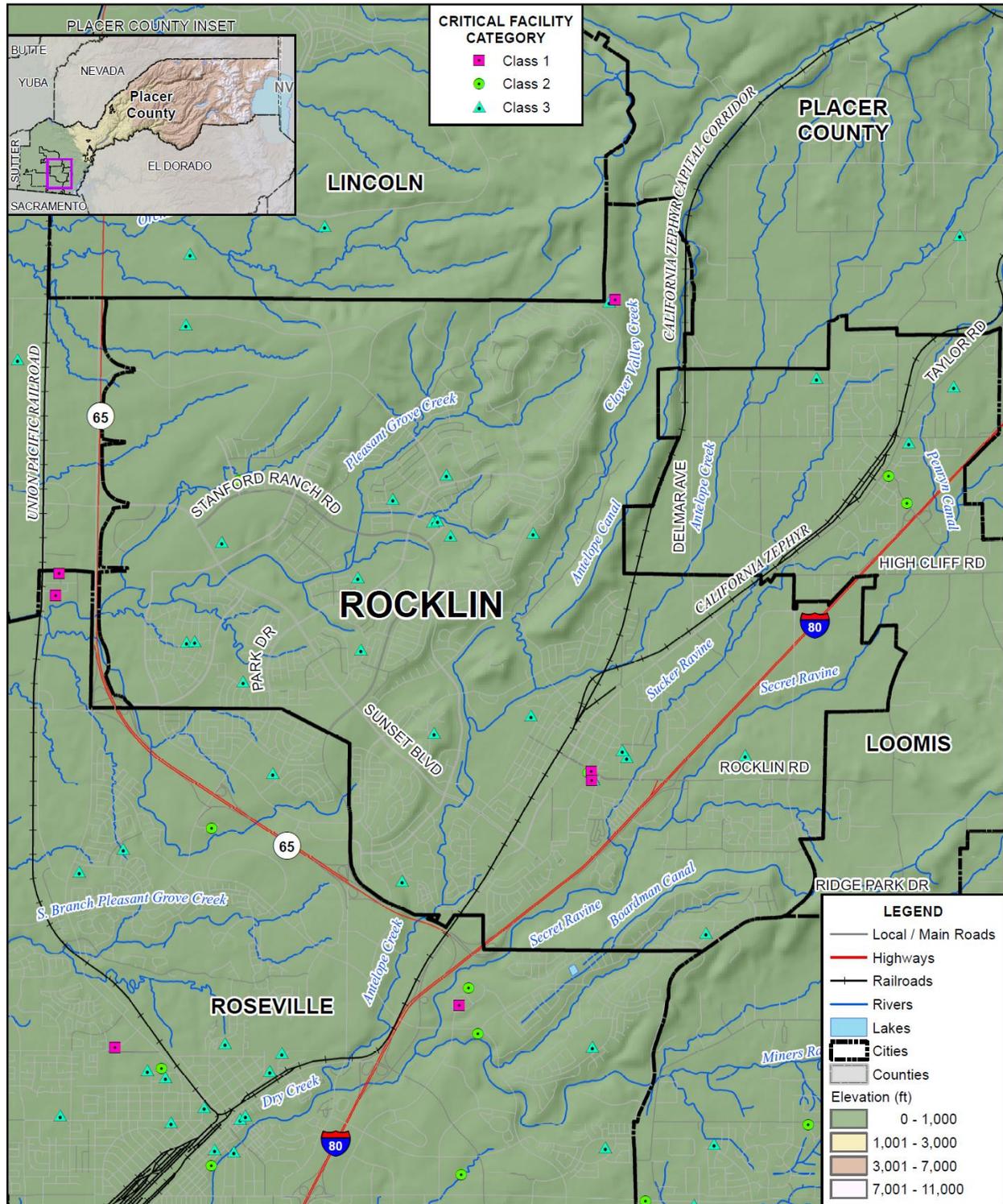
Critical Facilities and Infrastructure

Critical facilities and infrastructure are those buildings and infrastructure that are crucial to a community. Should these be damaged, it makes it more difficult for the community to respond to and recover from a disaster. For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the base plan. An inventory of critical facilities in the City of Rocklin from Placer County GIS is shown on Figure E-2 and detailed in Table E-7. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure E-2 City of Rocklin – Critical Facilities



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-7 City of Rocklin – Critical Facilities

Critical Facility Class	Critical Facility Type	Facility Count
Class 1	Communication Transmission Sites	1
	Dispatch Center	1
	Emergency Operation Center	1
Class 2	Fire Station	3
	Police Station	1
Class 3	Hall	2
	Hazardous Materials Facility	1
	School	19
	Water Treatment Plant	1
Rocklin Total		30

Source: Placer County GIS

Natural Resources

Natural resources are unique to each area and are difficult to replace. Should a natural disaster occur, these species and locations are at risk. The City of Rocklin has a variety of habitat types that include urban, annual grasslands, seasonal wetlands, riparian zones, and oak savannah woodlands. These environments support plant and wildlife that include protected and special status species listed in the Table E-8.

Table E-8 City of Rocklin’s Protected and Special Status Species

Common Name	Reporting Agency	Protection Status	Habitat
Birds			
Aleutian Canada goose	USFWS	FD	Uses pastures and grain fields along the coasts of Oregon and California, and in California’s Central Valley. Nest on maritime islands.
American peregrine falcon	USFWS	FD; CE	Wetlands, woodlands, forested areas, agricultural areas, and coastal habitats. Nesting sites on ledges.
Bank swallow	USFWS	CT	Riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with sandy soil. Nest in colonies in burrows dug into riverbanks.
Black tern	USFWS	FSC; SC	Spring and summer in fresh emergent wetlands while breeding. Common on bays, salt ponds, river mouths and pelagic waters in spring and fall.
Burrowing owl	CNNDB/USFWS	SC, S2	Open grassland and desert habitats, in open parts of pinyon-juniper and ponderosa pine habitats. Uses rodent or other burrows for cover and nesting.
Cooper’s hawk	GL-DEIR	SC	Oak woodlands, riparian or other forest habitat near water

Common Name	Reporting Agency	Protection Status	Habitat
Ferruginous hawk	USFWS	FSC; SC	Open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys and fringes of pinyon-juniper habitats. Roosts in open area, usually in a lone tree or pole.
Golden eagle	GL-DEIR	SC, Fully Protected	Rolling hills, mountain areas, sage-juniper flats and deserts.
Grasshopper sparrow	USFWS	FSC	Tall and mixed grassland habitats including native prairies, hayfields, pastures, and fallow fields.
Greater sandhill crane	USFWS	CT	Wet meadows. Tend to nest in open habitat or in the cover of bulrush and bur reed.
Lawrence's goldfinch	USFWS	FSC	Open oak woodlands, mesquite, and riparian thickets.
Lewis' woodpecker	USFWS	FSC	Open pine-oak woodlands, coniferous forests, and riparian woodlands. Associated with burned and logged woodlands.
Little willow flycatcher	USFWS	CE	Wet meadows and montane riparian habitats with extensive willow thickets.
Loggerhead shrike	USFWS	FSC; SC	Open habitats with scattered shrubs, trees, utility lines or other perches. Lowlands and foothills throughout California.
Long-billed curlew	USFWS	FSC; SC	Wet meadow habitat, Coastal estuaries, upland herbaceous areas, and croplands.
Mountain plover	USFWS	FPT; SC	Short grasslands and plowed fields of the Central Valley.
Sharp-shinned hawk	GL-DEIR	SC	Deciduous riparian forest at mid-elevation, conifer forest, and oak woodlands.
Short-eared owl	USFWS	FSC; SC	Grasslands, prairies, dunes, meadows, irrigated lands and saline and fresh emergent wetlands. Nests in depression in dry ground concealed in vegetation.
Swainson's hawk	CNNDB/USFWS	CT	Open desert, grassland, or cropland with scattered, large trees or small groves.
Tricolored blackbird	CNNDB/USFWS	SC; S3	Emergent wetland vegetation with cattails, tules, and/or thickets.
Vaux's swift	USFWS	FSC; SC	Redwood and Douglas-fir habitats with nests in large hollow trees and snags.
Western spadefoot	CNNDB	SC	Primarily in grassland habitats, also found in valley-foothill hardwood woodlands.
White-faced ibis	USFWS	FSC; SC	Fresh emergent wetlands, shallow lacustrine waters, and the muddy ground or wet meadows and irrigated/flooded pastures and croplands.
White-tailed kite	CNNDB/USFWS	S3, Fully Protected	Lowland grasslands, agriculture, wetlands, oak-woodlands, savannah, and riparian habitats associated with open areas.

Common Name	Reporting Agency	Protection Status	Habitat
Reptiles			
California horned lizard	USFWS	FSC; SC	Wide range of habitats from gravelly-sandy substrate containing scattered shrubs, to clearing in riparian woodlands.
Giant garter snake	USFWS	FT; CT	Marshes, sloughs, and slow-moving creeks, with nocturnal retreats in holes and mammal burrows.
Northwestern Pond Turtle	USFWS	FSC; SC	Pacific slope drainages from Washington to Baja California.
Amphibians			
California red-legged frog	GL-DEIR	FT; SC	Pools, ponds, slow streams, and marshes.
Fish			
Central Valley fall/late fall-run Chinook salmon	USFWS	FC; SC	Wide range of habitats from gravelly-sandy substrate containing scattered shrubs, to clearing in riparian woodlands.
Central Valley steelhead	USFWS	FT	Marshes, sloughs, and slow-moving creeks, with nocturnal retreats in holes and mammal burrows.
Green sturgeon	USFWS	FSC; SC	Pacific slope drainages from Washington to Baja California.
Sacramento splittail	USFWS	FT; SC	Primarily in the Sacramento-San Joaquin estuary.
Winter-run Chinook salmon	USFWS	FE; CE	The ocean and the Sacramento River and its tributaries.
Invertebrates			
California Linderiella fairy shrimp	CNNDB/USFWS	S2/S3	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.
Vernal Pool Tadpole Shrimp	CNNDB/USFWS	FE; S2/S3	Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.
Valley Elderberry Longhorn Beetle	CNNDB/USFWS	FT; S2	Only occurs in the Central Valley of California in association with Blue Elderberry (<i>Sambucus mexicana</i>).
Vernal Pool Fairy Shrimp	CNNDB/USFWS	FT; S2/S3	In a static rain-filled pools in the central valley grasslands and central and south coastal mountains.
Mammals			
Fringed myotis bat	USFWS	FSC	Roosts in caves, mines, and rock crevices within a variety of habitats.
Greater western mastiff-bat	USFWS	FSC; SC	Open, semi-arid to arid habitats, including conifer and deciduous woodlands, annual and perennial grasslands, chaparral, and urban.
Long-eared myotis bat	USFWS	FSC	Woodland and forest habitats, roosting in rock crevices, under bark, and tree snags.
Long-legged myotis bat	USFWS	FSC	Woodlands and forest habitats generally over 4,000 feet. Roosts in rock crevices, under bark, in tree snags, and cliffs.

Common Name	Reporting Agency	Protection Status	Habitat
Pacific western big-eared bat	USFWS	FSC; SC	All but alpine and sub-alpine habitats.
San Joaquin pocket mouse	USFWS	FSC	Dry, open grasslands or scrub area on fine textured soils in the Central and Salinas valleys.
Small-footed myotis bat	USFWS	FSC	Occurs in a variety of habitats, roosting in caves, crevices, and buildings.
Spotted bat	USFWS	FSC	Arid or ponderosa pine forests, and marshlands. Roosts in small cracks in cliffs and stony outcrops.
Yuma myotis bat	USFWS	FSC	Variety of habitats from juniper and riparian woodlands to desert regions near open water. Associates with water and roosts in caves, attics, under bridges, mines, and similar places.
Habitats			
Alkali Meadow	CNNDB	S2	
Alkali Seep	CNNDB	S2	
Northern Hardpan Vernal Pool	CNNDB	S3	
Northern Volcanic Mud Flow Vernal Pool	CNNDB	S1	
Plants			
Big-scale Balsamroot	CNNDB	S2	Valley and foothill grassland, cismontane woodland.
Boggs Lake Hedge-hyssop	CNNDB/USFWS	CE, S3	Clay soils in marshes, swamps and vernal pools.
Dwarf Downingia	CNNDB	S3	Valley and foothill grassland and several types of vernal pools.
Hispid Bird's-Beak	CNNDB/USFWS	FSC; S2	In damp alkaline soils in meadows, playas, and valley and foothill grassland.
Legenere	CNNDB/USFWS	FSC; S2	In beds of vernal pools.
Red Bluff Dwarf Rush	CNNDB	S2	Chaparral, valley and foothill grassland, cismontane woodlands, and vernal pools.

Source: Rocklin General Plan EIR, Appendix E, 2008

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk.

The City of Rocklin has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. Table E-9 lists the historical buildings in the City.

Table E-9 City of Rocklin – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Finnish Temperance Hall, Finn Hall (P664)			X	8/20/1985	Rocklin
First Transcontinental Railroad-Rocklin (780)		X		11/20/1962	Rocklin

Source: California Department of Parks and Recreation Office of Historic Preservation, <http://ohp.parks.ca.gov/>

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Prehistoric Resources Present in the Rocklin Area

- Bedrock grinding mortars
- House pits (sites of prehistoric houses)
- Grinding stones
- Chipped stone tools
- Bone tools

Historic Resources Present in the Rocklin Area

- Historic foundations
- Rock walls
- Well pits
- Ditches
- Historic mines and mining artifacts

The Rocklin Historical Society (RHS) and Rocklin History Museum are key historic resources for the City.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. Information from the City of Rocklin General Plan Housing Element, the California Department of Finance, the US Census Bureau form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. Rocklin has generally seen steady periods of high growth. Rocklin has seen growth rates as shown in Table E-10.

Table E-10 City of Rocklin – Population Changes Since 1950

Year	Population	Change	% Change
1950	1,155	–	–
1960	1,495	340	29.4%
1970	3,039	1,544	103.3%
1980	7,344	4,305	141.7%
1990	19,033	11,690	159.2%
2000	36,330	17,297	90.9%
2010 ¹	56,974	20,644	56.38%
2020 ²	70,350	13,376	23.5%

Source: ¹US Census Bureau, ²California Department of Finance

Special Populations and Disadvantaged Communities

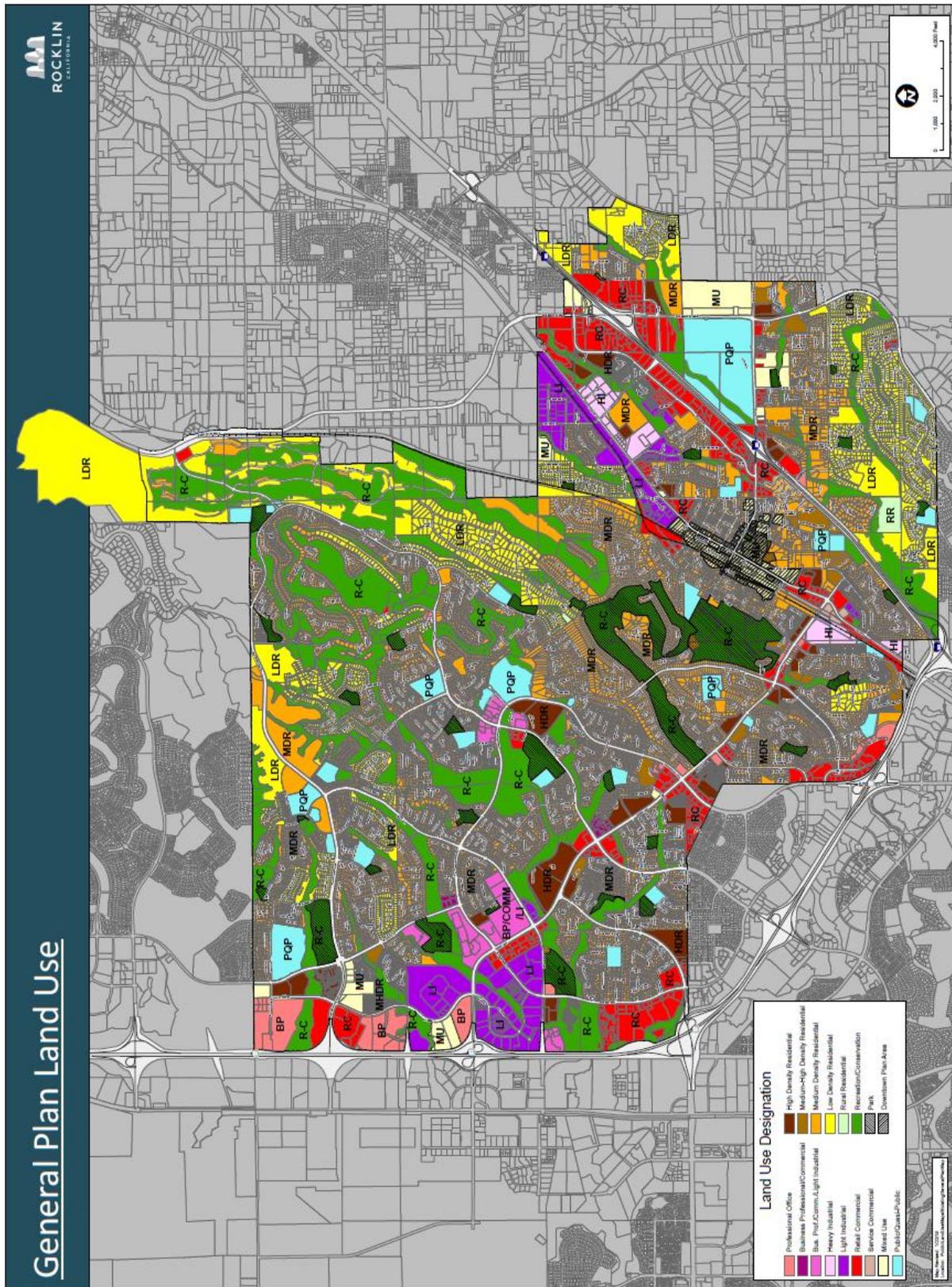
There are 55 and older age-restricted subdivisions in Rocklin and there are numerous congregate care/assisted living facilities that are built or are being proposed to be built that have, or will have, elderly populations. Hazard-related concerns or issues regarding the vulnerability of elderly populations primarily relate to the potential need for evacuation of elderly citizens in the event of a hazard that creates a need for evacuations.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City’s land use designations are generally described below and mapped on the Land Use Diagram (Figure E-3). The Rocklin Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Rocklin. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use, dated 2019, for the City of Rocklin from the City of Rocklin General Plan Land Use Element is shown on Figure E-3.

Figure E-3 City of Rocklin – Land Use Diagram



Source: City of Rocklin General Plan Land Use Element

Development since 2016 Plan

As discussed in Section 4.3.1 of the Base Plan, future development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Building Department tracked total building permits issued since 2016 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table E-11 and Table E-12. No development has occurred in hazard areas since 2016.

Table E-11 City of Rocklin – Total Development Since 2016

Property Use	2016	2017	2018	2019	2020
Agricultural	0	0	0	0	0
Commercial	10	9	9	9	4
Industrial	0	0	0	0	0
Residential	547	669	586	439	422
Unknown	0	0	0	0	0
Total	557	678	595	448	426

Source: City of Rocklin Building Department

Table E-12 City of Rocklin – Development in Hazard Areas since 2016

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area ¹	Other
Agricultural	0	0	0	0
Commercial	0	0	0	0
Industrial	0	0	0	0
Residential	0	0	0	0
Unknown	0	0	0	0
Total	0	0	0	0

Source: City of Rocklin Building Department

¹Moderate or higher wildfire risk area

Future Development

The majority of future growth in Rocklin is anticipated to be concentrated in four areas: Clover Valley, the mid- to eastern portion of the Northwest Rocklin Annexation Area (Whitney Ranch), the Sierra College area and the Croftwood area, as these areas represent the last portions of the city with large tracts of vacant lands (see Figure 3.0-9, Neighborhood Areas, of the 2012 Rocklin General Plan Draft EIR). Because the City of Rocklin is surrounded by other jurisdictions on all sides, it is likely that the City boundaries will not expand beyond their current locations. The primary hazard in these undeveloped areas is wildland fires, as the areas contain extensive grasslands and oak woodlands. As these areas develop the majority of the grasslands and oak woodlands will be replaced with urban development and some of the current wildland hazards will be mitigated as a result of the development, but the development will also include the preservation of grassland and oak woodland areas that will create an urban/wildland fire hazard interface.

The Sacramento Council on Governments (SACOG) modeled population projections for the City of Rocklin and other areas of the region in 2012 for a Metropolitan Transportation Plan/Sustainable Communities Strategy report. This forecast uses a 2008 base year estimate with projections to 2020 and 2035 for population, housing units, households and employment. SACOG estimated the City population in 2020 and 2035 to be 65,845 and 72,312 respectively.

Figure E-3 above shows the City of Rocklin's land use. While the map does not specifically identify future growth areas but some understanding of future growth areas can be obtained from the map by seeing areas that lack road infrastructure and individual lots versus those areas that show those features.

More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

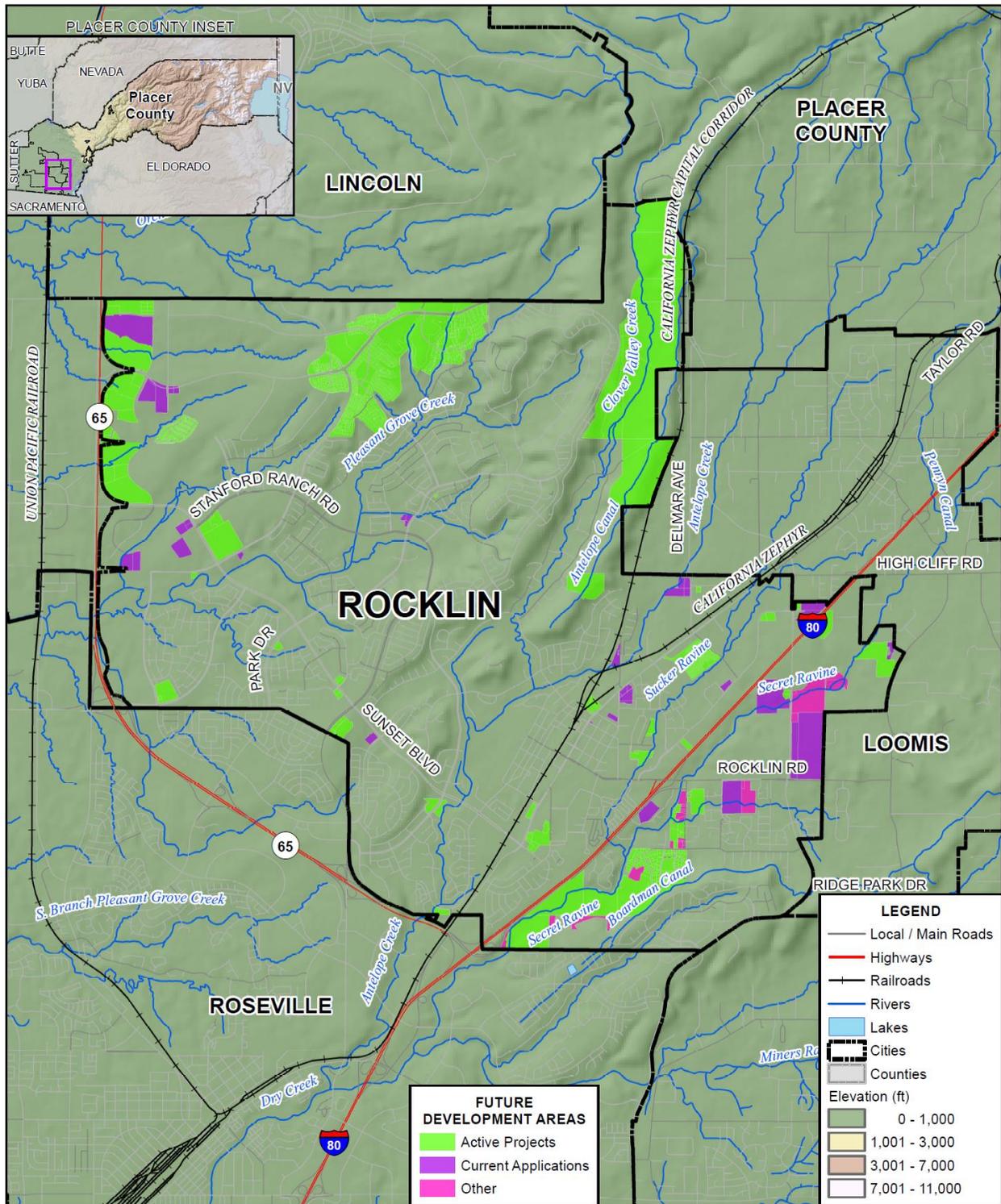
GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and acreages with future development projects in the City of Rocklin. Future development areas in the City were provided in mapped format by the City. 3 types of future were provided:

- Active Projects (36 areas)
- Current Applications (23 areas)
- Other (2 areas)

Using the GIS parcel spatial file for each of these areas, the 3 types and 61 areas associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure E-4 shows the locations of future development areas the City is planning to develop. Table E-13 shows the parcels and acreages of each future development area in the City.

Figure E-4 City of Rocklin – Future Development Areas



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-13 City of Rocklin – Future Development Area Parcels and Acres

Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Active Projects			
Bass Pro Shops Outdoor Storage	1	1	12.5
Blue Oaks Marketplace II (Rocklin West) PAD I	1	1	11.8
Blue Oaks Marketplace II (Rocklin West) TPM	1	1	0.3
Clover Valley Small Lot TSM	16	0	448.8
Croftwood Unit 2 Revised TPM	1	1	25.3
Farron Street Retail (Rocklin Retail)	2	1	2.6
Granite Bluffs SD	1	0	1.6
Granite Lakes Estates Development Agreement	116	110	98.8
GRANITE TERRACE	2	0	7.9
Highlands Parcel A	1	0	30.4
Knights Way TPM	2	0	0.3
Los Cerros Subdivision	1	0	27.3
McChevron - Modification to Approved Project	1	1	1.6
Niello Jaguar Land Rover	1	1	2.2
Orchard Creek TPM	2	0	46.6
Park Drive Self Storage	1	0	1.7
Quarry Place Apartments (AKA Pacific Pointe)	7	1	15.1
Quick Quack Car Wash at Sierra College	2	0	2.0
Racetrack Subdivision	2	0	2.2
Rocklin Gateway-ZL Rocklin (AKA Downtown Gateway)	5	0	6.6
Rocklin Meadows & Greenbrae Island Annexation	6	0	14.4
Sierra Pine Subdivision	216	1	34.8
South Whitney Mixed Use Townhomes & Medical Center	1	0	2.8
Spring Valley Phase II Village 3&4	222	201	18.1
Stanford Plaza PH 1 C	2	0	1.8
Stanford Ranch Storage (Parcel 56)	3	2	40.0
Stanford Terrace Condominiums (Stanford Villages)	5	3	10.9
Sunset Hills Townhomes	1	0	4.6

Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Sunset Station	2	0	2.0
Tractor Supply Design Review	2	0	3.9
Vista Oaks Subdivision	2	0	89.1
Vue at Rocklin Ridge Apartments - Clubhouse	1	1	3.2
Wave Storage Yard Expansion	1	0	0.9
West Oaks Townhouses	1	0	1.6
Whitney Ranch Non-Residential Development	23	1	152.0
Whitney Ranch PH 3	52	0	12.4
Whitney Ranch Residential Development	797	307	392.7
Active Projects Total	1503	634	1,531.1
Current Applications			
Cell Marque	1	1	0.0
College Park (Sierra Villages)	4	0	92.1
Cool Pools - Mixed Use	1	1	0.2
Domum & SDG Headquarters	1	0	1.0
Fairway Condos	1	1	2.9
Granite Marketplace	4	0	12.9
J&S ASPHALT HEADQUARTERS	2	0	4.3
Jacques Indian Creek Drive Tentative Parcel map	1	0	3.0
Lemke RV	1	1	2.3
Lifehouse Parcel Map	1	1	9.9
MAVERIK GAS STATION	3	0	5.1
Orchard Creek Business Park Rezone	1	0	39.0
Pasquetti Engineering Headquarters	2	0	7.3
Placer Academy Charter School Expansion aka Harve*	3	3	2.8
Placer Academy Temporary Modular Units	1	1	1.8
Placer Creek Apartments	3	0	21.8
Quarry Row Subdivision	6	1	7.1
ROCKLIN CORPORATE CENTER GPA / REZONE	2	0	11.6
Rocklin Park Senior Living Addition	1	1	9.0
Secret Ravine Community	1	0	24.1
STRIKES PARCEL MAP	1	1	8.6
Whitney Ranch Chevron & Carwash	2	0	2.8

Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
YANKEE HILL PARCEL MAP	7	0	4.9
Current Applications Total	50	12	274.3
Other			
Vacant Land - Sierra College / Rocklin Road	9	3	61.0
Vacant Land - Southeast Rocklin	19	12	32.2
Other Total	28	15	93.2
Grand Total			
	1,581	661	1,898.6

Source: City of Rocklin GIS

E.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table E-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, critical facilities and infrastructure, and future development.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the City, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City and the County are shown in Section 4.2.11 of the Base Plan.

Past Occurrences

There have been two state and one federal disaster declaration from drought. This can be seen in Table E-14.

Table E-14 Placer County – State and Federal Drought Disaster Declarations 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the City are the same as those for the County and includes 4 multi-year droughts since 1950. Details on past drought occurrences can be found in Section 4.2.11 of the Base Plan.

The City made changes to the vegetation in the landscaping and parks to be more drought tolerant and that required less water usage.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Water in the City is provided by Placer County Water Agency. The City is not aware of any concerns to this water supply.

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. The increased dry fuels and fuel loads associated with drought conditions can also result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts.

Other qualitative impacts associated with drought in the planning area are those related to water intensive activities such as, municipal usage, commerce, tourism, recreation and agricultural use. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Future Development

As the population in the area continues to grow, so will the demand for water. Ongoing planning will be needed by the City and water agencies to account for population growth and increased future water demands.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Low

Although rated as a low significance hazard, due to its importance in Placer County and in California, the flood hazard is included here

Hazard Profile and Problem Description

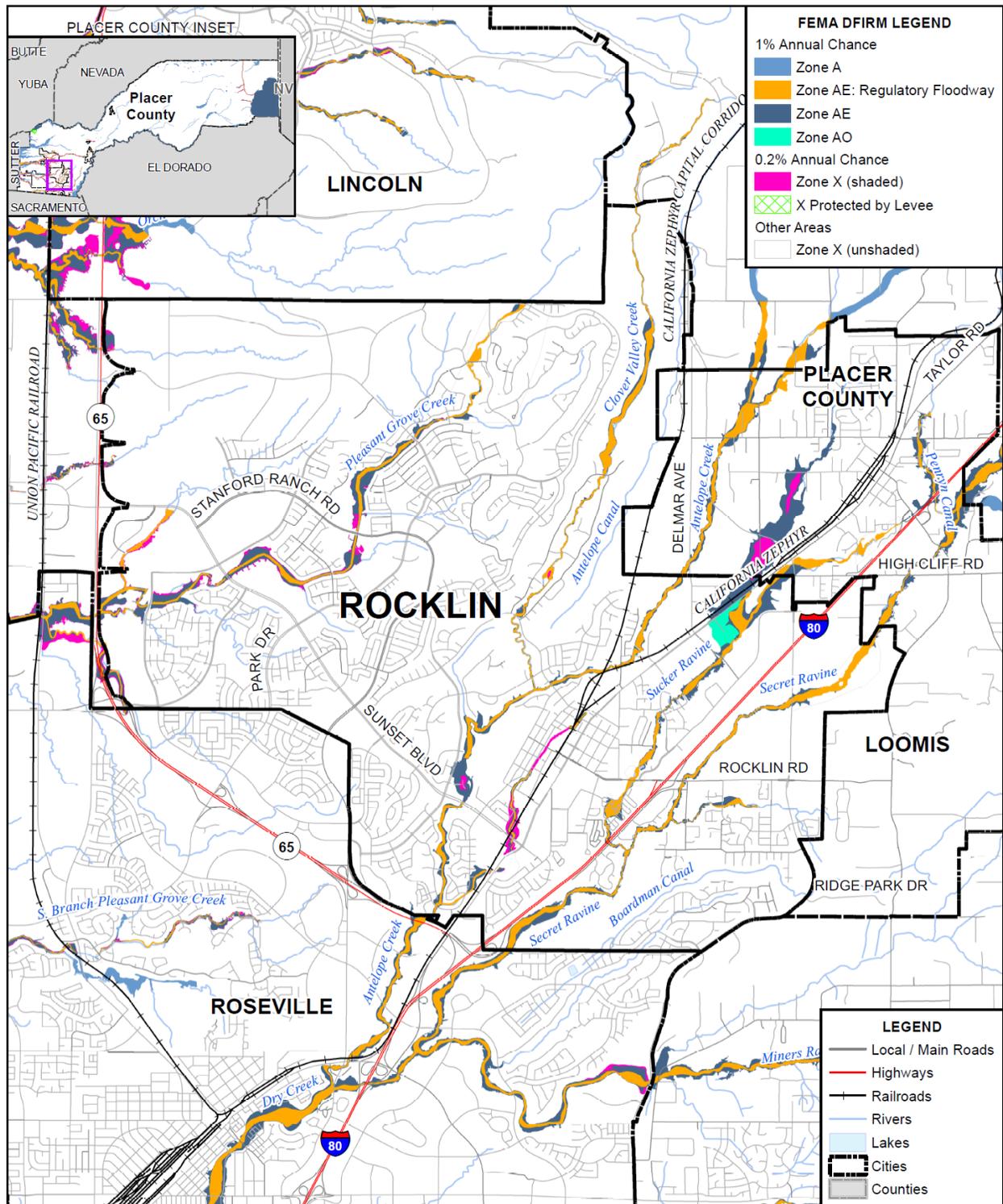
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the City, and have caused damages in the past. Flooding is a significant problem in Placer County and the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

As previously described in Section 4.2.13 of the Base Plan, the Placer County Planning Area and the City of Rocklin have been subject to historical flooding. Rocklin is traversed by several stream systems and is at risk to the 1% and 0.2% flood.

Location and Extent

In the City of Rocklin, much of the flood damage occurs in the floodplains of Antelope Creek, Secret Ravine Creek, Clover Valley Creek, and Sucker Ravine. The City of Rocklin has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure E-5.

Figure E-5 City of Rocklin – FEMA DFIRM Flood Zones



FOSTER MORRISON
CONSULTING



COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-15 details the DFIRM mapped flood zones located within the City.

Table E-15 City of Rocklin– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in City of Rocklin
A	1% annual chance flooding: No base flood elevations provided	
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table E-16.

Table E-16 City of Rocklin – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	602	4.8%	132	2.3%	470	6.9%
0.2% Annual Chance	46	0.4%	11	0.2%	34	0.5%
Other Areas	11,877	94.8%	5,600	97.5%	6,277	92.6%
Total	12,524	100.0%	5,743	100.0%	6,781	100.0%

Source: FEMA DFIRM 11/2/2018

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table E-17. These events also likely affected the City to some degree.

Table E-17 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the City’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County and City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits.

Assets at Risk

Based on the vulnerability of Rocklin to the flood hazard, the sections that follow describes significant assets at risk in the City of Rocklin. This section includes the values at risk, flooded acres, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Rocklin. The methodology described in Section 4.3.12 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table E-18 is a summary table for the City of Rocklin. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table E-19 breaks down Table E-18 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in FEMA flood zones in the City.

Table E-18 City of Rocklin – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	185	115	\$23,373,619	\$47,773,479	\$37,270,632	\$108,417,730
0.2% Annual Chance Flood Hazard	47	40	\$4,015,333	\$7,975,437	\$4,436,746	\$16,427,516
Other Areas	23,425	20,854	\$3,078,318,160	\$8,111,424,358	\$4,798,444,657	\$15,988,187,175
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table E-19 City of Rocklin – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone AE Floodway						
Commercial	5	2	\$848,703	\$662,110	\$662,110	\$2,172,923
Industrial	2	0	\$894,000	\$0	\$0	\$894,000
Miscellaneous	13	0	\$880,771	\$0	\$0	\$880,771
Natural / Open Space	19	0	\$46,852	\$0	\$0	\$46,852
Residential	39	36	\$5,678,475	\$10,412,141	\$5,206,070	\$21,296,686
Zone AE Floodway Total	78	38	\$8,348,801	\$11,074,251	\$5,868,180	\$25,291,232

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone AE						
Commercial	8	0	\$1,763,567	\$0	\$0	\$1,763,567
Industrial	2	0	\$689,437	\$0	\$0	\$689,437
Institutional	2	0	\$0	\$0	\$0	\$0
Miscellaneous	10	0	\$88,434	\$0	\$0	\$88,434
Natural / Open Space	5	0	\$0	\$0	\$0	\$0
Residential	69	68	\$8,348,919	\$23,332,419	\$11,666,212	\$43,347,550
Zone AE Total	96	68	\$10,890,357	\$23,332,419	\$11,666,212	\$45,888,988
Zone AO						
Commercial	1	1	\$34,209	\$79,840	\$79,840	\$193,889
Industrial	7	6	\$3,903,145	\$13,012,915	\$19,519,373	\$36,435,433
Miscellaneous	1	0	\$0	\$0	\$0	\$0
Residential	2	2	\$197,107	\$274,054	\$137,027	\$608,188
Zone AO Total	11	9	\$4,134,461	\$13,366,809	\$19,736,240	\$37,237,510
1% Annual Chance Flood Hazard Total	185	115	\$23,373,619	\$47,773,479	\$37,270,632	\$108,417,730
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Commercial	2	1	\$371,332	\$382,832	\$382,832	\$1,136,996
Institutional	1	1	\$79,248	\$99,065	\$99,065	\$277,378
Miscellaneous	5	1	\$183,955	\$416,160	\$416,160	\$1,016,275
Natural / Open Space	1	0	\$0	\$0	\$0	\$0
Residential	38	37	\$3,380,798	\$7,077,380	\$3,538,689	\$13,996,867
Zone X (shaded) Total	47	40	\$4,015,333	\$7,975,437	\$4,436,746	\$16,427,516
0.2% Annual Chance Flood Hazard Total	47	40	\$4,015,333	\$7,975,437	\$4,436,746	\$16,427,516
Other Areas						
Zone X (unshaded)						
Agricultural	5	0	\$2,215,610	\$0	\$0	\$2,215,610
Commercial	679	480	\$435,450,400	\$885,507,351	\$885,507,351	\$2,206,465,102
Industrial	187	148	\$83,567,624	\$182,253,570	\$273,380,360	\$539,201,554
Institutional	83	40	\$44,523,107	\$219,484,994	\$219,484,994	\$483,493,095
Miscellaneous	1,042	19	\$53,090,397	\$6,875,969	\$6,875,969	\$66,842,335

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Natural / Open Space	615	5	\$2,821,507	\$9,089,248	\$9,089,248	\$21,000,003
Residential	20,814	20,162	\$2,456,649,515	\$6,808,213,226	\$3,404,106,735	\$12,668,969,476
Zone X (unshaded) Total	23,425	20,854	\$3,078,318,160	\$8,111,424,358	\$4,798,444,657	\$15,988,187,175
Other Areas Total	23,425	20,854	\$3,078,318,160	\$8,111,424,358	\$4,798,444,657	\$15,988,187,175
Rocklin Grand Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table E-20 summarizes Table E-19 above and shows City of Rocklin loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table E-20 City of Rocklin – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	185	115	\$47,773,479	\$37,270,632	\$85,044,111	\$17,008,822	0.029%
0.2% Annual Chance Flood Hazard	47	40	\$7,975,437	\$4,436,746	\$12,412,183	\$2,482,437	0.004%
Grand Total	232	155	\$55,748,916	\$41,707,378	\$97,456,294	\$19,491,259	0.03%

Source: FEMA 11/2/2018 DFIRM, Placer County 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table E-19 and Table E-20, the City of Rocklin has 115 parcels and \$85 million of structure and contents values or values in the 1% annual chance flood zone, and 40 improved parcels and \$12.4 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.10 of the Base Plan, there is a 1% chance in any given year of a flood event causing \$17.0 million in damage and a 0.2%

chance in any given year of a flood event causing \$2.5 million in damage in the City of Rocklin. The loss ratio of 0.029% and 0.004% indicates that flood losses for 1% and 0.2% annual chance flooding, respectively, would be minor and able to recover from.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.12 of the Base Plan, was used for the City of Rocklin as well as for the County as a whole. Table E-21 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table E-21 City of Rocklin – Flooded Acres by Flood Zone

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.000%	0	0.00%	0	0.000%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	0	0.00%	0	0.00%	0	0.00%
Zone A Total	0	0.000%	0	0.00%	0	0.000%
Zone AE Floodway						
Agricultural	1	0.000%	0	0.00%	1	0.000%
Commercial	27	0.003%	11	0.006%	16	0.002%
Industrial	22	0.002%	2	0.001%	20	0.003%
Institutional	13	0.001%	1	0.000%	12	0.002%
Miscellaneous	97	0.011%	0	0.000%	97	0.013%
Natural / Open Space	82	0.009%	4	0.002%	78	0.011%
Residential	56	0.006%	48	0.027%	8	0.001%
Zone AE Floodway Total	298	0.033%	66	0.036%	232	0.032%
Zone AE						
Agricultural	1	0.000%	0	0.00%	1	0.000%
Commercial	30	0.003%	8	0.004%	22	0.003%
Industrial	16	0.002%	2	0.001%	14	0.002%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Institutional	8	0.001%	0	0.000%	7	0.001%
Miscellaneous	95	0.011%	0	0.000%	95	0.013%
Natural / Open Space	91	0.010%	3	0.002%	88	0.012%
Residential	38	0.004%	34	0.019%	4	0.001%
Zone AE Total	279	0.031%	47	0.026%	232	0.032%
Zone AO						
Agricultural	0	0.00%	0	0.00%	0	0.00%
Commercial	1	0.000%	1	0.000%	0	0.00%
Industrial	19	0.002%	17	0.009%	2	0.000%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	3	0.000%	0	0.00%	3	0.000%
Natural / Open Space	0	0.00%	0	0.00%	0	0.00%
Residential	2	0.000%	2	0.001%	0	0.00%
Zone AO Total	24	0.003%	19	0.011%	5	0.001%
1% Annual Chance Flood Hazard Total	602	0.067%	132	0.073%	470	0.065%
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	0		0		0	
Commercial	6	0.001%	3	0.002%	3	0.000%
Industrial	1	0.000%	0	0.000%	1	0.000%
Institutional	0	0.000%	0	0.000%	0	0.000%
Miscellaneous	14	0.002%	0	0.000%	14	0.002%
Natural / Open Space	16	0.002%	0	0.00%	16	0.002%
Residential	8	0.001%	7	0.004%	1	0.000%
Zone X (shaded) Total	46	0.005%	11	0.006%	34	0.005%
0.2% Annual Chance Flood Hazard Total	46	0.005%	11	0.006%	34	0.005%
Other Areas						
Zone X (unshaded)						
Agricultural	52	0.006%	0	0.00%	52	0.007%
Commercial	1,116	0.124%	634	0.352%	482	0.067%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Industrial	374	0.042%	211	0.117%	163	0.023%
Institutional	753	0.084%	140	0.078%	613	0.085%
Miscellaneous	3,380	0.376%	3	0.002%	3,376	0.470%
Natural / Open Space	1,556	0.173%	140	0.078%	1,416	0.197%
Residential	4,647	0.517%	4,471	2.483%	176	0.024%
Zone X (unshaded) Total	11,877	1.321%	5,600	3.110%	6,277	0.873%
Other Areas Total	11,877	1.321%	5,600	3.110%	6,277	0.873%
Rocklin Grand Total	12,524	1.393%	5,743	3.189%	6,781	0.943%

Source: FEMA 11/2/2018 DFIRM

Population at Risk

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Rocklin – 2.68. According to this analysis, there is a total population of 284 and 99 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table E-22.

Table E-22 City of Rocklin – Count of Improved Residential Parcels and Population by Flood Zone

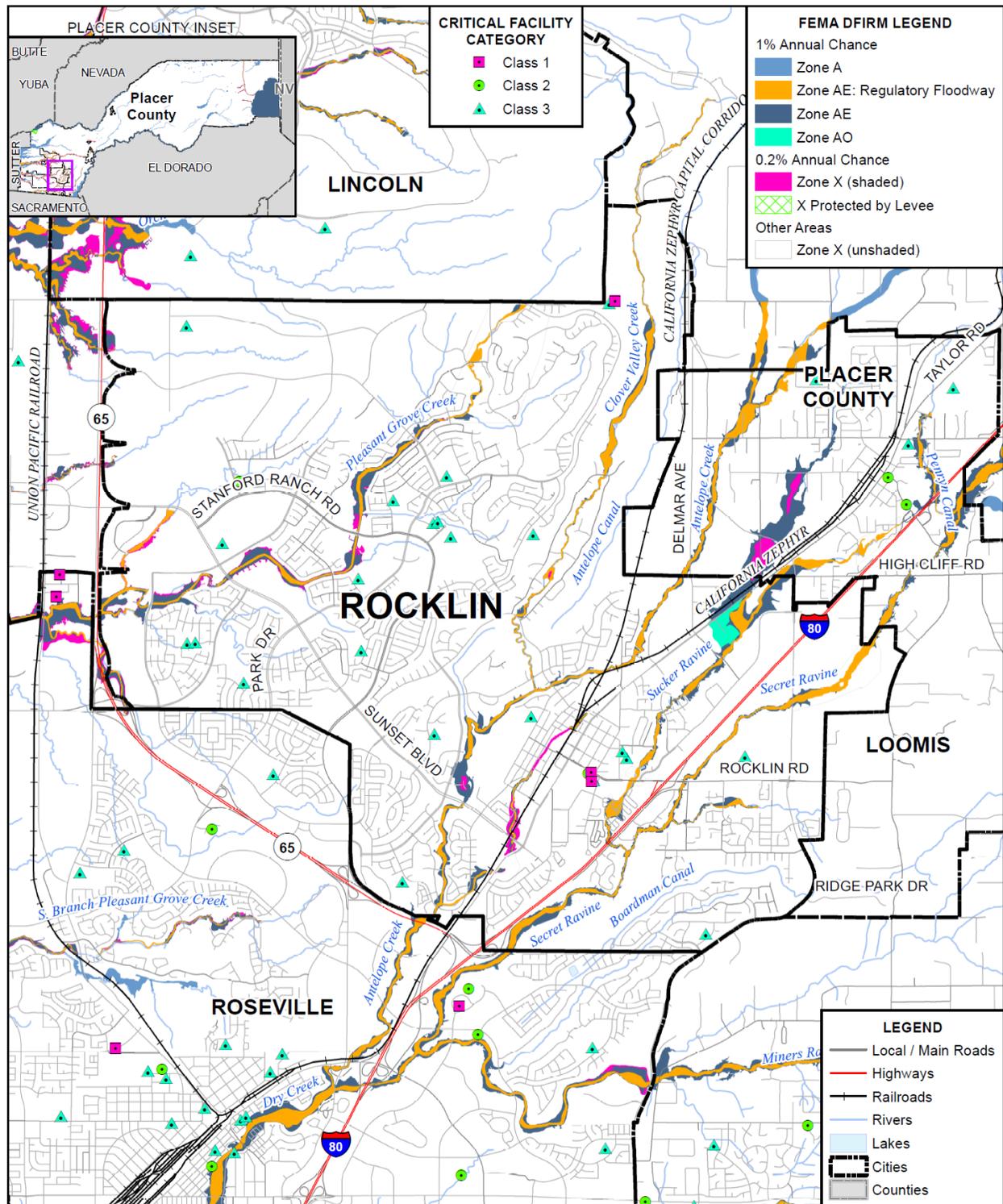
Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Rocklin	106	284	37	99

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Rocklin in identified DFIRM flood zones. Critical facilities in a FHSZ in the City of Rocklin are shown in Figure E-10 and detailed in Table E-36. As shown, no critical facilities fall in any mapped DFIRM flood zone. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure E-6 City of Rocklin – Critical Facilities in DFIRM Flood Zones



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Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

COUNTY OF
Placer

Table E-23 City of Rocklin – Critical Facilities by DFIRM Flood Zone

Flood Zone	Critical Facility Class	Critical Facility Type	Facility Count
Other Areas			
Zone X (unshaded)	Class 1	Communication Transmission Sites	1
		Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	3
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
		School	19
		Water Treatment Plant	1
Zone X (unshaded) Total			30
Other Areas Total			30
Rocklin Total			30

Source: CAL FIRE, Placer County

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Rocklin joined the National Flood Insurance Program (NFIP) on May 15, 1984. The City does not participate in CRS program. NFIP data indicates that as of August 21, 2020, there were 145 flood insurance policies in force in the City with \$47,806,200 of coverage. Of the 145 policies, 131 were residential (single-family homes) and 12 were non-residential. Of the 145 policies, 39 are in the A zones, and 106 are in the in B, C, and X zones. There have been 26 historical claims for flood losses totaling \$250,459.45. There has been 1 substantial damage claim since 1978. NFIP data further indicates that there are 4 repetitive loss (RL) and 0 or severe repetitive loss (SRL) buildings in Rocklin. The Planning Team for the City did further research:

- One of the 3 RL properties is located in another jurisdiction (community of Granite Bay in unincorporated Placer County).
- The second of the 3 RL properties is on Cimerron Court. The property includes both X and AE zones.
- The final of the 3 RL properties is on Rocklin Road. It is a mobile home park in both the X and AE Zone. This is a mobile home park. The City could not identify a particular property as FEMA provided only the generic address for the park. A small portion of this mobile home park was subject to a FEMA LOMR in 2015, but the majority of the park was not.
- The City searched records for the 4th repetitive loss building and could find no records. It is unknown if this building has been mitigated.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 115 improved parcels within the 1% annual chance flood zone, only 39 (or 39.8 percent) of those parcels maintain flood insurance. This can be seen on Table E-24.

Table E-24 City of Rocklin – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Rocklin	115	39	39.8%

Source: FEMA DFIRM 11/2/2018, Placer County 2020 Parcel/ Assessor's Data

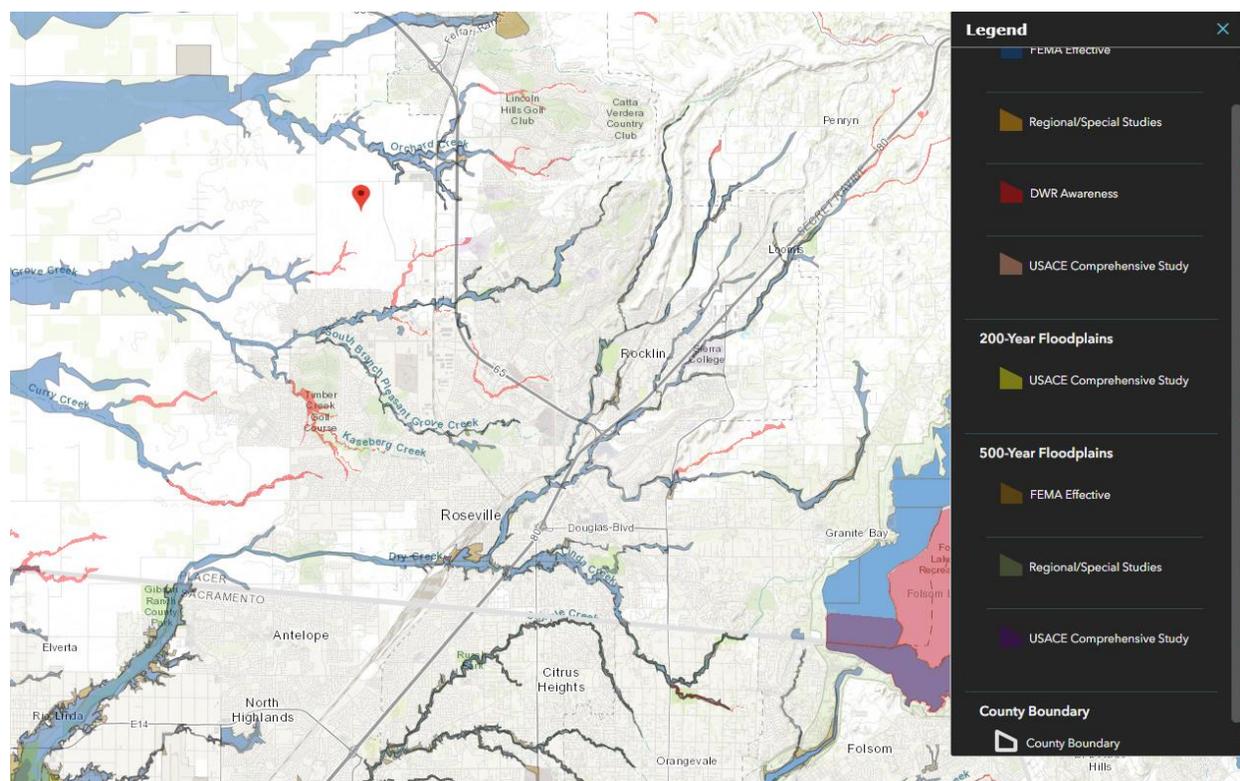
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Placer County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for Rocklin is shown in Figure E-7.

Figure E-7 City of Rocklin – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2% (2002 Sac and San Joaquin River Basins Comp Study).

Future Development

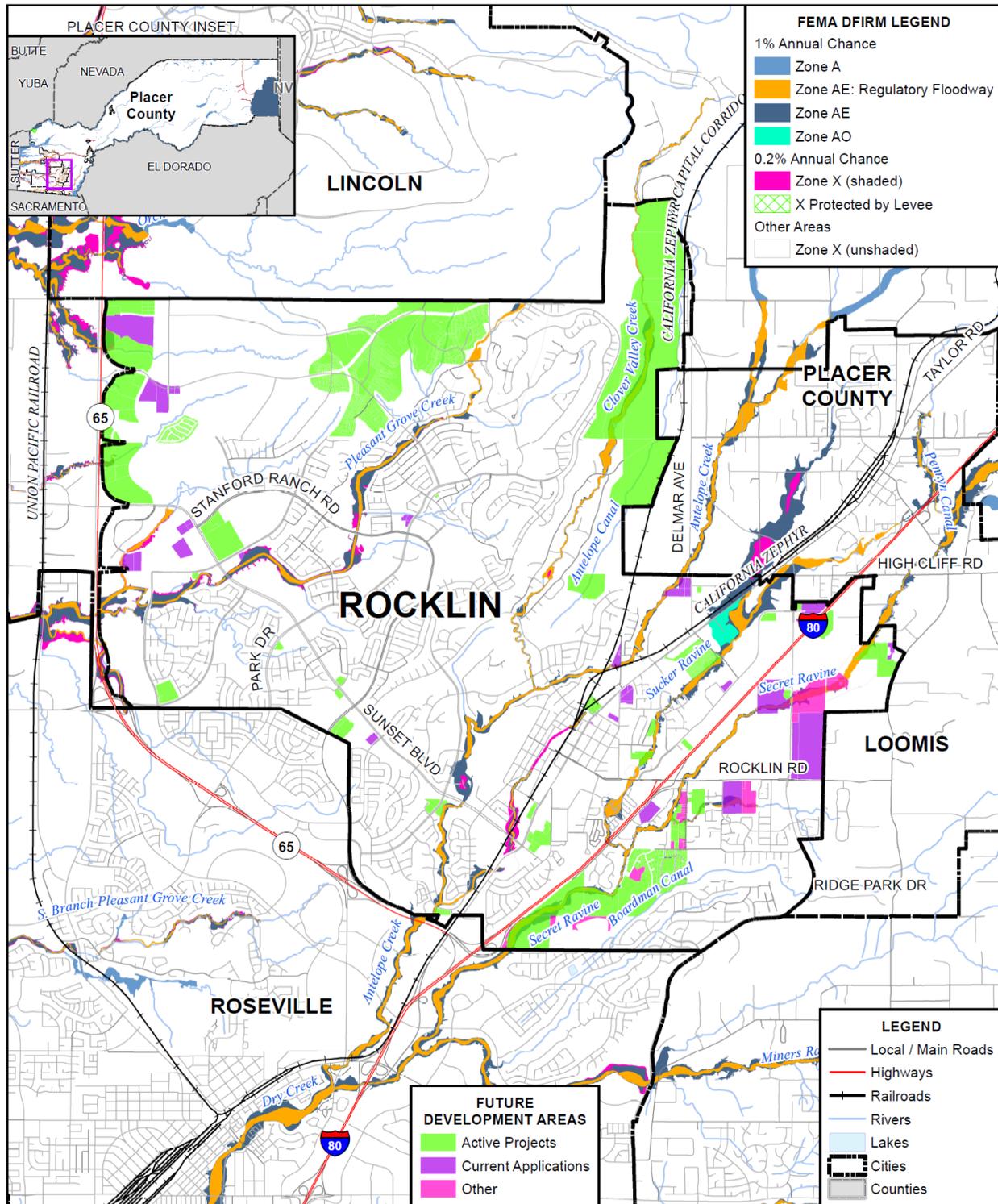
The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

The City evaluates each proposed development project to determine if it is in or near a floodplain. If it is, the City requires that any structure be constructed out of the floodplain and have a first floor at least two feet above the 100-year floodplain elevation. The City also continues to explore ways to address floodplain issues through the use of drainage studies, drainage improvements, elevation certificates and other available strategies. The City has a GIS Division which assists in the development of GIS-based mapping of pertinent information. This data can be used by all departments and agencies for emergency pre-planning and during emergency incidents.

GIS Analysis

The City provided 3 types and 67 Future Development Areas were used as the basis for the inventory of future development areas for the City. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure E-8 shows the locations of future development areas the City is planning to develop on the FEMA DFIRM. Table E-25 shows the parcels and acreages of each future development area in the City in each FEMA DFIRM.

Figure E-8 City of Rocklin – Future Development in FEMA DFIRM Flood Zones



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Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-25 City of Rocklin – Future Development Areas in FEMA DFIRM Flood Zones

Flood Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
1% Annual Chance Flood Hazard			
Zone AE			
<i>Current Applications</i>			
College Park (Sierra Villages)	1	0	21.7
J&S ASPHALT HEADQUARTERS	1	0	2.2
<i>Current Applications Total</i>	<i>2</i>	<i>0</i>	<i>23.9</i>
<i>Other</i>			
Vacant Land - Southeast Rocklin	1	0	0.1
<i>Other Total</i>	<i>1</i>	<i>0</i>	<i>0.1</i>
Zone AE Total	3	0	24.1
Zone AE Floodway			
<i>Active Projects</i>			
Clover Valley Small Lot TSM	1	0	24.7
Vista Oaks Subdivision	1	0	44.9
<i>Active Projects Total</i>	<i>2</i>	<i>0</i>	<i>69.7</i>
<i>Other</i>			
Vacant Land - Sierra College / Rocklin Road	2	0	7.9
<i>Other Total</i>	<i>2</i>	<i>0</i>	<i>7.9</i>
Zone AE Floodway Total	4	0	77.6
1% Annual Chance Flood Hazard Total	7	0	101.7
Other Areas			
Zone X (unshaded)			
<i>Active Projects</i>			
Bass Pro Shops Outdoor Storage	1	1	12.5
Blue Oaks Marketplace II (Rocklin West) PAD I	1	1	11.8
Blue Oaks Marketplace II (Rocklin West) TPM	1	1	0.3
Clover Valley Small Lot TSM	15	0	424.0
Croftwood Unit 2 Revised TPM	1	1	25.3
Farron Street Retail (Rocklin Retail)	2	1	2.6
Granite Bluffs SD	1	0	1.6
Granite Lakes Estates Development Agreement	116	110	98.8
GRANITE TERRACE	2	0	7.9
Highlands Parcel A	1	0	30.4
Knights Way TPM	2	0	0.3
Los Cerros Subdivision	1	0	27.3

Flood Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
McChevron - Modification to Approved Project	1	1	1.6
Niello Jaguar Land Rover	1	1	2.2
Orchard Creek TPM	2	0	46.6
Park Drive Self Storage	1	0	1.7
Quarry Place Apartments (AKA Pacific Pointe)	7	1	15.1
Quick Quack Car Wash at Sierra College	2	0	2.0
Racetrack Subdivision	2	0	2.2
Rocklin Gateway-ZL Rocklin (AKA Downtown Gateway)	5	0	6.6
Rocklin Meadows & Greenbrae Island Annexation	6	0	14.4
Sierra Pine Subdivision	216	1	34.8
South Whitney Mixed Use Townhomes & Medical Center	1	0	2.8
Spring Valley Phase II Village 3&4	222	201	18.1
Stanford Plaza PH 1 C	2	0	1.8
Stanford Ranch Storage (Parcel 56)	3	2	40.0
Stanford Terrace Condominiums (Stanford Villages)	5	3	10.9
Sunset Hills Townhomes	1	0	4.6
Sunset Station	2	0	2.0
Tractor Supply Design Review	2	0	3.9
Vista Oaks Subdivision	1	0	44.1
Vue at Rocklin Ridge Apartments - Clubhouse	1	1	3.2
Wave Storage Yard Expansion	1	0	0.9
West Oaks Townhouses	1	0	1.6
Whitney Ranch Non-Residential Development	23	1	152.0
Whitney Ranch PH 3	52	0	12.4
Whitney Ranch Residential Development	797	307	392.7
Active Projects Total	1,501	634	1,461.4
Current Applications			
Cell Marque	1	1	0.0
College Park (Sierra Villages)	3	0	70.4
Cool Pools - Mixed Use	1	1	0.2
Domum & SDG Headquarters	1	0	1.0
Fairway Condos	1	1	2.9
Granite Marketplace	4	0	12.9
J&S ASPHALT HEADQUARTERS	1	0	2.1

Flood Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Jacques Indian Creek Drive Tentative Parcel map	1	0	3.0
Lemke RV	1	1	2.3
Lifehouse Parcel Map	1	1	9.9
MAVERIK GAS STATION	3	0	5.1
Orchard Creek Business Park Rezone	1	0	39.0
Pasquetti Engineering Headquarters	2	0	7.3
Placer Academy Charter School Expansion aka Harve*	3	3	2.8
Placer Academy Temporary Modular Units	1	1	1.8
Placer Creek Apartments	3	0	21.8
Quarry Row Subdivision	6	1	7.1
ROCKLIN CORPORATE CENTER GPA / REZONE	2	0	11.6
Rocklin Park Senior Living Addition	1	1	9.0
Secret Ravine Community	1	0	24.1
STRIKES PARCEL MAP	1	1	8.6
Whitney Ranch Chevron & Carwash	2	0	2.8
YANKEE HILL PARCEL MAP	7	0	4.9
<i>Current Applications Total</i>	<i>48</i>	<i>12</i>	<i>250.4</i>
<i>Other</i>			
Vacant Land - Sierra College / Rocklin Road	7	3	53.0
Vacant Land - Southeast Rocklin	18	12	32.1
<i>Other Total</i>	<i>25</i>	<i>15</i>	<i>85.1</i>
Zone X (unshaded) Total	1,574	661	1,797.0
Other Areas Total	1,574	661	1,797.0
Grand Total	1,581	661	1,898.6

Source: City of Rocklin GIS, FEMA 11/2/2018 DFIRM

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from

November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Rocklin is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

The City noted that localized flood is an annual occurrence. Specific incidences of damages from localized flooding that could not be recalled.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the City and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Rocklin are summarized in Table E-26.

Table E-26 City of Rocklin – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Second Street	X						
Cimerron Court	X						
Farrier Drive				X			
Paragon Court	X						
El Don Drive	X			X			
Aguilar Road	X	X	X	X			
Fleet Circle	X						
Bryce Court	X						

Source: City of Rocklin

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also

be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

Future development in the City will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses. The City has a GIS Division which assists in the development of GIS-based mapping of pertinent information. This data can be used by all departments and agencies for emergency pre-planning and during emergency incidents.

Pandemic

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. It is important to realize that this LHMP Update does not examine pandemic contingency plans, but instead focuses on examining the risk of a normal hazard occurrence.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe a pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the City, County, and surrounding region is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table E-27.

Table E-27 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**
- The **February 1957-1958 Influenza Pandemic (H2N2)**
- The **1968 Influenza Pandemic (H3N2)**

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**
- **2019/2020 COVID 19**

At the beginning of the COVID-19 pandemic, the City of Rocklin businesses, schools, and residents followed CDC guidelines and state protocols which resulted in shutdowns, limited activities, and restricted movement. These restrictions have relaxed exponentially as the months have gone on and guidelines have expanded and the City is opening up again.

Vulnerability to and Impacts from Pandemic

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the City. Pandemic can have varying levels of impact to the citizens of the City and greater County, depending on the nature of the pandemic and often on preexisting conditions of those exposed.

Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) an unemployment rose significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Funding Revenues decreased in areas such as Gas Tax, Transportation/Occupancy, Community Development, recreation

programs/events, etc. Residents and City employees sheltered in place, and in some cases worked from home, further reducing overall revenues in the community. Additional expenses were incurred by the City for items including Personal Protective Equipment and physical barriers (e.g. front counter enclosure, sneeze guards at cubicles).

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the City could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the City. If the median age of City residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause Public Safety Power Shutdown (PSPS) events, creating significant issues in the City. However, PSPS events in the City have been declining with PG&E’s refined system for shutting power off in high wildfire risk areas. The City noted that PG&E has isolated their system and, in theory, Rocklin’s impact from future PSPS could be minimized greatly if implemented correctly.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential

over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2. The City has opened cooling stations just 1-2 times over the last 10 years.

From late spring through fall, it is not unusual for temperatures to exceed 90°F and higher. Provided by the Western Regional Climate Center, Table E-28 illustrates historical temperature patterns for Rocklin.

Table E-28 Rocklin Record High Temperatures and Days above 90 Degrees by Month

Month	Temperature (F)	Year	Number of Days >= 90°F
May	107°	1910	5.4
June	115°	1961	14.7
July	115°	1933	26.0
August	118°	1933	24.6
September	114°	1950	15.4
October	105°	1910	3.4
Totals			89.5

Source: Western Regional Climate Center

Vulnerability to and Impacts from Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-115°F in rather extreme situations. During these times, drought conditions may worsen and the City may see an increase in dry fuels. Also, PSPS events may occur during these times as well. Health issues are the primary concern with this hazard, although economic impacts can also be an issue.

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Future Development

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population in each City shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary. The City has a GIS Division which assists in the development of GIS-based mapping of pertinent information. This data can be used by all departments and agencies for emergency pre-planning and during emergency incidents.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire City is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table E-29.

Table E-29 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

Data for the following table were provided by the Rocklin Weather Station for the period of record from 1904 to 1976 illustrating historical temperature patterns in the Rocklin area. Table E-33 illustrates historical temperatures in Rocklin.

Table E-30 Rocklin Record Low Temperatures and Days below Freezing by Month

Month	Temperature (F)	Year	Number of Days <= 32°F
January	14°	1937	12.7
February	20°	1929	6.7
March	23°	1944	3.6
April	27°	1929	1.0
May	19°	1928	0.1
October	25°	1917	0.7
November	20°	1921	5.6
December	14°	1932	12.1
Totals			42.5

Source: Western Regional Climate Center

The City noted that cold and freeze is a regional phenomenon; events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The City experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the City. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Future Development

Like extreme heat, vulnerability to freeze will increase as the average age of the population in the City shifts. The elderly and homeless are more at risk to the effects of freeze. The City has a GIS Division which assists in the development of GIS-based mapping of pertinent information. This data can be used by all departments and agencies for emergency pre-planning and during emergency incidents.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rare in the City and Placer County. Duration of severe storms in California, Placer County, and the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.2.3 of the Base Plan.

Past Occurrences

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This is the cause of many of the federal disaster declarations related to flooding. The City noted no past occurrences since 2016.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause significant and localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires. In the City localized flooding and tree damage/trees falling are impacts of concern.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

Future Development

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Rocklin. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These high winds can result in red flag days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

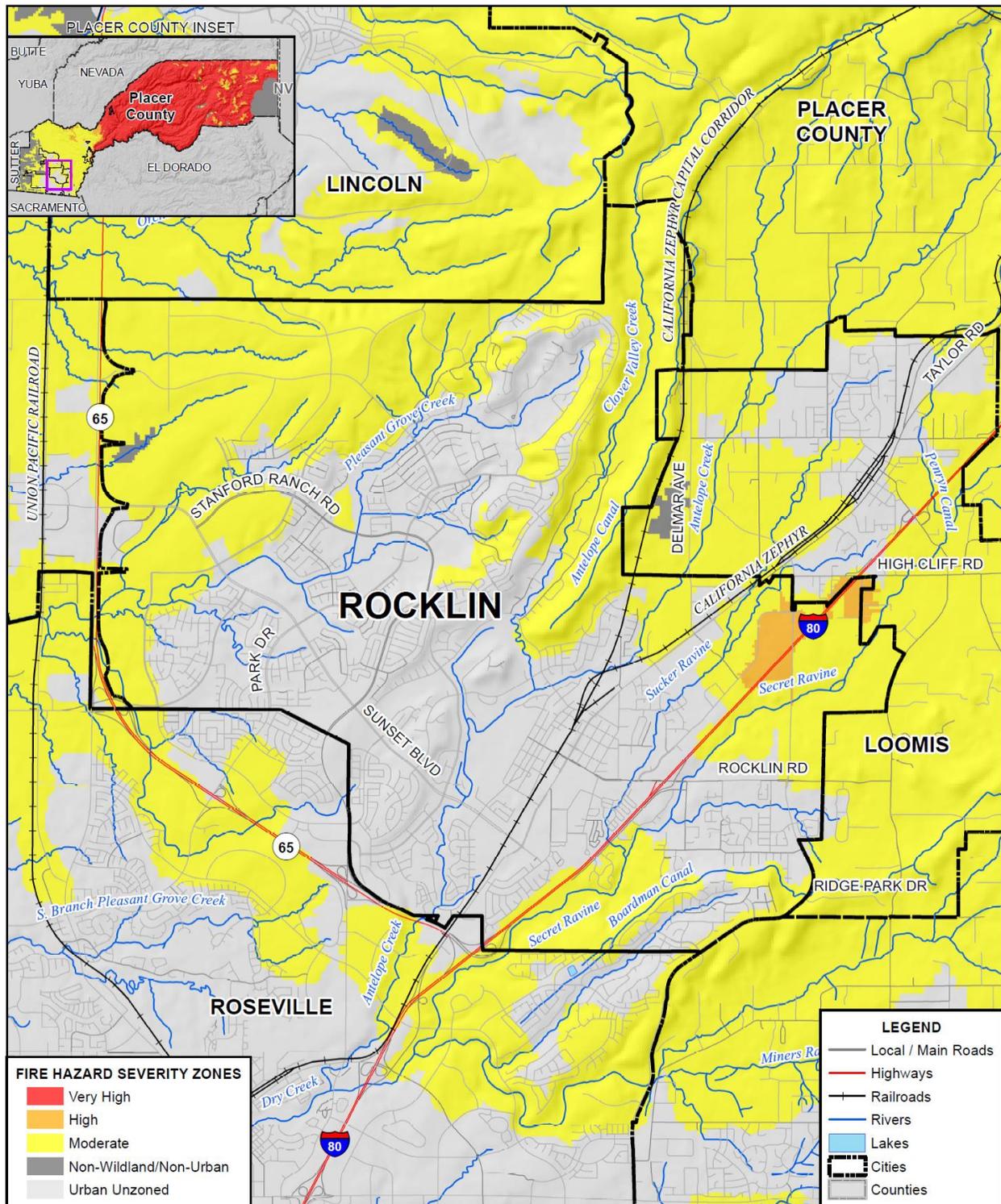
Location and Extent

Wildfire can affect all areas of the City. According to the Community Safety Element of Rocklin’s General Plan, while the major fire threat in the city is related to urban development, annexations in recent decades incorporated large areas of grassland subject to wildfire. These areas include Clover Valley Lakes, the southern end of China Garden Road, portions of Whitney Oaks, the Croftwood/Dias Lane area, the Sunset Ranchos and various open-space easements and recreational properties.

CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the City of Rocklin were created. Figure E-9 shows the CAL FIRE FHSZ in the City. As shown on the maps, fire hazard severity zones within the City range from urban unzoned to high.

The Planning Team for the City noted that the large orange area (High Risk) located to the north of I-80 and to the east of Sierra College Boulevard has now been mostly developed with shopping centers. Updated mapping may not deem this a high risk area.

Figure E-9 City of Rocklin – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table E-31.

Table E-31 City of Rocklin – Geographical FHSZ Extents

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	160	1.3%	64	1.1%	96	1.4%
Moderate	5,799	46.3%	1,922	33.5%	3,877	57.2%
Non-Wildland/non-Urban	18	0.1%	1	0.0%	17	0.3%
Urban Unzoned	6,547	52.3%	3,757	65.4%	2,790	41.1%
Total	12,524	100.0%	5,743	100.0%	6,781	100.0%

Source: CAL FIRE

Past Occurrences

There has been six state and five federal disaster declaration due to wildfire, as shown in Table E-32.

Table E-32 Placer County – State and Federal Wildfire Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The City of Rocklin has been impacted by drift smoke generated by fires in Northern California. These fires reduce air quality within the city, affecting the elderly population and citizens with underlying respiratory illness. Poor air quality from regional fires affects outdoor activities such as team sports, maintenance provided by city workers, and special events (e.g., concerts, celebrations, etc.). In 2020, the City purchased air purification units for some city facilities due the poor air quality caused by fires in Butte, Yolo, Solano, and Napa counties.

Vulnerability to and Impacts from Wildfire

The wildfire hazard is one of the highest priority hazards in the County and City, and is the hazard with the greatest potential for catastrophic loss. High fuel loads in the County and Cities, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in

frequent and sometimes catastrophic fires. The more urbanized areas within the County are not immune from fire. The dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and City, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Rocklin is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

Based on the vulnerability of Rocklin to the wildfire hazard, the sections that follow describes significant assets at risk in the City of Rocklin. This section includes the values at risk, population at risk, and critical facilities at risk.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Rocklin. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Rocklin are shown in Table E-33, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table E-33 City of Rocklin – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High	80	52	\$29,058,654	\$77,794,570	\$71,806,255	\$178,659,479
Moderate	8,160	6,686	\$1,199,256,172	\$3,194,734,621	\$1,928,183,688	\$6,322,174,481
Non-Wildland/Non-Urban	4	0	\$2,638,707	\$0	\$0	\$2,638,707
Urban Unzoned	15,413	14,271	\$1,874,753,579	\$4,894,644,083	\$2,840,162,092	\$9,609,559,754
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Table E-34 breaks out the Table E-33 by adding the property use details by fire hazard severity zone for the City.

Table E-34 City of Rocklin – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
High						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	42	23	\$24,096,489	\$65,817,945	\$65,817,945	\$155,732,379
Industrial	0	0	\$0	\$0	\$0	\$0
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	6	0	\$598,946	\$0	\$0	\$598,946
Natural / Open Space	3	0	\$0	\$0	\$0	\$0
Residential	29	29	\$4,363,219	\$11,976,625	\$5,988,310	\$22,328,154
High Total	80	52	\$29,058,654	\$77,794,570	\$71,806,255	\$178,659,479
Moderate						
Agricultural	5	0	\$2,215,610	\$0	\$0	\$2,215,610
Commercial	208	133	\$200,216,725	\$381,254,314	\$381,254,314	\$962,725,353
Industrial	75	57	\$37,565,207	\$74,385,108	\$111,577,662	\$223,527,977
Institutional	26	14	\$20,973,316	\$124,835,430	\$124,835,430	\$270,644,176
Miscellaneous	502	15	\$44,983,404	\$6,498,240	\$6,498,240	\$57,979,884
Natural / Open Space	364	2	\$399,654	\$274,533	\$274,533	\$948,720
Residential	6,980	6,465	\$892,902,256	\$2,607,486,996	\$1,303,743,509	\$4,804,132,761
Moderate Total	8,160	6,686	\$1,199,256,172	\$3,194,734,621	\$1,928,183,688	\$6,322,174,481
Non-Wildland/Non-Urban						

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0
Industrial	1	0	\$2,638,707	\$0	\$0	\$2,638,707
Institutional	0	0	\$0	\$0	\$0	\$0
Miscellaneous	2	0	\$0	\$0	\$0	\$0
Natural / Open Space	1	0	\$0	\$0	\$0	\$0
Residential	0	0	\$0	\$0	\$0	\$0
Non-Wildland/Non-Urban Total	4	0	\$2,638,707	\$0	\$0	\$2,638,707
Urban Unzoned						
Agricultural	0	0	\$0	\$0	\$0	\$0
Commercial	445	328	\$214,154,997	\$439,559,874	\$439,559,874	\$1,093,274,745
Industrial	122	97	\$48,850,292	\$120,881,377	\$181,322,071	\$351,053,740
Institutional	60	27	\$23,629,039	\$94,748,629	\$94,748,629	\$213,126,297
Miscellaneous	561	5	\$8,661,207	\$793,889	\$793,889	\$10,248,985
Natural / Open Space	272	3	\$2,468,705	\$8,814,715	\$8,814,715	\$20,098,135
Residential	13,953	13,811	\$1,576,989,339	\$4,229,845,599	\$2,114,922,914	\$7,921,757,852
Urban Unzoned Total	15,413	14,271	\$1,874,753,579	\$4,894,644,083	\$2,840,162,092	\$9,609,559,754
Rocklin Total	23,657	21,009	\$3,105,707,112	\$8,167,173,274	\$4,840,152,035	\$16,113,032,421

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The FHSZ dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the FHSZs were counted and multiplied by the 2010 Census Bureau average household factors for the City of Rocklin – 2.68. According to this analysis, there is a total population of 17,404 residents of Rocklin at risk to moderate or higher FHSZs. This is shown in Table E-35.

Table E-35 City of Rocklin – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

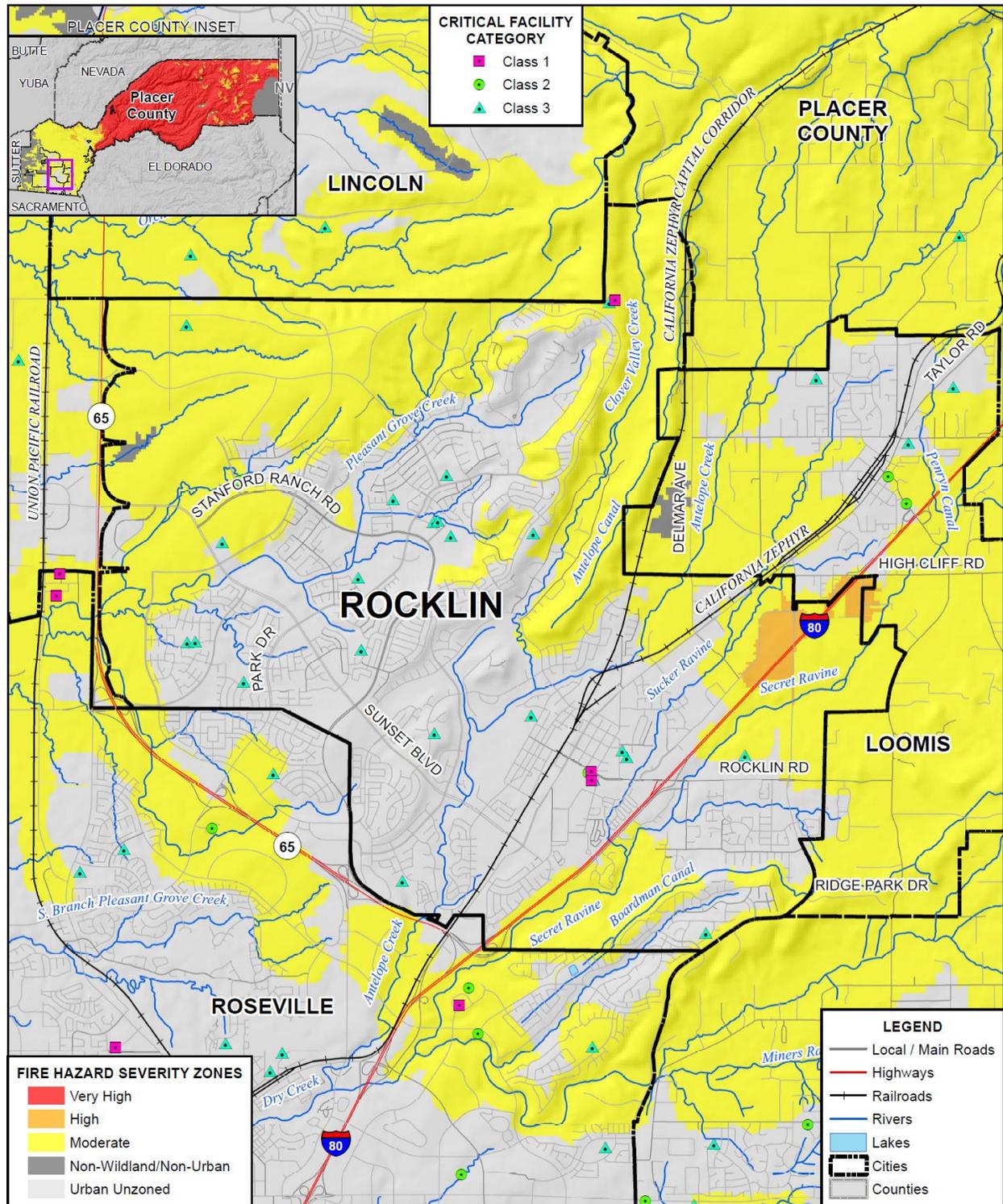
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Rocklin	0	0	29	78	6,465	17,326

Source: Placer County 2020 Parcel/Assessor's Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Rocklin in identified FHSZs. Critical facilities in a FHSZ in the City of Rocklin are shown in Figure E-10 and detailed in Table E-36. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure E-10 City of Rocklin – Critical Facilities in Fire Hazard Severity Zones



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-36 City of Rocklin – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Critical Facility Class	Critical Facility Type	Facility Count
Moderate	Class 1	Communication Transmission Sites	1
	Class 2	Fire Station	1
	Class 3	School	1
		Water Treatment Plant	1
Moderate Total			4
Urban Unzoned	Class 1	Dispatch Center	1
		Emergency Operation Center	1
	Class 2	Fire Station	2
		Police Station	1
	Class 3	Hall	2
		Hazardous Materials Facility	1
School		18	
Urban Unzoned Total			26
Rocklin Total			30

Source: CAL FIRE, Placer County

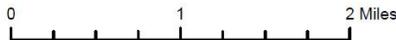
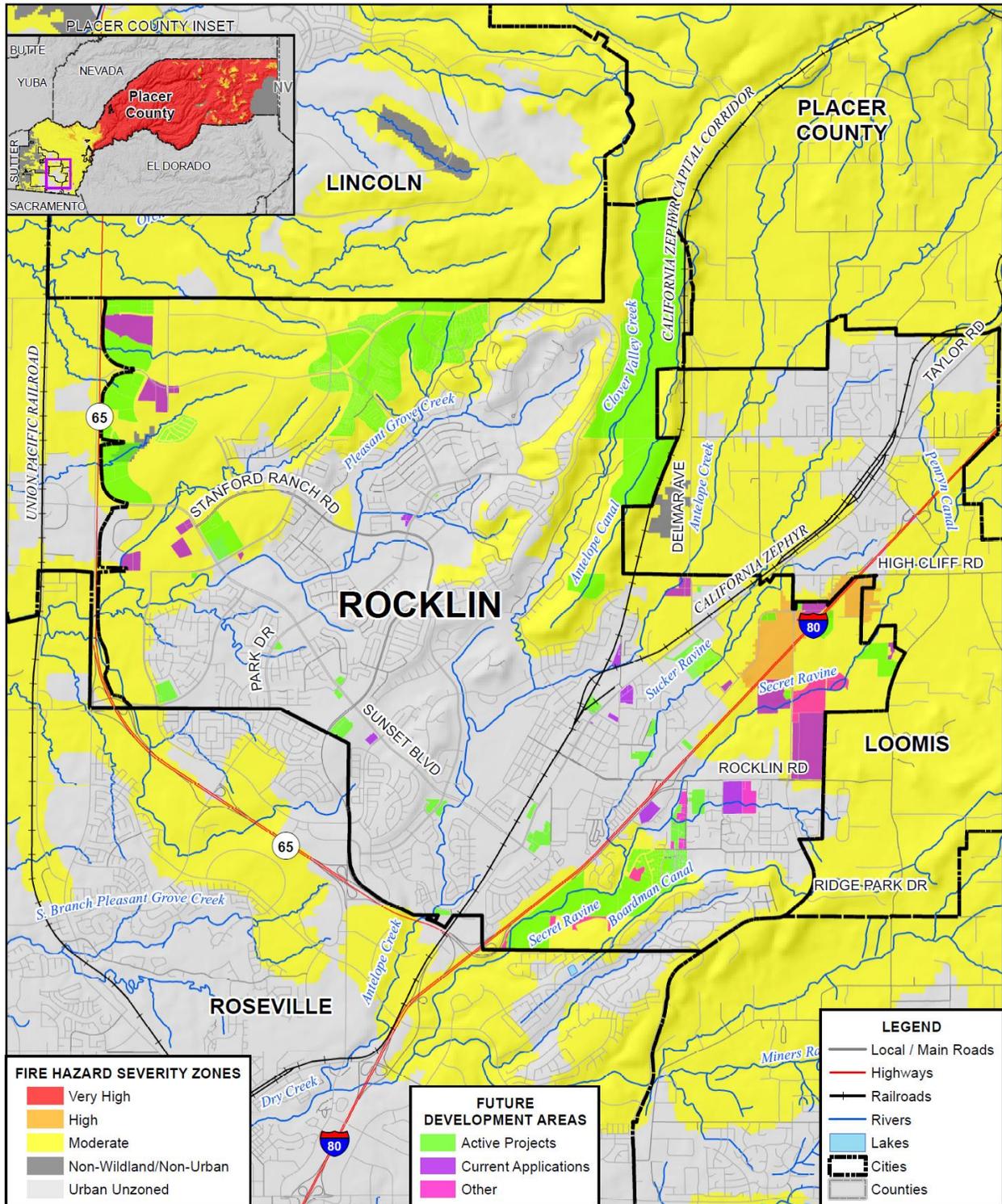
Future Development

Because the City of Rocklin is surrounded by other jurisdictions on all sides, it is likely that the City boundaries will not expand beyond their current locations. The primary hazard in these undeveloped areas is wildland fires, as the areas contain extensive grasslands and oak woodlands. As these areas develop the majority of the grasslands and oak woodlands will be replaced with urban development and some of the current wildland hazards will be mitigated as a result of the development, but the development will also include the preservation of grassland and oak woodland areas that will create an urban/wildland fire hazard interface. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

GIS Analysis

The City provided 3 types and 67 future development areas that were used as the basis for the inventory of future development areas for the City. Using the GIS parcel spatial file for each of these areas, the areas and parcels associated with future development projects for which the analysis was to be performed were identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area. Figure E-11 shows the locations of future development areas the City is planning to develop on the FHSZs. Table E-37 shows the parcels and acreages of each future development area in the City in each FHSZ.

Figure E-11 City of Rocklin – Future Development in FHSZs



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table E-37 City of Rocklin – Future Development in CAL FIRE FHSZs

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
High			
Active Projects			
Tractor Supply Design Review	2	0	3.9
Active Projects Total	2	0	3.9
Current Applications			
Granite Marketplace	2	0	1.2
Current Applications Total	2	0	1.2
High Total	4	0	5.1
Moderate			
Active Projects			
Bass Pro Shops Outdoor Storage	1	1	12.5
Clover Valley Small Lot TSM	15	0	447.2
Croftwood Unit 2 Revised TPM	1	1	25.3
Granite Lakes Estates Development Agreement	81	75	85.5
Highlands Parcel A	1	0	30.4
Los Cerros Subdivision	1	0	27.3
McChevron - Modification to Approved Project	1	1	1.6
Orchard Creek TPM	2	0	46.6
Quick Quack Car Wash at Sierra College	2	0	2.0
Sierra Pine Subdivision	61	0	12.3
Spring Valley Phase II Village 3&4	222	201	18.1
Stanford Ranch Storage (Parcel 56)	2	1	9.2
Vista Oaks Subdivision	2	0	89.1
Whitney Ranch Non-Residential Development	22	1	126.8
Whitney Ranch PH 3	52	0	12.4
Whitney Ranch Residential Development	795	307	389.6
Active Projects Total	1,261	588	1,336.0
Current Applications			
Cell Marque	1	1	0.0
College Park (Sierra Villages)	3	0	70.4
Domum & SDG Headquarters	1	0	1.0
Granite Marketplace	2	0	11.7

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
J&S ASPHALT HEADQUARTERS	2	0	4.3
Jacques Indian Creek Drive Tentative Parcel map	1	0	3.0
Lemke RV	1	1	2.3
Lifehouse Parcel Map	1	1	9.9
MAVERIK GAS STATION	3	0	5.1
Orchard Creek Business Park Rezone	1	0	39.0
Pasquetti Engineering Headquarters	2	0	7.3
Placer Creek Apartments	3	0	21.8
ROCKLIN CORPORATE CENTER GPA / REZONE	2	0	11.6
Secret Ravine Community	1	0	24.1
STRIKES PARCEL MAP	1	1	8.6
Whitney Ranch Chevron & Carwash	2	0	2.8
Current Applications Total	27	4	222.9
Other			
Vacant Land - Sierra College / Rocklin Road	7	2	46.7
Vacant Land - Southeast Rocklin	5	1	20.4
Other Total	12	3	67.1
Moderate Total	1,300	595	1,626.0
Non-Wildland/Non-Urban			
Active Projects			
Whitney Ranch Non-Residential Development	1	0	25.3
Active Projects Total	1	0	25.3
Non-Wildland/Non-Urban Total	1	0	25.3
Urban Unzoned			
Active Projects			
Blue Oaks Marketplace II (Rocklin West) PAD I	1	1	11.8
Blue Oaks Marketplace II (Rocklin West) TPM	1	1	0.3
Clover Valley Small Lot TSM	1	0	1.6
Farron Street Retail (Rocklin Retail)	2	1	2.6
Granite Bluffs SD	1	0	1.6
Granite Lakes Estates Development Agreement	35	35	13.3
GRANITE TERRACE	2	0	7.9

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Knights Way TPM	2	0	0.3
Niello Jaguar Land Rover	1	1	2.2
Park Drive Self Storage	1	0	1.7
Quarry Place Apartments (AKA Pacific Pointe)	7	1	15.1
Racetrack Subdivision	2	0	2.2
Rocklin Gateway-ZL Rocklin (AKA Downtown Gateway)	5	0	6.6
Rocklin Meadows & Greenbrae Island Annexation	6	0	14.4
Sierra Pine Subdivision	155	1	22.6
South Whitney Mixed Use Townhomes & Medical Center	1	0	2.8
Stanford Plaza PH 1 C	2	0	1.8
Stanford Ranch Storage (Parcel 56)	1	1	30.8
Stanford Terrace Condominiums (Stanford Villages)	5	3	10.9
Sunset Hills Townhomes	1	0	4.6
Sunset Station	2	0	2.0
Vue at Rocklin Ridge Apartments - Clubhouse	1	1	3.2
Wave Storage Yard Expansion	1	0	0.9
West Oaks Townhouses	1	0	1.6
Whitney Ranch Residential Development	2	0	3.1
Active Projects Total	239	46	165.9
Current Applications			
College Park (Sierra Villages)	1	0	21.7
Cool Pools - Mixed Use	1	1	0.2
Fairway Condos	1	1	2.9
Placer Academy Charter School Expansion aka Harve*	3	3	2.8
Placer Academy Temporary Modular Units	1	1	1.8
Quarry Row Subdivision	6	1	7.1
Rocklin Park Senior Living Addition	1	1	9.0
YANKEE HILL PARCEL MAP	7	0	4.9
Current Applications Total	21	8	50.3
Other			
Vacant Land - Sierra College / Rocklin Road	2	1	14.3

Fire Hazard Severity Zone / Future Development Type / Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Vacant Land - Southeast Rocklin	14	11	11.9
Other Total	16	12	26.1
Urban Unzoned Total	276	66	242.3
Grand Total	1,581	661	1,898.6

Source: City of Rocklin GIS, CAL FIRE

E.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

E.6.1. Regulatory Mitigation Capabilities

Table E-38 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Rocklin.

Table E-38 City of Rocklin Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	2012 City of Rocklin General Plan Update contains a Community Safety Element which addresses hazards through goals and policies but it does not identify specific projects. The Community Safety Element can be used to support mitigation actions provided they are consistent with the goals and policies. LHMP adopted and amended to General Plan in 2016.
Capital Improvements Plan	Y	Capital Improvement Plan last updated in 2020. The Plan identifies capital improvement projects such as street and roadway improvements but does not directly address hazards, although some projects when built will indirectly address hazards.
Economic Development Plan	Y	The Rocklin City Council includes a Strategic Plan as part of its annual budget adoption process, but it does not specifically address hazards or mitigation actions.
Local Emergency Operations Plan	Y	Emergency Operations Plan last updated in 2014. Addresses planned response to emergencies associated with disasters, technological incidents or other dangerous conditions created either by man or nature but does not identify specific mitigation projects.

Continuity of Operations Plan	Y	See Local Emergency Operations Plan above.
Transportation Plan	Y	See Capital Improvement Plan above.
Stormwater Management Plan/Program	Y	Conditions listed in City's standard improvement requirements and standard list of conditions.
Engineering Studies for Streams	Y	Hydraulic analyses are required for new development projects
Community Wildfire Protection Plan	Y	Wildfire hazards included in City's Emergency Operations Plan
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2019 CBC. The building code is adequately enforced.
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 2
Site plan review requirements	Y	Required prior to issuance of engineering, building, or planning permits. This is adequately enforced.
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Indirectly reduces hazard impacts through building setback, size and height requirements as well as lot coverage requirements. Adequately administered and enforced.
Subdivision ordinance	Y	Indirectly reduces hazard impacts through policies, standards, requirements and procedures that regulate the design and improvement of all subdivisions. Adequately administered and enforced.
Floodplain ordinance	Y	Reduces flooding hazards by applying regulations throughout the City for development within or near flood prone areas. Adequately administered and enforced.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	FEMA flood insurance rate maps (FIRM) are applicable and are an effective measure for reducing hazard impacts. Adequately administered and enforced.
Elevation Certificates	Y	Obtained by private property owners, does not directly reduce hazard impacts. Adequately administered and enforced.
Acquisition of land for open space and public recreation uses	Y	Open space and recreation uses identified in City's General Plan and created as part of development review process, assists in reduction of hazard impacts by preserving lands that may contain hazards. Adequately administered and enforced.
Erosion or sediment control program	Y	Erosion and Sediment Control Ordinance adopted, reduces hazard impacts related to water quality. Adequately administered and enforced.
Other		
How can these capabilities be expanded and improved to reduce risk?		

The City regularly reviews policies and ordinances related to local hazards. Additionally the City continuously works with surrounding agencies, school districts, the UAIC, and other stakeholders in the area to prepare for emergencies, identify high risk areas, and plan for inter-agency response.

Source: City of Rocklin

As indicated above, the City has several programs, plans, policies, codes and ordinances in place and/or that they follow. The General Plan for the City of Rocklin is the most comprehensive. The following section provides an overview of the General Plan and identifies specific policies related to hazard mitigation that are included in the plan

The City of Rocklin General Plan (2012 General Plan Update)

The City of Rocklin General Plan provides a vision for the future of the City. The plan discusses existing conditions and creates a framework of policies that encourage progress toward the agreed upon goals for the community.

The general plan includes a Community Safety Element that focuses on potential natural and human-created hazards. It describes activities and services that provide protection from these hazards and considers the potential impact of hazards to present and future development of the Rocklin Planning Area. Identified hazards include: geologic hazards, seismic safety, flood hazards, hazardous materials handling, emergency preparedness, and fire hazards. The action plan component of the Summary of Goals & Policies & Action Plan section of the Rocklin General Plan (October 2012) has been incorporated into the final version of the General Plan. Public safety and mitigation-related policies from the General Plan that have been developed are presented below in Table E-39 and Table E-40.

Table E-39 Rocklin General Plan Community Safety Element Goals and Policies

Safety Element Goals & Policies	
Goal for Community Safety	To minimize danger from hazards and to protect residents and visitors from earthquake, fire, flood, other natural disasters, and human-created hazards such as train derailment, industrial accidents, acts of war or terrorism, and accidental release of harmful materials. LHMP adopted into General Plan in 2016.
General Policies	
S-1	Require engineering analysis of new development proposals in areas with possible soil instability, flooding, earthquake faults, or other hazards, and to prohibit development that cannot mitigate the applicable hazard.
S-2	Maintain a City Emergency Operations Plan, to include the National Incident Management System (N.I.M.S.).
S-3	Coordinate with local and State Emergency Management agencies utilizing the Standardized Emergency Management System (S.E.M.S.) and National Incident Management System (N.I.M.S.) in order to facilitate multi-agency emergency response.
S-4	Identify in the Emergency Operations Plan evacuation routes and shelter locations for use in case of disasters or emergencies.
S-5	Maintain appropriate standards for minimum road widths and turnarounds.
S-6	Coordinate with State and Federal agencies regarding homeland security, recognizing the City’s role as first responder to local incidents.
Flooding Policies	

Safety Element Goals & Policies	
S-7	Consult with the Placer County Flood Control and Water Conservation District and other appropriate entities regarding regional approaches for the planning, construction, operation and maintenance of drainage and flood control facilities.
S-8	Maintain and implement the City’s Ordinance regarding “Flood Hazard Areas.”
S-9	Ensure that the City’s Regulatory Floodplain, based upon the most current information, both upstream and downstream, and is not adversely affected by new development.
S-10	Require that new development detain on-site drainage such that the rate of runoff flow is maintained at pre-development levels, except where detention is not recommended in plans and policies adopted by the Placer County Flood Control and Water Conservation District (PCFCWCD), and to require coordination with other projects’ master plans to ensure no adverse cumulative effects. In lieu of detention, the City may require retention and/or off-site drainage improvements that are more beneficial to the community’s overall drainage system.
S-11	Ensure that new development does not result in on-site flooding or increase flooding of off-site properties.
S-12	Require new development to annex into an existing drainage maintenance district where warranted.
Hazardous Materials/Contaminated Sites Policies	
S-13	Require existing and new commercial and industrial uses involving the use, handling, transport or disposal of hazardous materials within the City to disclose their activities in accordance with Placer County guidelines and the requirements of State law.
S-14	Require that construction activities cease if contamination is discovered on construction projects until the contamination is reported, and its extent is assessed, delineated, and isolated, as appropriate. Remediation shall occur to the satisfaction of the appropriate responsible agency (such as the Placer County Environmental Health Services, the Central Valley Regional Water Quality Control Board, the Department of Toxic Substances Control, or the City of Rocklin, depending on the type of contamination).
S-15	Require site-specific hazard investigations to be conducted, if determined to be necessary by the City, to confirm potentially contaminated soils prior to approval of new discretionary development projects.
Fire Hazards Policies	
S-16	Require new development and projects proposing land use changes to annex into existing or new Community Facilities Districts for fire prevention/suppression and medical response, or to create other financing mechanisms as necessary.
S-17	Require substantially vacant newly annexed areas containing wildland fire potential to bear additional costs associated with contracting to CalFire for fire suppression or provide other means of mitigation approved by the Fire Department until such time as urban services become available.
S-18	Incorporate fuel modification/fire hazard reduction planning (e.g., weed abatement, open space management plans, firebreaks, planting restrictions) on lands (both public and private) that contain terrain and vegetative features such as grass, woodlands and severe slopes
S-19	Maintain inter-jurisdictional cooperation and coordination, including automatic aid agreements with fire protection/suppression agencies in Placer County.
Seismic and Geologic Hazards Policies	
S-20	Provide for seismic safety and structural integrity in residential, commercial, industrial and public facilities through Building Code enforcement.

Safety Element Goals & Policies	
S-21	Require site-specific geotechnical studies of development proposals in areas subject to landslide potential, erosion, and/or slope instability.
Other Hazards Policies	
S-22 Require a risk analysis, as appropriate, when reviewing new projects located in close proximity to bulk hazardous material facilities, bulk petroleum transmission pipelines, and railroad travel routes.	
S-23 Require quarry safety protection measures prior to the development of any property containing or bordering on an existing quarry. The quarry safety protection measures shall identify public safety hazards associated with quarries and shall specify the protection methods that will be implemented to ensure public safety.	
S-24 Reduce the exposure of sensitive receptors to potential health risks from toxic air contaminants (TACs).	

Source: Rocklin Draft General Plan Update, Chapter 4D – Community Safety Element

Table E-40 Rocklin General Plan Mitigation Related Policies (Various Elements)

General Plan: Various Elements Goals & Policies	
Land Use Policies	
LU-19	Require projects that are approved on severe slopes (25 percent or greater) to establish grading design guidelines with their development application.
Conservation, Development, and Utilization of Natural Resources Policies	
OCR-46	Participate as appropriate in a regional approach to the management of drainage basins and flood plains with regional agencies such as the Placer County Flood Control and Water Conservation District.
OCR-47	Protect the designated City Regulatory Floodplains from encroachment by development that would impede flood flows or pose a hazard to occupants.
OCR-49	Minimize the degradation of water quality through use of erosion control plans and Best Management Practices.
OCR-50	Maintain a grading ordinance that minimizes erosion and siltation of creeks and other watercourses.
OCR-51	Evaluate development along stream channels to ensure that it does not create any of the following effects in a significant manner: reduced stream capacity, increased erosion or deterioration of the channel.
OCR-60	Work with the Placer County Water Agency to ensure that available methods and techniques to conserve potable water supplies are applied in Rocklin.
Public Facilities and Services Policies (Law Enforcement, Fire Protection, and Emergency Response)	
PF-12	Identify certain types of development, such as assisted living facilities and group homes that may generate higher demand or special needs for emergency services and require developer participation to mitigate the needs/demands.
PF-15	Require City-approved automated entry access to gated communities for emergency vehicles
PF-23	Require special fire suppression mitigation (such as sprinklering) for any new residential development located more than two road miles from a fire station and for any new commercial development located more than one and one-half road miles from a fire station.
PF-24	Support public education concerning fire and life safety.
PF-25	Require new development to meet fire flow requirements based on standards codified in the Uniform Fire Code.
Public Facilities and Services Policies (Utilities)	
PF-32	Request utility companies to expedite undergrounding of existing above ground utility lines.

General Plan: Various Elements Goals & Policies	
PF-33	Require undergrounding of utility lines in new development, except where infeasible for financial and/or operational reasons.
PF-34	Coordinate with utility companies regarding the location of new high voltage transmission lines, seeking undergrounding wherever possible.
PF-41	Assist the Placer County Water Agency in implementing water conservation practices.
PF-43	Require that new development proposals include Drainage Master Plans unless waived by the City Engineer.
PF-44	Acquire easements to creeks and waterways to allow for maintenance, inspection, and construction of storm drainage facilities.

Source: 2012 City of Rocklin General Plan

City of Rocklin Emergency Operations Plan

The City of Rocklin Emergency Operations Plan (EOP) and Resources Guide addresses the planned response for the City of Rocklin to emergencies associated with disasters, technological incidents, or other dangerous conditions created by either man or nature. It provides an overview of operational concepts, identifies components of the City emergency management organization, and describes the overall responsibilities of local, state, and federal entities.

E.6.2. Administrative/Technical Mitigation Capabilities

Table E-41 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Rocklin.

Table E-41 City of Rocklin's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Makes recommendations and/or final decisions on development proposals. Coordination is effective
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Public Services Department conducts tree trimming, weed abatement/grazing and drainage channel maintenance activities. Coordination is effective.
Mutual aid agreements	Y	Rocklin Fire Department belongs to statewide mutual aid system. Coordination is effective.
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y FT	Through a combination of City staff and contracting with outside firms, staffing is adequate to enforce regulations and staff is trained on hazards and mitigation. Coordination between agencies and staff is effective.

Floodplain Administrator	Y FT	Economic and Community Development Department has Floodplain Administrator.
Emergency Manager	Y FT	Fire Chief or Police Chief as designated by City Manager. Staffing is adequate to enforce regulations and staff is trained on hazards and mitigation. Coordination between agencies and staff is effective.
Community Planner	Y FT	Planning staff in Economic and Community Development Department. Staffing is adequate to enforce regulations and staff is trained on hazards and mitigation. Coordination between agencies and staff is effective.
Civil Engineer	Y FT	Engineering staff in Economic and Community Development Department. Staffing is adequate to enforce regulations and staff is trained on hazards and mitigation. Coordination between agencies and staff is effective.
GIS Coordinator	Y	GIS Division in Information Technology Division. Staffing is adequate to enforce regulations and staff is trained on hazards and mitigation. Coordination between agencies and staff is effective.
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Police and Fire Departments
Hazard data and information	Y	Police, Fire, Economic and Community Development and Public Services Departments.
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City of Rocklin will continue to assess their staffing levels to determine if a dedicated position is necessary for any of these categories that we do not currently have staffed. Currently, there are staff who have abilities related to many of these categories, who are distributed across departments that could be utilized in case of emergency.		

Source: City of Rocklin

E.6.3. Fiscal Mitigation Capabilities

Table E-42 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table E-42 City of Rocklin’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Authority to levy taxes for specific purposes	Y (requires 2/3 voter approval)	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
Fees for water, sewer, gas, or electric services	N	Water, sewer, gas and electric services in Rocklin are provided by others (non-City).
Impact fees for new development	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
Incur debt through private activities	N	
Community Development Block Grant	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
Other federal funding programs	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
State funding programs	Y	Has not been used in past for direct hazard mitigation activities, could be used to fund future mitigation actions.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City of Rocklin has historically been very fiscally conservative and maintains large reserve funds in case of emergencies. Additionally, the City can and will continue to pursue funding opportunities for hazard mitigation projects.		

Source: City of Rocklin

E.6.4. Mitigation Education, Outreach, and Partnerships

Table E-43 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table E-43 City of Rocklin’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Local citizen groups and non-profit organizations focused on environmental protection are active in Rocklin and region, but rarely focus on disaster mitigation. City could seek their assistance in helping to implement future mitigation activities.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	The City staffs an environmental education outreach booth at some special events, could assist with implementing future mitigation activities.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N?	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City continuously works with surrounding agencies, school districts, the UAIC, and other stakeholders in the area to prepare for emergencies, identify high risk areas, and plan for inter-agency response.		

Source: City of Rocklin

E.6.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

The City of Rocklin has many other ongoing mitigation efforts that include the following:

- Weed Abatement Program
- Annual Drainage Maintenance Program
- Managed Grazing Program (see Figure E-12)

Figure E-12 Managed Grazing Program



Source: City of Rocklin

- The Public Services Department is responsible for all storm drain maintenance in the City of Rocklin including:
 - ✓ Pipe cleaning and replacement
 - ✓ Catch basin cleaning & repair
 - ✓ Ditch cleaning & regrading
 - ✓ Inlet/outlet stabilization
 - ✓ Detention pond maintenance

E.7 Mitigation Strategy

E.7.1. Mitigation Goals and Objectives

The City of Rocklin adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

E.7.2. NFIP Mitigation Strategy

The City of Rocklin joined the National Flood Insurance Program (NFIP) on May 15, 1984. As a participant of the NFIP, the City of Rocklin has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Rocklin will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Rocklin actively participates with the County of Placer to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Rocklin as for Placer County since participation at the County level includes all local jurisdictions. An elected official of the City of Rocklin is a designated representative on the Placer County Flood Control District Board.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development and maintaining drainage systems.

The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City has a Flood Damage Prevention Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Placer County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Rocklin is not a current participant in the CRS program.

More information about the floodplain administration in the City of Rocklin can be found in Table E-44.

Table E-44 City of Rocklin Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	145 policies \$93,240 in premiums \$47,806,200 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	26 paid losses \$250,459.45 in losses paid 1 substantial damage claim
How many structures are exposed to flood risk within the community?	115 in 1% annual chance flood zone 40 in 0.2% annual chance flood zone
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	4 RL properties 0 SRL properties
Describe any areas of flood risk with limited NFIP policy coverage	This is unknown as no insurance analysis has been conducted.
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	The City provides floodplain management services associated with development in the floodplain. This includes determination of properties in the floodplain and permit reviews for new development.
What are the barriers to running an effective NFIP program in the community, if any?	The City needs a designated CFM on staff or contract basis to act as the City Floodplain Manager
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	No

NFIP Topic	Comments
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 9/27/2018
Is a CAV or CAC scheduled or needed?	N
Regulation	
When did the community enter the NFIP?	5/15/1984
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes, the city flood prevention ordinances meet minimum NFIP requirements and exceeds them in some areas such as prohibiting hazardous materials from being located in the SFHA and delineation of a floodway.
Provide an explanation of the permitting process.	Applications for a floodplain development permit shall be made using the criteria outlined in the floodplain development application packet available for download at www.auburnwa.gov/forms and in accordance with 15.68.170 of their flood prevention ordinance.
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

E.7.3. Mitigation Actions

The planning team for the City of Rocklin identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought & Water Shortage
- Floods: Localized Stormwater
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Rocklin Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this LHMP Update, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Location of Project: Citywide

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Rocklin in partnership with the County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents’ knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Action 3. Open Space Fire Prevention and Vegetation Management Prescribed Grazing

Hazards Addressed: Wildfire, Drought and Water Shortage, Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Open space areas provide natural breaks in development and are an asset to the community. Growth of trees, bushes, and natural grasses also could provide ladder fuels for fire if not maintained periodically.

Project Description: Fuel load management practices (grazing animals, chemical and mechanical weed abatement, mowing, discing, etc.) are implemented regularly to minimize fire fuel load concerns. Education and outreach with City residents on defensible space for fire concerns.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Routine Maintenance Agreement through California Department of Fish and Wildlife, City’s General Open Space Management Plan. City’s annual budget process.

Responsible Agency/ Department/Partners: Department of Public Services, Rocklin Fire Department, California Department of Fish and Wildlife, United States Army Corps of Engineers

Cost Estimate: Varies from year to year: \$150K-500K annually depending on projects and scope (this budget number includes work performed for creek maintenance as well)

Benefits (Losses Avoided):

Potential Funding: General Fund, CFD 5, CFD 6, various grants

Timeline: Year round/seasonal

Project Priority (H, M, L): H

Action 4. Creek Channel and Draining Way Clearing and Maintenance

Hazards Addressed: Flood, Localized Flood, Heavy Rains and Storms, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Open space areas provide natural breaks in development and are an asset to the community. Growth of trees, bushes, and natural grasses also can block storm water drain inlets and outlets over time and must be maintained in order to prevent local flooding concerns. Likewise, this same growth during the summer could provide ladder fuels for fire if not maintained periodically.

Project Description: Storm water drains and inlets are cleared regularly. Fuel load management practices (grazing animals, chemical and mechanical weed abatement, mowing, discing, etc.) are implemented regularly to minimize fire fuel load concerns. Education and outreach with City residents on defensible space for fire concerns.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Routine Maintenance Agreement through California Department of Fish and Wildlife, City's General Open Space Management Plan. City's annual budget process.

Responsible Agency/ Department/Partners: Department of Public Services, Rocklin Fire Department, California Department of Fish and Wildlife, United States Army Corps of Engineers

Cost Estimate: Varies from year to year: \$150K-500K annually depending on projects and scope

Benefits (Losses Avoided):

Potential Funding: General Fund, CFD 5, CFD 6, various grants

Timeline: Year round/seasonal

Project Priority (H, M, L): H

Action 5. *GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents*

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: GIS systems provide support to first responders and managers to help with the decision making process.

Project Description: Populate/maintain various data layers

Other Alternatives: n/a

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: Information Technology Division

Cost Estimate: Incorporated into annual budget

Benefits (Losses Avoided):

Potential Funding: General Fund, CFD 5, CFD 6, L&L 1, L&L 2, Gas Tax, various grants

Timeline: Annual maintenance/project specific

Project Priority (H, M, L): H



Annex F Alta Fire Protection District

F.1 Introduction

This Annex details the hazard mitigation planning elements specific to Alta Fire Protection District (AFPD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to AFPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

F.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table F-1. Additional details on plan participation and District representatives are included in Appendix A.

Table F-1 AFPD – Planning Team

Name	Position/Title	How Participated
Ed Snider	Board Director	Primary Contact / Initial LHMP editor for Alta Fire Protection Dist.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table F-2.

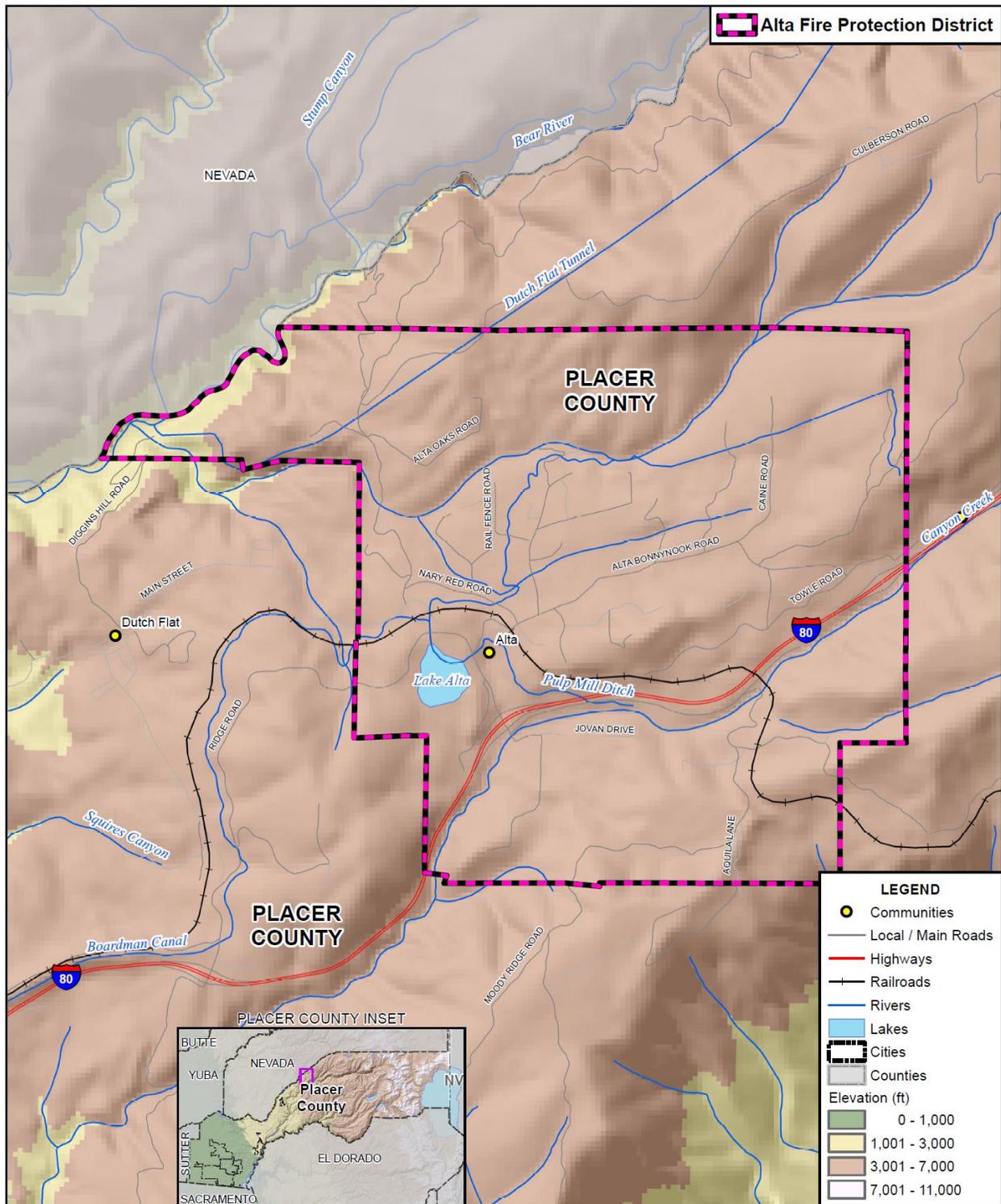
Table F-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Coordination with other agencies and groups	The Alta Fire Protection District does not have an official planning group, however many of its board members, volunteers and other involved persons are members of other fire and life safety groups and work in coordination with those groups to combine resources to implement the goals of the LHMP most effectively. For example, some of the lead individuals for creating the Alta Firewise Community group and CERT were members involved in the Alta Fire Protection District.

F.3 District Profile

The District profile for the AFPD is detailed in the following sections. Figure F-1 displays a map and the location of the District within Placer County.

Figure F-1 AFPD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

F.3.1. Overview and Background

The Alta Fire Department formed in 1948 to provide fire protection and public safety services for the residents of Alta. The Alta FPD was established after an election of voters, within the boundaries of the proposed District, and by a resolution put forth by the Placer County Board of Supervisors in 1958 to administer and govern the business and affairs of the Alta Fire Department. The District is a California Independent Non-enterprise Special District governed by California Health and Safety Code, Section 13800-13970 et seq. (Cited as the Fire District Law of 1987).

The Alta FPD services a 4.12 square mile area that houses approximately 640 full time residents. The District services the community of Alta. Alta sits at 3,477 above mean sea level in elevation and is a central location through which the Transcontinental Railroad operated by Union Pacific, Trans-Sierra petroleum pipeline operated by Kinder Morgan, Interstate 80 operated by CalTrans, and the Spaulding/Bowman Hydro Electric Project operated by PG&E. Interstate 80 has the highest traffic volume of any road in Northern California; the Transcontinental Railroad is the rail corridor through which the most volume of freight passes anywhere west of the Rockies; and the Trans-Sierra petroleum pipeline conveys the largest volume of petroleum products in Northern California.

F.4 Hazard Identification

AFPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table F-3).

Table F-3 AFPD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Significant	Likely	Critical	Moderate	–
Dam Failure	Limited	Occasional	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Limited	Likely	Limited	Moderate	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Negligible	Low	Medium
Floods: Localized Stormwater	Likely	Occasional	Limited	Moderate	Medium
Landslides, Mudslides, and Debris Flows	Likely	Occasional	Limited	Moderate	Medium
Levee Failure	Limited	Occasional	Negligible	Low	Medium
Pandemic	Limited	Occasional	Limited	Low	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	Medium	Low
Tree Mortality	Extensive	Highly Likely	Catastrophic	High	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

F.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

F.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 0, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table F-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

F.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the AFD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table F-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. AFPD’s physical assets, valued at over \$900 million, consist of the buildings and infrastructure to support the District’s operations, as well as assets the District protects.

Table F-4 AFPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Station 98	Fire Department	\$3,000,000	Wildfire, Hazardous Materials spill zone for railroad
Alta-Dutch Flat Elementary School	School	>\$10,000,000	Wildfire, Landslide, Hazardous Material Spill Zone for Railroad
Sierra First Baptist Church	Religious / Historical	\$600,000	Wildfire, Hazardous Material Spill Zone for Railroad
Camp Alta	Religious / Historical	\$2,000,000	Wildfire
Cal Fire Station 33	Fire Department	\$2,975,000	Wildfire, Hazardous Material Spill Zone for Railroad
Alta Powerhouse and Substation	Infrastructure – Historical	.	Oldest hydroelectric power-producing unit in the PG&E system, first produced electricity in 1902. Wildfire, Flooding
PCWA Hydrants	Infrastructure / Water Supply	>\$2 million	Many structures protecting these are wooden, at risk in wildfire
Alta Powerhouse After-bay and Dam	Infrastructure / Water Supply	>\$100 million	Failure would cause major flooding
Lake Alta	Recreation / Water Supply	Unknown	Public Water Supply in Railroad Hazardous materials spill zone Wildfire
Alta Reservoir	Infrastructure / Water Supply	>\$50 Million	Public Water Supply Wildfire
PCWA Boardman Canal	Infrastructure / Water Supply	>\$20 million	Key component for PCWA raw water transportation system, runs from Alta to Rocklin

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
UP Railroad	Infrastructure / Commercial Corridor	>\$100 million	Hazardous / flammable materials transportation
Kinder Morgan Pipeline	Infrastructure / Critical Utility	>\$100 million	Hazardous/ flammable materials transportation
Interstate 80	Infrastructure / Commercial Corridor	>\$500 million	Critical primary ingress / egress access for multiple communities

Source: AFPD

Natural Resources

AFPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

AFPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. AFPD provides services to residents and properties within the Alta Fire Protection District Boundary and to the surrounding communities through a mutual aid agreement. The areas regularly served are Alta, Baxter, Crystal Springs, Dutch Flat, Emigrant Gap, Gold Run, Moody Ridge, Nyack, Secret Town and Yuba Gap; essentially, the communities along the Interstate 80 corridor from about 5 miles east of Colfax (Highway 174 exit) to the Highway 20 exit on Interstate 80

It is important to note that there are several elderly, disabled, and low income people in the Alta community. In the case of a wildfire evacuation, these people may not have transportation. Likewise, in the event of a power outage during the winter months, these special populations may not be able to get to a shelter for warmth. Alta FPD has a Local Community Special Needs Citizen Network that is working to compile a database of these individuals.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan. Most parcels/properties within the Alta Fire Protection District have been built upon so new construction is what is called in-fill of the few vacant properties that still exist (estimated to be <10% of total parcels in the District). The District is currently in discussions with CalFire and Placer County regarding the service area boundary. By the time the LHMP is updated in 5 years, the District Boundary may change. This change would most likely be either inclusion of the Dutch Flat Fire District or dissolution of the Alta Fire Protection District into Dutch Flat Fire District or Placer

County Fire District. Discussions are ongoing and District boundary changes and services provided be identified before the end of 2022.

Development since 2016

No District facilities have been constructed since 2016. Maintenance and upkeep of the facilities owned and operated by the Alta Fire Protection District are current. No major additions or upgrades to facilities at the time of this update.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. The District is currently working with Placer County and CalFire on the Alta Fire Protection District Boundaries and how they might change in relation to surrounding Fire District Boundaries. Change made, if any, will likely occur by the end of 2022. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

F.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table F-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. The direct impacts of climate change over the past decade were an increase in fire activity because of lower amounts of annual precipitation, longer dry seasons, increased fuel loads due to bark beetle kill and primary growth of flashy fuels and shrubs and poor forest management of these primary and secondary vegetation growth patterns after large swaths of beetle kill trees are removed resulting in high levels of flashy fuel loads.

Vulnerability to and Impacts from Climate Change

The 2014 California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer

County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Assets at Risk

The District noted that its facilities will most likely not be at risk directly from climate change, however all assets listed in Table F-4 will be at risk from indirect issues due to climate change, most notable from increased wildfire risks.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought

- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table F-5.

Table F-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

A water shortage event occurred in January of 2016. Contamination of water supply requiring all lines water mains and distribution lines to be flushed caused water to be non-potable for about 2 weeks. The source of contamination was likely diesel fuel that drained into the creek. It was not determined if a spilled a container of fuel on the freeway or if it was intentionally dumped. The fuel went unnoticed for 3-days because the reservoir was frozen over, and the fuel was trapped between the ice and the top of the water, so no sheen was visible. This also pushed the fuel down in depth in of the water column to the extent that it was at the same level as the water suction/inlet for the Alta Water system. Residences noticed the odor, but testing of the water supply came up with no contaminants for that 3-day period until some of the lake had thawed. There have been at least 2 other incidents where vehicles ended up in either the creek or canal upstream of the lakes water diversion and 2 big rigs in addition that have ended up in Canyon creek just downstream of the diversion since this incident took place. Occurrences of a measurable quantity of substances ending up in the creek is about 1-2 times each year. The District had jet fuel truck in the creek about 3 years ago for which clean-up only recently wrapped up (2020), a truck left the freeway just after the Alta exit and went down the embankment stopping on Casa Loma road frontage just before the creek, a big rig leaving the freeway and ending up in Canyon Creek about 3 years ago and a car that flipped over and landed upside down in the canal servicing the reservoir on Alta Reservoir Rd. These are just 4 of the dozens of incidents that occur each decade.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual

drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Drought is a significant hazard to this forested District. Recent years of drought stress have resulted in high mortality levels, leaving the forest susceptible to disease and insect infestation. As a result of recent drought conditions throughout California, infestations of the Pine Beetle are on the rise and pockets of mortality are rapidly spreading. Several areas within the District forests show signs of Pine Beetle and thus will become more vulnerable to wildfire. Drought conditions also may impact the water supply of people residing within District boundaries.

Assets at Risk

All assets listed in Table F-4 will be at risk from issues related to drought, with increased wildfire behavior and tree mortality leading to increased fire risk being the most significant issue. A secondary issue are the properties in the district relying on wells for their water supply as a significant number of these wells have decreased output volumes and, in some cases, run completely dry, however, all of the assets located in Table F-4 are connected to the public water supply provided by PCWA (Placer County Water Agency).

Earthquake

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends

on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Placer County and the District fall within a low to moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer

construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The District believes there are no URM or soft story buildings in the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The AFPD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Assets at Risk

All assets listed in Table F-4 will be at risk from earthquakes, and while significant earthquakes do not regularly occur within the district, moderate earthquakes do occur on an interval of about once every 10 years, with potential for a large 6.0+/- magnitude quake about 1 time every 100 years.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Occasional
Vulnerability—Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The AFPD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture. The most significant ponding of water in the district related to heavy rainfall are low spots or areas that are drained by culverts which tend to plug up with debris.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted that localized flooding past occurrences can be found in the Severe Weather: Heavy Rains and Storms section of this Annex below.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Heavy rains occur on an annual basis in the Alta FPD service area. Impacts to the area usually include mild flooding and damage to infrastructure roads. The District experiences localized flooding annually. Though a drought was affecting much of California, heavy rains caused mild to moderate damages in the area and increasing hazards on Highway 80, a critical commercial corridor that goes through the District.

Flooding generally has not affected the ability for the fire department to respond to emergencies, but a plugged culvert or ditch could cause issues in a number of locations in the district, such as on Alta Reservoir Rd or Drum Powerhouse Rd.

Assets at Risk

No assets listed in Table F-4 have a general risk of flooding as the assets are all located in generally well drained area, but a blocked culvert or ditch could increase the risk of flooding at all of these facilities, but the likelihood of such an event would be low.

Landslide, Mudslide, Debris Flows

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading,

debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Debris flows can also occur in some areas of the County and the District. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows are also common during the rainy season in post fire areas.

Location and Extent

Landslides, mudslides, and debris flows can affect certain areas of the District. The CGS has estimated that the risk varies across the District and has created maps showing risk variance. This risk variance falls into multiple categories. These are discussed in Section 4.3.14 of the Base Plan. According to the District Planning Team, risk varies within the District range from low to moderate. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Past Occurrences

There have been no federal or state disaster declarations in the County from landslide. The District Planning Team noted the following past occurrences:

There have been landslides within the District, historically the E. Towle/W. Towle landslide (no specific dates could be recalled) which removed the historic Town of Towle. Old historic underground mining operations have caused fatal events within the District as well. The combination of large underground spring water sources and abandoned unmapped mining tunnels are common within the District. The combination of large underground spring water sources and abandoned unmapped mining tunnels are common within the District and several collapses resulting in sinkholes have occurred in the last 15 years.

On **February 10, 2017** heavy rains lead to a mudslide and rockslide that closed all lanes of traffic on Interstate 80 in the Alta, CA area. It took CalTrans several days to clean-up the slide and put in temporary barriers and fixes in place until the ground dried up enough to make more permanent fixes. The barriers still exist, but slope stabilization techniques were utilized to reduce but not eliminate the risk of slope failure in this specific location.

Vulnerability to and Impacts from Landslide

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity.

The District has identified several areas prone to landslides. These include the following landslide prone areas:

- Cut slopes for Roadways including Interstate 80
- Portions of the ends of East and West Towle Rd
- Cut and fill slopes for the Railroad

Assets at Risk

All District assets from Table F-4) are at risk from this hazard.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power

disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS.

More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

Generally, extreme heat in the district only occurs for 1-2 weeks per year with temperature in the mid to upper 90's or low 100's. The rest of the summer and fall, the heat is not usually an issue, but the low humidity associated with regional heat waves affecting Western Placer County does have an impact on the dryness of fuels on the western slope of the Sierra Nevada mountains and the Alta Fire Protection District.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts,

including loss of life, are the primary concern with this hazard, though economic impacts are also an issue. Extreme hot weather within the region, accompanies low humidity and increased risk of wildfire ignition and extreme fire behavior. Ignition potential is further increased due to critically low fuel moistures resulting from years of drought.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Also vulnerable to the effects of extreme hot weather is the elderly population located within District boundaries. The District contains a significant elderly population, with some residing in homes that have not been sufficiently updated to protect against extreme temperatures. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions. Wildfires are the most significant heat related risk factors in the Alta Fire Protection District.

Assets at Risk

All assets listed in Table F-4 are at risk from severe heat waves and the related risks of wildfire.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

The District experiences both rain and snow and depending on the specific event and timing, either are equally problematic. About 5 years of every 10 have at least 1 significant rain or snow event with about 3 out of every 10 years having multiple significant or a string of significant heavy rain and/or snow events resulting in localized flooding, road closures and downed trees.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths. The Alta Fire Protection District generally receives an average precipitation amount of 75-85 inches per year. Some of that precipitation falls as snow and an average snow year is 6-10 feet depending on the elevation in the district (~3500-4500ft). The district received 120 inches of rainfall in 2007-08 and 10-16ft of snow at least twice in the last decade. Blue Canyon, about 5 miles East of the Alta Fire Protection District, receives one of the highest amounts of precipitation in California on an annual basis.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table F-6.

Table F-6 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3. Freeze and snow are an annual occurrence within the District.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

In the District, this severe weather severely impacts the Highway 80 commercial corridor and compromises resident and emergency responder's ingress and egress. Infrastructure road surface damage and pavement deterioration are also concerns during winter. The elderly and special needs population located within District boundaries also require monitoring during severe weather episodes. The District contains a

significant elderly population, with some residing in homes that have not been sufficiently updated to protect against extreme temperatures.

Assets at Risk

All District assets (from Table F-4) are at risk from this hazard.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

A specific event was recalled by the District. In January of 2018 there was a severe rain events that caused flooding and culvert failures. The biggest impacts were felt at High Risk to Casa Loma Rd – Canyon Creek crossing about ½ mile upstream. The Road was severely eroded and at risk to slide. Temporary fixes such as rip-rap, and temporary road dividers are the permanent fix put in place by Placer County. This road services 100’s of residences on Moody Ridge and Casa Loma and is the eastern access point for all these residences. The western access point is on the west end of Mood Ridge Rd and is an old, converted flatbed railroad car which cannot support some fire engines and large equipment. This western bridge is at a moderate risk of being washed out and cannot provide adequate access for fire protection should the eastern

access bridge be washed out. Road closures continued for 6 months for clean-up, design and construction of bridge affecting access for approximately 15 homes and a Sons of Norway camp. Cleanup and bridge construction was said to have been ~3 million USD. Fill that washed down stream was approximately 80ft long x 40ft deep.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding.

Assets at Risk

All District assets (from Table F-4) are at risk from this hazard.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also cause PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the middle elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages

- Increased PSPS events
- Occasional building damage, primarily to roofs

In the District, wind and heavy rain events will bring trees down, and occasionally onto homes. This severe weather severely impacts the Highway 80 commercial corridor and compromises resident and emergency responder's ingress and egress. Infrastructure road surface damage and pavement deterioration are also concerns during winter. The elderly and special needs population located within District boundaries also require monitoring during severe weather episodes. The District contains a significant elderly population, with some residing in homes that have not been sufficiently updated to protect against extreme weather events.

Assets at Risk

All District assets (from Table F-4) will be at risk from issues related to heavy winds resulting in downed trees landing on structures and power lines.

Tree Mortality

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A

number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

There is not significant tree mortality within the district at this time. Most of the tree mortality in the district has been small stands of trees and less than an acre for each occurrence. The largest known incident within the district is on the East side of Lake Alta and is approximately about an acre in size. Just west of Lake Alta, the Frost Hill subdivision experienced about a 20-40 acre area of nearly 100% tree mortality related to the Bark Beetle.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

. Recent years of drought stress have resulted in high mortality levels, leaving the forest susceptible to disease and insect infestation. As a result of recent drought conditions throughout California, infestations of the Pine Beetle are on the rise and pockets of mortality are rapidly spreading. Several areas within the District forests show signs of Pine Beetle and thus will become more vulnerable to wildfire.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Impact to the District directly related to Bark Beetle related tree mortality is increased wildfire risk from the fuel loads.

Assets at Risk

All assets listed in Table F-4 will be at risk from increased wildfire behaviors.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Extremely High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the AFPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

All of the communities that the Alta FPD is responsible for or provide mutual aid to are listed on the National Fire Plan’s “Communities at Risk” list. These include the communities of Alta, Dutch Flat, Casa Loma, Emigrant Gap, and Gold Run.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the AFPD were created. Figure F-2 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from Moderate to Very High.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table F-7.

Table F-7 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

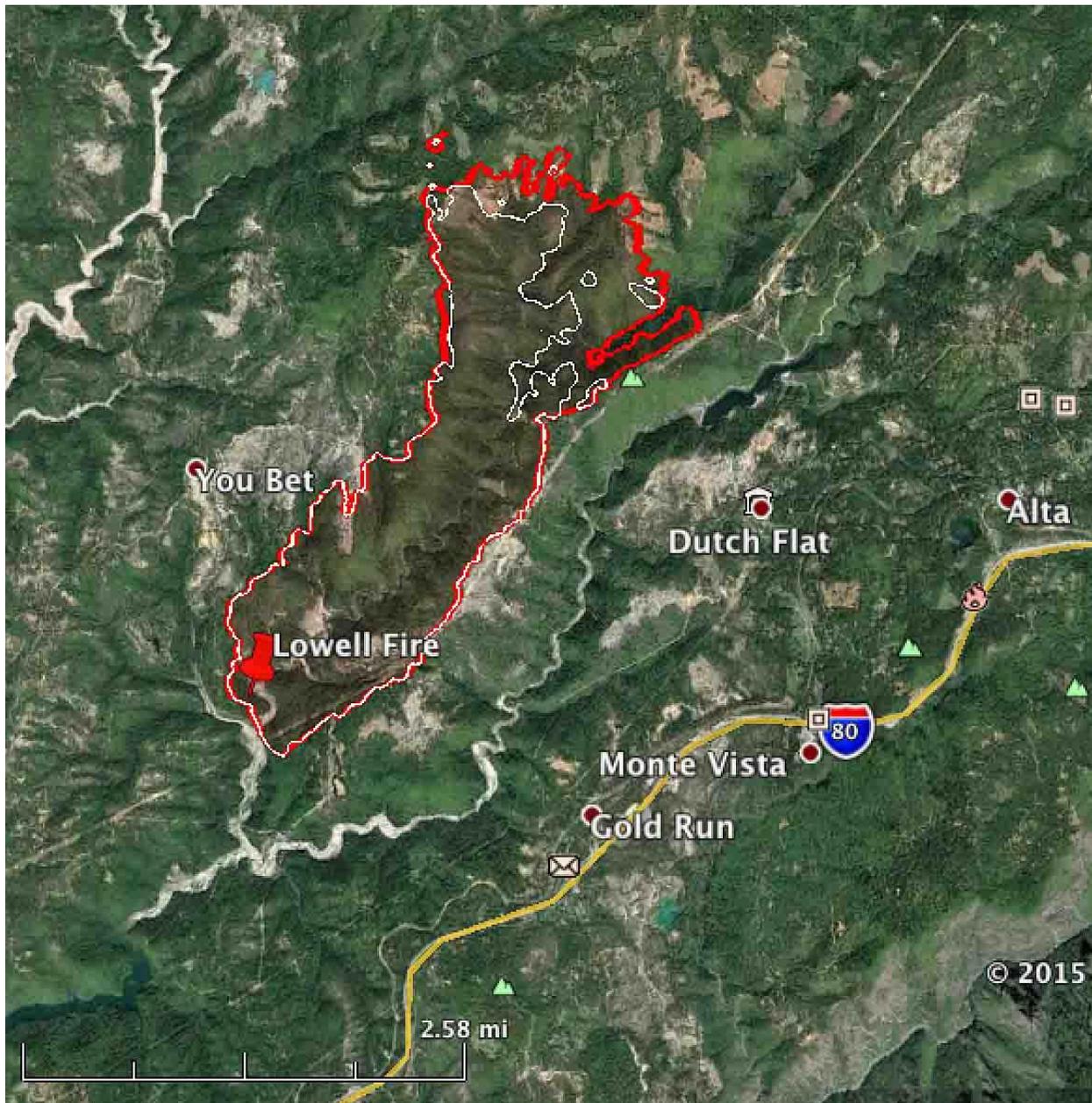
Source: Cal OES, FEMA

The District noted it was affected by the following wildfires:

June 2008 Government Springs Fire (part of the American River Complex Fire) – The American River Complex started during the June 21 lightning storm as a series of 9 fires within the American River drainage area in Placer County. While 5 fires were contained within 24 hours, four fires threatened the communities of Foresthill, Baker Ranch and Michigan Bluff. With moderate to rapid fire spread, the Peavine Fire was expected to double in size while the Government Springs Fire was expected to triple in size. The Westville Fire eventually merged with the Government Springs Fire. Smoke created health issues affecting the community of Foresthill. The fires burned for over five weeks and charred over 20,000 acres and cost over \$23 million to fight. 2 residential structures were destroyed; no fatalities occurred.

July 2015 Alta Lowell Fire – Dry vegetation, low humidity and high temperature caused a fire to start on Lowell Hill Rd just on the other side of the Bear River from Alta, CA. The fire burned approximately 4,000 acres and destroyed one structure. At least 4 injuries (2 CalFire and 2 US Forest Service employees). Roads were closed for safety. Mandatory evacuations were in effect for Red Dog Road East of Greenhorn Creek, You Bet Road East of Greenhorn Creek, Chalk Bluff, and Lowell Hill Roads. An evacuation advisory was in place for the Cascade Shores Community. While no fires or spot fires related these incidents occurred in the District, the Alta Fire Protection District did provide support in the form of equipment and staff to help in firefighting efforts.

Figure F-3 Alta Lowell Fire Perimeter



Source: Wildfire Today article - <https://wildfiretoday.com/2015/07/25/california-lowell-fire-causing-evacuations-east-of-grass-valley/> retrieved on 3/29/2021.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially

catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District has experienced direct wildfire threat annually, often deriving from the North Fork of the American River canyon, which experiences heavy recreational usage. The landscape along this canyon is densely vegetated and exists in a mixed mosaic of ownerships which makes landscape scale fuel reduction difficult. The District is also intersected by Highway 80 and the Union Pacific railroad, both of which increase the probability of roadside, railway ignition sources. The most recent threat to the community of Alta was the 2015 Lowell fire that burned 2,304 acres of forestland. The District is actively working with the community to install shaded fuel breaks in strategic locations.

Assets at Risk

As shown on the map in Figure F-2, all District assets from Table F-4 are at risk to wildfire.

F.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

F.6.1. Regulatory Mitigation Capabilities

Table F-8 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the AFPD.

Table F-8 AFPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N/A	N/A
Capital Improvements Plan	N	N/A
Economic Development Plan	N/A	N/A
Local Emergency Operations Plan	Y / Ongoing	Alta Fire Protection District's Community Center is a certified evacuation center with FEMA, is an alternate evacuation location for the Alta Dutch Flat Elementary School and a Community Resource Center utilized by PG&E during PSPS events for residents of the Alta Fire Protection District and surrounding communities.
Continuity of Operations Plan	Y / Ongoing	A mutual aid agreement with Placer County Fire / Cal Fire provides continuity of service for fire and life safety in the Alta Fire Protection District
Transportation Plan	N/A	N/A
Stormwater Management Plan/Program	N/A	N/A
Engineering Studies for Streams	N/A	N/A
Community Wildfire Protection Plan	Y / 2012	Western Placer Community Wildfire Protection Plan. Yes, the plan identifies hazards and contains a list of mitigation projects that is reviewed annually.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	N
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Enforced by Placer County
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 6Y
Site plan review requirements	N	
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	Responsibility of Placer County
Subdivision ordinance	N/A	Responsibility of Placer County

Floodplain ordinance	N/A	Responsibility of Placer County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	Responsibility of Placer County
Flood insurance rate maps	N/A	Responsibility of Placer County
Elevation Certificates	N/A	Responsibility of Placer County
Acquisition of land for open space and public recreation uses	N/A	Responsibility of Placer County
Erosion or sediment control program	N/A	Responsibility of Placer County
Hazardous Fuel Abatement program	Y	Responsibility of Placer County
How can these capabilities be expanded and improved to reduce risk?		
The hazardous fuel abatement program adopted by Placer County is designed to give Alta Fire Protection District residents, who are required to meet the CalFire guidelines for Defensible Space an avenue to get non-conforming properties who fail to meet those standards a way of getting the property owners of those properties to clear vegetation required for the 100ft defensible space program. It has not been determined if the program has yet to be effective.		

Source: AFD

The residents within the Alta Fire Protection District have worked to create a Firewise Community over the last 2 years and part of that process work on fuels reduction for properties in the District. The CWPP is managed by the Placer County Fire Safe Council, and a number of shaded fuel breaks have been created in and around the Alta Fire Protection District.

F.6.2. Administrative/Technical Mitigation Capabilities

Table F-9 identifies the District department(s) responsible for activities related to mitigation and loss prevention in AFD.

Table F-9 AFD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	In coordination with Placer County
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	Coordination has been effective and a permanent long term solution is in process for the District to ensure 24/7 coverage for Emergency Services
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	In coordination with Placer County
Floodplain Administrator	N	
Emergency Manager	Y	In coordination with Placer County

Community Planner	N	
Civil Engineer	Y	In coordination with Placer County
GIS Coordinator	Y	In coordination with Placer County
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	In coordination with Placer County
Hazard data and information	Y	In coordination with Placer County
Grant writing	Y	In coordination with Placer County
Hazus analysis	Y	Placer County GIS personnel.
Other		
How can these capabilities be expanded and improved to reduce risk?		
A formal agreement with Placer County Fire and CalFire to ensure continuity of services while maintaining and evacuation/community center and continuity of emergency services in coordination with a trained volunteer support role. This is in process and should be complete and in place by the end of 2022.		

Source: AFD

F.6.3. Fiscal Mitigation Capabilities

Table F-10 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table F-10 AFD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	N, N
Authority to levy taxes for specific purposes	N	N, N
Fees for water, sewer, gas, or electric services	N	N, N
Impact fees for new development	N	N, N
Storm water utility fee	N	N, N
Incur debt through general obligation bonds and/or special tax bonds	Y	Y (construction of existing fire department building) Not likely
Incur debt through private activities	N	N, N
Community Development Block Grant	N	N, N
Other federal funding programs	N	N, N
State funding programs	N	N, N
Other	Y	Local community fundraising Can be used in the future, with minimal income expected
How can these capabilities be expanded and improved to reduce risk?		

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
<p>Volunteers have been a key role in providing man hours for fundraisers, but even so, the amount of fundraising in a good year is less than \$10,000. There is not the population needed in the district to pull in more than 2,000-3,000 in an average year, funds need to be from outside sources. The process required for the district to implement fire fees for construction is not cost effective as a study of the fee structure must be audited every 5-10 years and the cost of the audit far exceeds any potential income to district given that most of the district is already at full build-out with only a few remaining vacant parcels still available for new construction.</p>		

Source: AFD

F.6.4. Mitigation Education, Outreach, and Partnerships

Table F-11 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table F-11 AFD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Alta Fire Wise Community partnership Yes, this partnership could help implement mitigation activities.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	Y	School programs are in place to teach wildfire protection plans and evacuations for students
StormReady certification	N	
Firewise Communities certification	Y	Process has been started in multiple AFD communities and for the district as a whole and is in progress
Public-private partnership initiatives addressing disaster-related issues	N	Agreement currently in place with PG&E for a community resource center during PSPS events
Other	Y	Inland waters hazmat trailer funded by Grant
<p style="text-align: center;">How can these capabilities be expanded and improved to reduce risk?</p>		
<p>The District's agreement with PG&E for a community resource center helps to keep residents informed about PSPS related events. The establishment of an Alta Fire Wise Community is an educational and functional resource for residents to stay informed about how to create and maintain defensible space and where to go for assistance for the elderly and low-income residents.</p>		

Source: AFD

The Alta FPD has automatic aid agreements with bordering Districts and mutual aid agreements with other fire agencies throughout the area. The District relies heavily upon this aid from neighbors.

The District also works with other agencies on wildfire-related matters. Working with professional fire experts from the U.S. Forest Service and California Department of Forestry and Fire Protection helps ensure that the District's work complements state and federal work and is up to standard for controlling wildfires.

F.6.5. Other Mitigation Efforts

The District is involved in a variety of mitigation activities including public education, fuels management projects, and other activities to reduce fuel loads and fire risk. These mitigation activities include:

- Public Education and Fire Safety
 - ✓ A variety of public outreach activities are conducted throughout the district on an annual basis.
 - ✓ The District maintain an active educational presence in the community and the Alta – Dutch Flat School
 - ✓ The District also coordinates the use of the County Chipper for local fuel reduction activities.
- Fuels Management Activities.
 - ✓ The District has been partnering with Cal Fire and PG&E to actively pursue fuel reduction opportunities. Several miles of shaded fuel break and roadside shaded fuel break have been recently installed and efforts to extend these breaks continue.
 - ✓ The District has worked together with Cal Fire, the Placer County RCD and the USFS to plan and develop strategic fuel breaks that will protect the community. Federal, State and Private Grants continue to support the planning and implementation.
 - ✓ Cooperation between Caltrans and Cal Fire is resulting in fuels reduction work and demonstration of proper fuels reduction implementation.
- Defensible Space
 - ✓ In recent years due to lack of funding, the district has limited involvement in the enforcement of the defensible space program. When funding has been available, the District provides annual defensible space inspections of area residents.
 - ✓ The District currently operates an elderly assistance program where they coordinate volunteers to clear properties. This is now managed by the Sierra First Baptist Church who has connections with the elderly and disadvantaged members of the community.
- Community Response
 - ✓ The District's CERT team has disbanded due to loss of interest. The trained individuals were not utilized by Emergency Services on incidents outside the district, and the small call volume within the district meant the CERT Team members were exclusively training for events that did not occur or for which they were not called upon by Placer County.
 - ✓ The community has worked to create a Fire Wise Community which is working on educating the public on fire prevention and defensible space management.

F.7 Mitigation Strategy

F.7.1. Mitigation Goals and Objectives

The AFPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

F.7.2. Mitigation Actions

The planning team for the AFPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: Localized Stormwater
- Landslides, Mudslides, and Debris Flows
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Reflective Addressing

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Severe Weather: Extreme Heat, Severe

Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In the Alta Community many residences have long driveways or are down private roads in which the addresses are not well marked making it difficult for emergency responders to locate the location of an emergency.

Project Description: Provide an educational resource to residents of the importance of clearly and properly marking their address such that it is easily visible from the street and to provide address signs for purchase at low cost to the residents of the community.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Education at community events and/or by educational brochures and flyers located in public places in the community

Responsible Agency/ Department/Partners: Alta Fire Protection District / Alta Fire Wise Community

Cost Estimate: Less than \$50/property

Benefits (Losses Avoided): Decreased emergency response times for residents which generally leads to better medical aide and reduced property damages from fires.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Action 2. Alta FireWise Community Established and Continuing

Hazards Addressed: Wildfire hazards

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many residents in the community believe they have created defensible space but are unaware of many fire hazards that still exist to their property and that put their homes and/or their neighbors' homes at risk during a wildfire.

Project Description: Provide an educational resource to residents of the importance of properly creating defensible space for their homes and to educate them about their responsibility and requirements by law for them to ensure their neighbors are also able to meet the defensible space requirements. Provide a resource to help the elderly and disabled to create defensible space and to coordinate community projects for creating defensible space in public spaces such as the school, church and along roadways that are evacuation routes.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Education at community events and/or by educational brochures and flyers located in public places in the community

Responsible Agency/ Department/Partners: Alta Fire Protection District / Alta Fire Wise Community

Cost Estimate: Unknown

Benefits (Losses Avoided): Decrease the number acres burned and homes lost during wildfires in the community.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Action 3. Apparatus Water Fill & Drafting Location Improvements

Hazards Addressed: Wildfire, Drought and Water Shortage, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Wildland and occasionally a structure fire requires an engine or water tender to travel as much as an hour round trip, plus time to refill the tanks. There are many locations where canals or lakes are much closer to the fire than a hydrant, but access to many of these locations is less than ideal for apparatus to access the canal or water source. In many of these locations, minor and low-cost alterations to a gate, access ramp or turnaround would allow an engine or water tender refill much closer to the fire location.

Project Description: Identify the potential sites along the I80 corridor between Colfax and Hwy 20 where minor or low-cost upgrades would allow for fire apparatus to draft water. Work with the agency that operates the water source for design and build of the upgrade.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing mechanism.

Responsible Agency/ Department/Partners: Placer County Fire / CalFire / Alta Fire Protection District / Placer County Water Agency / Nevada Irrigation District / PG&E

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduction in burned acreages from wildfires and reduced damage from structural fires

Potential Funding: Operating agencies, partners, grants and other unknown sources

Timeline: 2-5 years

Project Priority (H, M, L): M

Action 4. *Emergency Communications and Information System Improvements (HAM Radio and GMRS communications)*

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The topography in the mountain communities along the Interstate 80 corridor are such that communications via radio can be difficult. Radio signals generally require line of sight from the communications device to the communications tower/repeater. More tower/repeater locations or upgrades to existing tower/repeater locations can greatly improve the ability for emergency responders to communicate with mobile communication devices.

Project Description: Identify and build or upgrade communication sites to improve mobile communications for communities along the Interstate 80 corridor from Colfax to Highway 20.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Unknown

Responsible Agency/ Department/Partners: Alta Fire Protection District / Fire Wise communities / Placer County / CalFire

Cost Estimate: Unknown

Benefits (Losses Avoided): Increased mobile communications ability will increase the resources needed by emergency responders to request additional resources and provide for a safer work environment.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Action 5. *Evacuation / Reunification Center Improvements*

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Severe Weather: Extreme Heat, Severe

Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Having a large safe gathering location where information meetings and booths can be setup and where the students from the school can go off site if needed for emergency requiring an evacuation and/or a reunification process with family. The facility needed to have separate locations for parents and students for the reunification process, and the facility needed to have restrooms, kitchen and climate control (heat/ac).

Project Description: The Community center now has Heat/AC and during PSPS events a generator provided by PG&E. The project now is to determine what additional modifications and/or upgrades are needed and to find funding sources to cover the cost of the upgrades

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Unknown

Responsible Agency/ Department/Partners: Alta Fire Protection District

Cost Estimate: Unknown

Benefits (Losses Avoided): Providing a safe and comfortable location for students and residents to congregate during emergencies

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): M

Action 6. Home Hardening Education and Projects

Hazards Addressed: Wildfire hazards to homes and structures

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many residents in the community believe that by reducing vegetation and creating defensible space are unaware of many fire hazards that still exist to their homes and that put their homes and/or their neighbors' homes at risk during a wildfire.

Project Description: Provide an educational resource to residents of the importance of properly hardening their homes against fire in addition to creating defensible space for their homes and to educate them about their responsibility and requirements by law for them to ensure their neighbors are also able to meet the defensible space requirements. Provide a resource to help the elderly and disabled to better prepare their homes for wildfire by helping harden their homes and create defensible space; to coordinate community

projects for hardening structures in public spaces such as the school, church and along roadways that are evacuation routes.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Education at community events and/or by educational brochures and flyers located in public places in the community

Responsible Agency/ Department/Partners: Alta Fire Protection District / Alta Fire Wise Community

Cost Estimate: Unknown

Benefits (Losses Avoided): Decrease the number acres burned and homes lost during wildfires in the community.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Action 7. Natural Systems Protection / Community Fuel Breaks

Hazards Addressed: Wildfire, Drought and Water Shortage, Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The poor forest management over the last 50 years has resulted in unnatural and excessive fuel loads for all fuel types. The topography also contributes to the speed at which fires spread.

Project Description: Creating fire breaks and shaded fuel breaks along natural fire barriers (i.e. Ridgetops, Rivers, lightly vegetated rocky slopes) to help slow the progression of wildfires.

Other Alternatives: Proper forest management to thin out the forest in its entirety.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Managed by Placer County Fire and Cal/Fire fuel reduction programs

Responsible Agency/ Department/Partners: Placer County / CalFire

Cost Estimate: To be determined

Benefits (Losses Avoided): Providing fuel breaks and shaded fuel breaks to allow firefighters more time to fight wildfires and reduce the required to create fire containment lines.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Action 8. *Natural Systems Protection / Education and Awareness Programs*

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The poor forest management over the last 50 years has resulted in unnatural and excessive fuel loads for all fuel types resulting in larger and more severe fire behavior that does more damage to the forest than fires historically used to do.

Project Description: Educate residents about thinning their properties to create defensible space and help protect the forest on a larger scale.

Other Alternatives: Proper forest management to thin out the forest in its entirety.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Firesafe Council, Fire Wise Community programs, Placer County Outreach, CalFire Outreach

Responsible Agency/ Department/Partners: Placer County / CalFire / Alta Fire Wise Community / Placer County Fire Safe Council

Cost Estimate: Unknown

Benefits (Losses Avoided): Educating the public about forest thinning to reduce the acreages burned during wildfires and to reduce the number of structures destroyed during wildfires.

Potential Funding: Grant, County and Private funding sources

Timeline: Ongoing

Project Priority (H, M, L): H

Annex G Alpine Springs County Water District

G.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Alpine Springs County Water District (ASCWD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the Alpine Springs County Water District, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

G.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table G-1. Additional details on plan participation and District representatives are included in Appendix A.

Table G-1 Alpine Springs County Water District – Planning Team

Name	Position/Title	How Participated
Joe Mueller	District Manager	Reviewed and provided information and edits to Annex.
Miguel Ramirez	Operations Supervisor	Provided input on past hazards, current field conditions and utility system operations, facilities, and equipment available for emergency use.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table G-2.

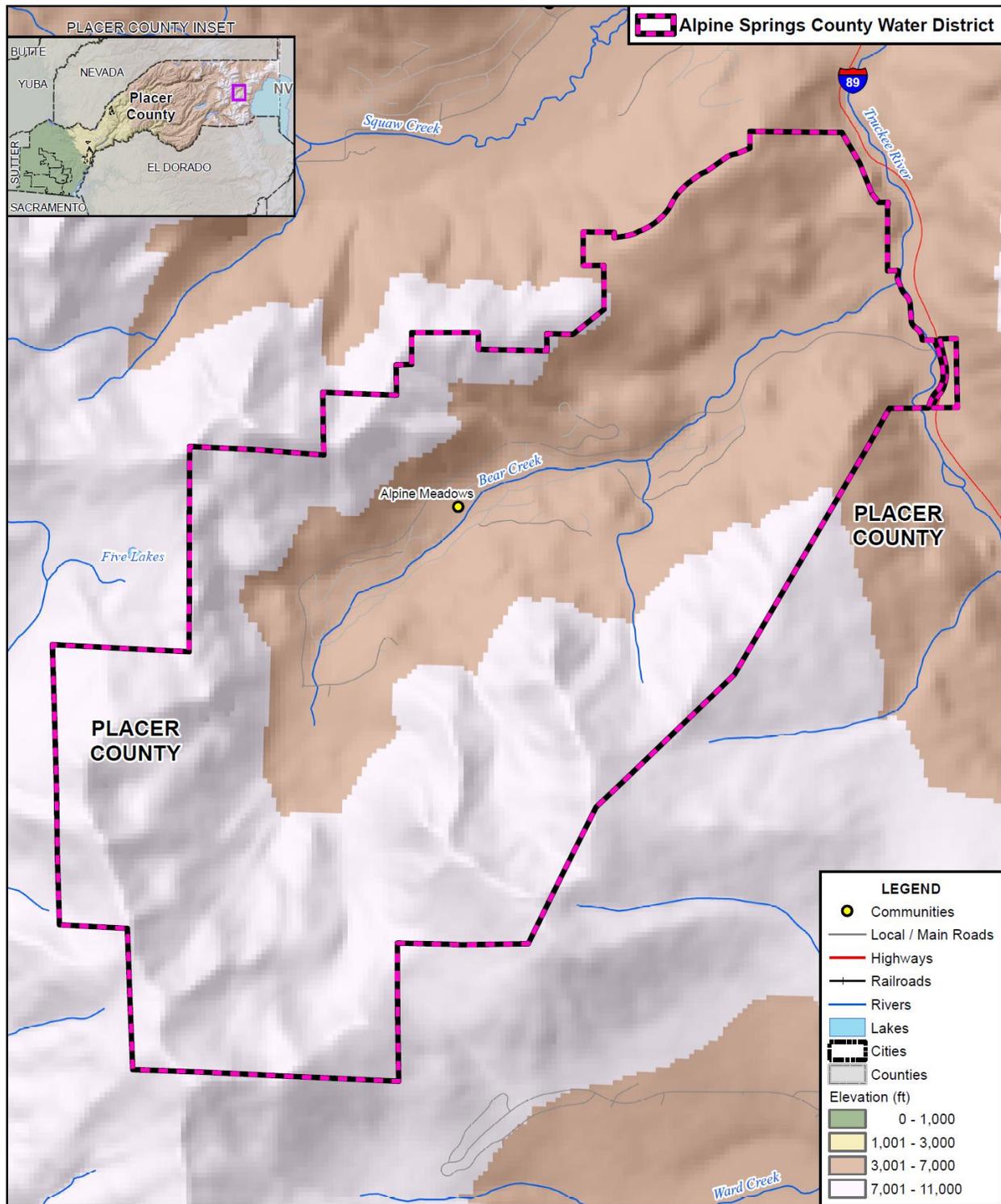
Table G-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No Hazard or mitigation related planning mechanisms have been completed since 2016

G.3 District Profile

The District profile for the Alpine Springs County Water District is detailed in the following sections. Figure G-1 displays a map and the location of the District within Placer County.

Figure G-1 Alpine Springs County Water District



FOSTER MORRISON
CONSULTING

0 0.65 1.3 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

G.3.1. Overview and Background

The Alpine Springs County Water District is located in Alpine Meadows just northwest of Lake Tahoe, along California State Highway 89, just outside of the Lake Tahoe Basin. The Alpine Meadows area encompasses approximately one square mile within Placer County and contains about 770 private parcels, interspersed among a few open space parcels. Bear Creek runs through the community, creating a riparian area near many of the homes. Most homes are situated along the creek or other riparian areas. The elevation of Alpine Meadows ranges from 6,185 feet at the mouth of the canyon to 6,835 feet at the ski area lodge and the top of the inhabited area. Mountain peaks above the community are at 8,637 feet. The private lands are surrounded by United States Forest Service (USFS) owned lands. The Alpine Meadows Ski Area is on USFS lands and is operated under a seasonal use agreement.

The Alpine Springs County Water District provides water, sewer, fire protection, parks, and garbage service to the residents of Alpine Meadows. The mission of Alpine Springs County Water District is to serve the residents of Alpine Meadows with:

- Adequate, safe, dependable drinking water and fire flow to meet community needs;
- Safe, efficient and non-hazardous collection of wastewater and refuse;
- Adequate and dependable fire protection services;
- Protection, preservation and enhancement of the urban forest setting with consideration for the property owner's continued use and enjoyment; and
- Offer recreation services and facilities serving all age groups.

G.4 Hazard Identification

The Alpine Springs County Water District identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table G-3).

Table G-3 Alpine Springs County Water District—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Significant	Likely	Limited	High	Medium
Climate Change	Extensive	Likely	Limited	Medium	Medium
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Likely	Catastrophic	High	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Occasional	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Medium	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Limited	Occasional	Negligible	High	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Limited	Unlikely	Negligible	Low	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Catastrophic	High	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Limited	Medium	Low
Tree Mortality	Significant	Likely	Negligible	Medium	High
Wildfire	Extensive	Occasional	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

G.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

G.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 0, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table G-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

G.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the Alpine Springs County Water District’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table G-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. Alpine Springs County Water District’s physical assets, valued at over \$7.1 million, consist of the buildings and infrastructure to support the District’s operations.

Table G-4 Alpine Springs County Water District Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Horizontal Well 1	Water Supply	\$100,000	wildfire, earthquake, landslide
Horizontal Well 2	Water Supply	\$150,000	wildfire, earthquake, landslide
Horizontal Well 3	Water Supply	\$150,000	earthquake, landslide wildfire
Horizontal Well 4	Water Supply	\$150,000	wildfire
Vertical Well R-1	Water Supply	\$550,000	earthquake, wildfire
Vertical Well R-2	Water Supply	\$550,000	earthquake, wildfire
AME Well	Water Supply	\$755,850	wildfire
Storage Tank 1	Water Storage Tank	\$175,000	wildfire, earthquake
Storage Tank 2	Water Storage Tank	\$175,000	wildfire, earthquake
Storage Tank 3	Water Storage Tank	\$175,000	wildfire, earthquake
Storage Tank 5	Water Storage Tank	\$175,000	wildfire, earthquake
Storage Tank 4 A	Water Storage Tank	\$1,800,000	wildfire, earthquake
Office Building	Administrative Office	\$500,000	wildfire, earthquake
Shop & Vehicle Storage Building	Utility, Shop & Vehicle Storage Building	\$870,000	wildfire, earthquake
Fire House	Fire Station	\$825,000	wildfire, earthquake
Standby Generator	Standby Generator	\$55,000	wildfire, earthquake
Total		\$7,155,850	

Source: Alpine Springs County Water District

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. ASCWD provides services to an estimated permanent population of approximately 500

residents. This includes four commercial centers, a 30-unit apartment complex, 462 single-family homes, and 130 condominiums. In addition to permanent residents, ASCWD serves a substantial number of seasonal and part-time residents, short-term rentals, and day visitors.

Natural Resources

Alpine Springs County Water District has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

In 2006, a wildlife and habitat analysis was done within the District boundaries to evaluate the potential for sensitive animal and plant species to be present. The results of the assessment indicate that areas within the District boundaries have the potential for the following:

- The mountain yellow-legged frog (*Rana muscosa*, which is federally listed as endangered);
- The willow flycatcher (*Empidonax traillii*, which is State listed as endangered);
- The northern goshawk (*Accipiter gentilis*, which is not listed);
- The Sierra Nevada mountain beaver (*Aplodontia rufa californica*, which is not listed);
- The Sierra marten (*Martes Americana sierrae*, which is not listed); and
- The western white-tailed jackrabbit (*Lepus townsendii*, which is not listed).

Historic and Cultural Resources

Alpine Springs County Water District has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Alpine Meadows is a popular ski resort and summer recreational area that also holds over 650 private residences, another 100 private parcels, and a few open space parcels. Most existing homes are situated along Bear Creek or other riparian areas. Multiple organizations own these private lands and are responsible for future development. The private lands are surrounded by USFS owned lands. As such, additional growth is limited to the private lands within the District boundaries.

Development since 2016

In 2018 water storage tank 4 and tank 4A was replaced with a new 870,000 gallon tank 4. The District continues to have preventative and corrective maintenance on all facilities.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. Numerous developers are currently in the

planning process for multi single family home developments within ASCWD service area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

G.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table G-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Avalanche

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Areas prone to avalanche hazards include hard to access areas deep in the backcountry and those in the more developed higher elevations of the County in the Tahoe basin. Avalanche hazards exist in eastern Placer County where combinations of the above criteria occur. The District services Alpine Meadows, a large ski resort located on both private and USFS lands. According to the Placer County Emergency Operations Plan, areas of particular concern include the Alpine Meadows and Bear Creek area.

Past Occurrences

There have been no state or federal disasters in the County related to avalanche. However, the District has experienced notable avalanches.

- In 1982, a 30-foot wall of snow plowed through the Alpine Meadows ski lodge and other ancillary buildings at 80 mph, killing seven people.
- On January 18, 2020, one man was killed and another man was seriously injured by an avalanche near the Subway ski run at Alpine Meadows.

Vulnerability to and Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

Given the known potential for avalanches in the area, avalanche areas have been well defined and avalanche control work is conducted as needed on a regular basis. Additional mitigation measures are in place through county ordinances and the building permit process.

Assets at Risk

Facilities from Table G-4 at risk from this hazard, Horizontal Wells 1 through 4, and Storage tanks 1 through 5.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the

majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table G-5.

Table G-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

A major portion of the Districts’ water supply is produced from horizontal wells located at an elevation above the Districts’ service area. The source of water supply for these horizontal is water store in the mountains above the wells. The wells have not shown any major reduction in production (about 6 to 8%)

during the recent drought. If the horizontal wells were to lose production the other source of supply would be from deep vertical wells located at the bottom, or lowest elevation in the service area. These wells are not equipped to pump water to any of the three higher water service zones within the District. Any loss of production in the higher elevation horizontal wells would leave approximately 75% of the Districts' water customer out of water.

Assets at Risk

No District assets (from Table G-4) are at risk from this hazard.

Earthquake

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Earthquakes on nearby fault segments in the Foothill Fault Zone could be the source of ground shaking in the Placer County Planning Area. Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The seismic hazard within the ASCWD service area is relatively low compared to many other parts of California. However, the area is considered to have a higher risk of an earthquake occurring due to the presence of several faults systems located in the area. The shaking potential is greatest in the eastern portion of the County, including the ASCWD service area.

Past Occurrences

There have been no past federal or state disaster declarations in Placer County from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The District noted that there are no URM or soft story buildings in the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The Alpine Springs County Water District is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life. There may be a lack of un-reinforced masonry buildings, compared to a more urban setting, however the ASCWD service area water storage tanks are circular prestressed concrete. In a report prepared for the ASCWD in 2013 by DN Tanks, the tanks do not meet design criteria, especially seismic criteria. The impact of an earthquake upon these water storage tanks would be very vulnerable to damage from severe ground shaking.

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from earthquake.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

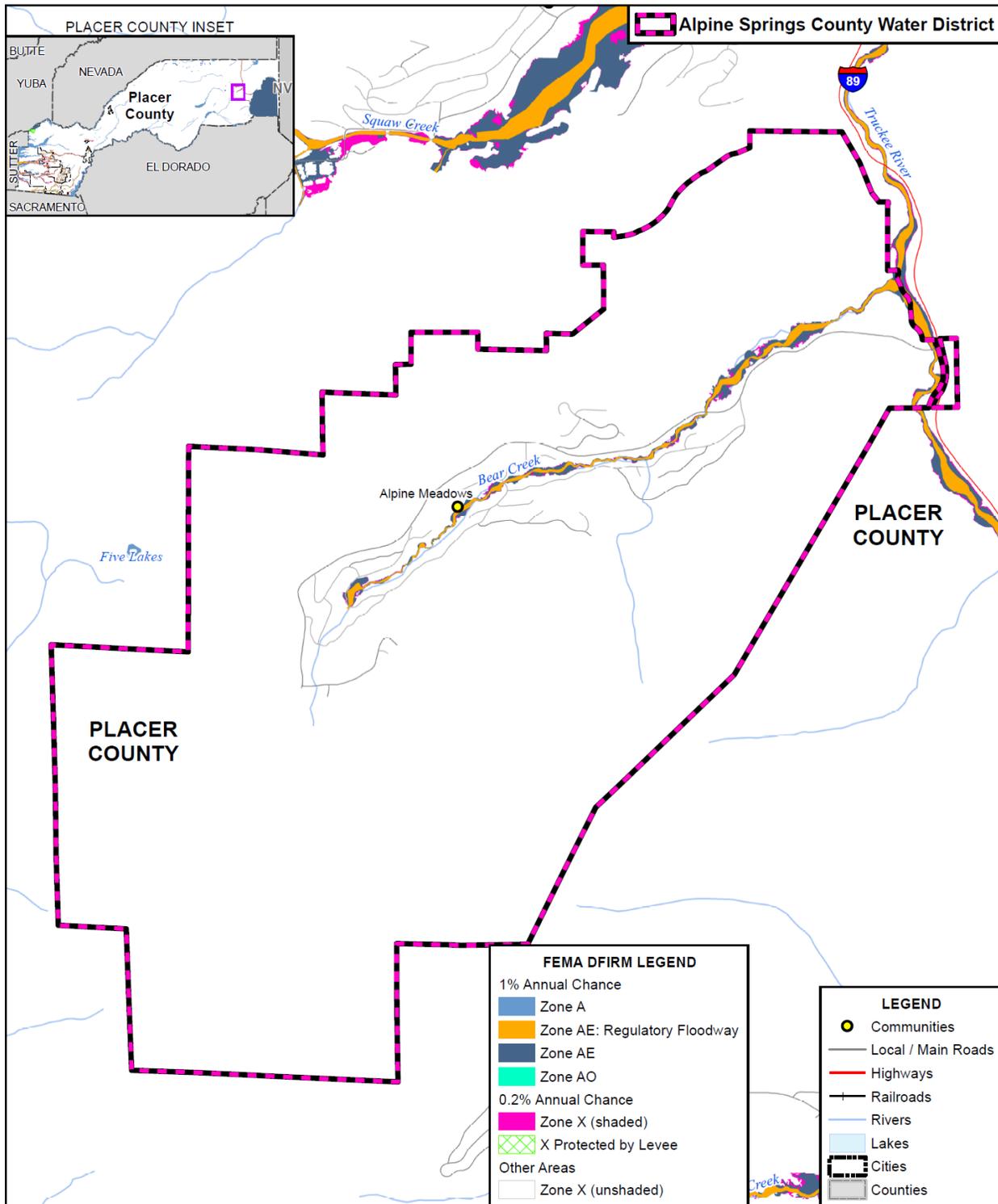
Bear Creek is the main drainage channel which runs the length of Alpine Meadows. The channel is fairly well defined and would be subject to flooding in selected area during a 1% or 0.2% annual chance flood event. The creek does have several crossings of local streets which are privately maintained. Based upon observations of these crossing it would appear that one or more of these creek crossing would be subject to wash out during a 1% or 0.2% annual chance flood event. The District is not aware of any specific studies which would confirm that flooding would or would not occur.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the Alpine Springs County Water District have been subject to historical flooding.

Location and Extent

The Alpine Springs County Water District has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure G-2.

Figure G-2 Alpine Springs County Water District – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.



Table G-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table G-6 Alpine Springs County Water District– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table G-7. These events also likely affected the District to some degree.

Table G-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

The District noted that the AME Well, Office Building, Shop & Vehicle Storage building from Table G-4 are at risk from this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

ASCWD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Bear Creek is the main drainage channel which runs the length of Alpine Meadows, the District's service area. The Bear Creek channel crosses several different local street and roadways. Several of the crossings are within areas where the streets are privately maintained. During past events the streets have not been subject to over topping. Based upon visual observations of these crossing it would appear that one or more of these creek crossing would be subject to wash out during a major rain event. The District is not aware of any specific studies which would confirm that flooding would or would not occur.

Past Occurrences

Heavy rains occur on an annual basis in the District service area. Often during these events, the local stormwater drainage system can be impacted. However, the District did not identify any past events resulting in significant damage.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break

utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

The District noted that all its facilities from Table G-4 are at limited risk from localized flooding.

Landslide, Mudslide, Debris Flows

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

According to the California Geological Survey (CGS), landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Debris flows, can also occur in some areas of the County and the District. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows are also common during the rainy season in post fire areas.

Location and Extent

Landslides, mudslides, and debris flows can affect certain areas of the District. The CGS has estimated that the risk varies across the District and has created maps showing risk variance. This risk variance falls into multiple categories. These are discussed in Section 4.3.14 of the Base Plan. According to the District Planning Team, risk varies within the District range from low to high. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Past Occurrences

There have been no federal or state disaster declarations in the County from landslide. There have been three landslides and debris flow events in the Alpine Meadows area. All events occurred in 1997. There was a landslide and debris flow out of East Gully which flow out of the gully and across Alpine Meadows Road. There was a landslide and debris flow event down an unnamed creek at the ski resort. The flow came down slope adjacent to the Kangaroo Lift. The flow entered the electric room and pump room of the ski resort. The third event was on the west side of Scott Peek. The event ran out without causing any damage.

Vulnerability to and Impacts from Landslide

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity.

Impacts in the District may be to structures, infrastructure, and to life safety. Impacts from landslide, mudslides and debris flow in the District include interruption of service and infrastructure damage. To date the district has not had any problems with landslides affecting its infrastructure.

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from this hazard.

Pandemic

Likelihood of Future Occurrence—Occasional
Vulnerability—High

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the

duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table G-8.

Table G-8 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

In response to the initial outbreak of COVID-19 and subsequent shelter in place orders, District management quickly developed protocols to avoid the spread of disease. Due to the essential nature of the work the District performs, Staff were required to continue to report for duty in person.

Staff adapted guidelines to prevent the spread of COVID-19 and protect the health and safety of employees. All in office staff continued to adhere to cleaning, physical distancing and hand-washing guidelines.

District Board meetings were adapted to a virtual environment via Zoom and the office was and remains closed to the public.

The evolving nature of the pandemic demanded flexibility and adaptability of staff. Pandemic-related policies have been implemented and updated on a continual basis since the onset of COVID-19 and in accordance with federal, state and local laws. This required dedication and attention to several authorities for information to properly communicate, inform and educate staff.

The rate of infection within the District was negligible and there have been no staff to staff transmissions as of April 2021. The fiscal impacts on the District have been insignificant. The District did not reduce staff or pay throughout the pandemic.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) and unemployment rose significantly. Supply chains for food and essentials can be interrupted. Prisons may need to release prisoners to prevent significant outbreaks.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snow storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In less populated areas, homes and residents may be isolated for days. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow has a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table G-9.

Table G-9 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

The District reported one incident related to the winter snow season. In February of 2007, water service lines from the distribution main to service boxes froze, causing water service to be interrupted to five homes. The homeowners purchased bottled water for drinking and cooking and hauled water for toilet flushing. No other damages were reported. Incidents of this type will likely occur again during extreme periods of frigid temperatures during the winter season.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. However, because this area is home to a premier ski area, not only is an abundance of snow good for the economy, but the area has historically been developed to accommodate big snow seasons.

Effects to the District from cold and freeze are limited as infrastructure and facilities were constructed with severe mountain environment in mind. Sustained winter power outages of several days have been experienced in the past due to storm.

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from this hazard.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Occasional

Vulnerability–High

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation, as snow (and sometimes rain), in the District falls mainly in the fall and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe precipitation (rain or snow) occurs during the fall, winter, and spring months, within the eastern side of the County. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding. The District did not identify any past events resulting in significant damage.

Vulnerability to and Impacts from Heavy Rain and Storms

While precipitation as snow is predominant during the winter months, heavy rain and severe storms are among the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already

saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can also occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from this hazard.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also contribute to PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of storm events, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District did not identify any past events resulting in significant damage

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

Assets at Risk

The District noted that all its facilities from Table G-4 are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, trees become more vulnerable and tree mortality is driven by a build-up in

endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as drought and high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. CAL FIRE representatives in the County noted that Placer County is still in the infestation cycle in most of the WUI and will be until drought cycle ends for several years. It is a high to very high likelihood to impact the County of Placer for a few more years. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

No events of past tree mortality have affected the District.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Assets at Risk

The District noted that none of its facilities from Table G-4 are at risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Occasional

Vulnerability–High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the Alpine Springs County Water District. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

According to the Community Wildfire Protection Plan (CWPP) for the Alpine Meadows area, lightning is the most common ignition source. Many lightning strikes are accompanied by rain so ignitions do not always expand to wildfires. Dry lightning occurs annually in the District and is a significant concern for ignition. Human ignitions are also a significant a concern. They often occur during the worst fire weather conditions and near populated areas creating the potential for damaging fires. Vehicle and home fires that spread to the wildland pose the greatest ignition risk in Alpine Meadows.

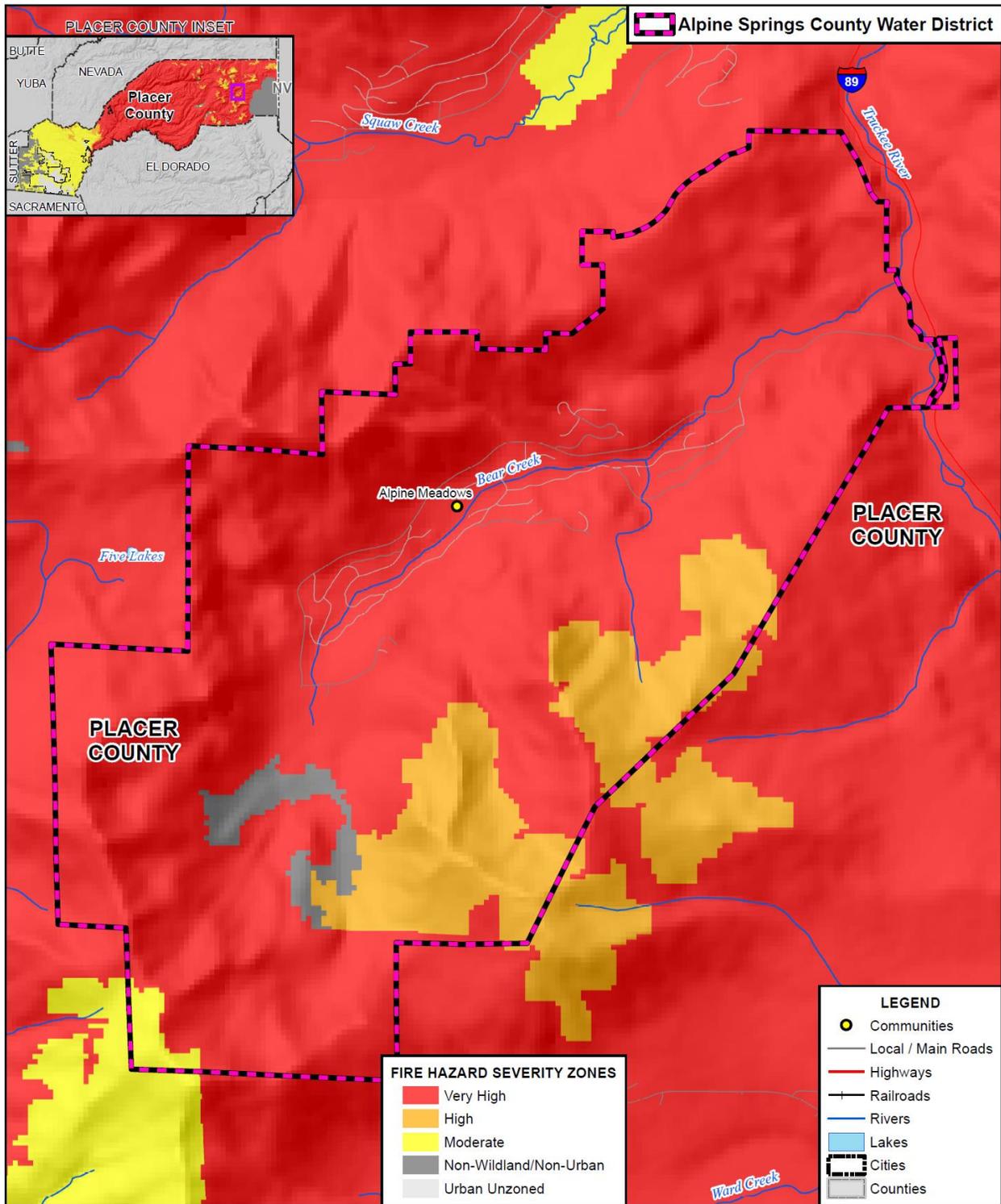
Once an ignition expands into a wildfire, weather and topography usually dictate how devastating the fire will be. According to the CWPP, the high elevation of Alpine Meadows allows for lower temperatures and better moisture recovery during the night. Southwest winds do blow down the canyon but are not very dry. Further, the topography of the canyon is open enough that there would not be a significant chimney effect during a fire. Therefore, the CWPP concludes that the fire weather and topography risk in Alpine Meadows is low relative to other areas in the Tahoe Basin as evidenced by the fire history data for this area. While

there have been a number of ignitions, none of the ignitions have resulted in large, destructive fires in recorded time.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the Alpine Springs County Water District were created. Figure G-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District range from Moderate to Very High.

Figure G-3 Alpine Springs County Water District – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table G-10.

Table G-10 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

None of the fire’s listed above created a major impact nor damages to the District and neighboring communities.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat

of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The Alpine Meadows CWPP concludes that the overall fire threat around the Alpine Meadow neighborhoods is low to moderate. The areas of highest threat are on the south facing slopes above the Juniper Mountain neighborhood. The overall risk of a catastrophic fire moving through the community is considered low, with the greatest risk to homes in the area from a structural fire spreading to one or more neighboring homes.

Assets at Risk

The District noted that all of its facilities from Table G-4 are at risk from this hazard.

G.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

G.6.1. Regulatory Mitigation Capabilities

Table G-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Alpine Springs County Water District.

Table G-11 Alpine Springs County Water District Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	No	Placer County
Capital Improvements Plan	Yes	Update each budget cycle.
Economic Development Plan	No	Placer County
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	No	Placer County
Stormwater Management Plan/Program	No	Placer County
Engineering Studies for Streams	No	Placer County
Community Wildfire Protection Plan	Yes 2015	

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	No	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	Score:
Fire department ISO rating:	Yes	Rating: 4
Site plan review requirements	Yes	
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	No	Placer County
Subdivision ordinance	No	Placer County
Floodplain ordinance	No	Placer County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	No	Placer County
Flood insurance rate maps	No	Placer County
Elevation Certificates	No	Placer County
Acquisition of land for open space and public recreation uses	No	Placer County
Erosion or sediment control program		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District is seeking to add additional communication resources to agencies that rely on outside resources.		

Source: Alpine Springs County Water District

As indicated above, the District in conjunction with Placer County has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Voluntary Water Conservation Program

The objectives of the voluntary water conservation program are to:

1. increase the awareness of valley residents as to the need to conserve water;
2. educate valley residents as to how they can conserve water; and
3. decrease household and commercial use of water, including water used for irrigation, during the months of June through October.

Other Programs

Other programs within the District include the following:

- Wildfire Prevention Program

- ✓ Community Chipper program
- ✓ Defensible space reviews for homeowners
- ✓ Building material reviews for homeowners

Water Conservation Plan

The District has a limited supply of water, and sometimes the demand for water exceeds the supply. To maintain reserve water supply capacity for the health and safety responsibilities of the District, the District has implemented a Water Conservation Plan.

Emergency Response Plan

The District has developed a policy to establish parameters by which the District shall plan for and respond to District-related emergency situations that include:

- Acts of God
 - ✓ Earthquake
 - ✓ Flood
 - ✓ Earth Slide
 - ✓ Avalanche
- Extended power outage
- Computer system failure, including SCADA
- Communication system failure
- Catastrophic infrastructure failure
- Loss of vehicle access to the valley
- Fire
- Pervasive water supply contamination

Community Wildfire Protection Plan, 2015

The CWPP was updated in 2015 as part of the Lake Tahoe Basin Community Wildfire Protection Plan. The Alpine Meadows area is included under the North Tahoe Fire Protection District (NTFPD). Alpine Springs County Water District is responsible for fire protection and Emergency Medical Transport (EMT) services. The District contracts with NTFPD for these services. The CWPP summarizes wildfire dangers and issues within the community, catalogs community wildfire protection needs, and identifies corrective action and community projects that will mitigate some of the problems.

Water Resource Policy

The District has developed a water resource policy to establish parameters by which the District will manage its water resources. This policy includes parameters for the protection of water sources, water quality, water quantity, and environmental considerations.

Watershed Management Policy

Water in the Bear Creek Valley is a precious and limited resource. It is therefore necessary for the protection of all life in the Valley – human and native flora and fauna – to establish parameters under which the District will protect and preserve the natural resources of the Bear Creek watershed.

Codes and Ordinances

Avalanche

Placer County’s avalanche management program defines Potential Avalanche Hazard Areas (PAHAs) where the minimum probability of avalanche occurrence is 1 in 100 per year or where avalanche damage has already occurred. According to the Placer County Avalanche Ordinance the following information must be disclosed in PAHAs:

- Identification that a structure is within a PAHA;
- A warning that avalanche control work is conducted in the area and avalanche warnings will be provided as feasible; and
- Identification of sources that provide weather information and general information on avalanches.

In addition, the County limits construction as necessary in PAHAs and will not issue a building permit for construction in a PAHA without certifying that the structure will be safe under the anticipated snow loads and conditions of an avalanche.

Wildfire

The District and Placer County have a number of standards and ordinances, based on California Public Resources Code 4290, in place to address community design issues regarding wildfire hazard preparedness. Ordinances specify details such as:

- Road, driveway and turnaround dimensions to provide safe ingress and egress for the public and fire suppression resources during a fire event;
- Emergency water supply for sustained firefighting operations; and
- Use of flame-resistant building materials in home construction, specifically in roofing and siding materials.
- The banning of open burning, including campfires during high fire hazard periods.

In addition to the codes and ordinances for community design, the District has adopted Planned Community Development Guidelines and Conditions for subdivisions based on the codes and ordinances. The document provides developers guidelines on mitigation measures and community design guidelines for subdivision construction in the District, streamlining the approval process by illustrating approved community design elements in the District.

G.6.2. Administrative/Technical Mitigation Capabilities

Table G-12 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the District.

Table G-12 Alpine Springs County Water District’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	No	Placer County
Mitigation Planning Committee	No	Placer County
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Yes	Tree removal as part of annual budget
Mutual aid agreements	Yes	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	No	
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Programs set up specifically for small low staff districts will be sought to increase District capabilities.		

Source: Alpine Springs County Water District

G.6.3. Fiscal Mitigation Capabilities

Table G-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table G-13 Alpine Springs County Water District’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Capital improvement projects are typically projects that replace existing assets. Funding for mitigation projects is at the discretion of the Board of Directors.
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	District enterprise funds include water, sewer, and solid waste. The District is currently researching the potential to allocate a portion of these funds to fuels reduction.
Impact fees for new development	Yes	The fire department assesses mitigation fees for new development.
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	No	
State funding programs	No	
Other	Yes	Sierra Nevada Conservation District
How can these capabilities be expanded and improved to reduce risk?		
Improvements to streamline the application process to receive funding from additional sources for mitigation will be sought.		

Source: Alpine Springs County Water District

G.6.4. Mitigation Education, Outreach, and Partnerships

Table G-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table G-14 Alpine Springs County Water District’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	District Newsletter - articles highlight fire safety, water conservation, and information important to the community

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	Yes	Holds an annual clean-up day.
Public-private partnership initiatives addressing disaster-related issues	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District will seek to engage local community and homeowner groups to assist with education and outreach.		

Source: Alpine Springs County Water District

The District has contracted with the North Tahoe Fire Protection District (NTFPD) to provide fire suppression and emergency medical services within the Alpine Meadows community. The Squaw Valley Fire Department (part of the Squaw Valley Public Service District) also provides automatic aid services to Alpine Meadows through agreement with the NTFPD.

The entire water district is classified by the State of California as State Responsibility Area (SRA). This means the responsibility for prevention and suppression of wildland fires is the responsibility of CAL FIRE. The USFS, Tahoe National Forest, and Truckee Ranger District provide these direct protection responsibilities on behalf of the State of California through an exchange of acres agreement.

Wildfire protection services are provided at the local level by the NTFPD. Through the NTFPD, Alpine Meadows is also covered by the Lake Tahoe Regional Chiefs Association mutual aid agreement, providing simplified access to Lake Tahoe Basin fire departments upon request. The NTFPD is also a signatory to the California Master Mutual Aid System. As a system participant, NTFPD has access to free firefighting resources throughout the State of California.

G.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

Alpine Meadows Consolidated Defensible Space Project

The project being proposed by ASCWD is to reduce dangerous forest fuel loading on 50 acres in the Alpine Meadows area (This project was completed in August 2012). The District has offered free residential chipping services and defensible space inspections to approximately 200 private properties over the last two (2) years. The project consisted of two elements. The first element was the reduction of overgrown forest fuels on common properties owned by three homeowners associations and the water district that intertwine between private homes along the valley. The second element is funding a community chipper program to the residents of the district for many years.

G.7 Mitigation Strategy

G.7.1. Mitigation Goals and Objectives

The Alpine Springs County Water District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

G.7.2. Mitigation Actions

The planning team for the Alpine Springs County Water District identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Avalanche
- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: 1% / 0.2% Annual Chance
- Floods: Localized Stormwater
- Landslides, Mudslides, and Debris Flows
- Pandemic
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Fire Fuels Mitigation

Hazards Addressed: Wildfire, Drought and Water Shortage, High Winds and Tornadoes, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: A buildup of forest fuel loads has substantially increased the risk of the spread of wildfire

Project Description: Parcel and forest treatment to reduce the forest loads in and around Alpine Meadows

Other Alternatives: N/A

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community cleanup days
- Community Chipping Program
- Outside contracts with Foresters and NTFPD

Responsible Agency/ Department/Partners: ASCWD

Cost Estimate: \$25,000 annually

Benefits (Losses Avoided): Catastrophic fire losses to homes and business

Potential Funding: Additional funding may be available if awarded the State of California Climate Investment Fire Prevention Grant

Timeline: Annually

Project Priority (H, M, L): High

Action 2. Emergency Electrical Generator Replacement Project

Hazards Addressed: Avalanche, Earthquake, Flood, Localized Flood, Landslide, Freeze and Snow, Heavy Rains, Wildfire

Issue/Background: This project would replace the District's single, fifty plus year old emergency diesel electrical generator. The District has a single emergency electrical generator. The generator was placed in service in 1961 and has reached the end of its useful life. The current generator serves only the office building, which is the designated Emergency Operation Center for the Valley. The new generator will be sized to supply emergency power to the office, fire station and vehicle storage building. It will also be equipped with an automatic transfer switch.

Other Alternatives: No other action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: ASCWD Long Range Capital Improvement Program

Responsible Office/Partners: Alpine Springs County Water District

Project Priority: High

Cost Estimate: \$55,000

Benefits (Losses Avoided): Protection of property and life safety.

Potential Funding: ASCWD Long Range Capital Improvement Program

Timeline: Within 5 years

Action 3. Water Storage Tank Replacement Project

Hazards Addressed: Earthquake and Wildfire

Issue/Background: This project would replace the District’s four circular prestressed concrete and one redwood water storage tanks. A recent inspection of the tanks found that “they clearly would not meet current design criteria, especially seismic criteria” and based up the tanks dimensions the tanks are subject to overturning in an earthquake. The District has four (4) 100,000 gallon prestressed concrete tanks and one (1) 500,000 gallon redwood tank. This project would replace one (1) 100,000 gallon concrete tank and the one (1) 500,000 gallon redwood tank with a single 600,000 gallon buried reinforce concrete water storage tank. Each of the three remaining 100,000 gallon tanks would be replaced by buried reinforced concrete water storage tanks. This project would provide the District with water storage facilities protected from earthquake and fire hazards.

Other Alternatives: No other action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: ASCWD Long Range Capital Improvement Program

Responsible Office/Partners: Alpine Springs County Water District

Project Priority: High

Cost Estimate:

- Water Storage Tanks 1, 2, 3, 4, and 5 100,000 gallons each at \$175,000 each.
- Water Storage Tank 4A 500,000 gallons \$1,000,000.

Benefits (Losses Avoided): Protection of property and life safety.

Potential Funding: ASCWD Long Range Capital Improvement Program

Timeline: Within 5 years

Action 4. Mineral Springs Soil Bank Stabilization Project

Hazards Addressed: Flood, Localized Flood, Heavy Rain and Storms, Landslide

Issue/Background: A section of the 10" sewer main that serves the Alpine Meadows community is located adjacent to and between Mineral Springs Trail and Bear Creek. Recent flooding (2006 and 1997) along with annual erosion by Bear Creek have eroded and undercut the 40 to 50 foot high bank approximately 30 feet. Continued erosion and undercutting by Bear Creek will result in the loss of this 10" sewer main. The failure of this 10" sewer main would result in approximately two thirds of the 650 sewer customers' sewage discharging into Bear Creek. Bear Creek discharges into the Truckee River. Discharge of sewage would pose a potential risk to human health and the environment.

This proposed project would complete evaluation of current site conditions, develop recommended slope stabilization (most likely large boulders 2 – 3 tons along with gabions), and install the recommended slope stabilization.

Other Alternatives: Replace approximately 150 feet of 10" sewer main with a pump station and force main. The pump station would require stand-by power because of the inability to provide on-site storage. The site is constrained. A second alternative would be to rent and have available during each major storm or flood event pump around equipment and facilities.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Alpine Springs County Water District in conjunction with Placer County Public Works Department.

Project Priority: High

Cost Estimate: \$550,000

Benefits (Losses Avoided): Potential fines for sewage overflows are estimated at \$10 per gallon. Depending on the time it would take to get pumping equipment into place, the fines range from a low of \$576,000 to \$1,483,200 (412 customers with average daily flow of between 140 gallons per day to 360 gallons per day). In addition to the fines, additional resources would be needed for spill response and clean up, pump around equipment rental and set up, and the construction of replacement facilities. Project would protect natural resources by reducing the potential for spills of untreated wastewater into waterways.

Potential Funding: Grant funding, budget funding, Placer County, ASCWD

Timeline: Within 5 years

Action 5. *Alpine Meadows Consolidated Defensible Space Continuation Project*

Hazards Addressed: Wildfire, Drought and Water Shortage, High Winds and Tornadoes, Climate Change

Issue/Background: This project would continue fuels reduction on an additional 50 acres of commonly held properties within the Bear Creek watershed, or the Alpine Meadows community. This project will also provide curbside chipping services and defensible space inspections for 200 homes. This project aims to build on the community awareness and educational efforts underway in the area in order to reduce fuel loadings on common properties and to inspire and educate private property owners to complete defensible

space treatments on their property. Finally, this project will serve as a model project by applying mitigation and monitoring techniques for prescribed burning of piles in a riparian area where no other means of slash disposal exists.

Other Alternatives: No other action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lake Tahoe Basin community Wildfire Protection Plan – August 2015

Responsible Office/Partners: Alpine Springs County Water District in conjunction with the North Tahoe Fire Protection District

Project Priority: High

Cost Estimate: \$ 200,000

Benefits (Losses Avoided): Protection of property and life safety

Potential Funding: Grant funding, Budget funding, North Tahoe Fire Protection District, ASCWD

Timeline: Within 5 years



Annex H Foresthill Fire Protection District

H.1 Introduction

This Annex details the hazard mitigation planning elements specific to Foresthill Fire Protection District (FFPD), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to FFPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

H.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table H-1. Additional details on plan participation and District representatives are included in Appendix A.

Table H-1 FFPD – Planning Team

Name	Position/Title	How Participated
Michael Ridley	Fire Chief	Provided data
Jed Matcham	Assistant Fire Chief	Reviewed data

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table H-2.

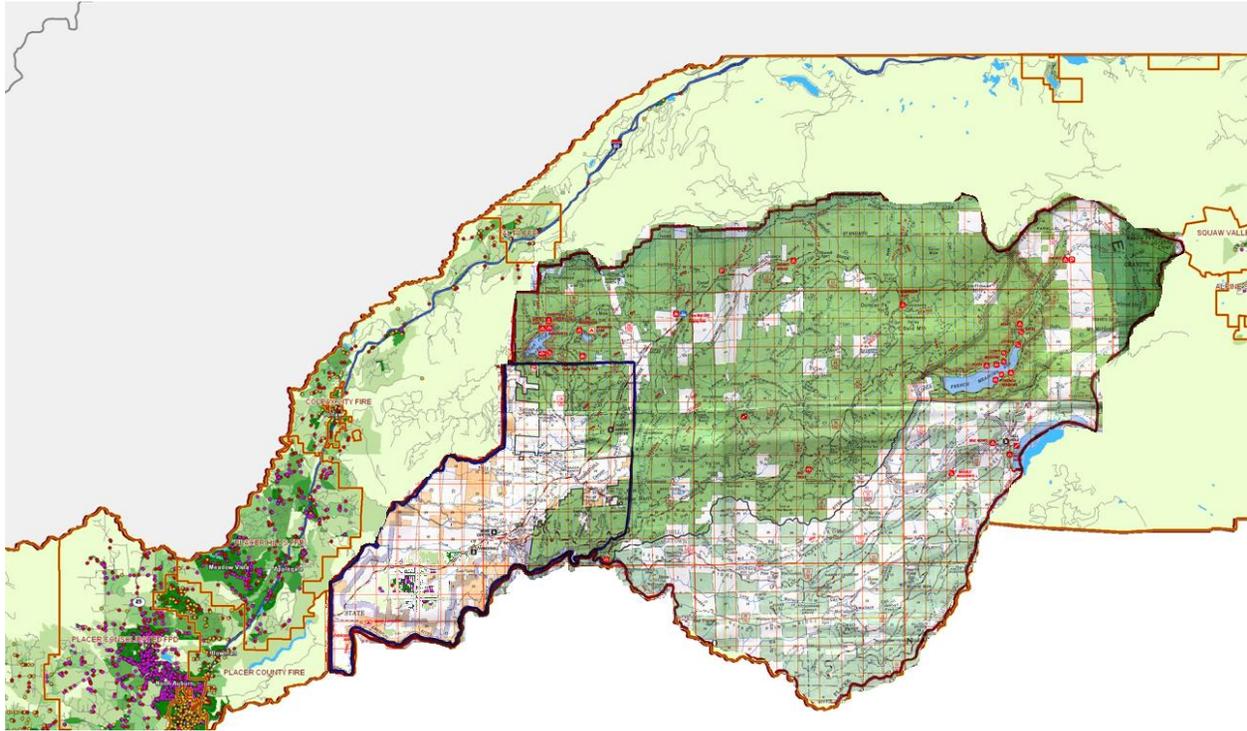
Table H-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No planning related to the LHMP was performed since 2016.

H.3 District Profile

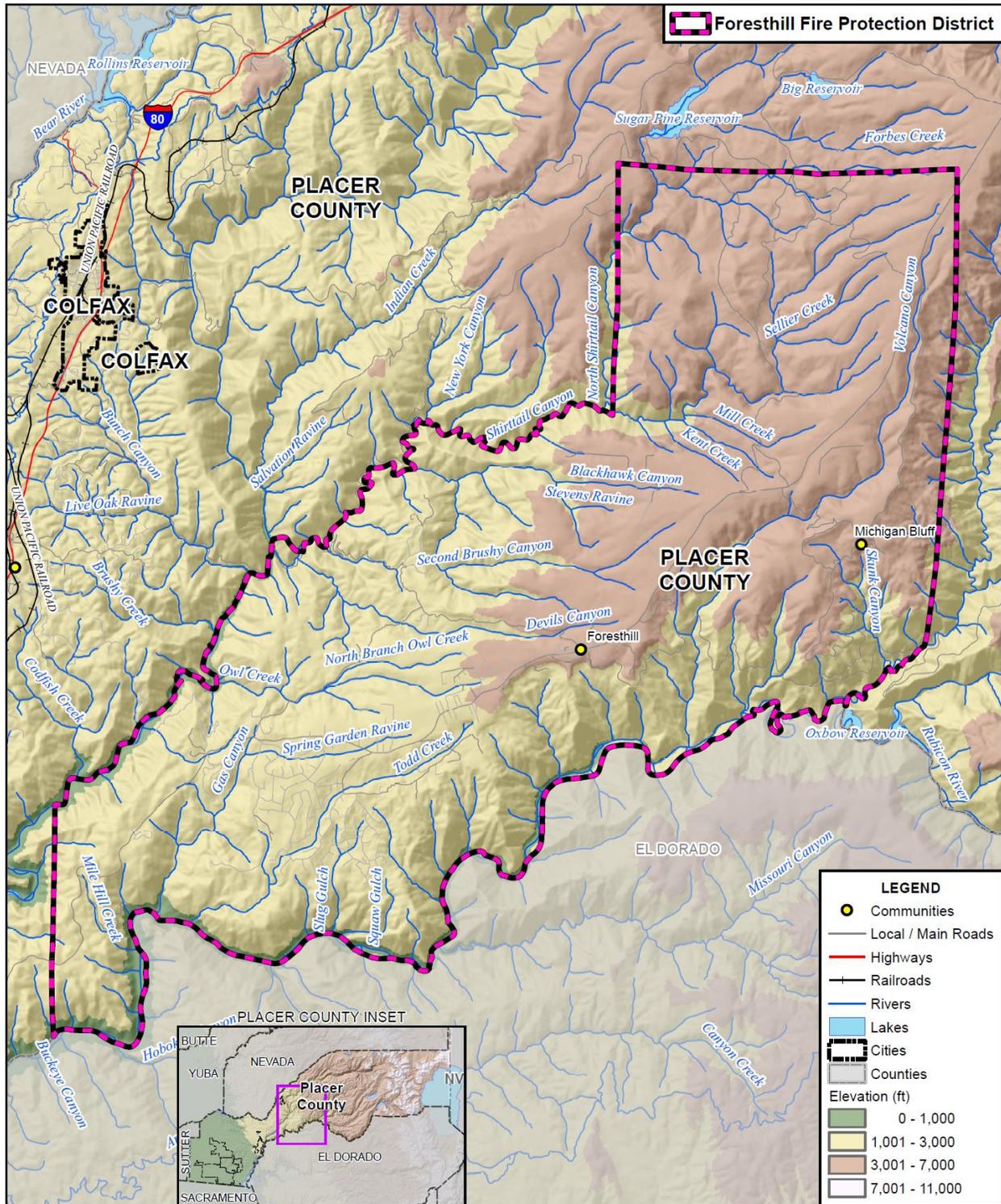
The District profile for the FFPD is detailed in the following sections. Figure H-1 and Figure H-2 display maps and the location of the District within Placer County.

Figure H-1 FFPD



Source: FFPD

Figure H-2 FFPD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

H.3.1. Overview and Background

The FFPD serves the greater Foresthill area including Todd Valley, Baker Ranch, Michigan Bluff, and Sugar Pine. The District provides local advanced life support to the community following the merge with Foresthill Ambulance Service. Fire stations located in Foresthill and Todd Valley respond to structure and wildland fires, vehicle accidents, and medical emergencies. The District is staffed by a combination of paid and volunteer firefighters, EMTs, and paramedics. The District was created in April of 1946, after over 15 years of service by the Foresthill Volunteer Fire Department.

Foresthill is located on a broad ridge between the North and Middle Forks of the American River. The Foresthill community covers approximately 11.2 square miles and is located at an elevation of 3,228 feet.

The community of Foresthill, California was founded in 1850 during the California Gold Rush when prospectors swarmed over the Sierra Nevada Mountain divide between the North and Middle Forks of the American River. After the gold played out, many Foresthill settlers turned to logging the tall trees that cover the divide and a dozen lumber mills were established in and around Foresthill. The harvesting of timber, just like gold, eventually became too costly to pursue and the mills were closed, causing many of the residents to seek employment “off the hill” in nearby Auburn and even Sacramento.

Foresthill, however, was not “down-and-out.” With the wonderful outdoor recreational opportunities of the Tahoe National Forest, beautiful lakes and snow covered mountains, and the improvement of Foresthill Road during the 1990s by the federal government, people seem to have rediscovered the Foresthill Divide. Land values are on the rise, beautiful new homes are springing up throughout the woods, and the new Foresthill High School makes K-12 education a unique mountain-top experience.

In the Foresthill area, wildland fire suppression is the primary responsibility of CDF and the USFS, with additional support provided through mutual aid. The District has primary responsibility for non-wildland fire incidents that include structure fires, vehicular fires, extreme weather events, mass casualty incidents, etc.

H.4 Hazard Identification

FFPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table H-3).

Table H-3 FFPD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Limited	Low	Medium
Climate Change	Extensive	Likely	Catastrophic	High	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Negligible	Low	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Low	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Extensive	Likely	Limited	Low	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	High	Low
Tree Mortality	Extensive	Highly Likely	Catastrophic	High	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

H.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

H.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section H.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table H-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

H.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the FFPD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table H-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. FFPD’s physical assets, valued at over \$14 million, consist of the buildings and infrastructure to support the District’s operations.

Table H-4 FFPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Station 88	Essential	\$5,500,000	Wildfire, earthquake
District Administration Building	Essential	\$2,500,000	Wildfire
Station 90	Essential	\$4,500,000	Wildfire
Station 89	Essential	\$1,000,000	Wildfire
Porter Garage	Essential	\$500,000	Wildfire, earthquake
Total		\$14,000,000	

Source: FFPD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. FFPD provides services to a population of over 7,000 people in an 89 square mile area. The median age of residents is 51.5 years old. 59% of the population is between the ages of 18 and 64 years old. The District has approximately 2,900 housing units. 99.3% of our population live and work in a Tier 3 Fire Hazard Severity Zone.

Natural Resources

FFPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

FFPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

Foresthill Divide is located between the Middle Fork and North Fork of the American River. With the views in the area, developers are planning subdivisions on the canyon rims directly adjacent to unmaintained Bureau of Reclamation lands.

According to the 2007 Capital Improvement Plan for the District, the 2007 service population was estimated at 7,300. Using the plan's 3 percent assumed growth rate, new development is anticipated to increase the service population between 2007 and 2030 by 7,100 for a total service population of 14,300 by year 2030. The plan indicates that an estimated \$12.6 million in capital improvements will be necessary by 2030 to meet the growing demands of the District's service area. This is beyond the capabilities of the Fire District to complete. This should be a Placer County issue to address.

As Foresthill area grows there will be further demand for emergency services, more vehicle accidents, and more fires. The development of the commercial property will also bring with it, an increase in use and storage of hazardous chemicals and associated environmental concerns.

It is important to note that there are several elderly, disabled, and low income people in the Foresthill area. In the case of a wildfire evacuation, these people may not have transportation. Likewise, in the event of a power outage during the winter months, these special populations may not be able to get to a shelter for warmth.

Development since 2016

There has been minor development since 2016, but the development has had little impact on the vulnerability of the District. No District facilities have been constructed since 2016. District Administration building has been upgraded and a Department Operation Center (DOC) has been developed. The District noted that its stations are too small to provide proper apparatus and equipment storage.

Future Development

The District has no direct control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. District facilities need to be expanded and the stations need to be rebuilt to fit the expanding role of the Fire District. However, there are no funds available for these critical needs. More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

H.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table H-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing. The Fire District has seen an increase in the number of responses related to medical and fire emergencies due to the higher temperatures, low moisture levels and tree mortality and related to the lesser amounts of precipitation.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires. One significant snow event in the past year that resulted in The District responding to more than 28 calls in a 24-hour period. Normally, we average about 2 calls per day.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

The District noted that higher temperatures in the summer and the severe snowstorms in the winter attract more people to the Tahoe National Forest. The District provides Advanced Life Support response and transport services to the area. These services provided are not fully funded and have a significant impact on the District's budget.

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely
Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table H-5.

Table H-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

All of the District's critical infrastructure from Table H-4 is within a Tier 3 Fire Hazard Severity Zone. This results in the threat of wildfire destroying some or all of the infrastructure.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

The District noted that there have been numerous Power Safety Power Shutoffs (PSPS) in Foresthill. 8 times in the past year out of 9 events that occurred in the County. The District noted that future events are likely as high winds affect the power grid and the District is in a Tier 3 Fire Hazard Zone.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well, especially when combined with the potential for severe wind events. Health impacts, including loss of life, are often the primary concern with this hazard, though economic impacts can also be an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions and spread.

The District does not have the ability to provide cooling centers to our populace. If the power is out our local schools, churches, etc. will not be able to provide shelter either. The extreme heat also results in medical responses that can require extended commitments of resources due to many incidents being remotely located out in the wilderness area. Extreme heat also plays a major factor in the ignitability of fuels, rapid spread of fire, and extent of fire damage when a fire occurs. This obviously requires the District to commit resources for longer periods of time, resulting in the inability to provide other emergency services to our jurisdiction.

Assets at Risk

No District assets (from Table H-4) are at risk from this hazard.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds are a primary factor in PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the lower to middle elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5. All PSPS events have caused damage to the power grid at different levels. Downed trees provide the biggest threat to the District.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

Impacts specific to the District include blocked roadways causing an inability to access incidents or those that need assistance, as well as blocking the only way to get into or out of Foresthill. Downed trees cause significant damage to structures.

Assets at Risk

Stations 89, 90 and the Administration office are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events. Several areas within the District forests show signs of Pine Beetle and thus will become more vulnerable to wildfire.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality,

along with numerous Tier 1 High hazard “hot spots”. A map of these areas is shown in in Section 4.3.18 of the Base Plan.

The District has had a severe issue with tree mortality due to drought, infestation, and human caused issues.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Assets at Risk

All District assets (from Table H-4) are at risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability– Extremely High

Hazard Profile and Problem Description

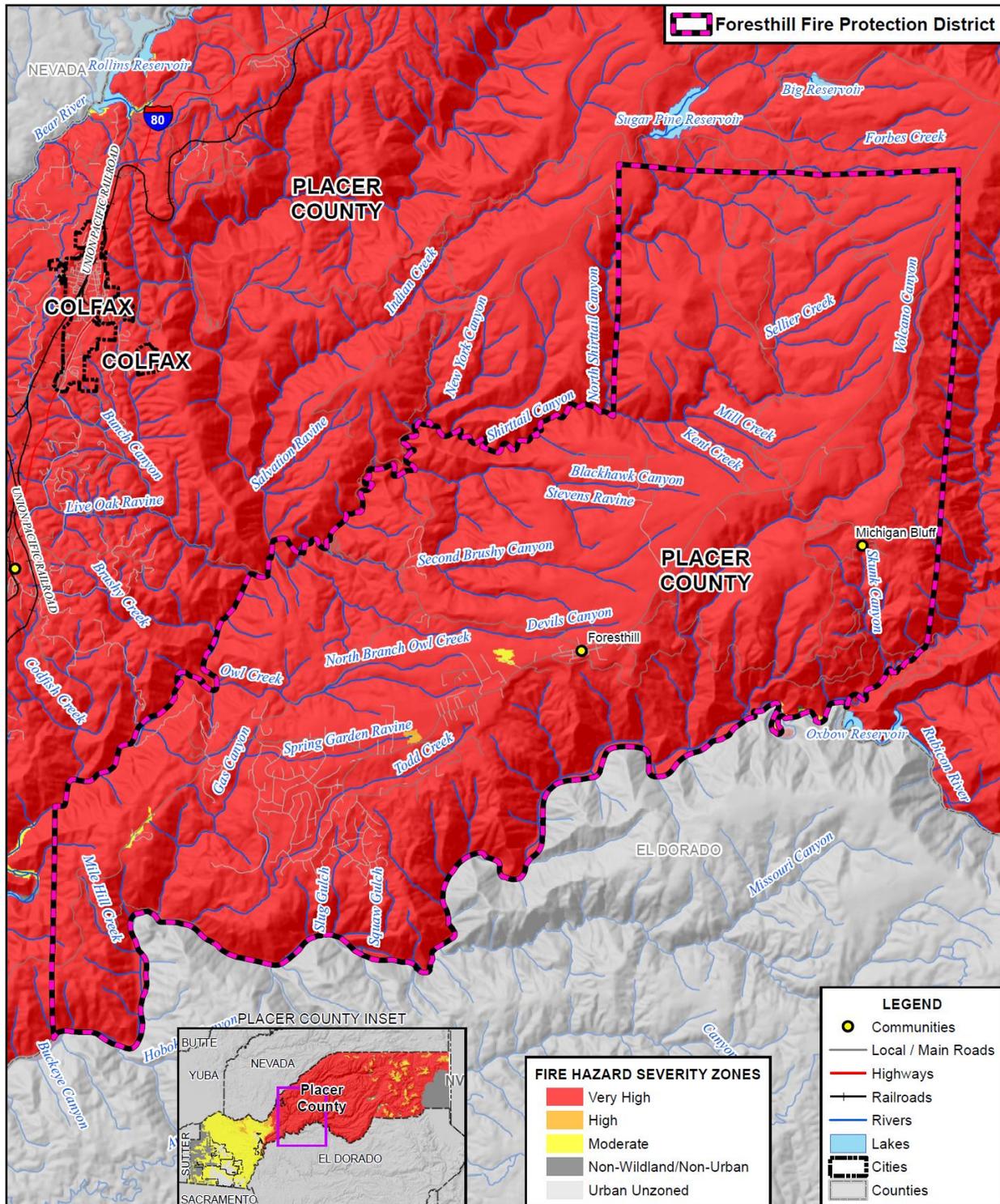
Wildland fire and the risk of a conflagration is an ongoing concern for the FFPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where

there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the FFPD were created. Figure H-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District fall within the Very High zone.

Figure H-3 FFPD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table H-6.

Table H-6 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

September 2006 – A wildland fire, started by a campfire on Ralston Ridge outside of Foresthill, grew to over 4,000 acres in size. The towns of Michigan Bluff, Foresthill, and Volcano were threatened. Infrastructure damage primarily involved damage to power lines

June 29 to July 18, 2016 – The Trailhead Fire was a wildfire burning in the Middle Fork American River canyon in both Placer County & El Dorado County. 5,646 acres were burned in and near Foresthill. Todd Valley and areas of Foresthill placed on evacuation orders. 2,600 + structures were threatened.

September 4 to 6, 2018 – The Sliger Fire was a wildfire burning in the Middle Fork American River canyon in both Placer County & El Dorado County. 104 acres were burned in and near Foresthill. Todd Valley placed on evacuation orders. 2,000 + structures were threatened.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff

patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The rural nature within the District boundaries makes the area particularly susceptible to fire due to the heavily forested, cross-compartmented nature of the terrain. The abundance of natural fuels, coupled with extreme low humidity common in the area during fires season, creates potentially volatile situations for both residents and responders.

Assets at Risk

All of the District’s structures from Table H-4 are at risk. One study shows us losing all of our assets from fire under the right conditions.

H.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

H.6.1. Regulatory Mitigation Capabilities

Table H-7 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the FFPD.

Table H-7 FFPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
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Comprehensive/Master Plan/General Plan	N	
Capital Improvements Plan	Y	
Economic Development Plan	N	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year: CFC 2019
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 3/3Y
Site plan review requirements	N	
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Vegetation Mitigation Plan for the District to enhance the Placer County Plan. FFPD needs would include upgrading our Department Operations Center, Continuity of Operations Plan, Disaster Recovery Plan, Improved fixed and mobile communications/data capabilities.		

Source: FFPD

As indicated above, the District, in conjunction with the County, has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Codes and Ordinances

FFPD, through Placer County has adopted the 2007 California Fire Code. FFPD also defers to Public Resource Codes 4290 (Fire Safe Access) and 4291 (Defensible Space). The Fire Marshal reviews pre-development plans for ingress and egress, fire flow requirements, fire hydrant placement, and placement of shaded fuel breaks. Plan reviews for single family residence in and out of hydrant areas are done as well to ensure proper access and water supply for fire suppression.

Foresthill/Iowa Hill, Community Wildfire Protection Plan, 2011

The Foresthill/Iowa Hill CWPP summarizes wildfire dangers and issues within the Foresthill/Iowa Hill areas. The CWPP also catalogs community wildfire protection needs and identifies corrective action and community projects that will mitigate some of the problems. Communities served by the CWPP with prioritized projects include Michigan Bluff, Baker Ranch, Foresthill, Todd Valley, Yankee Jims, Shirttail, Sugar Pin Reservoir, Hidden Treasure, Iowa Hill, Kings Hill, Big Dipper, and Roach Hill.

Foresthill/Iowa Hill Risk Assessment Plan, 2009

The Foresthill/Iowa Hill Risk Assessment and Mitigation Strategies (RAMS) process helps provide consistent out-year planning for fire mitigation activities, prevention education, and fuels treatment/biomass programs. RAMS prioritizes fire management units and communities by risk and hazard and develops a strategic out-year budget and program of work for the Foresthill/Iowa Hill Fire Safe Council. This RAMS Plan is an amendment to the Placer County Fire Plan/Placer County CWPP, and represents information that was developed collaboratively by members of the Foresthill/Iowa Hill Fire Safe Council and cooperating state and federal agencies.

Capital Improvement Plan, 2018

The Capital Improvement Plan for the District identifies and budgets projects for new public facilities that will be needed to serve the FFPD projected development and increase in service population through 2030.

Foresthill Divide, Iowa Hill Divide Emergency Plan, 2009

The Emergency Plan for the area provides specific planning information, direction, and coordination guidance on a functional as well as an organizational basis for first responding and contributing agencies facing emergencies in the Foresthill and Iowa Hill areas.

H.6.2. Administrative/Technical Mitigation Capabilities

The District is staffed by a combination of paid and volunteer firefighters, EMTs, and paramedics. The FFPD was created in April of 1946, after over 15 years of service by the Foresthill Volunteer Fire Department. The FFPD presently employs a staff of 18, including a Fire Chief, 2 Assistant Fire Chiefs, 3 Station Captains, three Engineers, an Office Manager, an administrative assistant, EMTs, firefighters, and paramedics, and is run by a five person Board of Directors.

Three fire stations house the fire engines, brush units, rescue units, a water tender, and three ambulances. Fire Station 88 is located on Gold Street, Station 89 on Foresthill Road near the Placer County corporate yard, and Station 90 is at the intersection of Foresthill Road and Happy Pines Road. The District office is located at 24320 Main Street at the old Safety Club building. Table H-8 identifies the personnel responsible for activities related to mitigation and loss prevention in the District.

Table H-8 FFPD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	In coordination with Placer County
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	
Other		
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"></div> <div style="width: 30%; text-align: center;"> Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective? </div> <div style="width: 30%;"></div> </div>		
Staff	Y/N FT/PT	
Chief Building Official	Y	In coordination with Placer County
Floodplain Administrator	N	
Emergency Manager	Y	In coordination with Placer County
Community Planner	N	
Civil Engineer	Y	In coordination with Placer County
GIS Coordinator	Y	In coordination with Placer County
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	In coordination with Placer County
Hazard data and information	Y	
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Low power AM (1020 AM) Emergency Alert Radio system. To enhance emergency notification of area residents and visitors of local events and emergency notification of evacuations or shelter in place directions/information. Working with the Placer County Sheriff’s Department. Grant writing assistance, adding/improving public notification systems for the challenging terrain in the area.		

Source: FFPD

H.6.3. Fiscal Mitigation Capabilities

Table H-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table H-9 FFPD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Used for capital expenses
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Impact fees to fund Fire District Capital Improvements (i.e. apparatus purchase). Regular and ongoing review/update of mitigation fees, Regular and ongoing updates to internal cost analysis to provide for full cost recovery of services		

Source: FFPD

H.6.4. Mitigation Education, Outreach, and Partnerships

Table H-10 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table H-10 FFPD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	Y	School programs

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
StormReady certification	N	
Firewise Communities certification	Y	
Public-private partnership initiatives addressing disaster-related issues	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Develop a school fire safe program and a more robust delivery system. Develop a High School Fire Cadet Program (as funds are available). Continued growth of our Firewise Communities working with the Foresthill/Iowa Hill Fire Safe Council. Continued to develop Firewise Communities Developed a Defensible Space Demonstration area for the public to tour 7/24/365 Developed a Ready, Set, Go Program with District specific printed materials Continue ongoing public education programs, Implement new public education programs,		

Source: FFPD

FFPD has many mutual aid agreements and partnerships in place to ensure the safety of the people and property within District Boundaries. Partnerships and/or mutual aid agreements are in place with the following entities:

- CAL FIRE
- USFS
- BLM
- Placer County Sheriff’s Office
- Placer County OES
- California Highway Patrol (CHP)
- American Medical Response (AMR)
- American Red Cross
- Placer County Water Agency

The District works closely with the Foresthill/Iowa Hill fires Safe Council, CAL FIRE, USFS, BLM, and private landowners.

H.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Defensible space inspections
- Continual fire safety education
- In process of becoming a Firewise Community
- Firewise workshop
- Firesafe Council
- Business Inspections
- Fire Education in Schools
- Shaded fuel breaks within Foresthill/Iowa Hill areas
- Fuel Reduction Projects

- Ready, Set, Go! Demonstration site.
- Fuels Reduction: Chipper Program

H.7 Mitigation Strategy

H.7.1. Mitigation Goals and Objectives

The FFPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

H.7.2. Mitigation Actions

The planning team for the FFPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Chipper Program for Foresthill FPD

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Floods: Localized Stormwater, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: With the limited number of chippers and crews a back log of debris removal is accumulating. This receptive fuel bed must be reduced.

Project Description: Increase to number of chippers in the County by providing Foresthill FPD with a chipper, a tow vehicle and a four-person crew and a supervisor. The crew could also double as a hand crew to assist in the suppression of a wildland fire.

Other Alternatives: County to increase the number of chippers and numbers of crews to address the hazard. There is a lot of potential and the mitigation is slower than the desired goal for defensible space and fire severity.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Not sure yet. Big goal/dream with a small agency.

Responsible Agency/ Department/Partners: Foresthill FPD, CalFire, BoR, BLM, USFS, State Parks

Cost Estimate: \$350,000 - \$400,000 (with startup costs).

Benefits (Losses Avoided): Saving lives and property. For the cost of saving one or two homes in the District, we could provide a valuable asset to the reduction of hazards from wildland fires.

Potential Funding: Not researched yet

Timeline: One year

Project Priority (H, M, L): High



Annex I Foresthill Public Utility District

I.1 Introduction

This Annex details the hazard mitigation planning elements specific to Foresthill Public Utility District (FPUD or District), a new participating jurisdiction to the 2021 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to FPUD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

Note: FPUD participated in the original 2005 Placer County LHMP. A copy of that document could not be located by FPUD, Placer County, or Cal OES. Additionally, staff turnover in the past 16 years has reduced institutional memory of that 2005 Plan. It can be assumed that none of FPUD’s proposed mitigation actions were completed, FPUD’s mitigation priorities at that time are unknown, and that the 2005 Plan was not incorporated into any FPUD planning mechanisms. Development in the District since 2005 was described by FPUD as minimal, and a general description of more recent development in the District is included in Section I.5.2 of this Annex.

I.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table I-1. Additional details on plan participation and District representatives are included in Appendix A.

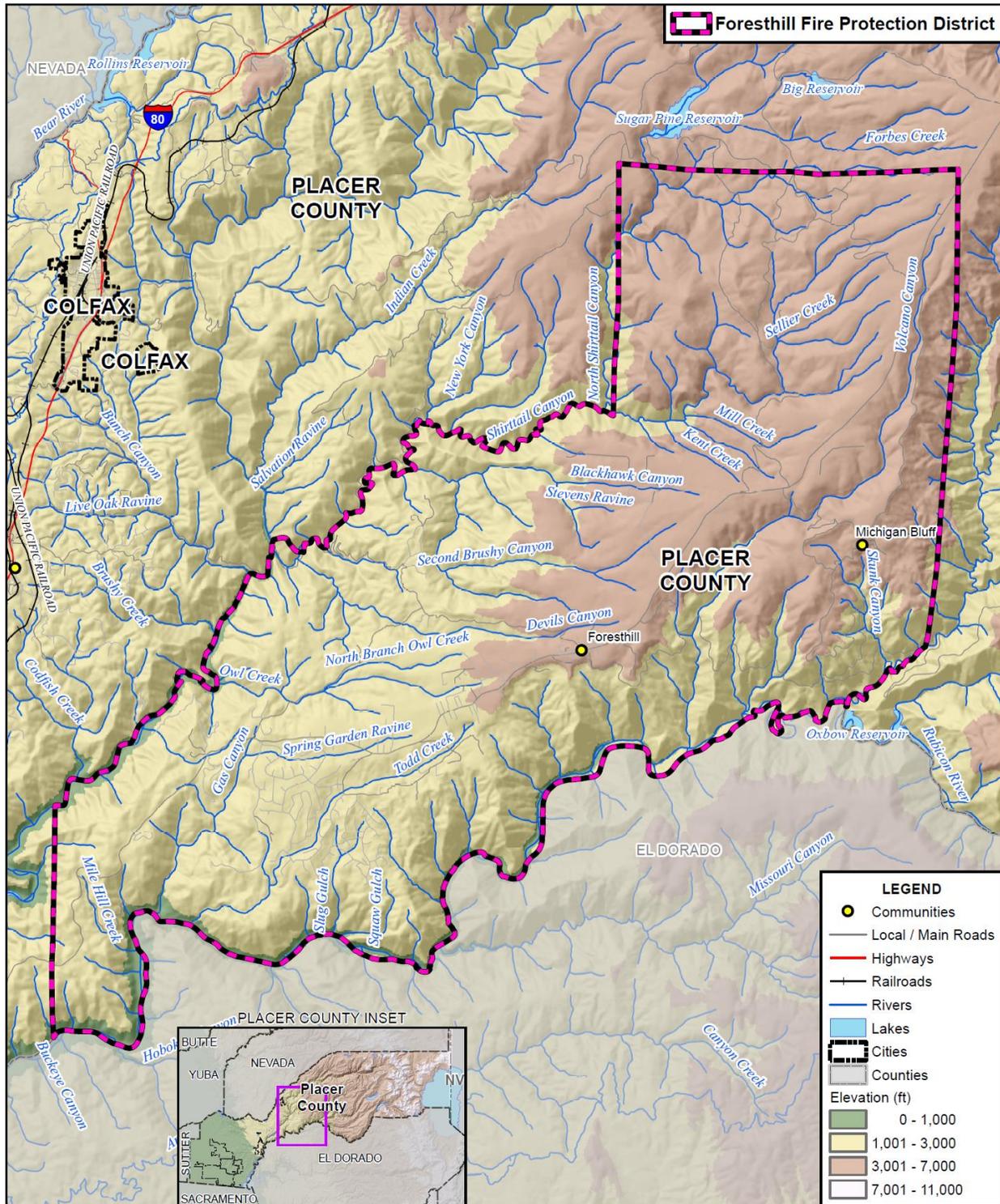
Table I-1 FPUD – Planning Team

Name	Position/Title	How Participated
Henry N. White	General Manager	Lead the effort. Attended meetings. Provided input for annex.

I.3 District Profile

The District profile for the FPUD is detailed in the following sections. Figure I-1 displays a map and the location of the District within Placer County.

Figure I-1 FPUD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

I.3.1. Overview and Background

Foresthill Public Utility District was formed in 1950 pursuant to the provisions of Section 15501 et seq. of the California Public Utilities Code for the purpose of operating a water system (the "Enterprise"). The District's service area comprises the unincorporated community of Foresthill, California, located in Placer County approximately 60 miles northeast of Sacramento.

The District is governed by a five member Board of Directors and currently employs seven full-time employees and one part-time employee. The District currently incorporates an area of approximately 13,000 acres and contains primarily residential development. The District as of February 1, 2020 provides 2,034 water service connections.

I.4 Hazard Identification

FPUD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table I-2).

Table I-2 FPUD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Low
Avalanche	Limited	Unlikely	Negligible	Low	Low
Climate Change	Limited	Unlikely	Negligible	Low	–
Dam Failure	Limited	Unlikely	Negligible	Medium	Low
Drought & Water Shortage	Limited	Likely	Limited	Medium	Low
Earthquake	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance	Limited	Unlikely	Negligible	Low	Low
Floods: Localized Stormwater	Limited	Likely	Negligible	Low	Low
Landslides, Mudslides, and Debris Flows	Limited	Likely	Negligible	Low	Low
Levee Failure	Limited	Unlikely	Negligible	Low	Low
Pandemic	Limited	Unlikely	Negligible	Low	Low
Seiche	Limited	Unlikely	Negligible	Low	Low
Severe Weather: Extreme Heat	Extensive	Highly likely	Negligible	Low	Low
Severe Weather: Freeze and Snow	Extensive	Highly likely	Negligible	Low	Low
Severe Weather: Heavy Rains and Storms	Extensive	Highly likely	Negligible	Low	Low
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Negligible	Low	Low
Tree Mortality	Extensive	Highly likely	Catastrophic	Low	Low
Wildfire	Extensive	Highly likely	Catastrophic	Low	Low
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

I.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

I.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section I.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table I-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

I.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the FPU’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table I-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. FPUD’s physical assets, valued at over \$67 million, consist of the buildings and infrastructure to support the District’s operations.

Table I-3 FPUD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Sugar Pine Dam	Earth dam	60,000,000	Fire, slide
Water Treatment Plant	Treatment plant	5,000,000	Fire
Headquarters Building	Office building	500,000	Fire
Water Storage Tank	Storage tank	1,500,000	Tree mortality
Total		\$67,000,000	

Source: FPUD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. The District currently incorporates an area of approximately 13,000 acres and contains primarily residential development. The District as of February 1, 2020 provides 2,034 water service connections.

Natural Resources

FPUD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

FPUD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. Growth is occurring at about 2% per year. There are no plans at this time to expand the District service area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

I.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table I-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

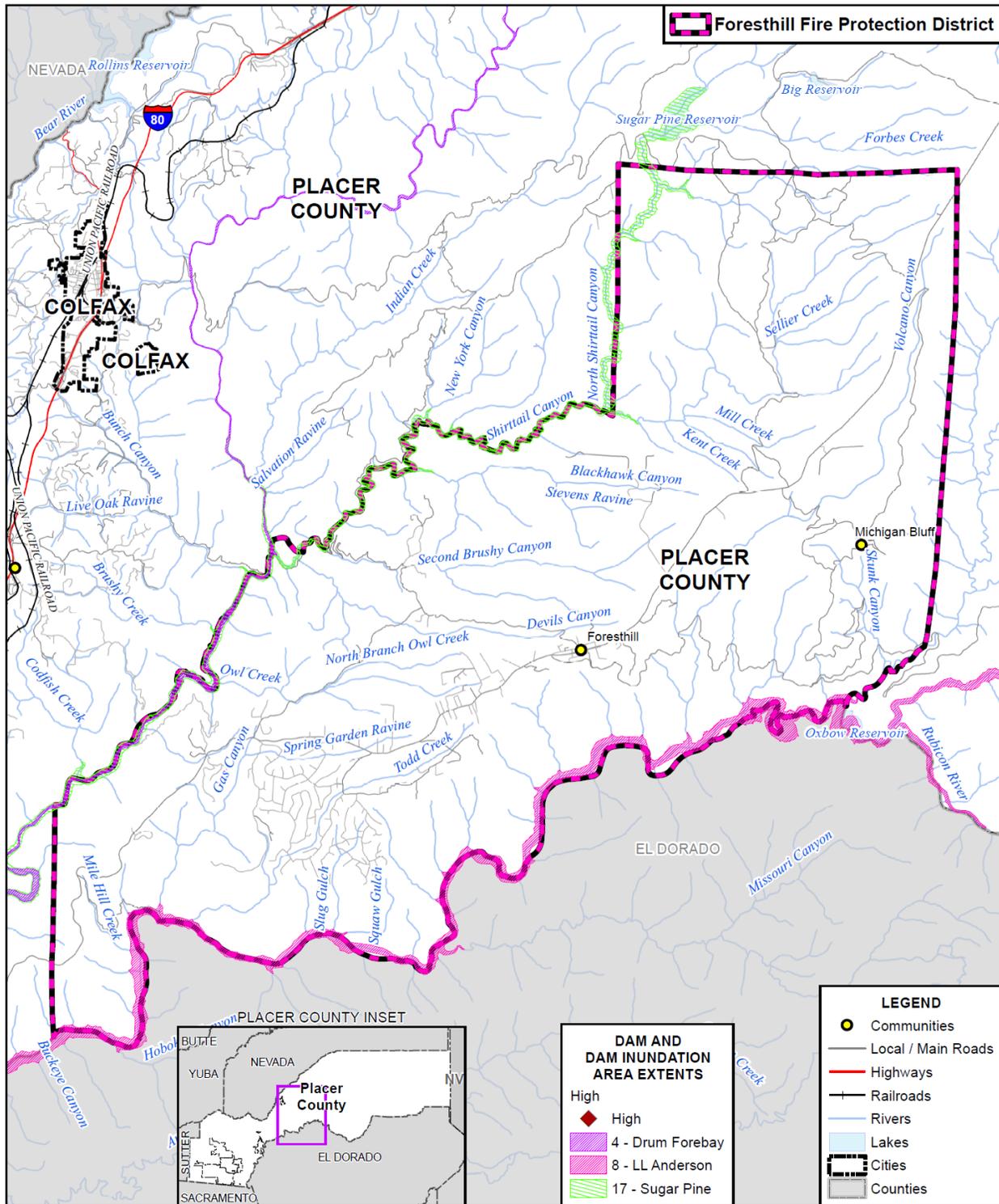
Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

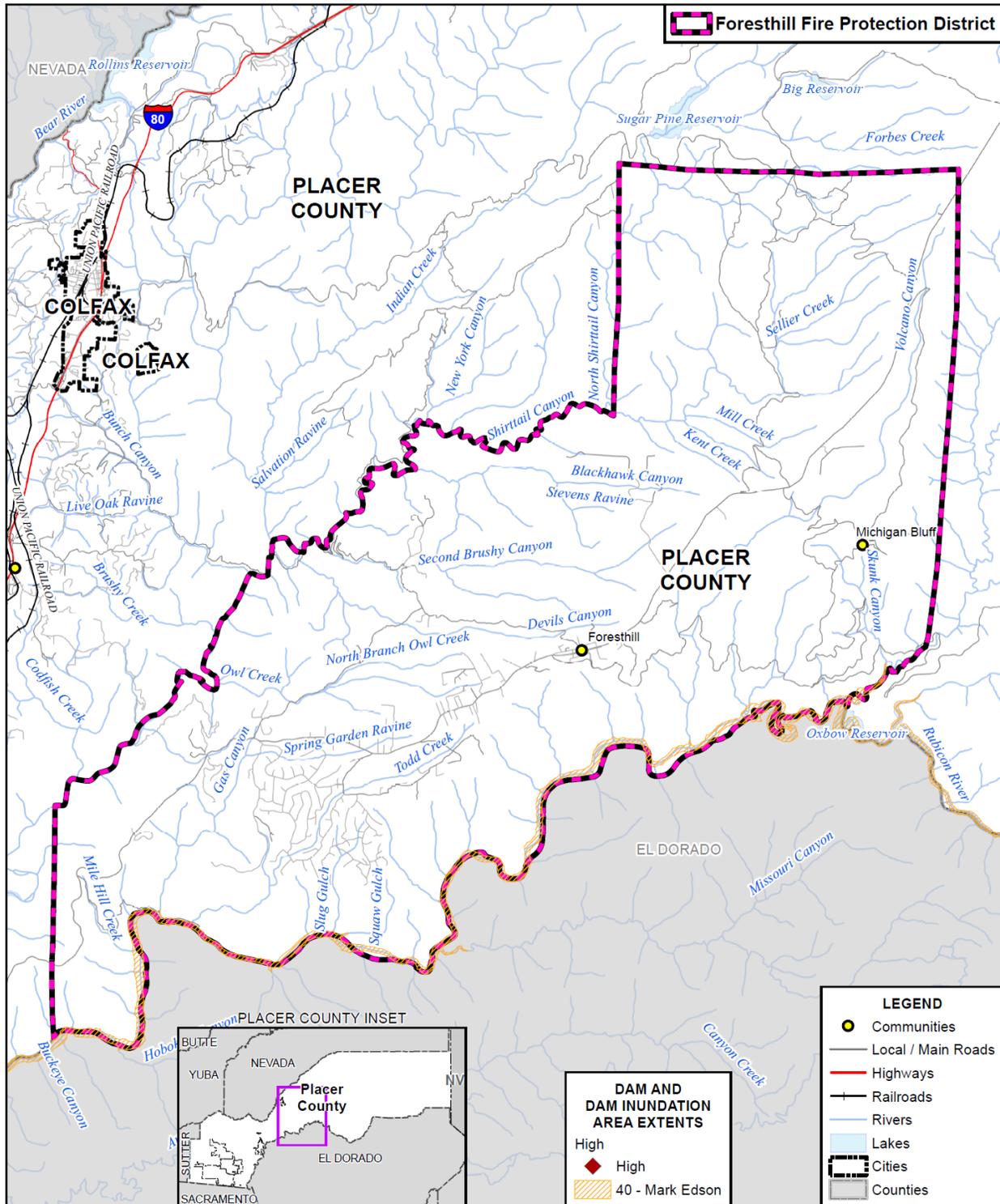
Dams inside the County that can affect the District can be seen on Figure I-2. Dams outside the County that can affect the District can be seen on Figure I-3.

Figure I-2 FPUD – Dam Inundation Areas from Dams Inside the County



Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Figure I-3 FPUD – Dam Inundation Areas from Dams Outside the County



FOSTER MORRISON
CONSULTING

0 2.5 5 Miles

COUNTY OF
Placer

Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

In addition to these shown above, the Sugar Pine Dam is a zoned earthfill dam constructed in 1982. The dam is 205.1 feet high with a volume of 981,000 cubic yards. The reservoir behind the dam holds 6,922 acre feet. The dam is in excellent condition.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District. The District has had two earthquakes in the general area. We followed emergency protocol and inspected the dam. The District found no damage from the earthquakes.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Failure of the dam at Big Reservoir would concern the District. The impact would be to fill and possibly spill Sugar Pine Reservoir.

Assets at Risk

The reservoir and spillway were designed to accommodate a failure.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table I-4.

Table I-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

The District was impacted by the drought in 1977. This drought led to the investment and construction of the Sugar Pine Dam and Reservoir.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

All District assets (from Table I-3) are at risk from this hazard.

I.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

I.6.1. Regulatory Mitigation Capabilities

Table I-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the FPUd.

Table I-5 FPUd Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	2011 (?)	Yes
Capital Improvements Plan	2021	yes
Economic Development Plan	?	I think the county has this
Local Emergency Operations Plan	2021	yes
Continuity of Operations Plan	2021	yes
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	2020	Yes
Community Wildfire Protection Plan	?	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year:

Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	2019	Rating: 04/4Y
Site plan review requirements	?	
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Elevation Certificates		
Acquisition of land for open space and public recreation uses		
Erosion or sediment control program		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District has limited regulatory mitigation capability, and depends on the County to provide regulation. Planning and land management tools assist the district in implementing hazard mitigation activities by have pre-thought necessary activities and responsibilities. Future planning will seek to plan for natural hazards and their mitigation.		

Source: FPUD

I.6.2. Administrative/Technical Mitigation Capabilities

Table I-6 identifies the District department(s) responsible for activities related to mitigation and loss prevention in FPUD.

Table I-6 FPUD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	N	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	

Emergency Manager	Y	Yes
Community Planner	N	
Civil Engineer	Y	Yes
GIS Coordinator	Y	Yes
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Yes
Hazard data and information	Y	Yes
Grant writing	Y	Yes
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District could use additional resources to improve and expand mitigation and loss prevention. This includes training staff on mitigation related efforts, as well as seeking coordination with the County and other local agencies on hazard mitigation related items.		

Source: FPUD

I.6.3. Fiscal Mitigation Capabilities

Table I-7 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table I-7 FPUD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes, construction, yes
Authority to levy taxes for specific purposes	Y	Yes construction of improvements, yes
Fees for water, sewer, gas, or electric services	Y	Yes, operations, yes
Impact fees for new development	Y	Yes, operations, yes
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Yes, construction, yes
Incur debt through private activities	Y	Yes, loan repayment/asset acquisition, yes
Community Development Block Grant	?	
Other federal funding programs	Y	Yes, construction, yes
State funding programs	Y	Yes, construction, yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District could expand securing debt to fund activities that would mitigate hazards and reduce risk.		

Source: FPUD

I.6.4. Mitigation Education, Outreach, and Partnerships

Table I-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table I-8 FPUD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	y	The Foresthill Forum discuss all of these topics
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	y	The district has a public outreach program
Natural disaster or safety related school programs	n	
StormReady certification	n	
Firewise Communities certification	y	
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District could allocate additional resources to expand and improve programs designed to reduce risk. The District will seek to increase the outreach done by those supporting the FireWise Community certification. Outreach programs will seek to have a mitigation component in the future.		

Source: FPUD

I.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Completion of the Foresthill Road Pipeline (see Figure I-4)

Figure I-4 Foresthill Road Pipeline



Source: FPUD

- Completion of Water Storage Tank (see Figure I-5)

Figure I-5 Water Storage Tank



Source: FPUD

I.7 Mitigation Strategy

I.7.1. Mitigation Goals and Objectives

The FPUD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

I.7.2. Mitigation Actions

The planning team for the FPUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Dam Failure
- Drought & Water Shortage

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Drought, Dam Failure/ additional of radial gates to dam

Hazards Addressed: Drought and dam failure

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Installing radial gates would address drought issues for the community of Foresthill and strengthen the spillway reducing the possibility of dam failure

Project Description: Installation of radial gates in the Sugar Pine Dam spillway

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Foresthill Public Utility District Capital Improvement Plan and the Foresthill Public Utility District Master Plan

Responsible Agency/ Department/Partners: Foresthill Public Utility District

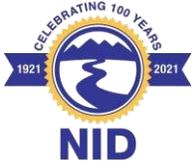
Cost Estimate: \$10,000,000

Benefits (Losses Avoided): Radial gates would increase storage capacity of Sugar Pine Reservoir by 30% thereby reducing impacts of drought and climate change

Potential Funding: Federal grants and partnerships

Timeline: Project is shovel ready and complete in two years

Project Priority (H, M, L): high



Annex J Nevada Irrigation District

J.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Nevada Irrigation District (NID or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to NID, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

J.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table J-1. Additional details on plan participation and District representatives are included in Appendix A.

Table J-1 NID – Planning Team

Name	Position/Title	How Participated
Greg Jones	Assistant General Manager	Oversite and Review
Chip Close	Water Operations Manager	Facility vulnerability and risk assessment as well as historical references
Doug Roderick	Engineering Manager	Capital improvement planning and forecasting
Keane Sommers	Hydroelectric Manager	Facility vulnerability and risk assessment as well as historical references

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table J-2.

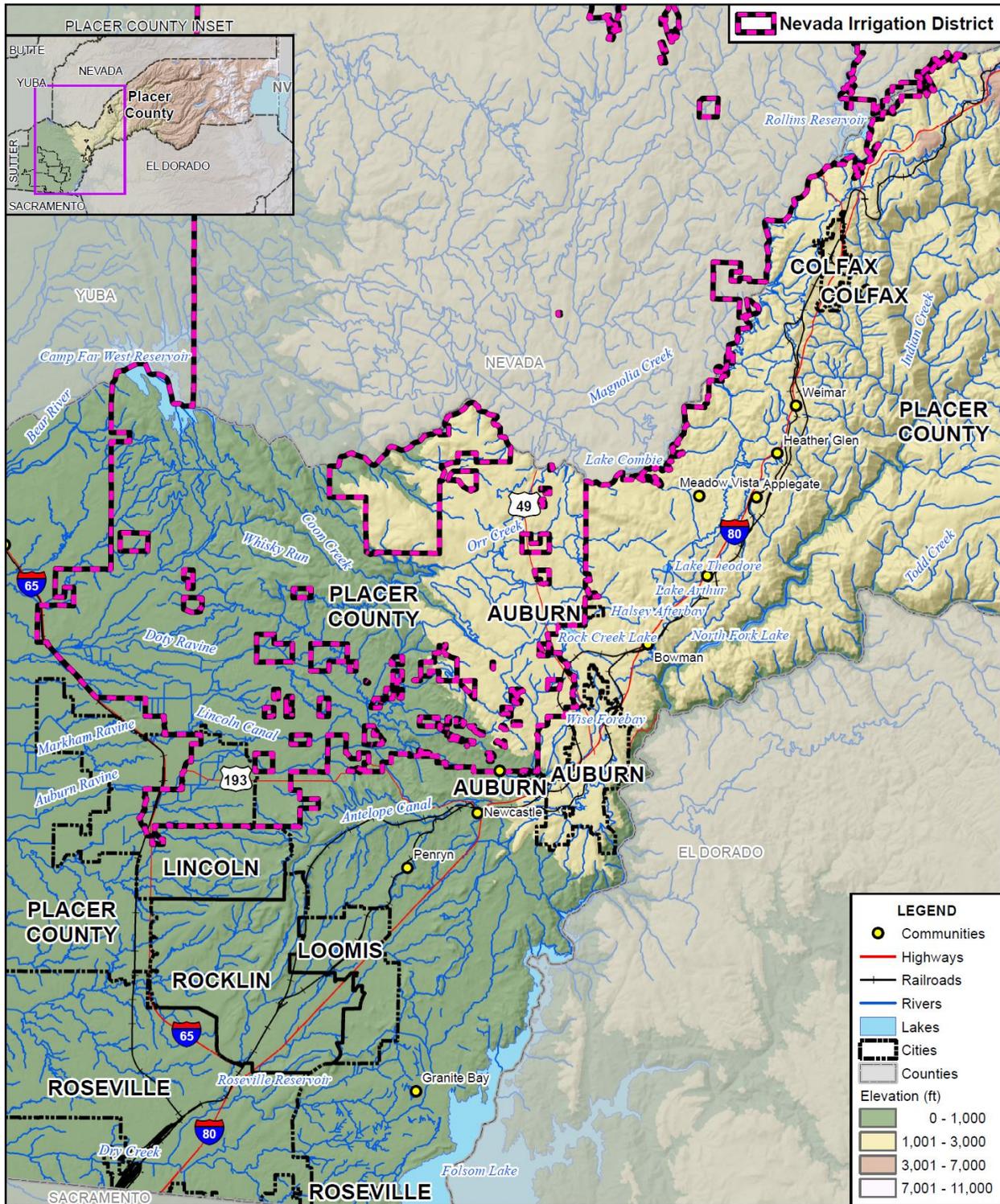
Table J-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Capital Improvement Planning	Priority of projects were adjusted to meet level of risk

J.3 District Profile

The District profile for the NID is detailed in the following sections. Figure J-1 displays a map and the location of the District within Placer County.

Figure J-1 NID



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

J.3.1. Overview and Background

Formed in 1921, the Nevada Irrigation District is a diversified water resource agency that supplies over 30,000 homes, farms, and businesses in Nevada, Placer and Yuba Counties in the foothills of Northern California's Sierra Nevada Mountains. NID provides service in an expansive geographic area covering 287,000 acres that makes the District one of the largest in the State of California.

The District is organized primarily to supply water for irrigation, municipal, domestic, industrial, and hydroelectric purposes. NID collects water from the mountain snowpack on 70,000 acres of high mountain watershed and stores it in an extensive system of reservoirs. Water flows to customers in the foothills through over 500 miles of canals and another 400 miles of pipeline. Along the path, it is used to generate clean hydroelectric energy and to provide public recreational opportunities at NID's multiple reservoirs and campgrounds.

The highest elevation on NID mountain watershed is the peak of 8,373-foot English Mountain which rises east of Bowman Reservoir. The District's highest reservoir is French Lake at 6,835 feet. The District's lowest elevation water service is located about 100 miles to the southwest, at 150 feet above sea level, south of Lincoln in Placer County.

NID has precipitation records for Bowman Reservoir (elev. 5,650 ft.) dating back to 1929. The 69.2-inch annual average precipitation at Bowman compares to an annual average of 56 inches at 2,700 feet near Nevada City and 52 inches at 2,400 feet in Grass Valley.

Irrigation Water

NID has supplied an average 150,000 acre-feet of water per year. About 90 percent of this total is used for local agriculture. NID serves approximately 5,600 raw water customers. Most purchase their water on a seasonal basis — the six-month irrigation season normally runs from on or about April 15 through October 14. Some irrigation customers purchase both summer and winter water for year-around service.

Irrigation water is used to irrigate pasture, golf courses, gardens, nurseries, orchards, and vineyards for both commercial and home production. Grapes, apples, peaches, nuts, berries, corn, rice, wheat, and oats are among the many crops grown with NID water.

Many customers realize other benefits from NID Irrigation water including filling ponds and reservoirs for stock watering, fire suppression, and recreation. Availability of irrigation water is an important factor in the preservation of open space, and greenbelt areas. There are an estimated 97,000 irrigable acres in the Nevada Irrigation District, about a third of which are presently in irrigation.

Treated Drinking Water

Through the years, NID service has changed along with the communities it supplies. The District continues to supply irrigation water, as it has since the 1920s, but today's demand is for piped and treated drinking water.

NID's treated water service areas are located in and around Grass Valley and Nevada City, Alta Sierra, Lake of the Pines, Penn Valley, Lake Wildwood, Smartville, and North Auburn areas.

Generally, treated water is available in the more populated areas, as it can be very expensive to extend treated water main lines into rural areas where there are few customers to share the costs. In recent years, the District has been successful in working with local property owners to form local water quality improvement districts.

The transition to treated drinking water began in the late 1960s and early 1970s when NID constructed its first water treatment plants. Today, the District operates a network of six modern water treatment plants in Nevada, Placer, and Yuba counties.

NID presently produces about 3 billion gallons — approximately 9,000 acre-feet — of treated drinking water per year. The district's treatment plants are operated by state-licensed and certified technicians. Water treatment processes include chlorination, coagulation, flocculation, sedimentation, and filtration.

NID treated water meets and exceeds standards set by the California Department of Health Services. As required by state law, NID produces an annual water quality report, the Consumer Confidence Report, which is distributed each spring to each treated water customer.

NID's flushing program is conducted annually in the winter months and is designed to keep treated water pipelines clean and ensure a fresh, high quality water supply.

Recreation

The Nevada Irrigation District manages 29 reservoirs in the foothills and mountains of the Northern Sierra providing recreational opportunities such as hiking, camping, boating, fishing, and swimming.

At Rollins and Scotts Flat reservoirs, NID provides public parks, trails, campgrounds and beaches for the community's enjoyment. Higher up in the mountains, NID maintains and operates campgrounds in the Jackson Meadows and Bowman Lake areas.

Sierra Foothill Recreation

Camping, fishing, swimming, sunning, boating, water skiing, sailing, kayaking and other activities are popular at both Rollins and Scotts Flat reservoirs in the Sierra foothills. Day use parks, campgrounds and beaches are operated by NID and in some cases, by private operators, under contract with NID.

Scotts Flat is situated among the tall pines at the 3100-foot elevation nine miles east of Nevada City via Highway 20 and Scotts Flat Road. It offers 169 campsites at two large campgrounds, plus a group camp. Across the lake, accessible via Red Dog and Quaker Hill Roads from Nevada City, is the Cascade Shores Day Use Area. Scotts Flat is a popular spot for swimming, boating and water Skiing

Rollins Reservoir, located at the 2100-foot elevation off Highway 174 between Grass Valley and Colfax, has four independently operated campgrounds. Long Ravine, Greenhorn, Orchard Springs and Peninsula

offer a combined 250 campsites and a complete range of services including stores, restaurants, fuel sales and rentals.

Sierra Mountain Recreation

At higher elevations in the Sierras, NID maintains and operates campgrounds and recreational facilities in the Jackson Meadows – Bowman Lake areas.

Jackson Meadows features several campgrounds, picnic day use sites and boat ramps.

At Bowman Lakes area, campgrounds are located at Bowman, Canyon Creek, Sawmill and Faucherie Lakes in the Bowman corridor.

The primary recreation season in the high mountain areas generally runs from Memorial Day through Labor Day, depending on weather.

We Partner for Trails

Trails help to cultivate a healthy community. NID partners with the Bicyclists of Nevada County (BONC), Youth Bicyclists of Nevada County (YBONC) and the Bear Yuba Land Trust to provide multiuse trails for recreation. The trails we provide at Scotts Flat Lake and Rollins Lake attract hikers and bicyclists from throughout the region.

Hydroelectric

NID is a leader among northern California water agencies in the production of clean, renewable hydropower. Operating seven hydropower plants, it generates enough electricity to supply the District's own energy needs plus that of about 60,000 homes.

NID began producing electricity in 1965 with the completion of the \$65 million Yuba-Bear Power Project. The original project included the Chicago Park and Dutch Flat powerhouses and, in 1980, the Rollins and Bowman powerhouses were added. Additional small power plants were added during the 1980s at Scotts Flat and Combie reservoirs to make use of existing water releases.

The District has power sales agreements that market NID's electricity to the Pacific Gas & Electric Company and the Northern California Power Agency. NID's Hydropower operations are a huge win for customers. In addition to contributing millions in revenues from power sales to offset water rates for the customer, Hydro also covers all of the costs of upper division water storage, conveyance, delivery, maintenance, and operations from the headwaters of the Middle and South Yuba Rivers, Bear River, Canyon Creek, and Deer Creek watersheds through the District's mid-elevation storage reservoirs of Scotts Flat, Rollins and Combie.

NID's hydropower facilities include 13 reservoirs and 20.75 miles of pipes, flumes, tunnels and open ditch canals.

J.4 Hazard Identification

NID identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table J-3).

Table J-3 NID—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Significant	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Likely	Limited	Medium	Medium
Climate Change	Extensive	Highly Likely	Critical	High	High
Dam Failure	Significant	Unlikely	Critical	High	Medium
Drought & Water Shortage	Extensive	Occasional	Critical	High	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Pandemic	Extensive	Occasional	Critical	High	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: High Winds and Tornadoes	Limited	Highly Likely	Critical	Medium	Low
Tree Mortality	Extensive	Highly Likely	Limited	Medium	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

J.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

J.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section J.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table J-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

J.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the NID’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table J-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. NID’s physical assets, valued at over \$1.4 billion, consist of the buildings and infrastructure to support the District’s operations.

Table J-4 NID Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Rollins Power House	Critical Facilities	\$19,170,815	Earthquake, Flood, Wildfire, Tree Mortality
Combie South Power House	Critical Facilities	\$5,334,820	Earthquake, Flood, Wildfire, Tree Mortality
Dutch Flat Afterbay	Critical Facilities	\$400,000,000	Earthquake, Flood, Fire
Rollins Reservoir	Critical Facilities	\$500,000,000	Earthquake, Flood, Wildfire, Tree Mortality
Combie Reservoir	Critical Facilities	\$250,000,000	Earthquake, Flood, Wildfire, Tree Mortality
North Auburn Water Treatment Plant	Critical Facilities	\$3,713,610	Earthquake, Flood, Wildfire, Freeze and Snow
Water Canal System	Critical Facilities	\$66,361,517	Earthquake, Flood, Freeze and Snow, Wildfire, Tree Mortality, Landslide
Orr Creek Reservoir	Critical Facilities	\$2,000,000	Earthquake, Flood
Pickett Reservoir	Critical Facilities	\$100,000	Earthquake, Flood
Buildings and Warehouses	Critical Facilities	\$2,000,000	Earthquake, Flood, Wildfire, Tree Mortality
Administration Buildings	Critical Facilities	\$4,450,00	Earthquake, Flood, Wildfire, Tree Mortality
Pipelines and Tanks	Critical Facilities	\$34,110,630	Earthquake, Flood, Wildfire, Tree Mortality
Other assets	Critical Facilities	\$147,000,000	Earthquake, Flood, Wildfire
Total		\$1,429,795,842	

Source: NID

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. NID provides domestic water service to over 19,500 service connections representing a population of over 100,000,000 people. In addition, the District provides wholesale water utilized by other

municipalities to supply another 6,000 plus homes. The District also provides irrigation water to more than 5,500 farms and properties throughout Placer, Nevada and Yuba Counties.

Natural Resources

NID has a variety of natural resources of value to the District. Several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table J-5 and Table J-6.

Table J-5 Plant Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Dwarf downingia <i>Downingia pusilla</i>	CNPS 2.2	Vernal Pools in valley foothill grasslands	Unlikely to occur. No appropriate habitat in the project area. Nearest known occurrence 2.2 air miles northwest of downtown Lincoln, 1.2 road miles south of Wise Road/Hwy. 65 intersection.
Legenere <i>Legenere limosa</i>	CNPS 1B.1	Vernal pools and swales, seasonal marshes, artificial ponds, floodplains of intermittent streams, and other seasonally inundated habitats.	May occur in floodplains of intermittent streams in the project area. Known from only two occurrences in the project vicinity. One located north of Pleasant Grove Creek, south of Placer Boulevard, east of Highway 65. The second is at the Orchard Creek Conservation Bank approximately 3 miles southwest of Lincoln (Jones & Stokes 2002).
big-scale balsamroot <i>Balsamorhiza macrolepis var. macrolepis</i>	CNPS 1B.2	Chaparral, cismontane woodland and valley and foothill grassland, and vernal moist meadows on sandstone, serpentine, or basalt outcrops. From 300 to 4,600 feet in elevation.	Added to table August 2009, no analysis for the project area completed.
Stebbins's morning-glory <i>Calystegia stebbinsii</i>	FE, CE, CNPS 1B.1	Chaparral (openings), cismontane woodland, serpentinite or gabbroic. 600–2,400 ft.	Unlikely to occur. No appropriate habitat present in the project area. This plant is known from fewer than 15 occurrences in specific, isolated areas of Nevada and El Dorado counties (CDFG 2004).
Dubious pea <i>Lathyrus sulphureus var. argillaceus</i>	CNPS 3	Cismontane woodland, chaparral, lower and upper montane coniferous forest. Usually full sun to part shade, woodland openings. 500–1,000 ft.	May occur in woodland habitats on the project site.
Ahart's Dwarf Rush <i>Juncus leiospermus var. abartii</i>	CNPS 1B.2	Vernal pool margins and mesic valley and foothill grassland areas at elevations of 30–100 meters.	May occur in non-native grassland habitats in the project area. Reported in Placer County only from one occurrence at the Lincoln Airport.

Name	Status	Habitat	Potential Occurrence
Red Bluff Dwarf Rush <i>Juncus leiospermus</i> var. <i>leiospermus</i>	CNPS 1B.1	Meadows and seeps, vernal pools, and vernal mesic areas in chaparral, cismontane woodland, and valley and foothill grassland from 115 to 3,350 feet.	May occur in woodland and non-native grasslands habitats. Known from north of Roseville in 1982, but was relocated in 1997 (CNDDDB 2002).
Butte County fritillary <i>Fritillaria eastwoodiae</i>	CNPS 3	Chaparral, cismontane woodland, lower montane coniferous forest (openings), wet and dry slopes red clay or sandy loam. 100–5,000 ft.	May occur in woodland habitats on the project site.
Brandegee’s clarkia <i>Clarkia biloba</i> ssp. <i>brandegeae</i>	CNPS 1B.2	Chaparral, cismontane woodland, often roadcuts. 900–3,000 ft.	May occur in woodland habitats on the project site. The nearest occurrences are in the Lake Combie Quad along the Bear River (CDFG 2004).
Boggs Lake Hedge-hyssop <i>Gratiola heterosepala</i>	CE, CNPS 1B.1	Foothill Riparian	May occur in riparian habitat present in the project area. Known from only three occurrences in the project vicinity. Two of these occurrences are located between Rocklin and Roseville; the third is located just north of Lincoln (Placer County 2003).
Pincushion navarretia <i>Navarretia myersii</i> ssp. <i>myersii</i>	CNPS 1B.1	Vernal pools, valley and foothill (non-native) grasslands in clay soils. 66–1,083 feet	Northern limits of City of Lincoln. Exact location unknown (needs more fieldwork).

Status Codes:

Federal FE = Federally listed as Endangered FT = Federally listed as Threatened FC = Federal Candidate species	State CE = California listed as Endangered CT = California listed as Threatened CR = California listed as Rare CSC = California Species of Concern CFP = California Fully Protected	California Native Plant Society 1B = rare, threatened or endangered in California and elsewhere. 2 = rare in California but more common elsewhere. 3 = need more information 4 = plants of limited distribution; a watch list. _1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat) _2 = Fairly endangered in California (20-80% occurrences threatened) _3 = Not very endangered in California (<20% of occurrences threatened, or no current threats known)
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Status and habitat information from California Natural Diversity Database (CDFG 2004), California Native Plant Society Electronic Inventory (CNPS 2003), and USFWS Official Species Lists.

¹Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009)

Table J-6 Wildlife Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Invertebrates			
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Found in vernal pools (seasonal wetlands)	Unlikely to occur. No appropriate habitat present.
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE –	Vernal pools containing clear to highly turbid water.	Unlikely to occur. No appropriate habitat present.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT –	Associated with various species of elderberry shrubs (<i>Sambucus</i> spp.); generally occurs along waterways and in floodplains.	May occur if elderberry shrubs are present in the project area. Nearest known occurrences in the vicinity of the Lincoln airport and Lincoln Rodeo Grounds.
Fish			
Delta smelt <i>Hypomesus transpacificus</i>	FT CT	Found only in the Sacramento-San Joaquin Estuary and they reside primarily in the interface between salt and freshwater. Decline in population due in large part to reductions in delta water outflow.	Unlikely to occur. Project is located outside of species' known distribution.
Longfin smelt <i>Spirinchus thaleichthys</i>	– CT, CSC	In the Sacramento-San Joaquin estuary adults and juveniles can be found in water ranging from nearly pure sea water to completely fresh water. Adult and juvenile longfin smelt occupy mostly the middle or bottom of the water column in the salt or brackish water portions of the estuary, although larval smelt are concentrated in near-surface brackish waters. Spawning takes place in fresh water, over sandy-gravel substrates, rocks, and aquatic plants.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley steelhead <i>Oncorhynchus mykiss irideus</i>	FT –	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in small streams and tributaries with cold, clean water flowing over graveled bottoms and deep pools.	Rainbow trout/steelhead adults and fry have been seen in Coon Creek, Auburn Ravine, Dry Creek, Secret Ravine, and Miners Ravine (CALFED Bay-Delta Program 2000).
Central Valley spring-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FT CT	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Sacramento winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FE CE	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley fall/late fall-run chinook salmon <i>Oncorhynchus tshawytscha</i>	– CSC	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	The Bear River supports an occasional run of adult fall-run chinook salmon in years when flows are sufficient to provide passage (Yoshiyama et al. 1996).
Green sturgeon <i>Acipenser medirostris</i>	FT CSC	In the Sacramento River, adult sturgeon are in the river, presumably spawning, when temperatures range between 8-14°C. Preferred spawning substrate likely is large cobble, but can range from clean sand to bedrock.	Unlikely to occur. Project is located outside of species' known distribution.
Amphibians			
California tiger salamander <i>Ambystoma californiense</i>	FT CSC	Breeds in freshwater ponds or vernal pools, in association with upland areas with small mammal burrows	Unlikely to occur. Project is located outside of species' known distribution.
Western spadefoot toad <i>Spea hammondi</i>	– CSC	Requires vernal pools and seasonal wetlands below 4,500 feet that lack predators for breeding. Also occurs in grassland habitat and occasionally in valley-foothill oak woodlands and orchards.	Unlikely to occur. Project is located outside of species' known distribution.
California red-legged frog <i>Rana aurora draytonii</i>	FT CSC	Breeds in quiet streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 5,200 feet elevation. Known to occur adjacent to breeding habitats in riparian areas, heavily vegetated streamside shorelines, and non-native grasslands. Sierran streams historically supported populations of red-legged frog; however, these populations have been eliminated.	Unlikely to occur. Project supports minimal suitable habitat and species is not known from the project vicinity. Project area is not designated by USFWS as critical habitat or a core recovery unit. However, the project area is in the historical range of the species. Nearest known occurrence is in El Dorado National Forest, near Michigan Bluff (CNDDDB 2004).
Foothill yellow-legged frog <i>Rana boylei</i>	– CSC	Inhabits valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows. Breeds in rocky streams with cool, clear water from 0 to 4,500 feet.	Appropriate habitat present in intermittent drainages within the proposed project site. Nearest known occurrences are located in Missouri Creek Canyon in Tahoe National Forest and Greenhorn Creek, where two adults were detected in 1999 (CDFG 2004).

Name	Status	Habitat	Potential Occurrence
Reptiles			
Western pond turtle <i>Actinemys marmorata</i>	– CSC	Occurs up to 6,000 feet in perennial wetlands and slow moving creeks and ponds with overhanging vegetation. Requires suitable basking sites such as logs and rocks above the waterline.	Appropriate habitat present in Orr Creek Reservoir and stock ponds located within the project area. Nearest known occurrences are located 4 mi. WNW of Newcastle and on Wolf Creek in Nevada County (CDFG 2004).
California horned lizard <i>Phrynosoma coronatum frontale</i>	– CSC	Occurs in riparian woodlands and annual grasslands, exposed sandy-gravelly substrate with scattered shrubs, and clearings from 0 to 6,500 feet.	Appropriate habitat present in the non-native grasslands in the project area. Nearest known occurrences are 2.5 miles west of Highway 49 and 20 Junction in Nevada City and on Alta Vista Road in Grass Valley (CDFG 2004).
Giant garter snake <i>Thamnophis gigas</i>	FT CT	Primarily associated with marshes and sloughs, less with slow-moving creeks, and absent from larger rivers. Nocturnal retreat is holes, especially mammal burrows, crevices, and surface objects. During the day the giant garter snake often basks on emergent vegetation such as cattails and tules.	Unlikely to occur. Project is located outside of species' known distribution.
Birds			
White-tailed (black shouldered) kite <i>Elanus leucurus</i>	– CFP	Inhabits herbaceous and open stages of most habitats mostly in cismontane California. Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands.	Appropriate nesting and foraging habitat present within the project area.
Northern harrier (nesting) <i>Circus cyaneus</i>	– CSC	Frequents meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. Mostly found in flat, or hummocky, open areas of tall, dense grasses, moist or dry shrubs, and edges for nesting, cover, and feeding.	May forage in non-native grasslands and nest in the project area.
Swainson's hawk <i>Buteo swainsoni</i>	BCC CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands, suitable grain or alfalfa fields, or livestock pastures.	Unlikely to occur. Project is located outside of species' known distribution.
Ferruginous hawk (wintering) <i>Buteo regalis</i>	BCC –	Winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County. Prefers open terrain, plains, and foothills. Does not nest in California.	Winter Visitor. May forage in non-native grasslands in the project area.

Name	Status	Habitat	Potential Occurrence
Bald eagle <i>Haliaeetus leucocephalus</i>	FD (Delisted 7/9/07) CE, CFP (nesting and wintering)	Local winter migrant to various California lakes. Most of the breeding population is restricted to northern counties. Regular winter migrants to the region.	Foraging habitat present in Combie Reservoir.
American peregrine falcon <i>Falco peregrinus anatum</i>	Former FE (Delisted on 8/20/99), BCC CE, CFP (nesting)	Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds	Unlikely to occur. No appropriate habitat present in the project area.
California black rail <i>Laterallus jamaicensis</i>	BCC CFP, CT	Forages and nests in tidal emergent wetlands dominated by pickleweed or in brackish marshes supporting bulrushes and pickleweed; Usually found in immediate vicinity of tidal sloughs.	Unlikely to occur due to lack of suitable habitat. Previously unknown populations were recently discovered in the foothills of Nevada County (Tecklin 1990). Known to occur in isolated marshes along Garden Bar Road, McCourney Road, and in and near Spenceville Wildlife Area (CDFG 2004).
Mountain plover <i>Charadrius montanus</i>	BCC CSC	Short grasslands and plowed fields with little vegetation, and open sagebrush areas of the Central Valley from Sutter and Yuba counties southward.	Unlikely to occur. Project is located outside of species' known distribution.
Long-billed curlew <i>Numenius americanus</i>	BCC	Found in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen counties. Winter visitor along the California coast and in the Central and Imperial valleys.	Winter Visitor. May forage in wet meadows in the project area.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	FC, BCC CE	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	Unlikely to occur. Project is located outside of species' known distribution.
Western burrowing owl <i>Athene cunicularia</i>	BCC CSC (Burrow sites.)	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Vaux's swift <i>Chaetura vauxi</i>	– CSC (nesting)	Prefers redwood and Douglas fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes.	Unlikely to occur. Project is located outside of species' known distribution.
Black swift <i>Cypseloides niger</i>	BCC CSC (nesting)	Breeds locally in Sierra Nevada and Cascades. Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Unlikely to occur. Project is located outside of species' known distribution.
Lewis' woodpecker <i>Melanerpes lewis</i>	BCC (nesting)	Winter resident in open oak savannas, broken deciduous, and coniferous habitats with brushy understory. Uses logged and burned areas. Winters in the Central Valley, Modoc Plateau, and the Transverse and other ranges in Southern California. Breeds locally along eastern slopes of the Coast Ranges, and in Sierra Nevada, Warner Mts., Klamath Mts., and in the Cascade Range.	Winter Visitor. May forage in the project area.
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	– CE (nesting)	Wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Breeding seldom occurs below 5,000 feet. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows	Unlikely to occur. Project is located outside of species' known distribution.
Bank swallow <i>Riparia riparia</i>	– CT (nesting)	Migrant found primarily in riparian and other lowland habitats in California west of the deserts. Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean for nesting. Feeds primarily over riparian areas during breeding season and over grassland and cropland during migration.	Unlikely to occur. Project is located outside of species' known distribution.
Yellow warbler (nesting) <i>Dendroica petechia brewsteri</i>	– CSC	Uncommon nester over most of California, except the Central Valley, Mojave Desert, and high elevations of the Sierra. Winters along the lower Colorado River and in parts of Imperial and Riverside counties. Nests in riparian habitats dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas near streams.	May occur in woodland and riparian habitats in the project area

Name	Status	Habitat	Potential Occurrence
Yellow-breasted chat (nesting) <i>Icteria virens</i>	– CSC	Uncommon migrant in California. Nests in a few locations such as Sweetwater and Weber Creeks, El Dorado County; Pit River, Shasta County; Russian River, Sonoma County; Little Lake Valley, Mendocino County; and upper Putah Creek, Yolo County. Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry, and grape.	May occur in woodland and riparian habitat in the project area. Documented nesting at Little Wolf Creek, Bear River, Dry Creek, Indian Springs Creek, Deer Creek, and the Middle and South Yuba River (Nevada Co. Planning Dept. 2002).
Modesto song sparrow <i>Melospiza melodia mailliardi</i>	– CSC	Found in a variety of habitats including: riparian willow thickets, valley oak riparian with an understory of blackberry, ruderal areas along levees and irrigation canals, and cattail and tule marshes.	May occur in riparian habitats in the project area. Known to occur in western Placer County and adjacent Sierra foothill counties (Grinnell and Miller 1944; Gardali 2002).
Grasshopper sparrow <i>Ammodramus savannarum</i>	– CSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches	May occur irregularly in non-native grasslands in the project area. One singing male was found in an annual grassland east of Lincoln; it was only present for a few days (April 1999). A fall migrant was found along Brewer Road (September 1999). (Easterla pers. comm.; Webb 2003.)
Tricolored blackbird <i>Agelaius tricolor</i>	BCC CSC (nesting colony)	Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grassland and cropland habitats. Found throughout the Central Valley and on the coast.	May forage in non-native grasslands and nest in some raw water storage facilities.
Lawrence’s goldfinch <i>Carduelis lawrencei</i>	BCC	Occurs in valley foothill hardwood and valley foothill hardwood-conifer. Breeds in open oak or other arid woodland and chaparral, near water.	May occur in woodland habitats in the project area.
Loggerhead shrike <i>Lanius ludovicianus</i>	– CSC (nesting)	Open habitats with sparse shrubs and trees (or other suitable perch sites) and bare ground and/or low, sparse herbaceous cover; oak woodlands for nesting. Found in lowlands and foothills throughout California	May forage in non-native grasslands and nest in woodland habitats in the project area.
Mammals			
Spotted bat <i>Enderma maculatum</i>	– CSC	Habitats range from arid deserts and grasslands through mixed conifer forests up to 10,600 feet in southern California. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes.	May roost or forage in the project area in all habitat types, but project area outside of species’ historic range.

Name	Status	Habitat	Potential Occurrence
Greater western mastiff bat <i>Eumops perotis californicus</i>	– CSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, chaparral, desert scrub, and urban areas in southeastern San Joaquin Valley and Coastal Ranges from Monterey County south. Typically roosts in caves, crevices or other rock formations. Requires open areas for foraging.	Unlikely to occur. Project area is outside of species' known distribution.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	– CSC	Occurs from low desert to mid-elevation montane habitat. Occurs in rural settings, inland deserts, coastal redwoods, oak woodland of the inner Coast Range and Sierra, and low to mid-elevation mixed forest.	May roost or forage in the project area in all habitat types, but project area outside of species' historic range.
Status Codes			
Federal FE = Federally listed as Endangered FT = Federally listed as Threatened = Federal Species of Concern FC = Federal Candidate species FPT = Federally Proposed Threatened BCC = Birds of Conservation Concern	State CE = California listed as Endangered CT = California listed as Threatened CR = California listed as Rare CSC = California Species of Concern CFP = California Fully Protected		

Status and habitat information is taken from California Natural Diversity Database (CDFG 2004), Zeiner et al. (1990), and USFWS Official Species List

¹ Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009).

Historic and Tribal/Cultural Resources

NID has a variety of historic, tribal, and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan. Domestic water service with the District's service area boundary in the North Auburn area has increased by roughly 40 connections in the last 5 years. Irrigation water service has increase by 180 customers in the 5 year window. A majority of future residential developments within Placer County will occur outside the District's service area boundary.

Development since 2016

In March 2021, the District completed the Combie Phase 1, the main water supply artery into Placer County. In addition, the District has expanded its domestic water supply distribution system into the Placer County

Government Center to support future water needs. The District has annexed 11 parcels in its internal boundary who are eligible to receive irrigation water as feasible.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. The District relies on the city and county planning departments to establish future growth areas. The Districts reviews each growth or building project to assess water supply availability and determine the amount of water needed during drought. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

J.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table J-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Agriculture Pests and Disease

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

The Nevada Irrigation District (NID) is preparing its 2020 Agricultural Water Management Plan (AWMP) and 2020 Urban Water Management Plan (UWMP) due to the State of California, Department of Water Resources in 2021. Because NID is both a municipal drinking water supplier and an agricultural raw water supplier it submits both documents to the State Department of Water Resources (DWR) every five years. These plans contain pertinent information regarding agriculture and water supply and will be available on the NID website after they are finalized at <https://www.nidwater.com/ag-urban-water-management-plans>.

The NID service area covers the Sierra Nevada foothills, which is very different than agricultural areas in the Sacramento and San Joaquin Valleys. The service area topography contains many sloped areas with rock outcroppings, as well as less sloped areas better suited for pasture, orchards, and row crops. The foothill area contains numerous fractured rock systems that allow for private wells, but also complicate the ability to understand and quantify percolation and subsurface systems. Soil types, infiltration rates, and water holding capacities vary widely from a clay dominant soil type to a sandy, alluvial soil type in valley areas.

Summers are generally dry with mild to hot temperatures. Winters are relatively wet, especially in the upper elevations around Nevada City and Grass Valley, with snow levels usually around 3,500 ft and occasionally as low as 1,000 ft. Based on the historical data obtained from the California Irrigation Management Information System (CIMIS) and the Western Regional Climate Center (WRCC), the District's service area's average minimum and maximum monthly temperatures range from 26.4 to 92.5 degrees Fahrenheit.

Location and Extent

The gross acreage of the NID jurisdictional area is 287,000 acres which includes portions of Nevada, Placer and Yuba counties, of which approximately 32,000 acres is irrigated agriculture. These areas are typically in the lower elevation of the District, in the Sierra Nevada Foothills. About ninety percent of all the water delivered by NID is for agricultural use in Nevada and Placer Counties. Most agricultural water customers purchase water seasonally, from mid-April through mid-October. Over the past five years, the District averaged approximately 20 new agricultural customers per year. The District delivers approximately 110,000 Acre Feet of irrigation water annually.

There are multiple crops within the District's service area that vary due to topographical, geological, climatic, and soil condition differences. NID surveys its agriculture customers annually to inventory the type and approximate acreage of crops cultivated by their customers. NID checks the reported value against past reports, but does not verify and validate every report. The customer-provided crop data is in NID's 2020 AWMP Public Draft Crop Reports. Information from the reports is provided to the California State Water Resources Control Board with the District's annual water rights filings. Of the 32,000 acres of irrigated lands, approximately 20,000 acres are irrigated pasture, and family farms, forage, fruit crops and nuts comprise the majority of the remaining acres. Each crop type has a different consumptive use rate, and crops that are more temperature sensitive and vulnerable to climate change will likely require additional irrigation or an extended irrigation season.

NID's water management facilities include storage, treatment, and conveyance facilities. The District operates and maintains nine reservoirs with a combined storage total of 280,085 acre-feet (AF). The two major distribution and storage systems within the District are the Deer Creek System and the Bear River System. These systems are a mixture of canals, siphons, pipelines, and other water conveyance structures. The system is supplied by diverting NID's surface water rights into the canals at either reservoirs or at other diversion facilities located on the streams. Typical canal operations divert enough flow to allow the purchased deliveries to each customer on the canal. To maintain proper flow rates through customer delivery points, the water surface in the canal is maintained at certain levels, as is typical for miner's inch delivery systems. However, this also results in water exiting the canal at the downstream terminus. Many of these spills are then captured again at the next downstream diversion point for another canal.

Past Occurrences

There are no current state or federal disasters in Placer County related to agriculture, however planning scenarios should include a worst case event as impacts associated with climate change and elevated drought risks can trigger disease and pest outbreaks. Although outside of the NID irrigation district area, there are current threats and agricultural concerns that managers and farmers are responding to. For instance, as of July 2017, 200 square miles in south Placer County are under a citrus quarantine after the discovery of the psyllids in western Lincoln in September 2016, and single psyllid in Roseville in June 2017. The found psyllids did not test positive for the disease, but as a precautionary measure a quarantine has been put into effect for Lincoln, a significant portion of Roseville and portions of Rocklin and Granite Bay. (<https://www.placer.ca.gov/1554/Mandarin-Threat>).

Vulnerability to and Impacts from Agriculture Pests and Disease

According to the USDA, every year natural disasters, such as droughts, extreme heat and cold, floods, fires, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. More specific impacts by hazard were listed in Section 4.3.6 of the Base Plan.

In addition to threats to agriculture from weather and other natural hazard events, agriculture in the County is at risk from insects, pests, and noxious weeds. Establishment of an invasive species would be detrimental to the agricultural industry of Placer County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem.

In addition, invasive weeds can increase fire risk in the County.

Assets at Risk

NID does not own agricultural lands, however it does provide water for irrigation in Placer County. Due to the potential for widespread impacts, specific agricultural hazards associated with climate and water availability may have significant impacts that are widespread in the region. The potential for these impacts is correlated with climate change and local climate factors, as well as natural cycles of disease and pests. According to Placer County data, approximately 11% of employment is attributed to agriculture in Placer County, with significant growth in small farms and the “farm to fork” operations.

The potential for damages and interruptions within this water system are associated with the terrain that the canals and reservoirs flow through and associated potential for drought, wildfire, landslides, flooding, hazardous trees and anthropogenic disturbance. The District’s water supplies are very vulnerable to drought and are expected to be further impacted by climate change. The supply system relies on spring and summer snow melt runoff, as well as capture and storage in reservoirs to release during the irrigation season. During droughts and periods of warmer winters when there is less snowpack, runoff is reduced, and the District must manage its storage and customer demands to meet requirements. The most prominent and obvious cause for the fluctuation in natural runoff is the variability in hydrologic conditions, as seen in the wide variations in annual rainfall/snowpack accumulations. The supply availability reduction is dependent on the severity and length of the drought. In addition to the hydrologic impacts on NID’s supplies, there can also be regulatory reduction as well, as during the last drought the State mandated supply curtailments and NID was not able to access its available supply.

Avalanche

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Road and highway closures, damaged structures and critical infrastructure, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type

of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Areas prone to avalanche hazards include hard to access areas deep in the backcountry and those in the more developed higher elevations of the County in the Tahoe basin. Avalanche hazards exist in eastern Placer County where combinations of the above criteria occur.

Past Occurrences

There have been no state or federal disasters in the County related to avalanche. Heavy snow in the early 1990's blocked water flow in the South Yuba Canal and created constraints on the Districts water delivery system. Emergency pumps were brought in to pump water from Scotts Flat as a backup while the snow was cleared.

Vulnerability to and Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

NID has critical water supply facilities in the high alpine watershed that supply a majority of the District's annual water needs. These facilities are located in remote, steep terrain that is subject to avalanche during heavy winters. The primary danger with an avalanche is the potential for blockage of canals and damage to the many elevated flumes relied upon for conveyance.

Heavy snow in the early 1990's blocked water flow in the South Yuba Canal and created constraints on the Districts water delivery system. Emergency pumps were brought in to pump water from Scotts Flat as a backup while the snow was cleared. The District has completed a permanent pumping facility as an emergency backup supply should future heavy snows or avalanches damage District facilities on the Nevada County branch. Most of the water supply facilities are shared between the District and PG&E. Both agencies would coordinate to facilitate necessary repairs.

Assets at Risk

An avalanche that cuts water supply from Spaulding Reservoir has the potential to affect domestic and irrigation water supplies, powerhouse generation, and have a negative effect on recreation at the local reservoirs

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Climate models predict that the Sierra Nevada Region will experience warming average annual temperatures ranging from an increase of 2°F - 4°F in the winter and 4°F - 8°F in the summer by the end of the century. This shift to a warmer climate is expected to have wide ranging effects on the annual weather conditions, snowfall, forest health, water availability, and wildfire. One of the most concerning impacts of climate change on the District is reduced forest resilience and the projected decrease in annual snowpack accumulation due to the transition of average annual precipitation from snow to rain caused by increasing temperatures. As a headwaters region, snowpack is the largest source of storage within the NID system, and the series of reservoirs rely heavily on the timed release of water in snowpack to recharge reservoirs into the late summer when rain no longer falls. Actively managing forested landscapes can help NID address climate change impacts, prepare for the future, and reduce risks (such as wildfire ignition) that are exacerbated by a warmer climate.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

The effects of climate change are variable across the whole of the District service area. Increasing average temperatures and a shift in winter precipitation from snow to rain will have immediate effects on the function of NID’s water collection system; especially in the upper elevation snowpack. Lower elevations may see more variability in weather conditions, drought, and severe storm events which are a risk to operation and maintenance of the water system due to the unpredictability and potential to damage infrastructure.

Wildfire is one hazard that is significantly influenced by increased average temperature, drought, and excessive tree mortality impacts of climate change. All elevations of the District have the potential for severe damages in the event of a catastrophic wildfire.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

The District noted that due to the long-term nature of climate change, no one disaster can be directly attributed to climate change alone. Climate change has exacerbated many Nevada County disasters by increasing the frequency of hazardous weather conditions, decreasing snowpack, increasing the likelihood of flood, and intensifying wildfire.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

The direct impacts of climate change on District facilities, water conveyance system, or and operations are broad. Drought can impact stream flow, water supply, and lead to conflicts between environmental and anthropogenic uses. Increased wildfire potential, and increased burn severity can destroy infrastructure as well as have long-lasting impacts to the watersheds NID collects water resources from. Increased flows due to excessive or above average runoff can impact infrastructure designed for a historic flow regime by over topping

Assets at Risk

All District assets which are impacted by wildfire, decreased water supply, decreased snowpack, increased runoff, or excessive tree mortality and hazard trees are at risk.

Dam Failure

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

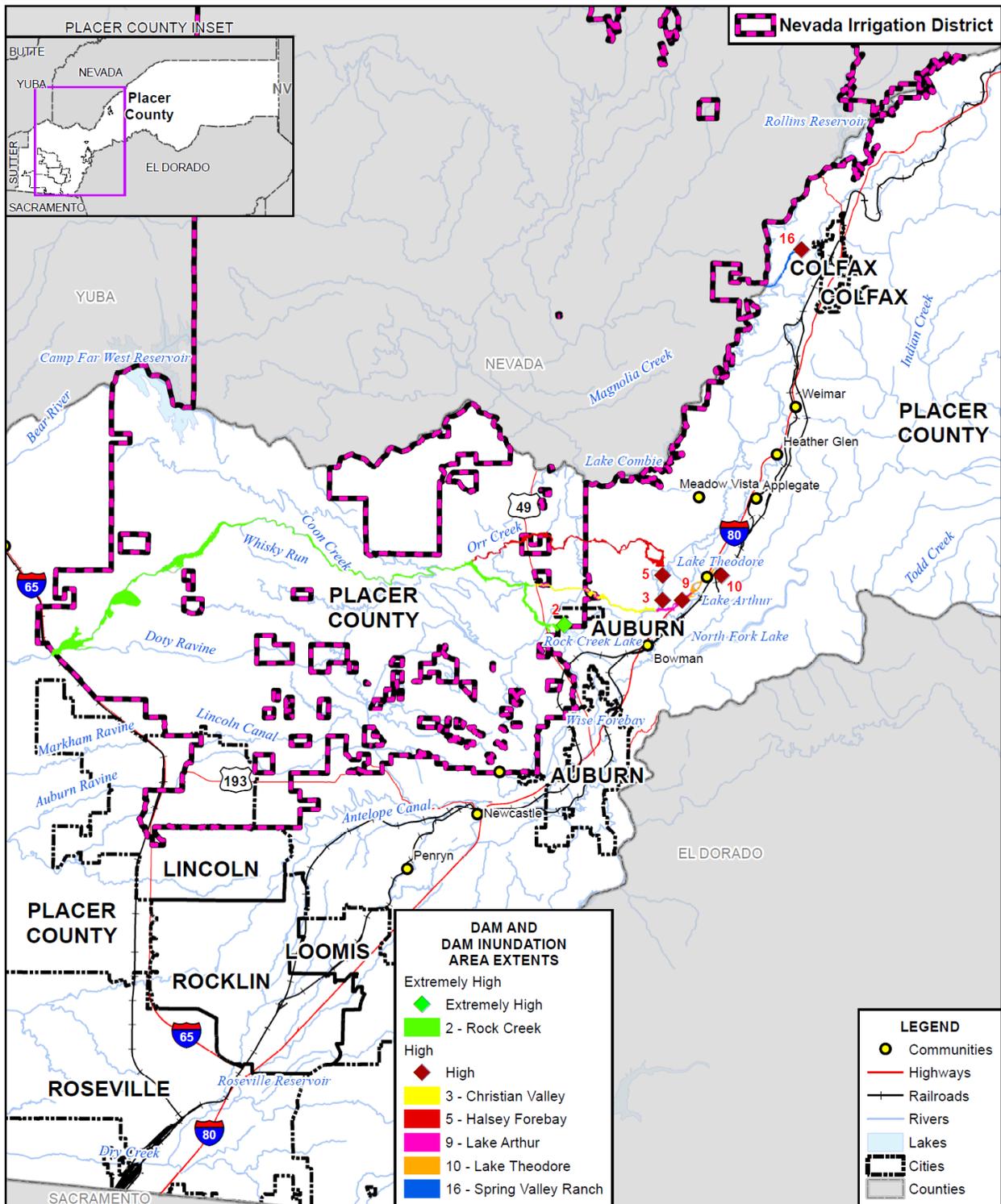
Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as flooding or an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

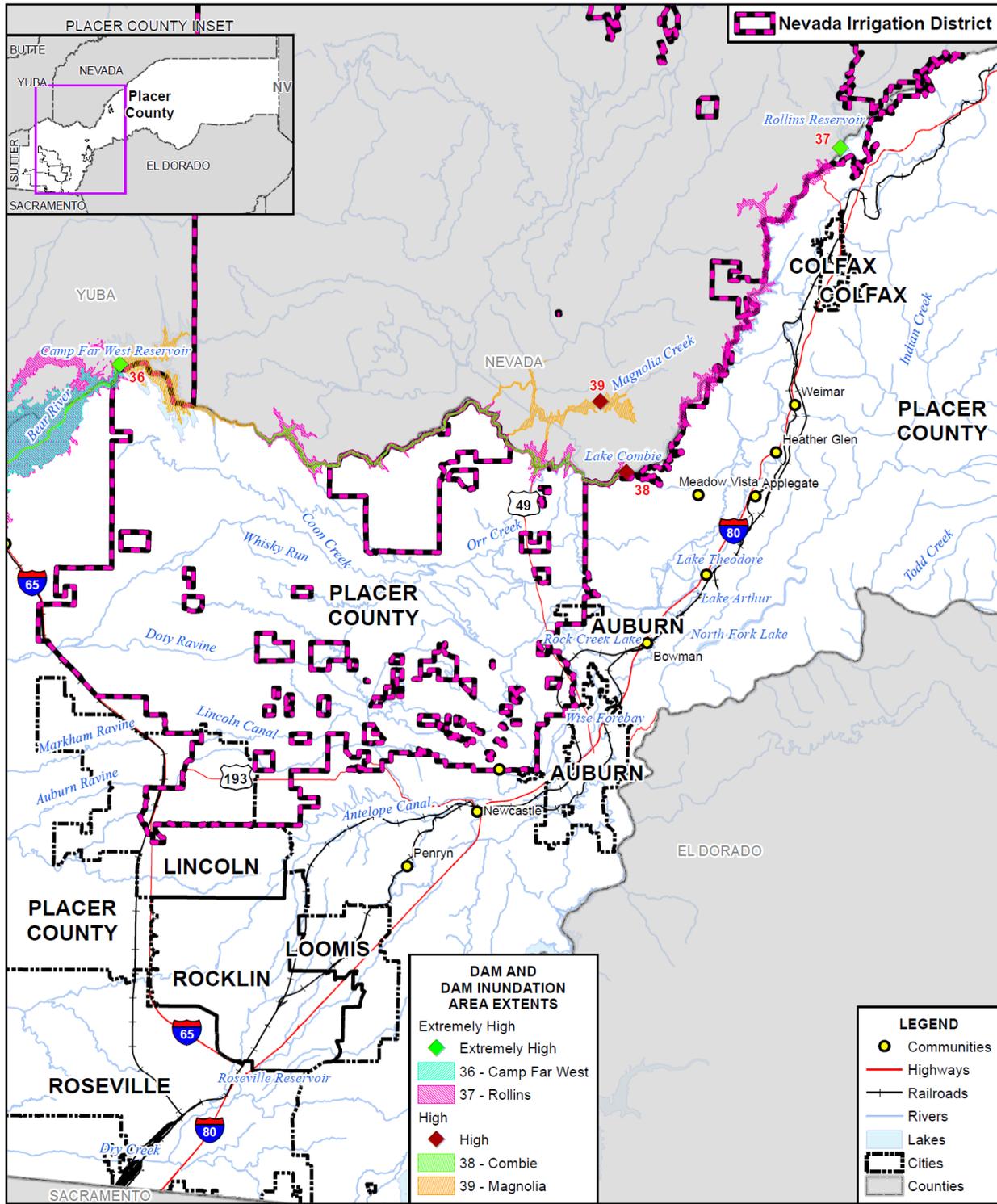
Dams inside the County that can affect the District can be seen on Figure J-2. Dams outside the County that can affect the District can be seen on Figure J-3.

Figure J-2 NID – Dam Inundation Areas from Dams Inside the County



Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Figure J-3 NID – Dam Inundation Areas from Dams Outside the County



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0 5 10 Miles

COUNTY OF Placer

Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

NID owns several dams of concern. The District's highest dam is the rock fill-earth core dam at Rollins Reservoir, built in 1965 and standing 242 feet tall. The Jackson Meadows dam (1965) is second highest at 195 feet, Bowman North Rockfill Dam is 178 feet, Scotts Flat dam (1965) is 175 feet, and the Bowman South Arch dam (1925) is 171 feet high.

French Dam, constructed in 1858-59, is the District's oldest dam still in use. Other dams that originated in the 1800s include the Bowman Rockfill dam (1872), and Faucherie, Sawmill and Jackson, all constructed prior to 1880 and have since been entirely torn down and rebuilt at different times. In the lower division, Van Giesen Dam at Combie Reservoir is the oldest, built in 1928. Additional information related to NID's dams can be found on its website at: <https://www.nidwater.com/dam-safety>.

Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Based on analysis provided in the Placer County General Plan Background Report, only five dams within Placer County have the potential to affect more than 100 persons: Folsom Dikes No. 5 & 6; Lake Tahoe Dam; Camp Far West Dam; Lake Combie Dam; and Rollins Reservoir Dam. Of these five, a failure of Rollins Reservoir or Combie Dams could potentially impact areas within the NID. Failure of Dutch Flat Forebay or Afterbay could also potentially impact services provided by NID, albeit in a limited capacity.

Assets at Risk

All District assets are at risk in the event of dam failure due to the loss of water in the overall system.

Drought & Water Shortage

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and

economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages, or it can last for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table J-7.

Table J-7 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan. Specific past occurrences for the District include:

A severe drought that affected the District and all of California is the drought of **1977-1978**. This drought was severe enough to trigger implementation of the District’s Drought Contingency Plan at the most restrictive level – that of mandatory rationing and reduction in service to irrigation customers up to 50%.

The 1991-1992, drought also severely impacted the District and other areas of Placer County and surrounding California foothills.

After 2 years of below-average rainfall and very low snow-melt run off, Governor Schwarzenegger in June of 2008 declared a state of emergency for drought conditions statewide. The final California Department of Water Resources showed snowpack water content at only 67 percent of normal.

The District experienced below average precipitation and minimal snowpack from 2012 to 2015 and again from 2017 to 2020. Current precipitation conditions are below average as well. In 2014 the District recorded a snowpack reading of 5% of average, the lowest snowpack reading since it began collecting this data in 1921. Governor Brown declared a state of emergency and the State Water Resources Control Board restricted water use and curtailed many of the Districts water rights. The limited water supply along with the States mandated actions necessitated the enactment of the Districts Drought Contingency Plan. Mandatory reductions of 36% were required for all treated water customers, while ag water customers provided voluntary cutbacks. Throughout the drought, the District proactively managed its water resources during the dry years through conservation and careful water management. The District also purchased supplemental waters from neighboring agencies to help bolster supply.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. However, climate change impacts are trending towards more variable weather events, and therefore, unpredictability of drought. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

With the unknowns of drought and globally changing climate conditions, NID, more than ever, is promoting water conservation and expansion of storage.

Continued prolonged drought would be detrimental to the District's finances. As people are asked to conserve, water use reduced, resulting in decreased revenue. Additionally, during drought, the District purchases supplemental water supplies to bolster reservoir storage. The expense of purchasing water can eclipse 2.5 million dollars.

Assets at Risk

The main asset at risk during drought is the financial health of the District. The loss of water sales in combination with additional water purchases expenses is detrimental to the District's funds. In addition, District hydroelectric powerhouses would be shut down due to limited natural flows, thus providing another hit to District finance via loss of power generation.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismic shaking maps for the area show Placer County and the District fall within a low to moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The NID is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Earthquake vulnerability for the District lies in the water delivery infrastructure and not in its buildings. Earthquakes can cause a separation of underground water supply mains causing flooding and ultimately leading to water supply interruptions.

Earthquakes also have the potential to cause failures of the canal berm/levee system and cause flooding and supply water interruptions.

Additionally, the District is responsible for multiple water storage dams that are susceptible to damage and potentially major flooding during a large earthquake event. The District's Dam facilities are under the jurisdiction of the CA Department of Dam Safety and the Federal Energy Regulatory Commission which require adherence to a strict set of safety guidelines and Dam safety protocol.

Assets at Risk

A strong earthquake has the potential to cause damage to nearly all District facilities.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional/Unlikely

Vulnerability–High

Hazard Profile and Problem Description

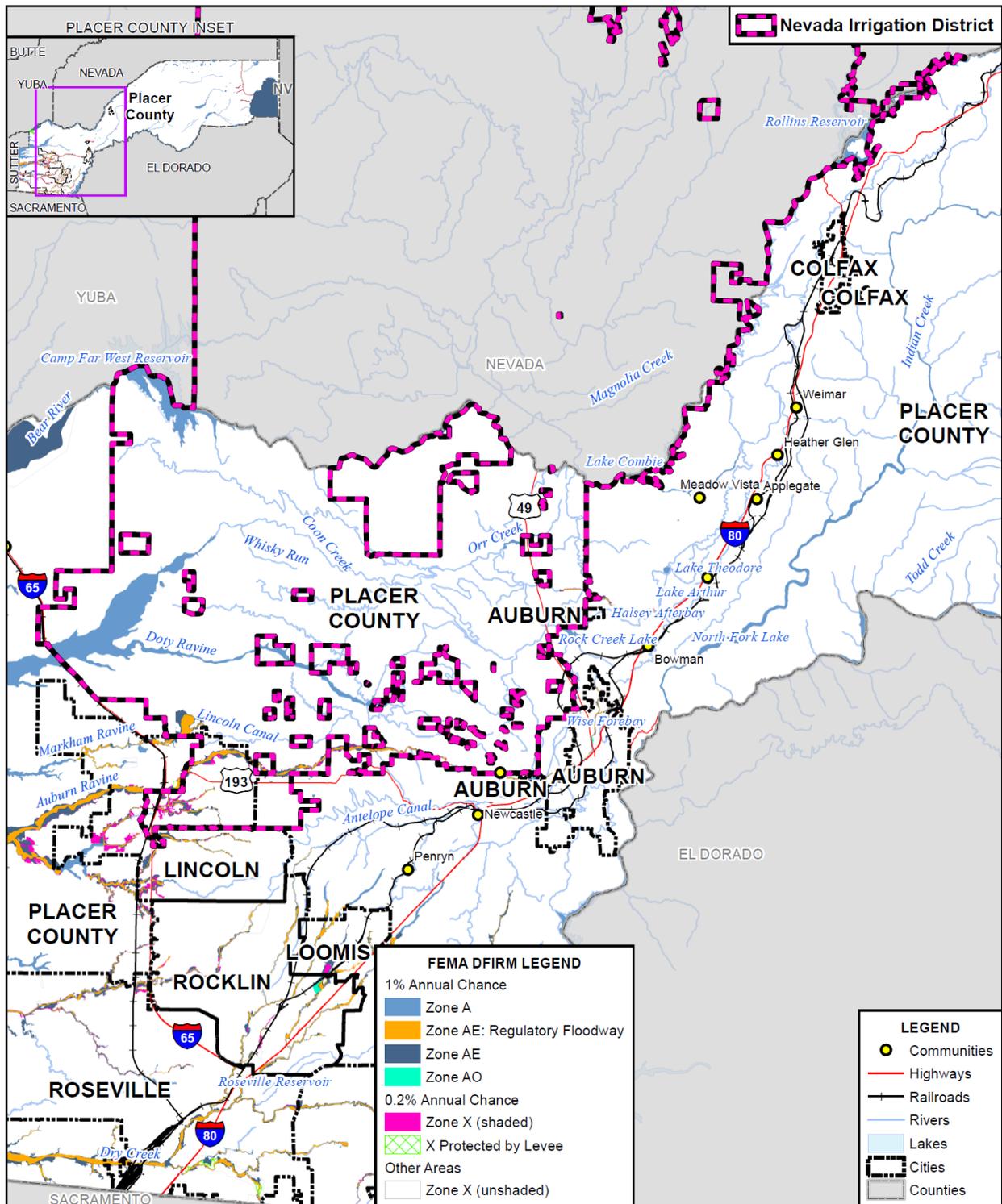
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the NID have been subject to historical flooding.

Location and Extent

The NID has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure J-4.

Figure J-4 NID – FEMA DFIRM Flood Zones



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0 5 10 Miles

COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table J-8 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table J-8 NID– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table J-9. These events also likely affected the District to some degree.

Table J-9 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Heavy prolonged precipitation in late 1996 caused flood damage across much of the District’s service area. President Clinton proclaimed the area a disaster area while Governor Wilson followed suit. Many of the Districts main diversion dams and canals were washed out. Over 50 applications for flood damage assistance for the repair of NID facilities were submitted to FEMA and Cal OES.

Another flood event to impact the District is the late December floods of 2005. Excessive rain for a prolonged period caused severe flooding in the Sierra foothills, in and around Placer County. Impacts included damage to the District’s canal system as well as damage to roads and properties throughout District boundaries.

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Flooding and soil erosion due to heavy rains and snow runoff have been a historical problem throughout Placer County. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and flooding. Water flow can be high in peak runoff periods with historical downstream flooding. The primary impacts from flooding within the District include damage to roads, utilities, bridges; and flooding of homes, businesses and critical facilities. Flooding has also caused canals to overtop and erosion of the canal levees.

Assets at Risk

All District assets are potentially at low risk of this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The NID is subject to localized flooding throughout the District. The Districts treated water system is susceptible to localized flooding damages from concentrated storm water runoff causing erosion of soil and exposing the water main. The exposed water main is then weekend and vulnerable to breakage due to the loss of securing soils. Treated water pipelines also have the potential to cause localized flooding during water main breaks. The District's canal systems are subject inundation and overtopping during a localized flood event. The overtopping can lead to property damages.

Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. Past flooding incidents, although minor in scope, have occurred on nearly every District canal. Occasionally the District will receive a claim for localized flooding of property due to an overtop in a canal from heavy rains. The District experiences on average ten to twenty of these types of claims annually.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

NID supplies both drinking and irrigation water to portions of Placer County. The conveyance of water is accomplished through over 400 miles of pipe and nearly 500 miles of open canal. Both the water pipelines and canal facilities are subject to damages from localized flooding.

The District's treated water system is susceptible to localized flooding damages from concentrated storm water runoff causing erosion of soil and exposing the water main. The exposed water main is then weekend and vulnerable to breakage due to the loss of securing soils. Treated water pipelines also have the potential to cause localized flooding during water main breaks.

The District performs ongoing canal rehabilitation to fortify facilities to bolster against storm water infiltration. In addition, the District has finished the replacement of the Combie Ophir 1 canal, a major water delivery system to Placer County.

Assets at Risk

The Districts canal water systems as well as the domestic water supply systems are assets that are most vulnerable to localized flooding.

Landslide, Mudslide, Debris Flows

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Debris flows, can also occur in some areas of the County and the District. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows are also common during the rainy season in post fire areas.

Landslides have the potential to displace or cutoff water supply canals and distribution lines supplying District customers.

Location and Extent

Landslides, mudslides, and debris flows can affect certain sloped areas of the District. The CGS has estimated that the risk varies across the District and has created maps showing risk variance. This risk variance falls into multiple categories. These are discussed in Section 4.3.14 of the Base Plan. According to the District Planning Team, risk varies within the District range from low to high. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Past Occurrences

There have been no federal or state disaster declarations in the County from landslide. The District Planning Team noted the following past occurrences of landslides.

In 1980, NID experienced a major landslide that caused the Combie Phase 1 canal to wash down the mountain side and into the Bear River. In addition to the loss of water supply to much of Placer County, the mud and debris that flowed into the Bear River system necessitated a major environmental cleanup.

In 2011 the PG&E – Bear River Canal suffered a landslide that rendered the canal inoperable for over a month. The canal is one of the main water supply arteries for Placer County. Local water purveyors including NID and PCWA had to enact Water Shortage Contingency Planning and ration water supplies to Ag water customers until repairs were complete.

In 2017 A landslide destroyed an elevated flume section of the South Yuba Canal and interrupted water flows into Nevada County for four months. Alternate supplies and conservation became key to making it through the episode

Vulnerability to and Impacts from Landslide

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity.

Heavy rain events during the winter months tend to destabilize the soils on many of the steep hillsides that NID's Canals flow through. These destabilizations can cause minor landslides or debris flows that slide into or block NID canals. In addition to the blockage, the flows within the canal only exasperate the problem as the water backs up and overflows the berms thereby creating an even more destructive mud/ debris flow.

Impacts in the District may be to structures, infrastructure, and to life safety.

Assets at Risk

Localized flooding has the potential to affect the Districts canal systems, small reservoirs, treated water distribution system, and the North Auburn Water Treatment Plant.

Levee Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

A majority of the nearly 500 miles of NID canals are manmade and were designed with small levees to direct the flow of water. These canals levees are vulnerable to failure for a multitude of reasons including but not limited to, overtopping flows, rodent and varmint intrusion, vegetation weakening, etc.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees. While the District is not located in areas protected by levees constructed for flood control purposes and seen in the most recent FEMA DFIRMs, the District has over 400 miles of NID canals designed with small levees to direct the flow of water.

Past Occurrences

There have been no federal or state disaster declarations from levee failure. The last levee/canal berm failure occurred in 2012 and caused damage to multiple private properties. Small scale levee failures occur nearly every year during extreme thunderstorm type events. Most of the overtopping's or failures are minor in nature and can be fixed in short order through ongoing maintenance activities.

Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach. When a levee is breached, the flows contained within the canal escape and flood the surrounding private properties including private residences.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Much of the District's 500 miles of canal include a berm for entrapment of flows. These canal berms can be classified as small scale levees. Failure of the levee allows irrigation water to escape the normal water conveyance canal and causes flooding and erosion of the natural landscape. In some cases, these levee breaches can cause damages to private properties.

Assets at Risk

Water and Canal Systems are the assets at risk of a levee failure

Pandemic

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table J-10.

Table J-10 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme heat events are closely related to drought, climate change, and tree mortality when it comes to impacts to District operations. Extreme heat events can range in severity and duration, leading to varying increases in water demand/use along with hazardous work conditions for employees who work outdoors to maintain District function. Extreme heat events typically occur at lower elevations in western Nevada County and can last for short or long periods of time, though climate change may create variations to these

conditions that push the reach of affected areas higher in elevation for a longer duration. Extreme heat events can have fatal effects on native vegetation and trees, leading to stress, partial/complete failure, or increased mortality. Extreme heat events have the potential to cause earlier melt off of snowpack, should these events occur earlier in the summer, leading to water availability issues in the late summer when resources are needed most.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

NID covers both the lower and upper elevations of the County. Separate location and extent discussions for these areas follow. Lower elevations of the District Service area are more vulnerable to extreme heat events as average temperature in these areas are lower than those seen in higher elevations. High elevation forest communities may experience stress from extreme heat events as the likelihood of extreme heat at these elevations and the forest community's natural adaptations to extreme heat may be low.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

The district has been affected economically by PSPS shutdowns. Because it is not reasonable for a water utility to halt operations for any extended period of time, the District has invested in backup generators at key facilities so there is no interruption in service. These facility upgrades cost \$296,974 and NID's hydropower generation is also significantly affected during this power shut-off events.

The District has experienced multiple PSPS related outages during the event period. The loss of power at District facilities has limited both treated and irrigation water supply availability within Placer County. The District was able to mitigate these events with the rental of portable generators, however this is a temporary solution. Future mitigation will occur with the installation of a permanent stationary generator at the North Auburn Water Treatment Plant.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts, including loss of life, are the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

District powerhouses, water treatment plants and offices all run on external power provided by PG&E. In the event of prolonged PSPS events, these assets run a vulnerability risk.

Assets at Risk

District powerhouses, water treatment plants and offices are at risk from this hazard. A PSPS event affects the District's North Auburn Water Treatment Plant, and the Edgewood and Magnolia canal systems.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include extreme cold and freezing temperatures, heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Extreme Cold/Freeze and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Location and Extent

NID covers both the lower and upper elevations of the County. Separate location and extent discussions for these areas follow.

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F

in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table J-11.

Table J-11 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Past freeze / snow events have led to disruption of water flow in the Districts Mountain Division. In 2017, a heavy snow event occurred that halted access to the Districts facilities that supply water to the Placer County corridor. In addition to the flow issues, snow had filled in the canal. Crews initially tried access via helicopter, but continue inclement weather limited that. Eventually, crews utilized snow cats to gain access an event that took multiple days to gain access and another couple of days to clear snow from the canal. This is just a single example of how freeze and snow events could detrimentally affect water supplies. These events happen on a regular basis.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

NID is subject to multiple hazards during severe freeze events. First, NIDs High Sierra facilities are vulnerable to freezing so severe that the waters within the supply canals become solid ice. When this occurs, water deliveries to the system become impossible. NID has experienced multiple events where crews were sent out day and night to break ice to keep water flowing to critical water treatment facilities.

Second, freezing in the lower reaches of NID's service area where customers are not acclimated or prepared for cold temperatures causes freezing of water distribution systems and burst pipes. Once the pipes thaw, water free flows through the broken pipes and creates water demands that NID treatment systems have a tough time keeping up with.

Lastly severe winter weather with freezing and heavy snow makes access to the District's mountain division conveyance facilities nearly impossible. The District is equipped with snow cats, snow mobiles, and tracked sided by sides, yet access during inclement weather can takes days.

Assets at Risk

The District's Water Canal Systems are at risk from this hazard.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months, depending on the location in the County.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding. Heavy rain, thunderstorm activity, and hail usually occur on an annual basis in the NID service area.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Often during heavy rain events, the raw water distribution system can be impacted. Heavy runoff from storm activity can cause excessive water in District canals resulting in an overtopping of the canal. An overtopping will washout the canal berm resulting in localized flood damage and interruption of the water supply. On an annual basis the District receives 20 to 40 claims stemming from these overtopping events.

Assets at Risk

The District's Water Canal Systems are of the greatest risk to heavy rains and storms.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also cause PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring, primarily in the western part of the County.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District, but would more likely occur in Western Placer. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the lower and middle elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

Assets at Risk

All District assets from Table J-4 are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer and Nevada County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, effect overall forest health, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

Tree mortality is a risk to the District's canal systems. As trees die and rot, they become weak and fall. In 2013, the District experienced a wind event that caused many of the standing dead trees to fall across elevated fume sections of the Districts water supply canal. The District coordinated with PG&E on clean up and repair which took over a month. During this time, District customers were required to conserve water use until repairs could be completed.

The District budgets tens of thousands of dollars annually for hazard tree removal in campgrounds where public safety is paramount and at other vulnerable District facilities, including the vicinity around water treatment plants.

Vulnerability to and Impacts from Tree Mortality

Placer and Nevada Counties are unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the counties.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban interface (WUI) or urban areas pose a greater risk to due to their proximity to residents, businesses, and road, power, water, and communication infrastructure than dead or dying trees pose in remote areas with no nearby structures, infrastructure or recreation areas.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

The District owns open watershed lands as well as properties in the WUI which contain key infrastructure and recreation areas with numerous potential targets. Depending on the size and location of hazard trees, removal of part or all of the tree can be both difficult, risky, and costly in some cases. Every year, trees are identified on District property that are adjacent to significant targets, both District-owned and private. The District is vulnerable to the risk of damage caused by tree failure, the financial burden of preemptive removal, and the potential liability of neglecting to remove significant hazards on time.

In addition to infrastructure and human health and safety concerns, excessive tree mortality has an impact on forest health and wildfire risk in affected stands. Trees killed by pests and disease have the potential to

spread these illnesses to healthy live trees, decreasing overall forest health. Downed and standing dead and dry woody material additionally increases the risk of extreme wildfire, leading to a potential loss of large tracts of forest land. This has significant effects on water quality and quantity, water availability, and sedimentation into liquid storage reservoirs. Post wildfire forests may take many decades to recover, and they have significant impacts on downstream storage reservoirs and water system infrastructure.

Assets at Risk

Most notable assets at risk are canal systems, campgrounds, buildings/structures, and power lines in striking distance from dead, dying, or damaged trees.

Wildfire

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

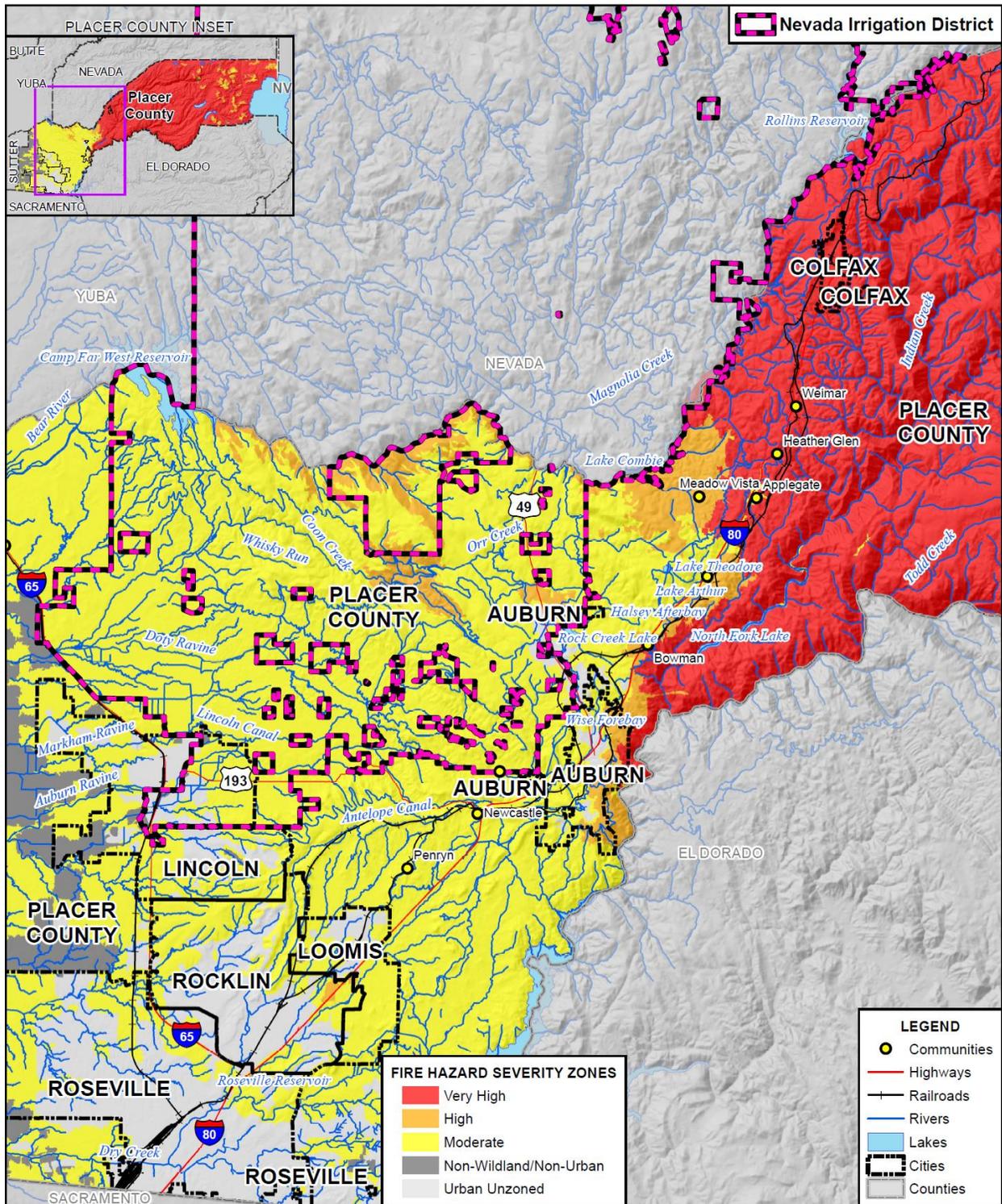
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the NID. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural fire regime. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the NID were created. Figure J-5 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from Urban Unzoned to Very High.

Figure J-5 NID – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table J-12.

Table J-12 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The Washoe Fire in August **2007** had impacts to the NID. This fire occurred in the wildland urban interface area of the Tahoe Park and Tahoe Woods subdivisions, along the west shore of Lake Tahoe. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to the west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89 in West Lake was closed for a period of time.

2009. The wind driven 49er Fire occurred in the urban sections of North Auburn and burned through the Districts North Auburn Water Treatment Plant. 62 homes were destroyed and infrastructure damaged. Power remained out for multiple days making the production of potable water to the area difficult.

2015 The Lowell Hill burned along Bear River corridor and through many of the of the District’s water conveyance facilities. Access to canal systems was impossible and the threat of contaminants from firefighting activities was a concern. In addition, the Districts powerhouses were knocked offline during the event.

The most notable recent wildfire to impact the District was the Jones Fire in 2020. The wind driven fire occurred in the South Yuba River canyon and burned over the Districts Newtown Canal. 21 structures and 705 acres were burned during the 12 day fire, having impacts to communities as well as infrastructure and the health of the landscape within the burn area.

Air quality considerations are a vulnerability when particulate AQI index reaches unhealthy levels, it becomes a safety concern for staff to be in the field. Additional PPE and rest periods are necessary to keep staff safe.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this

section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The size in acreage and the severity of wildfire in California is increasing. Five of the top twenty largest California wildfires occurred in 2020. The deadliest and most destructive of which was the Camp Fire which burned over 150,000 acres, 18,000 structures, and caused at least 85 fatalities in 2018. The massive scale of this wildfire had significant impacts to not only the public, but utility infrastructure as well. Costs of disaster related debris removal, emergency protective measures to protect life and property, and permanent repair to damaged or destroyed infrastructure, including repair and replacement of Paradise Irrigation District's water system features, reached more than \$129 million,

All of the Districts Mountain Division infrastructure is located within an extreme fire threat zone. A major fire in this area has the potential to cut off water supply to Placer County. In addition, District infrastructure is vulnerable to burning during a fire. Damage to any of these facilities may take a long period of time to facilitate repairs.

Assets at Risk

All District assets are vulnerable to wildfire damages.

J.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

J.6.1. Regulatory Mitigation Capabilities

Table J-13 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the NID.

Table J-13 NID Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	Last update 2011. The plan covers the expected expansion of District facilities over the next 30 years. The hazards covered include the expected flow ranges thus allowing for upsizing of pipes and canals to prevent storm water flooding. The District is in the process of updating this Raw Water Master Plan in the fall of 2021.
Capital Improvements Plan	Y	Ongoing annually. Projects are initiated based on Master Planning, facility inspection, and available capacity.
Economic Development Plan		N/A
Local Emergency Operations Plan	Y	The District has multiple Emergency Plans that are updated annually. These plans cover emergencies ranging from treated water supply to a major dam failure.
Continuity of Operations Plan		In development
Transportation Plan		N/A
Stormwater Management Plan/Program	Y	Storm water management is covered by District policy. The policy states all future facilities will be designed in a manner that does not allow storms water to infiltrate District canals.
Engineering Studies for Streams	Y	Studies are ongoing for stream health, flow rates, and ramping rates.
Community Wildfire Protection Plan	N	Covered in our Emergency Response Plans.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		The District also maintains a drought contingency plan to assist water management during periods of drought or water supply shortages, a Public Safety Plan for FERC Facilities, an Owner's Dam Safety Plan for dams; a Vegetation Management Plan for powerhouses, powerlines, penstocks, and canals/flumes; and an Illness and Injury Prevention Plan.
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	Version/Year: N/A

Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:
Fire department ISO rating:	N/A	Rating:
Site plan review requirements	N/A	
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	N/A	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	
Flood insurance rate maps	N/A	
Elevation Certificates	N/A	
Acquisition of land for open space and public recreation uses	N/A	
Erosion or sediment control program	N/A	
Other	N/A	
How can these capabilities be expanded and improved to reduce risk?		
The District will continue to update and add to plans that mitigate hazards in the District.		

Source: NID

As indicated above, the District has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

NID Agricultural Water Management Plan, 2015 – Updated 2021

The Agricultural Water Management Planning Act requires all agricultural water suppliers that provide water to 10,000 or more irrigated acres to adopt and submit an AWMP to the California Department of Water Resources (DWR). The purpose of the Act is to evaluate water use and applicable management practices to make the best use of available resources. The District’s AWMP also addresses the new AWMP requirements established by the Governor in Executive Order B-29-15 (April 1, 2015), and listed below.

- Prepare a Drought Management Plan that describes the actions and measures the supplier will take to manage water demand during drought; and,
- Quantify water supplies and demands for 2013, 2014, and 2015, to the extent data is available.

This AWMP addresses the District’s water system and includes a description of the service area, water uses, water resources, and a comparison of water supply and water demands during the planning cycle (2011 through 2015). Also described are the District’s water supply reliability, water use efficiency information, water shortage allocation policies, and Drought Management Plan. Urban Water management Plan, 2015 – Updated 2021 The Urban Water Management Planning Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to adopt and submit a UWMP every five years to the California Department of Water Resources (DWR). The Act describes the contents of the UWMP as well as how

urban water suppliers should adopt and implement the UWMP. This UWMP addresses the District’s water system and includes a description of the service area, water use, water supply sources, and a comparison of water supply and water demands during normal, single dry, and multiple-dry years. Also described is the District’s water conservation program.

Raw Water Master Plan, 2013 – Updated 2022

Nevada Irrigation District’s Plan for Water was last updated in 2005 and adopted in 2013. The plan helps guide decisions related to the water system over the next 50 years. Long range planning ultimately involves forecasting & projecting future conditions based on realistic, valid and supportive assumptions. Regardless of the technology, science, or process used, assumptions still must be made to produce a forecast. The District is updating the plan to reflect changes in water demand, supply and the potential effects of climate change. The plan is an organizational tool that seeks to align resource decision making with community values and District operational needs, including technical and cost criteria requirements. When complete the plan will show how a variety of future water supply and demand scenarios could be integrated to ensure our community enjoys the same high-quality, reliable water system we have now. The Plan for Water is born of the FERC relicensing effort, climate change impacts, financial requirements, and new regulatory requirements. The Plan for Water does not re-analyze or revisit any new requirements set by FERC or the State. Instead, it sets these requirements as the new normal, and looks ahead 50 years to anticipate potential supply/demand scenarios and identify alternative solutions

Vegetation Management Plan

The Vegetation Management Plan (“VMP”) addresses vegetation modification guidelines and best practices to minimize wildfire risk associated with the District’s powerhouses and related transmission lines, penstocks, and flumes located within the District’s boundary in both Nevada County and Placer County, California. The VMP has been developed to identify best management practices for vegetation management methods and applications for the District’s seven (7) powerhouses and their associated transmission lines, penstocks, and canals/flumes. The VMP was also developed with the inclusion of invasive weed management, revegetation, and human and resource protection measures as appropriate. The purpose of the VMP is to provide fire prevention procedures, reporting, and safe fire avoidance and suppression practices for District personnel and contractors responsible for operating and maintaining the existing District hydroelectric facilities. A primary purpose of the VMP is to establish procedures and protocols for management of native vegetation and treatment of invasive weeds in order to maintain a desirable environmental condition that is consistent with the safe and effective operation and maintenance (O&M) of District hydroelectric facilities. The VMP contains descriptions of specific vegetation management actions, including treatment of invasive weeds, which the District will use to achieve desired conditions in and around project-related transmission corridors, hydroelectric facilities, and access roads that are associated with each of the District’s seven powerhouses. The vegetation management strategies outlined in the VMP describe how the District will achieve a variety of desired conditions, dependent on the type of site, from bare ground (powerhouses and switchyards) to compatible native vegetation communities (penstocks and transmission corridors).

Emergency Action Plan

The Emergency Action Plan (EAP) is to reduce the risk of loss of life, injuries, and damage to property that could occur in the unlikely event of a failure or operational incident at one or more of the Nevada Irrigation District (NID/District) facilities covered by the EAP.

It has been determined that water storage behind the dams making up the Yuba-Bear Project, Combie Dam, Scotts Flat Dam, Deer Creek Diversion Dam, and Loma Rica Airport Dam may present a potential hazard to downstream inhabitants and property in the event of a dam failure. To minimize the chances for loss of life and damage to property, it is important to respond quickly to a potentially hazardous situation and to provide a coordinated effort with clearly assigned areas of responsibilities.

Timely detection and identification of a dam safety emergency is a necessary component of planning and operation of dam facilities. Once an emergency situation is identified, proper evaluation, classification, and notification to internal and external agencies is critical for reducing downstream effects and the potential for loss of life. The EAP includes preventative and mitigation actions for responding to potential or active dam safety emergencies. The EAP is intended to provide information and structure to assist the District and emergency responders with executing a coordinated and effective emergency response. The EAP is a confidential document and not available to the general public.

Healthy Forest Management and Wildfire Mitigation Plan

NID owns nearly 6,000 acres of forested land, generally located in borders around storage reservoirs and in scattered parcels where District infrastructure is located. Strategic forest management is therefore necessary for the District and those that rely on its water supply for the protection of source water, the water system, ecosystem values, and human health and property. The past 30 years of reduced logging and over a century of suppressing the frequent, low to moderate-intensity fire cycles with which local forest communities evolved, has led to overcrowded forest conditions that are at-risk of unnaturally severe wildfire. This plan is intended to provide management guidelines that include: an overview of the District's forest land, forest issues, program objectives and action items, and supporting information. The priority objectives of the District's forestry program involve significantly reducing the risk of wildfire ignition and hazardous trees around storage reservoirs, hydroelectric and treatment facilities, water conveyance infrastructure and within recreation areas, where risks to human health and safety, water supply, and system operation are highest.

Water Planning Projections

The Water Planning Projections consists of three studies that analyze the hydrology, water supply and water demand that help NID determine if its water storage and delivery system will provide sufficient water to meet customer demands over time and under variable conditions. The Water Planning Projections are used to prepare a number of planning reports such as the Urban Water Management Plan and the Agricultural Management Plan required to be updated and submitted to the State of California every five years. The Water Planning Projections is also used to prepare the District's Plan for Water, formerly called a Raw Water Master Plan, and is considered when making decisions about capital improvements to its water storage and delivery system.

Owner's Dam Safety Program

NID owns, operates, and maintains dams and the associated appurtenant works. Under normal circumstances, these assets produce hydroelectric power and water for consumptive and irrigation uses. Under adverse conditions, such as those related to hydrologic, geologic, and seismic hazards, these assets may pose a risk to lives and property. It is the objective of NID to mitigate these risks and maintain the long-term safe and reliable operation of these assets. It is the policy of NID to continue the safe operations of the dam inventory and associated appurtenant works, while maintaining compliance with all applicable laws and regulations. The purpose of the Owner's Dam Safety Program (ODSP) is to manage the safety of the District dams and their ancillary facilities for the protection of life, property, and the environment. The ODSP is intended to ensure that NID's Board of Directors, Management, Chief Dam Safety Coordinator (CDSC), Dam Safety Engineer (DSE), dam operational, maintenance, and engineering staff, consultants, construction contractors, and other agents have a good understanding and constant awareness of the ongoing need to watch for and improve the safety of the dams to ensure the safety of the public. This ODSP is applied to all the District Dams and the ancillary facilities under the jurisdiction of Federal Energy Regulatory Commission (FERC) or California Division of Safety of Dams (DSOD). These include FERC's Yuba-Bear Project (P-2266), Combie Dam Project (P-2981), Scotts Flat Dam Project (P-5930), and Loma Rica and Deer Creek Diversion Dams (both are DSOD jurisdiction only). The ODSP also applies to the spillways, penstocks, outlet structures, instruments, reservoirs, and stream beds associated with the dams.

Drought Contingency Plan

The purpose of the Nevada Irrigation District's Drought Contingency Plan is to provide guidance to staff and customers to help minimize drought or water supply shortage impacts. The plan identifies drought action levels, appropriate agency responses, water demand reduction goals, and provides recommended demand management measures to assist customers in water conservation. The mandatory reduction measures implemented through this plan are designed to preserve minimal supplies for public health and safety. Mandatory reduction stages will trigger the formation of the Drought Hardship Committee whose purpose is to review hardship applications and determine whether additional water can be provided to the applicants with an economic hardship and/ or those utilizing best management practices.

Nevada Irrigation District Public Safety Plan

The purpose of the Public Safety Plan is to describe the hazards that exist at or near hydropower facilities and operations, and the safety devices or other measures that are employed to enhance the protection of the public that utilize the Nevada Irrigation District's (NID) Yuba-Bear, Scotts Flat, and Combie Hydroelectric Projects (Projects) land and water. The Federal Energy Regulatory Commission (FERC) is primarily concerned with the hazards created by Project structures and operations. However, hazards created by natural conditions in Project waters and at recreational areas operated or leased by licensees of hydropower projects are equally important. The Projects are a series of dams, reservoirs, forebays, afterbays, tunnels, pipelines, conduits, powerhouses, transmission lines, roads, and structures needed to operate and maintain the District's facilities. The purpose of the Projects is to store and provide water for irrigation and domestic use and to generate electrical power as a secondary use.

Because the dams, reservoirs, roads and other features are located in a mountainous area that has great attraction for recreation, these Project facilities also serve as recreational facilities. However, the primary purpose of each of these facilities is to supply water to downstream users. Thus, while the primary purpose is to provide water and power, recreational use of the facilities is an important part of operations, and great effort is put into making this use as safe as possible while still meeting Project goals and commitments.

NID is committed to public safety. The District will continue to regularly review their current operating procedures, and where applicable and practical, modify them to improve safety within the Projects.

Continuity of Operations Plan

This Plan provides guidance to NID and will ensure essential functions and services are maintained during an influenza pandemic. This Plan neither replaces nor supersedes any current, approved continuity plan; rather it supplements it, bridging the gap between traditional, all-hazards continuity planning and the specialized continuity planning required for a pandemic by addressing additional considerations, challenges, and elements specific to the dynamic nature of a pandemic. This Plan stresses that essential functions will be maintained during a pandemic outbreak through mitigation strategies, such as social distancing, increased hygiene, the vaccination of employees and their families, and similar approaches. Influenza may not, in itself, require a traditional continuity response, such as partial or full relocation of the organization's essential functions, although this response may be concurrently necessary due to other circumstances.

Covid-19 Prevention Plan, CPP

This CPP is designed to control exposures to the SARS-CoV-2 virus that may occur in our workplace. This CPP lives within the Codes of Safe Work Practices in the Injury and Illness Prevention Program (IIPP). The General Manager or appointee has overall authority and responsibility for implementing the provisions of this CPP in our workplace. In addition, all managers and supervisors are responsible for implementing and maintaining the CPP in their assigned work areas and for ensuring employees receive answers to questions about the program in a language they understand. All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Injury and Illness Prevention Program

It is the policy of the Nevada Irrigation District to provide a safe and healthful work environment for all of its employees – an environment that is absent of recognized hazards that may cause, death or serious physical harm to its employees. In an effort to achieve this goal, the District maintains an Injury and Illness Prevention Program that conforms to the best safe practices. A collectively involved and consulted workforce contributes to a work environment where health and safety are core values. NID has a basic responsibility to make the safety of employees a primary objective; at the same time, workers have a right to work in places where all risks to their health and safety are properly controlled. The successful operation of the District depends not only on service to the public, but also how safely each job is performed.

J.6.2. Administrative/Technical Mitigation Capabilities

NID is governed by a five-member Board of Directors, elected to four-year terms by District voters. The board is the District’s policy-making body and policy is carried out by approximately 185 full- and part-time employees. Members of the board are elected from within and represent five geographical divisions within the District. As a state agency, NID operates under rules and regulations adopted under authority conferred by the California Water Code. NID is headquartered at an 18-acre site located on West Main Street in Grass Valley. The District also operates a maintenance yard on Gold Hill Road near Lincoln and a Hydroelectric Department office off Interstate 80 near Colfax. Table J-14 identifies the District department(s) responsible for activities related to mitigation and loss prevention in NID.

Table J-14 NID’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Planning a collaboration between the Districts Engineering, Operations, Maintenance and Hydroelectric Departments
Mitigation Planning Committee	Y	Mitigation Planning is a function of the planning team listed above
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Yes	The District has a fully staffed water operations maintenance and hydroelectric maintenance divisions with approximately 90 dedicated positions to keep facilities in proper order.
Mutual aid agreements	Yes	The District has mutual aid agreements with many neighboring agencies including, PG&E, PCWA, City of Grass Valley, City of Nevada City, and Placer County.
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	Yes	The District has a risk manager that will act as an emergency manager during an emergency. Table top emergency exercises are practiced with multiple agencies every 5 years. The Districts Management team has completed NIMS training
Community Planner		
Civil Engineer	Yes	The District has an in house engineering department with a staff of 6 licensed engineers trained in all aspects of District functions.
GIS Coordinator	Yes	The District has a drafting division that maintains the Districts GIS system. The group has coordinated with outside agencies during emergencies to provide mapping information.
Other		
Technical		

Warning systems/services (Reverse 911, outdoor warning signals)	Yes	The District has electronic warning systems for its dams, water treatment plants and canals. Facilities are manned or monitored on a 24 hour a day 7 day a week basis. The District also utilizes an answering service as backup.
Hazard data and information	Yes	The District maintains a current SDS data base
Grant writing	Yes	The District has an in house grant writer
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued vigilance and a prioritization of safety and risk management will continue into the future. The District has developed its own safety department and is in the process of updating its Emergency Response Plan, and Vulnerability Assessment.		

Source: NID

J.6.3. Fiscal Mitigation Capabilities

Table J-15 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table J-15 NID's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
General Property Taxes	Yes	The District receives annual allocations of County Property taxes which are predominantly used for capital improvement projects and debt service.
Authority to levy taxes for specific purposes	Yes	The District levies taxes for the Cement Hill Community Facility District and Rodeo Flat Assessment District
Fees for water, sewer, gas, or electric services	Yes	Fees are set based on cost of service every 5 years
Capacity fees for system expansion	Yes	The District receives capacity fees used to expand the water system
Storm water utility fee	No	
Incur debt through revenue bonds and/or special tax bonds	Yes	Revenue Bonds and special taxes have both been utilized to fund projects within the District
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	The District has been the recipient of Depart. of Water Resources grant funding
State funding programs	Yes	State Revolving Loan Funding
Other		

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
How can these capabilities be expanded and improved to reduce risk?		
A dedicated resource planning division level of staffing would greatly improve NID's ability to increase vulnerability awareness and help plan for future mitigation programs.		

Source: NID

J.6.4. Mitigation Education, Outreach, and Partnerships

Table J-16 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table J-16 NID's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	The District works with Multiple NGO's that focus on watershed protection such as: SYRCL, Bear Yuba Land Trust and others that could help spread the word during emergency
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	The District has a dedicated Water Efficiency Staff and a Public Information Team to help spread the water conservation message
Natural disaster or safety related school programs	N/A	
StormReady certification	N/A	The District has a storm water action plan in place that is implemented during forecasted heavy storms
Firewise Communities certification	N/A	
Public-private partnership initiatives addressing disaster-related issues	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Ongoing communication and coordination throughout traditional and social media platforms.		

Source: NID

J.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Updated Coordinated Operating Agreement with PG&E
- NID Regional Water Supply Project
- Cole Siphon Replacement Project
- Rock Creek Bypass Encasement Project
- Lincoln Canal Encasement Project

- North Auburn Highway 49 Transmission Project
- North Auburn Treatment Plant VFD's and Permanent Backup Generator
- Permanente generator installation at headquarters office
- Purchased additional portable generators
- Combie Phase 1 Replacement Project

In addition, acutely hazardous chlorine gas has been removed at all the Districts Water Treatment Plants. The District has switched to bleach to lessen the hazard level to the neighboring residences.

Development of interties between NID & PCWA to allow for multi-agency coordination and backup water supply. PCWA and the District have four interties that are utilized for maintenance and emergency activities. Additionally, the District has completed an emergency intertie with PG&E that will allow for an additional delivery point of raw water for both NID and PCWA. Water agreements between NID, PCWA and Placer County ensure ongoing water supply for the Placer County Government Center in Auburn.

J.7 Mitigation Strategy

J.7.1. Mitigation Goals and Objectives

The NID adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

J.7.2. Mitigation Actions

The planning team for the NID identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Avalanche
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Landslides, Mudslides, and Debris Flows
- Levee Failure
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless

of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. 2015 Agricultural Water Management Plan – Updated 2021

Hazards Addressed: Climate Change, Drought and Water Storage Hazards, Agricultural Hazards

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Agricultural Water Management Planning Act requires all agricultural water suppliers that provide water to 10,000 or more irrigated acres to adopt and submit an AWMP to the California Department of Water Resources (DWR). The purpose of the Act is to evaluate water use and applicable management practices to make the best use of available resources. The District’s AWMP also addresses the new AWMP requirements established by the Governor in Executive Order B-29-15 (April 1, 2015), and listed below.

- Prepare a Drought Management Plan that describes the actions and measures the supplier will take to manage water demand during drought; and,
- Quantify water supplies and demands for 2013, 2014, and 2015, to the extent data is available.

Project Description: This AWMP addresses the District’s water system and includes a description of the service area, water uses, water resources, and a comparison of water supply and water demands during the planning cycle (2011 through 2015). Also described are the District’s water supply reliability, water use efficiency information, water shortage allocation policies, and Drought Management Plan. This AWMP is the year 2015 AWMP as required by the Agricultural Water Management Planning Act (Act) (California Water Code Section 10820(a)), which requires all agricultural water suppliers that provide water to 10,000 or more irrigated acres within their service area to prepare an AWMP.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plan For Water, Raw Water Master Plan

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): Reduced risk to ag hazards.

Potential Funding: NID - Grants

Timeline: Within 2021

Project Priority (H, M, L): Medium

Action 2. Avalanche Mitigation

Hazards Addressed: Avalanche

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Nevada Irrigation District has critical water supply facilities in the high alpine watershed that supply a majority of the District’s annual water needs. These facilities are located in remote, steep terrain that is subject to avalanche during heavy winters. The primary danger with an avalanche is the potential for blockage of canals and damage to the many elevated flumes relied upon for conveyance. Heavy snow in the early 1990’s blocked water flow in the South Yuba Canal and created constraints on the Districts water delivery system. Emergency pumps were brought in to pump water from Scotts Flat as a backup while the snow was cleared. The District is currently working on a permanent pumping facility as an emergency backup supply should future heavy snows or avalanches damage District facilities.

Project Description: Purchase new SnoCat and tracked UTV to improve access options. Install and provide telemetry from two new snow measurement station in Upper Division. Install and provide telemetry from two new weather stations in the Upper Division

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing mechanism.

Responsible Agency/ Department/Partners: Nevada Irrigation District, California Department of Water Resources, Sierra Avalanche Center

Cost Estimate:

- SnoCat = \$225,000
- Tracked UTV = \$30,000
- Snow Measurement Stations = \$75,000
- Weather Stations = \$10,000

Benefits (Losses Avoided): Improved worker safety during snow events

Potential Funding:

Timeline: 1-5 years

Project Priority (H, M, L): Medium

Action 3. Canal Culvert Replacement Program

Hazards Addressed: Water Supply Reliability, Flood Control

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Canal Crossings are facilitated with numerous culverts throughout the Placer County area. These culverts are often undersized, aged, and failing. During heavy rain events these culverts backup water causing flooding and overtopping of the canal upstream of the culvert. Overtopping often results in erosion of the canal berm and presents possible property damage. Nevada Irrigation District is currently engaged in a culvert replacement project aimed at resolving these issues.

Project Description: Removal and replacement of culverts and headwalls within District canals.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering and Encroachment Departments provide oversight on these projects

Responsible Agency/ Department/Partners: Nevada Irrigation District and associated property owners

Cost Estimate: Varies per year, some projects paid for by private parties. While cost estimates varies based on size and location, average cost of culvert install is \$20,000.

Benefits (Losses Avoided): Life, Safety, Localized Flooding, Reduction in loss of private property

Potential Funding: District funding, grants

Timeline: ongoing

Project Priority (H, M, L): Medium

Action 4. Centennial Water Supply Project

Hazards Addressed: Water Supply Reliability, Climate Change, Flood Control Protection, Power Outages

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Nevada Irrigation District is embarking on a regional water storage and supply reliability project known as Centennial Water Supply Project. The proposed project includes a water storage reservoir between Rollins and Combie Lakes. The project is necessary to bolster water supply for the surrounding regions to help combat prolonged drought, future demand needs. The project will also provide environmental benefits.

Project Description: Construct Roller Compacted Concrete Dam that will impound 110,000 ac-ft reservoir on the Bear River for water supply.

Other Alternatives: Conservation, and water use restrictions

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District has just begun studying this proposed project. Currently feasibility and environmental studies are under way.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: 300-400 Million Dollars

Benefits (Losses Avoided): Regional water supply reliability including protection from long term drought and climate change, clean renewable power generation, and environmental benefits are a small sample of some of the highlights this project will bring forward.

Potential Funding: Still being researched, District Funding, Grants

Timeline: 10+ years

Project Priority (H, M, L): Currently low as the District focuses on Plan for Water process.

Action 5. Combie Phase 1 Replacement

Hazards Addressed: Water Supply Reliability, Flood Control, Earthquake Vulnerability

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: A majority of the water that supplies Placer County properties within the Nevada Irrigation District flows through the Combie Phase 1 Canal. The Canal has reached its life expectancy and is experiencing leakage and structural issues. The concrete flume sections are separating and the general condition of the concrete is failing. The District is the beginning stages of design for the replacement of the open canal with a pipe. This project includes the replacement of the elevated siphon crossing the Bear River. This facility has had experienced failures in the recent past that caused flood damage and extended water outages for the northern portions of Placer County.

Project Description: Removal and replacement of 54-inch aerial siphon and replace 9100 feet of concrete flume with 96-inch Reinforced Concrete Pressure Pipe.

Other Alternatives: No other financially feasible option exists.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District has completed the 54-inch aerial siphon and it is in service. Construction began for the installation of the 96-inch RCCP in 2019 and will be completed in 2021.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: Approximately \$27 million.

Benefits (Losses Avoided): Associated property damage and loss of water supply to the entire Placer County region and two water treatment plants.

Potential Funding: Bonds and District Capital

Timeline: Will be finished in 2021

Project Priority (H, M, L): High

Action 6. Continuity of Operations Plan

Hazards Addressed: Pandemic

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Organizations across the Nation perform essential functions and services that may be adversely affected in the event of a natural or man-made disaster. In such events, the Nevada Irrigation District (NID/District) will have continuity plans to assist in the continuance of their essential functions. Continuing to perform essential functions and provide essential services is vital to NID's ability to remain a viable entity during times of increased threats from all hazards, manmade or natural. Since the threat to an organization's continuity of operations is great during a pandemic outbreak; it is important for organizations, in particular the Nevada Irrigation District, to have a Continuity of Operations Plan for Pandemic Influenza (Plan) in place to ensure it can carry out its essential functions and services. While organizations may be forced to suspend some operations due to the severity of a pandemic outbreak, an effective Plan will assist NID in its efforts to remain operational, as well as strengthen the ability to resume operations.

Project Description: This Plan provides guidance to NID and will ensure essential functions and services are maintained during an influenza pandemic. This Plan neither replaces nor supersedes any current, approved continuity plan; rather it supplements it, bridging the gap between traditional, all-hazards continuity planning and the specialized continuity planning required for a pandemic by addressing additional considerations, challenges, and elements specific to the dynamic nature of a pandemic. This Plan stresses that essential functions will be maintained during a pandemic outbreak through mitigation strategies, such as social distancing, increased hygiene, the vaccination of employees and their families, and similar approaches. Influenza may not, in itself, require a traditional continuity response, such as partial or full relocation of the organization's essential functions, although this response may be concurrently necessary due to other circumstances.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Injury and Illness Prevention Plan

Responsible Agency/ Department/Partners: NID

Cost Estimate: To be determined.

Benefits (Losses Avoided): Continued performance of essential functions

Potential Funding: NID - Grants

Timeline: 1-5 years

Project Priority (H, M, L): H

Action 7. Pandemic Planning

Hazards Addressed: Covid 19 Prevention Plan

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The General Manager or appointee has overall authority and responsibility for implementing the provisions of this CPP in our workplace. In addition, all managers and supervisors are responsible for implementing and maintaining the CPP in their assigned work areas and for ensuring employees receive answers to questions about the program in a language they understand. All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Project Description: This CPP is designed to control exposures to the SARS-CoV-2 virus that may occur in our workplace. This CPP lives within the Codes of Safe Work Practices in the Injury and Illness Prevention Program (IIPP).

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Injury and Illness Prevention Planning

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): Employee and Agency health and resiliency

Potential Funding: NID - Grants

Timeline: Currently in place

Project Priority (H, M, L): H

Action 8. Dam Failure Mitigation

Hazards Addressed: Dam Failure

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: A dam failure can range from a small uncontrolled release to a catastrophic failure, caused by prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. Dam failure flooding varies by area depending on which dam fails and the nature and extent of the dam failure and associated flooding. The district's highest dam is the rock fill-earth core dam at Rollins Reservoir, built in 1965 and standing 242 feet tall. The Jackson Meadows dam (1965) is second highest at 195 feet, Scotts Flat dam (1965) is 175 feet, and the Bowman South Arch dam (1925) is 171 feet high. French Dam, constructed in 1858-59, is the district's oldest dam still in use. Based on analysis provided in the Placer County General Plan Background Report, only five dams within Placer County have the potential to affect more than 100 persons: Folsom Dikes No. 5 & 6; Lake Tahoe Dam; Camp Far West Dam; Lake Combie Dam; and Rollins Reservoir Dam. Of these five, a failure of Rollins Reservoir or Combie Dams could potentially impact areas within the NID. Failure of Dutch Flat Forebay could also potentially impact services provided by NID, albeit in a limited capacity.

Project Description: Van Giesen Dam (Combie Lake) Stabilization and Scour Protection – Construct improvements necessary to stabilize dam and protect against scour during extreme flood events. Combie South Powerhouse Access Improvements – Construct improved access to powerhouse for safety and security.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Dam EAPs

Responsible Agency/ Department/Partners: Nevada Irrigation District, California Department of Water Resources Division of Safety of Dams, and Federal Energy Regulatory Commission.

Cost Estimate:

- Dam Improvements: \$13,287,000
- Road Improvements: \$150,000

Benefits (Losses Avoided): Loss of life in the event of a dam failure.

Potential Funding: CA DWR, Cal OES, FEMA, and other grant funding sources.

Timeline: When funding is available

Project Priority (H, M, L): Medium

Action 9. Water Conservation and Drought Preparedness

Hazards Addressed: Drought & Water Storage

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The impact of a drought on the District is primarily one of water supply. Most water provided by the NID comes from snowmelt from the high mountain watershed. A multiple year drought can severely compromise the water supply within the district. The District experienced below average

precipitation and minimal snowpack from 2012 to 2015 and again from 2017 to 2020. Current precipitation conditions are below average as well. In 2014 the District recorded a snowpack reading of 5% of average, the lowest snowpack reading since it began collecting this data in 1921. Governor Brown declared a state of emergency and the State Water Resources Control Board restricted water use and curtailed many of the Districts water rights. The limited water supply along with the States mandated actions necessitated the enactment of the Districts Drought Contingency Plan. Some of the action items from the plan include: limiting and or suspending additional Ag water sales, mandatory treated water reductions, and the establishment of a water waste reporting program. The District has proactively managed its water resources in preparation for additional dry years. In addition to conservative water management, the District also purchased supplemental waters from neighboring agencies to help bolster water supply. After 2 years of below-average rainfall and very low snow-melt run off, Governor Schwarzenegger in June of 2008 declared a state of emergency for drought conditions statewide. The final California Department of Water Resources showed snowpack water content at only 67 percent of normal. The 1991-1992, drought also severely impacted the District and other areas of Placer County and surrounding California foothills. A severe drought that affected the District and all of California is the drought of 1977-1978. This drought was severe enough to trigger implementation of the District's Drought Contingency Plan at the most restrictive level – that of mandatory rationing and reduction in service to irrigation customers up to 50%. With the unknowns of drought and globally changing climate conditions, NID, more than ever, is promoting water conservation and expansion of liquid storage. In addition to water storage concerns, prolonged drought is contributing to the success of forest pests, such as the pine bark beetle, which is leading to heightened levels of tree mortality. These high levels of mortality are costly to mitigate, and pose a serious risk to facilities and visitors to NID-owned campgrounds.

Project Description: NID prioritizes projects to increase water system efficiency, and also to make forested watersheds more resilient to drought. Reduce understory and selectively thin forested watershed lands to increase surface runoff, snowpack accumulation and reduce loss through evapotranspiration. Reducing competition in forest stands can help increase the resiliency of remaining trees to disturbances such as drought. Invest in enhancement of wet meadow environments on open watershed lands to provide late summer flows, attenuate runoff, and reduce evaporative loss.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Draft District Forest Management Plan, English Meadow Forest Management Plan, CABY IRWM Project List

Responsible Agency/ Department/Partners: Nevada Irrigation District; CABY

Cost Estimate: \$5 million

Benefits (Losses Avoided): Increase water availability via thinning of overstocked forest stands in addition to reduced loss from evapotranspiration. Decreased mortality in well-managed tree stands with healthy forest conditions.

Potential Funding: CAL FIRE, Sierra Nevada Conservancy, CABY IRWM Grants

Timeline: Annual

Project Priority (H, M, L): H

Action 10. Drought Contingency Plan

Hazards Addressed: Drought, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The mandatory reduction measures implemented through this plan are designed to preserve minimal supplies for public health and safety. Mandatory reduction stages will trigger the formation of the Drought Hardship Committee whose purpose is to review hardship applications and determine whether additional water can be provided to the applicants with an economic hardship and/ or those utilizing best management practices.

Project Description: The purpose of the Nevada Irrigation District's Drought Contingency (Plan) is to provide guidance to staff and customers to help minimize drought or water supply shortage impacts. The plan identifies drought action levels, appropriate agency responses, water demand reduction goals, and provides recommended demand management measures to assist customers in water conservation.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: NID Drought Contingency Plan

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): See Plan

Potential Funding: NID - Grants

Timeline: Current

Project Priority (H, M, L): H

Action 11. Flood Mitigation

Hazards Addressed: Flood, Localized Flood, Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Flooding and soil erosion due to heavy rains and snow runoff have been a historical problem throughout Placer County. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and flooding. Water flow can be high in peak runoff periods with historical downstream flooding. The primary impacts from flooding within the district include damage to roads, utilities, bridges; and flooding of homes, businesses and critical facilities. Flooding has also caused canals

to overtop and erosion of the canal levees. The most recent flood event to impact the District is the late December floods of 2005. Excessive rain for a prolonged period caused severe flooding in the Sierra foothills, in and around Placer County. Impacts included damage to the District's canal system as well as damage to roads and properties throughout District boundaries. Heavy prolonged precipitation in late 1996 caused flood damage across much of the District's service area. President Clinton proclaimed the area a disaster area while Governor Wilson followed suit. Many of the District's main diversion dams and canals were washed out. Over 50 applications for flood damage assistance for the repair of NID facilities were submitted to FEMA and Cal OES.

Project Description: Improvement of District remote sensing equipment, Supervisory Control and Data Acquisition (SCADA) system, and communication network. Components include software upgrades, hardware upgrades, and new communication tower construction.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: \$750,000.

Benefits (Losses Avoided): Improved forecasting, real time monitoring field conditions.

Potential Funding: CAL OES, FEMA, CA DWR Grants

Timeline: Within 5 years

Project Priority (H, M, L): Medium

Action 12. Healthy Forest Management and Wildfire Mitigation Plan

Hazards Addressed: Tree Mortality, Wildfire, High Winds

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NID owns nearly 6,000 acres of forested land, generally located in borders around storage reservoirs and in scattered parcels where District infrastructure is located. Strategic forest management is therefore necessary for the District and those that rely on its water supply for the protection of source water, the water system, ecosystem values, and human health and property. The past 30 years of reduced logging and over a century of suppressing the frequent, low to moderate-intensity fire cycles with which local forest communities evolved, has led to overcrowded forest conditions that are at-risk of unnaturally severe wildfire (CAL FIRE). Significant competition for resources such as water and sunlight place stress on individual trees and forest communities and decrease the ability of the forest to defend itself from pests and diseases. This accumulation of understory vegetation, coupled with increased stress and pest presence can lead to significant tree mortality; further exaggerating the issue of extreme wildfire risk. When

the ignition risk associated with WUI residents and the campgrounds that NID owns is factored in, the potential for a catastrophic wildfire becomes very high.

Project Description: The goals of the District’s Watershed Program are:

“The protection of residents, visitors, and District infrastructure from wildfire and hazard trees” and “the protection and improvement of District forest land for the health of the watershed and associated ecosystem services, including water supply, recreation, soil retention, and carbon sequestration.”

This plan is intended to provide management guidelines that include: an overview of the District’s forest land, forest issues, program objectives and action items, and supporting information. The priority objectives of the District’s forestry program involve significantly reducing the risk of wildfire ignition and hazardous trees around storage reservoirs, hydroelectric and treatment facilities, water conveyance infrastructure and within recreation areas, where risks to human health and safety, water supply, and system operation are highest.

This plan is intended to inform and support District staff as they plan and implement forest and vegetation management projects. It provides context and related literature to support increased understanding by staff that will utilize these recommendations and Managers and District Board Members who will oversee our programs and set direction as we move forward. This plan also can be shared with partners at Nevada County, Consolidated Fire, CAL FIRE, and other local organizations that are working towards our collective goals for safer communities, reduced wildfire risk and severity, and long-term water resource protection.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: This action creates a planning mechanism.

Responsible Agency/ Department/Partners: NID

Cost Estimate: To be determined

Benefits (Losses Avoided): Reduced wildfire risk to people and property.

Potential Funding: NID - Grants

Timeline: Within 5 years

Project Priority (H, M, L): H

Action 13. Forest Resilience Program

Hazards Addressed: Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Climate models predict that the Sierra Nevada Region will experience warming average annual temperatures ranging from an increase of 2°F - 4°F in the winter and 4°F - 8°F in the summer by the end of the century. This shift to a warmer climate is expected to have wide ranging effects on the annual weather conditions, snowfall, forest health, water availability, and wildfire. One of the most concerning impacts of climate change on the District is reduced forest resilience and the projected decrease in annual snowpack accumulation due to the transition of average annual precipitation from snow to rain caused by increasing temperatures. As a headwaters region, snowpack is the largest source of storage within the NID system, and the series of reservoirs rely heavily on the timed release of water in snowpack to recharge reservoirs into the late summer when rain no longer falls. Actively managing forested landscapes can help NID address climate change impacts, prepare for the future, and reduce risks (such as severe wildfire) that are exacerbated by a warmer climate.

Project Description: Forest thinning and selective harvest projects to reduce forest stand density and accumulated fire fuels, thereby reducing risk of extreme and carbon intensive wildfire. Understory thinning also decreases stress in the residual stand, leading to increased carbon sequestration rates, less liquid water loss to evapotranspiration, and increased pest resistance. Creating areas where snowfall can reach to the forest floor promotes prolonged snowpack and increased accumulation greater than areas where dense vegetation prevents optimal snowpack.

Other Alternatives: Carbon emission reduction strategies

Existing Planning Mechanism(s) through which Action Will Be Implemented: Draft District Forest Management Plan

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: Forest Thinning: \$2,000 - \$3,000 per acre

Benefits (Losses Avoided): Increased snowpack accumulation, increased carbon sequestration rates, increased water availability, increased habitat resilience to possible disturbance, decreased risk of wildfire

Potential Funding: Sierra Nevada Conservancy, CAL FIRE, Wildlife Conservation Board.

Timeline: Annual

Project Priority (H, M, L): H

Action 14. Injury and Illness Prevention Program

Hazards Addressed: Pandemic

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: A collectively involved and consulted workforce contributes to a work environment where health and safety are core values. NID has a basic responsibility to make the safety of employees a primary objective; at the same time, workers have a right to work in places where all risks to their health

and safety are properly controlled. The successful operation of the District depends not only on service to the public, but also how safely each job is performed.

Project Description: It is the policy of the Nevada Irrigation District to provide a safe and healthful work environment for all of its employees – an environment that is absent of recognized hazards that may cause, death or serious physical harm to its employees. In an effort to achieve this goal, the District maintains an Injury and Illness Prevention Program that conforms to the best safe practices.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Covid 19 Prevention Planning

Responsible Agency/ Department/Partners: NID

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to staff.

Potential Funding: NID - Grants

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 15. Public Safety Plan (FERC)

Hazards Addressed: Climate Change, Drought & Water Storage, Earthquake, Flood, Landslides, Severe Weather, Tree Mortality, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: This Public Safety Plan complies with FERC’s Guidelines for Public Safety at Hydropower Projects, dated March 1992 and updated November 29, 2011.

The purpose of the Public Safety Plan is to describe the hazards that exist at or near hydropower facilities and operations, and the safety devices or other measures that are employed to enhance the protection of the public that utilize the Nevada Irrigation District’s (NID) Yuba-Bear, Scotts Flat, and Combie Hydroelectric Projects (Projects) land and water. The Federal Energy Regulatory Commission (FERC) is primarily concerned with the hazards created by Project structures and operations. However, hazards created by natural conditions in Project waters and at recreational areas operated or leased by licensees of hydropower projects are equally important.

Project Description: The Projects are a series of dams, reservoirs, forebays, afterbays, tunnels, pipelines, conduits, powerhouses, transmission lines, roads, and structures needed to operate and maintain the District’s facilities. The purpose of the Projects is to store and provide water for irrigation and domestic use and to generate electrical power as a secondary use.

Because the dams, reservoirs, roads and other features are located in a mountainous area that has great attraction for recreation, these Project facilities also serve as recreational facilities. However, the primary purpose of each of these facilities is to supply water to downstream users. Thus, while the primary purpose is to provide water and power, recreational use of the facilities is an important part of operations, and great effort is put into making this use as safe as possible while still meeting Project goals and commitments.

NID is committed to public safety. The District will continue to regularly review their current operating procedures, and where applicable and practical, modify them to improve safety within the Projects.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: To be determined.

Benefits (Losses Avoided): Identifies hazards near hydropower facilities and operations. Describes safety devices and safety measures. Describes operational controls and inspection and maintenance. Regulatory compliance.

Potential Funding: NID or Grants

Timeline: On-going

Project Priority (H, M, L): Medium

Action 16. North Auburn Treatment Plant VFD's and Permanent Backup Generator

Hazards Addressed: Water Supply Reliability, Wildfire, Earthquake Vulnerability

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The North Auburn Treatment Plant has been impacted by loss of power by PSPS events as well as wildfires. The need is to install a permanent backup generator to allow the treatment plant to continue to operate and supply treated water and fire hydrants within the North Auburn service area.

Project Description: Replace the high-lift pumps motor control center, install VFD's and a permanent natural gas driven backup generator that can run the water treatment plant.

Other Alternatives: No other financially feasible option exists.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District is currently in design of the improvements. Construction scheduled to be completed in 2022.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: Approximately \$600,000.

Benefits (Losses Avoided): Reduces/eliminates potential loss of treated water supply to the entire North Auburn Treatment Plant Service area.

Potential Funding: District Capital

Timeline: Will be finished in 2022

Project Priority (H, M, L): High

Action 17. Orr Creek Diversion

Hazards Addressed: Water Supply Reliability, Flood Control

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Districts Orr Creek Diversion Structure was built in the early 1900's and has gone through a number of modifications and additions. The older portion of the structure is leaking and needs replacement. The proposed project would strengthen the diversion dam to guard against failure, repair leakage under the dam, and provide a discharge valve to allow for flow control below the dam. This facility is the lifeline to hundreds of acres of irrigated lands in Placer County. District is currently working on a District wide reservoir storage study that will help guide the District in developing strategies regarding existing reservoirs.

Project Description: Upgrade/Improve/Replace existing diversion structure or bypass around the facility and abandon.

Other Alternatives: Leave the facility as is or move the diversion to a different location.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District has included the Orr Creek Diversion in its capital improvement plan and is part of the District wide reservoir storage study currently being completed.

Responsible Agency/ Department/Partners: Nevada Irrigation District Engineering Department

Cost Estimate: \$2,000,000

Benefits (Losses Avoided): The retrofit of the facility would provide the structural integrity to minimize potential dam failure. The project will provide water supply reliability to the many customers who receive water from this diversion structure. The installation of an outlet valve will allow the District to better control the waters that flow past the facility particularly during heavy precipitation events. Abandoning of the structure and constructing a new diversion upstream that would be better suited to handle flood events.

Potential Funding: District Funding, Grants

Timeline: 3 to 5 years

Project Priority (H, M, L): Medium priority. Project will progress as funding becomes available

Action 18. *Owner's Dam Safety Program, Revision 3.0*

Hazards Addressed: Climate Change, Drought and Water Storage, Earthquake, Flood, Landslides, Mudslides, Sever Weather, Wildfire, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NID owns, operates, and maintains dams and the associated appurtenant works. Under normal circumstances, these assets produce hydroelectric power and water for consumptive and irrigation uses. Under adverse conditions, such as those related to hydrologic, geologic, and seismic hazards, these assets may pose a risk to lives and property. It is the objective of NID to mitigate these risks and maintain the long-term safe and reliable operation of these assets. It is the policy of NID to continue the safe operations of the dam inventory and associated appurtenant works, while maintaining compliance with all applicable laws and regulations.

The purpose of the Owner's Dam Safety Program (ODSP) is to manage the safety of the District dams and their ancillary facilities for the protection of life, property, and the environment. The ODSP is intended to ensure that NID's Board of Directors, Management, Chief Dam Safety Coordinator (CDSC), Dam Safety Engineer (DSE), dam operational, maintenance, and engineering staff, consultants, construction contractors, and other agents have a good understanding and constant awareness of the on-going need to watch for and improve the safety of the dams to ensure the safety of the public.

Project Description: This ODSP is applied to all the District Dams and the ancillary facilities under the jurisdiction of Federal Energy Regulatory Commission (FERC) or California Division of Safety of Dams (DSOD). These include FERC's Yuba-Bear Project (P-2266), Combie Dam Project (P-2981), Scotts Flat Dam Project (P-5930), and Loma Rica and Deer Creek Diversion Dams (both are DSOD jurisdiction only). The ODSP also applies to the spillways, penstocks, outlet structures, instruments, reservoirs, and stream beds associated with the dams.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: To be determined.

Benefits (Losses Avoided): Mechanism to comply with regulatory standards. Mitigate risks to lives and property related to hydrologic, geologic, and seismic hazards associated with dams.

Potential Funding: NID or Grants

Timeline: On-going

Project Priority (H, M, L): Medium

Action 19. Raw Water Master Plan

Hazards Addressed: Drought, Climate Change, Flood, Severe Weather

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Nevada Irrigation District’s Plan for Water was last updated in 2005 and adopted in 2013. The plan helps guide decisions related to the water system over the next 50 years. Long range planning ultimately involves forecasting & projecting future conditions based on realistic, valid and supportive assumptions. Regardless of the technology, science, or process used, assumptions still must be made to produce a forecast.

Project Description: The District is updating the plan to reflect changes in water demand, supply and the potential effects of climate change. The plan is an organizational tool that seeks to align resource decision making with community values and District operational needs, including technical and cost criteria requirements. When complete the plan will show how a variety of future water supply and demand scenarios could be integrated to ensure our community enjoys the same high-quality, reliable water system we have now. The Plan for Water is born of the FERC relicensing effort, climate change impacts, financial requirements, and new regulatory requirements. The Plan for Water does not re-analyze or revisit any new requirements set by FERC or the State. Instead, it sets these requirements as the new normal, and looks ahead 50 years to anticipate potential supply/demand scenarios and identify alternative solutions

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Raw Water Master Plan 2011, 2015 Agricultural Water Management Plan – Updated in 2021, 2015 Urban Water Management Plan – Updated in 2021

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): Reduced risk to drought and water shortage.

Potential Funding: NID - Grants

Timeline: Continuous

Project Priority (H, M, L): Medium

Action 20. Raw Water Replacement Program

Hazards Addressed: Water Supply Reliability, Flood Control, Levee Failure, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: There are raw water facilities (canals) throughout the Placer County area. These canals are often aged, leaking or undersized. During heavy rain events these canals can backup water causing flooding and overtopping of the canal. Leaking and overtopping often results in erosion of the canal berm and presents possible property damage. Leaking canals also can exasperate water shortages during drought. Nevada Irrigation District is currently engaged in a raw water replacement program that is budgeted annual and aimed at resolving these issues.

Project Description: Encasement and lining of District canals and replacement/upgrades of existing canal structures/pipelines.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering Department and Maintenance Department provides oversight on these projects.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: Minimum of \$1,000,000 annually. Budgets for this program varies per year based on projects identified.

Benefits (Losses Avoided): Life, Safety, Localized Flooding, Reduction in loss of private property, improved efficiency of water supply deliveries

Potential Funding: District funding, grants

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 21. Reservoir Cleaning

Hazards Addressed: Water Supply Reliability, Flood Control

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Large onstream reservoirs and small reservoirs located within the canal system are filling with sediment from continued years of use. Adequate reservoir storage is very beneficial during storms and heavy rain. As the reservoir accumulates sediment, water storage is reduced and the ability to regulate water efficiency is diminished. Reduced reservoir storage in the small reservoirs can result in upstream canal overtopping and property damage. District is currently working on a District wide reservoir storage study that will help guide the District in developing strategies regarding this complex issue.

Project Description: Removal of sediment with existing District reservoirs.

Other Alternatives: Watershed mitigation, sediment basins

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering and Maintenance Departments provide oversight on these projects.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: Removal of sediment in District reservoirs would exceed \$150,000,000

Benefits (Losses Avoided): Water Quality, Water storage and prevention of property damage

Potential Funding: District Funding, Grants

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 22. Resilient Headwaters Forests

Hazards Addressed: Severe Weather Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Extreme heat events are closely related to drought, climate change, and tree mortality when it comes to impacts to District operations. Extreme heat events can range in severity and duration, leading to varying increases in water demand/use along with hazardous work conditions for employees who work outdoors to maintain District function. Extreme heat events typically occur at lower elevations in western Nevada County and can last for short or long periods of time, though climate change may create variations to these conditions that push the reach of affected areas higher in elevation for a longer duration. Extreme heat events can have fatal effects on native vegetation and trees, leading to stress, partial/complete failure, or increased mortality. Extreme heat events have the potential to cause earlier melt off of snowpack, should these events occur earlier in the summer, leading to water availability issues in the late summer when resources are needed most.

Project Description: Removal of hazardous trees with potential to strike District Facilities or recreational visitors to campgrounds based on their potential to fail during extreme heat events

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: \$500 - \$8,000 per tree removed depending on location, size, and disposal

Benefits (Losses Avoided): Reduced likelihood of loss of life and property due to trees or parts of trees falling due to extreme heat events.

Potential Funding: Nevada Irrigation District; Hazard Tree Removal Grants

Timeline: Annual

Project Priority (H, M, L): High

Action 23. Tree Mortality Mitigation

Hazards Addressed: Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Drought and pest related tree mortality is a serious issue facing the District and the Sierra Nevada Region of California. Prolonged drought is leading to an increase of forest pests and diseases that are targeting trees stressed by drought; leading to widespread and above average levels of tree mortality. Increased tree mortality is a threat to district facilities and infrastructure as standing dead trees have a higher potential to fall and damage infrastructure. Dead and dying trees also pose a significant fire risk as dead and dry vegetative material acts as prime fire fuel. Governor Brown declared a state of emergency in 2014 due to the unprecedented level of tree mortality in California, stating that there were 22 million dead trees in 2014 throughout California with tens of millions expected to die by the end of the year. Part of the state of emergency declared that agencies, utilities and local governments shall undertake efforts remove dead and dying trees in high hazard zones. The Tree Mortality Task force, comprised of state and federal agencies, local governments and stakeholders determined in 2017 that Placer county and the Tahoe National Forest were high priority areas based on their high tree mortality (Placer: 774,000 trees from 2010-2016; Tahoe; 718,000 from 2010 – 2016)

Project Description: Annually assess and remove as necessary standing dead, dying and diseased trees with potential to strike district infrastructure, visitors, or structures adjacent to district owned property in the event of failure. Removed downed woody debris where feasible and accessible to reduce wildfire threat and spread of fatal tree diseases. Thin understory vegetation and selectively harvest open watershed lands to increase health and potential success of residual trees and remove trees who have become a host to forest pests with potential for mortality or spread of pest species.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Draft District Forest Management Plan, English Meadow Forest Management Plan

Responsible Agency/ Department/Partners: Nevada Irrigation District, CAL FIRE, Sierra Nevada Conservancy, Wildlife Conservation Board, US Forest Service

Cost Estimate: \$100,000 annually

Benefits (Losses Avoided): Reduced loss of District infrastructure, life and property due to damage caused by falling trees. Reduced loss of healthy trees to increased tree mortality by increasing health and the trees ability to fight off pests. Remove excessive fire fuels which threaten existing life healthy trees

Potential Funding: CAL FIRE, Sierra Nevada Conservancy, CABY

Timeline: Annual

Project Priority (H, M, L): H

Action 24. 2015 Urban Water Management Plan – Updated 2021

Hazards Addressed: Climate Change, Drought

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Urban Water Management Planning Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to adopt and submit a UWMP every five years to the California Department of Water Resources (DWR). The Act describes the contents of the UWMP as well as how urban water suppliers should adopt and implement the UWMP.

Project Description: This UWMP addresses the District’s water system and includes a description of the service area, water use, water supply sources, and a comparison of water supply and water demands during normal, single dry, and multiple-dry years. Also described is the District’s water conservation program. This UWMP is the year 2015 UWMP as required by the Urban Water Management Planning Act of 1983 (Act). The Act is described in California Water Code Division 6, Part 2.6, Sections 10610 through 10657.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plan For Water – Raw Water Master Plan

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): See Plan

Potential Funding: NID - Grants

Timeline: Continuous

Project Priority (H, M, L): Medium

Action 25. Vegetation Management Plan (Hydroelectric Facilities)

Hazards Addressed: Climate Change, Wildfire, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: This Hydroelectric Facilities Vegetation Management Plan (“VMP”) addresses vegetation modification guidelines and best practices to minimize wildfire risk associated with the District’s

powerhouses and related transmission lines, penstocks, and flumes located within the District's boundary in both Nevada County and Placer County, California. The VMP has been developed to identify best management practices for vegetation management methods and applications for the District's seven (7) powerhouses and their associated transmission lines, penstocks, and canals/flumes. The VMP was also developed with the inclusion of invasive weed management, revegetation, and human and resource protection measures as appropriate.

Project Description: The purpose of the VMP is to provide fire prevention procedures, reporting, and safe fire avoidance and suppression practices for District personnel and contractors responsible for operating and maintaining the existing District hydroelectric facilities. A primary purpose of the VMP is to establish procedures and protocols for management of native vegetation and treatment of invasive weeds in order to maintain a desirable environmental condition that is consistent with the safe and effective operation and maintenance (O&M) of District hydroelectric facilities. The VMP contains descriptions of specific vegetation management actions, including treatment of invasive weeds, which the District will use to achieve desired conditions in and around project-related transmission corridors, hydroelectric facilities, and access roads that are associated with each of the District's seven powerhouses. The vegetation management strategies outlined in the VMP describe how the District will achieve a variety of desired conditions, dependent on the type of site, from bare ground (powerhouses and switchyards) to compatible native vegetation communities (penstocks and transmission corridors).

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This will create a planning mechanism.

Responsible Agency/ Department/Partners: Nevada Irrigation District

Cost Estimate: To be determined.

Benefits (Losses Avoided):

- Fire prevention procedures
- Reporting
- Safe fire avoidance and suppression practices
- Resource protection
- Reduce risk of fire
- FERC license and regulatory compliance
- Vegetation control

Potential Funding: NID or Grants

Timeline: On-going

Project Priority (H, M, L): Medium

Action 26. Water Planning Projections

Hazards Addressed: Drought, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The need to update NID’s Water Planning Projections is driven by a series of requirements and assumptions, including the new Yuba-Bear System Federal Energy Regulatory Commission (FERC) regulatory requirements, state-derived climate change data, and the state-mandated planning requirements. Together, these requirements and assumptions constitute significantly new planning assumptions and drive the need to update and revise NID’s Water Planning Projections when necessary.

Project Description: The Water Planning Projections consists of three studies that analyze the hydrology, water supply and water demand that help NID determine if its water storage and delivery system will provide sufficient water to meet customer demands over time and under variable conditions. The Water Planning Projections are used to prepare a number of planning reports such as the Urban Water Management Plan and the Agricultural Management Plan required to be updated and submitted to the State of California every five years. The Water Planning Projections is also used to prepare the District’s Plan for Water, formerly called a Raw Water Master Plan, and is considered when making decisions about capital improvements to its water storage and delivery system.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing mechanisms.

Responsible Agency/ Department/Partners: NID

Cost Estimate: Various

Benefits (Losses Avoided): See Projections

Potential Funding: NID - Grants

Timeline: Continuous

Project Priority (H, M, L): Medium

Action 27. Water Service Auburn Valley CSD

Hazards Addressed: Water Supply Reliability

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Auburn Valley CSD is a small subdivision on the north end of Placer County. The water supplied to the subdivision is accomplished through a number of ground water wells. Current

drought conditions have exposed some well yield issues that have affected the available water supply to the area.

The District has the potential to supply the subdivision with treated surface water from either its North Auburn or Lake of the Pines water systems. Both connection points would take a substantial amount of infrastructure in pipelines to connect. Regardless, should the Auburn Valley CSD's wells go dry, an alternative water supply will be needed in short order.

Project Description: Installation of treated water pipeline to serve community from the District's North Auburn WTP.

Other Alternatives: Auburn Valley could drill more wells or purchase surface water from NID and treat onsite

Existing Planning Mechanism(s) through which Action Will Be Implemented: Auburn Valley is not within NID's service boundary; however efforts to include them are already underway. Once inside, the District would have the opportunity to provide water, be it treated or raw. The project would be handled by the Nevada Irrigation Districts Engineering Department.

Responsible Agency/ Department/Partners: Nevada Irrigation District / Auburn Valley CSD

Cost Estimate: \$1.5 Million to connect to the Districts treated water system.

Benefits (Losses Avoided): Reliable water supply to a vulnerable system. This would alleviate a potential public health and safety issue should the CSD run out of water.

Potential Funding: Grants, Private Funding

Timeline: 3 to 5 years

Project Priority (H, M, L): Currently medium priority as the District works to include the area within its boundaries.

Action 28. Forest Resilience and Wildfire Risk Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: All communities within the northwestern portion of Placer County served by the NID are listed on the National Fire Plan's "Communities at Risk" list as set forth in Section 4.3.2 of the main plan. Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District's area is in the wildland urban interface with increasing residential development. As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires. Forest overgrowth due to the efficiency of modern firefighting techniques, and

the vast acreages of land in need of understory thinning or selective harvest to decrease the fuel without natural fire is a serious problem. If wildfire does not impact the forest first, native insects and diseases which thrive in dense forest conditions may eventually kill millions of trees; further adding to the accumulated dead and dry fuels that would otherwise have been cleared out by low intensity fire. Explosions in insect populations usually start during a drought, when the lack of water combined with overcrowded forest conditions impact the trees' ability to reject the insects. Without a change in management practices on public lands, there is little hope of avoiding unusually high tree mortality experienced by other national forests. The size in acreage and the severity of wildfire in California is increasing. Five of the top twenty largest California wildfires occurred in 2020. The deadliest and most destructive of which was the Camp Fire which burned over 150,000 acres, 18,000 structures, and caused at least 85 fatalities in 2018. The massive scale of this wildfire had significant impacts to not only the public, but utility infrastructure as well. Costs of disaster related debris removal, emergency protective measures to protect life and property, and permanent repair to damaged or destroyed infrastructure, including repair and replacement of Paradise Irrigation District's water system features, reached more than \$129 million. The most notable recent wildfire to impact the District was the Jones Fire in 2020. The wind driven fire occurred in the South Yuba River canyon and burned over the Districts Newtown Canal. 21 structures and 705 acres were burned during the 12 day fire, having impacts to communities as well as infrastructure and the health of the landscape within the burn area.

Project Description: Reduce the density, and horizontal and vertical connectivity of fire fuels on District-owned property. Properly managed forest stand will be less likely to spark ignition, support an existing fire, or allow a less dangerous ground fire to reach the canopy where it will become a severe crown fire. Areas of high ignition potential, such as campgrounds, are prioritized for treatment along with important infrastructure and District and Private structures. Ongoing vegetation removal and control along the Bowman Transmission Line

Other Alternatives: Prescribed burning as a maintenance of desired condition.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Draft District Forest Management Plan

Responsible Agency/ Department/Partners: Nevada Irrigation District, CAL FIRE, Sierra Nevada Conservancy

Cost Estimate: \$2,000 - \$3,000 per acre for fuel reduction. \$100,000 annually for transmission line vegetation management.

Benefits (Losses Avoided): Infrastructure defense, maintenance of high water quality, avoidance of costly repair and replacement, protection of life and property.

Potential Funding: Nevada Irrigation District, CAL FIRE CFIP Grant, Sierra Nevada Conservancy,

Timeline: Reoccurring annually.

Project Priority (H, M, L): High



Annex K Newcastle Fire Protection District

K.1 Introduction

This Annex details the hazard mitigation planning elements specific to Newcastle FPD (District), a new participating jurisdiction to the 2021 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the District, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

K.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table K-1. Additional details on plan participation and District representatives are included in Appendix A.

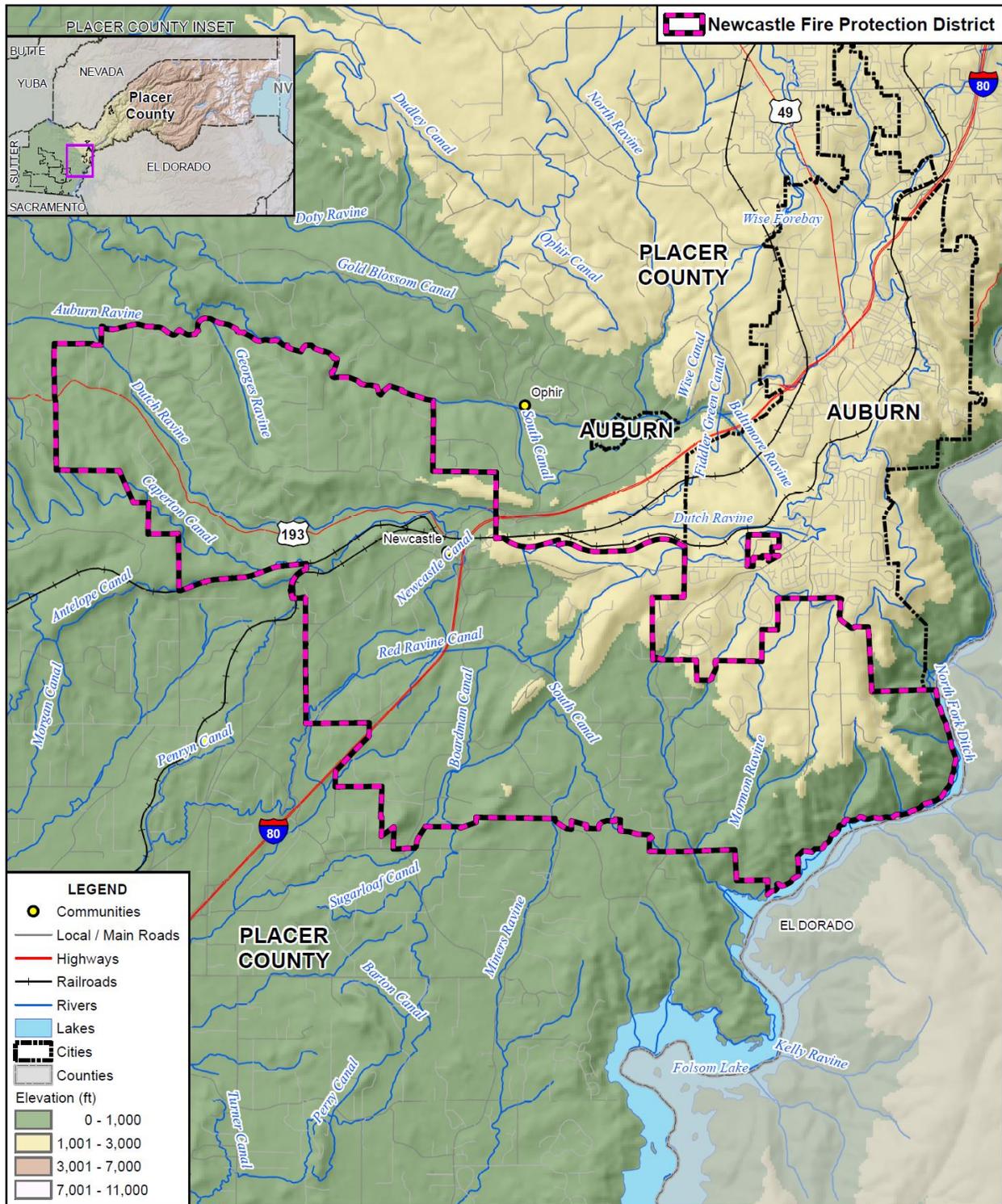
Table K-1 Newcastle FPD – Planning Team

Name	Position/Title	How Participated
Ian Gow	Fire Chief	Review and approval of information provided
Gillian Lofrano	District Manager	Provided data and information
Mark D'Ambrogi	Fire Marshal	Participated in meetings, completed required information

K.3 District Profile

The District profile for the Newcastle FPD is detailed in the following sections. Figure K-1 displays a map and the location of the District within Placer County.

Figure K-1 Newcastle FPD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

K.3.1. Overview and Background

Newcastle Fire Protection District is located in the Sierra Foothills of Placer County, California. The District was established in 1868 and has been located in the same building since 1922 in the heart of the town of Newcastle. The District covers 15 square miles, serves approximately 6200 residents, and responds to approximately 700 calls for service annually.

The District is governed by a five member Board of Directors which is elected by voters of the District. The Fire Chief (currently shared with Placer Hills Fire Protection District) oversees 6 full time employees and 3-4 active volunteer firefighters.

The Newcastle Fire Protection District cross staffs both a Type 1 and Type 3 Wildland Interface Engine with a minimum staffing of two Personnel. Both personnel are trained to a minimum of EMT-1 with advanced scope of skills. One captain and one engineer are minimum staffing with intern, seasonal and volunteer personnel augmenting staffing to provide three personnel when possible. The District is an “All-Risk” department that provides a timely response to all types of fires, medical emergencies, rescues, and hazardous material incidents. Additional services include a year-round fire prevention program incorporating building occupancy inspections, new building plan reviews and an aggressive risk reduction and Public Education delivery model.

The District currently has two benefit assessments levied of which bring in \$340,358 and \$167,493 annually to help fund the District. A portion of these assessments are for capital expenditures mainly a new fire station.

The current fire station has been used since 1922 and does not meet the needs of an Essential Public Service Facility. The building no longer can support personnel, equipment, and public services in its current condition. The Board of Directors have been diligently planning relocation and construction of a new station.

Currently the Newcastle Fire Protection District has an agreement with Placer Hills Fire Protection District for Administrative Services that include: A Fire Chief, District Manager, Fire Marshal services, and Battalion Chief coverage.

K.4 Hazard Identification

Newcastle FPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table K-2).

Table K-2 Newcastle FPD —Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Significant	Likely	Limited	Low	Medium
Avalanche	Limited	Unlikely	Limited	Low	Medium
Climate Change	Limited	Likely	Critical	Medium	–
Dam Failure	Limited	Unlikely	Limited	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance	Limited	Likely	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Likely	Critical	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Critical	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Significant	Unlikely	Critical	Low	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Extensive	Unlikely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Unlikely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Limited	Low	Low
Tree Mortality	Limited	Likely	Limited	Medium	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

K.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

K.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section K.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table K-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

K.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the Newcastle FPD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table K-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. Newcastle FPD’s physical assets, valued at over \$4 million, consist of the buildings and infrastructure to support the District’s operations.

Table K-3 Newcastle FPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Station 41	Essential	\$4,000,000	Wildfire/Earthquake
Total		\$4,000,000	

Source: Newcastle FPD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. NFPD provides services to a number of resident types of which include retired individuals, a majority of the population, senior and elderly persons, working families that commute to school and work, and recreational enthusiasts utilizing natural resources in the area.

Natural Resources

Newcastle FPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

Newcastle FPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

The District is in the process of relocating and constructing a new fire station to serve the existing response area, there will be no expansion of the current response area once the new station is built.

The District is also in the preliminary stages of providing Advanced Life Support (ALS) in the response area. ALS is an advanced level of emergency medical care that has been proven to save lives of the sick and injured.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. The District plans to continue the Administrative Services Agreement with Placer Hills FPD for Fire Chief, District Manager, Fire Marshal services, and Battalion Chief coverage. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

K.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table K-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation

- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table K-4.

Table K-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Impacts that may affect the District due to drought are the increased risks of wildfire due to reduced fuel moistures and reduction of water sources for firefighting activities.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

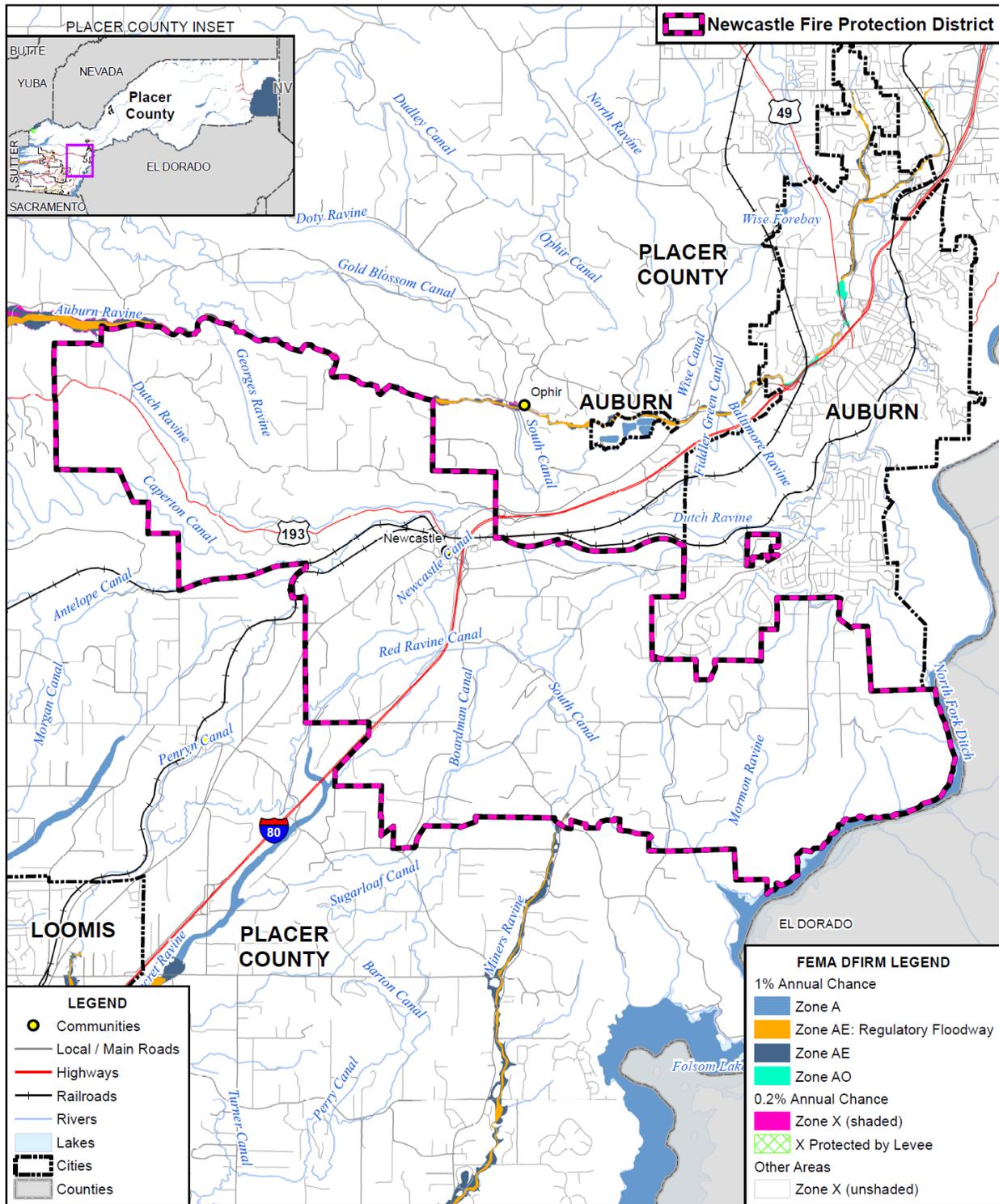
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the Newcastle FPD have been subject to historical flooding.

Location and Extent

The Newcastle FPD has areas located in the 1% annual chance floodplain. This is seen in Figure K-2.

Figure K-2 Newcastle FPD – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.



Table K-5 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table K-5 Newcastle FPD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table K-6. These events also likely affected the District to some degree.

Table K-6 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The Newcastle FPD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The District tracks localized flooding areas. localized flood areas identified by the Newcastle FPD are summarized in Table K-7

Table K-7 Newcastle FPD – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Taylor Rd at Tunnel					X		X

Source: Newcastle FPD

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

The District noted no minor flooding has occurred in the past 5 years that have caused delays and or re-routing to emergency calls for service.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

The District's concerns with localized flooding include increased response times to emergencies and the ability of citizen evacuation in flooded areas.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS.

More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

The District has experienced increased wildfire danger during times of extreme heat and increased medical responses due to heat related illness.

During times of PSPS the District has been affected with loss of power that impacts communications such as internet and phone. Station 41 does not have back-up generator power and is limited in full facility function during these periods.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well, especially when

combined with the potential for severe wind events. Health impacts, including loss of life, are often the primary concern with this hazard, though economic impacts can also be an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions and spread.

The effects of extreme heat to the District include increased wildfire danger and potential heat related issues to personnel engaging in emergency response.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall

on the western side of the County is 1.4 inches. Freeze and snow has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table K-8.

Table K-8 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3. The District experiences very few times of snow with limited impact, usually a short term event. When freeze does occur it can have an impact on travel roads of which may result in extended response times. An increase for calls of service due to broken water pipes does occur during these events as well as traffic accidents.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. During extreme winter events, response times to emergencies may be extended.

Impacts to the District include extended response times, increase in freeze related incidents of broken water pipes, increase in vehicle accidents, and medical emergencies related to freezing conditions.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

Minor rock debris slides have occurred during heavy and prolonged periods of rain. Occurrences are confined to a county roadway. This has happened at Taylor Rd on each side of the tunnel.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed

trees can break utilities and interrupt services. Minor rock debris slides have occurred during heavy and prolonged periods of rain. Occurrences are confined to a county roadway.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas is shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

The landscape of the District is primarily oak woodland and brush with limited conifer species. Tree mortality has not been prevalent in the District. There has been an occasional tree or so on private properties with tree mortality.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

The primary concerns the District has concerning tree mortality is the increased dead fuel loading for wildfire and falling dead trees into structures causing damage and or injury.

Assets at Risk

No District assets (from Table K-3) are at risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the Newcastle FPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the

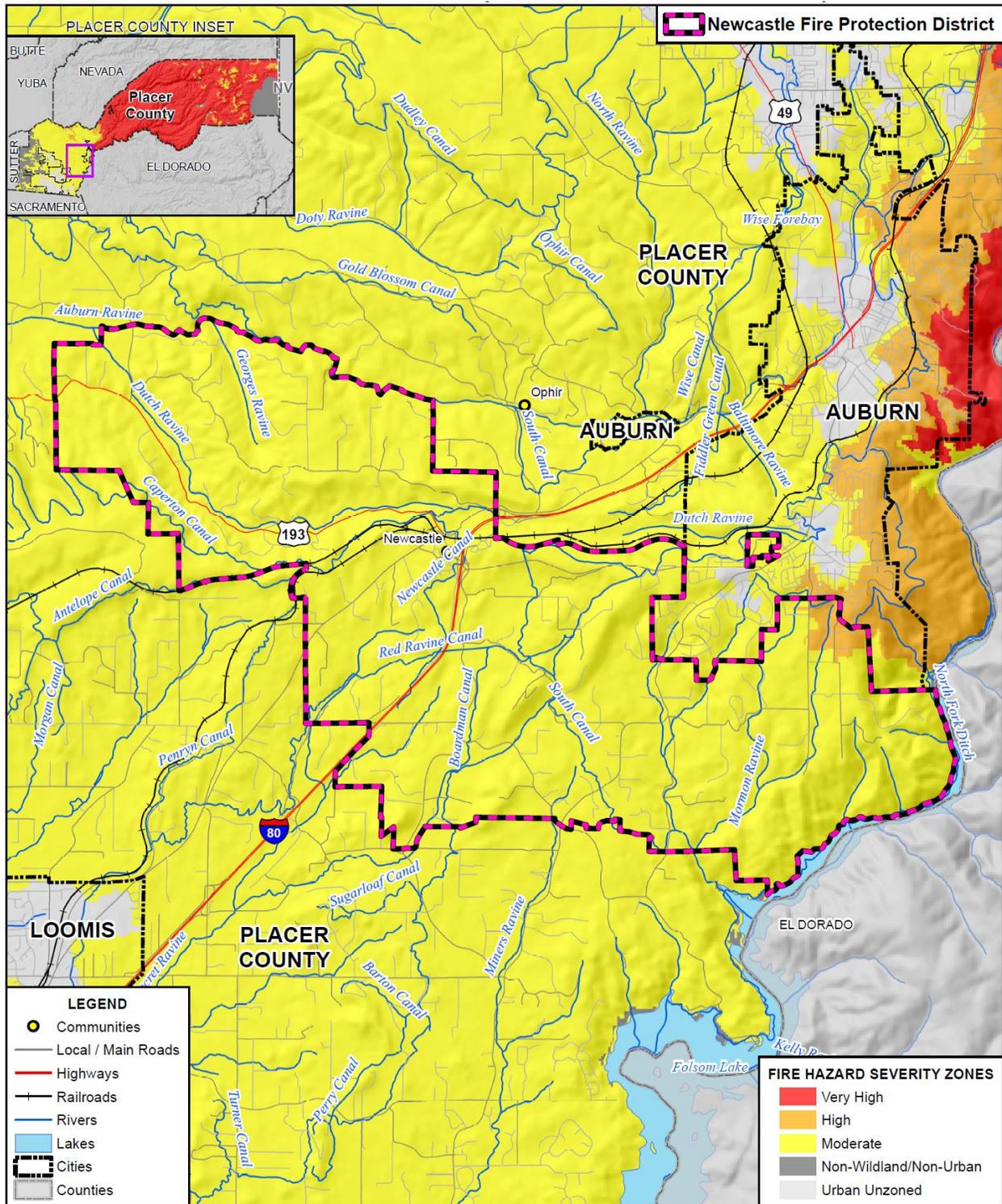
foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the Newcastle FPD were created. Figure K-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District range from moderate to high.

The entire Newcastle Fire District is within State Responsibility Area (SRA). Cal Fire is the primary agency for wildfire with assistance from the Placer Hills Fire District. Wildfire activity is captured and recorded by Cal Fire for the LHMP.

Figure K-3 Newcastle FPD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table K-9.

Table K-9 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The Newcastle Fire District noted that the District responds to structure fires. There have been no significant sole structure fires within the District in the last 5 years.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat

of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Since all of the District is within a Fire Hazard Severity Zone as identified by Cal Fire and is a combination of Wildland Urban Intermix and Wildland Urban Interface, main concerns are for the safety of citizens and protection of structures from wildfire. Given the right conditions; weather, fuels, and topography, a wildfire can significantly impact and cause catastrophic damage to development within the District.

Assets at Risk

All District assets (from Table K-3) are at risk from this hazard.

K.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

K.6.1. Regulatory Mitigation Capabilities

Table K-10 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Newcastle FPD.

Table K-10 Newcastle FPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y	Through coordination with Placer County
Continuity of Operations Plan	Y	Local District Operating Procedures, to follow Placer County Plan
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	

Community Wildfire Protection Plan	Y	In coordination with the Greater Auburn Area Fire Safe Council
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: Enforced through Placer County CDRA
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 4/4X
Site plan review requirements	Y	Enforced through District Standard Conditions for Development
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	(All these areas the District falls under Placer County)
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Continued cooperative planning and building review processes to ensure all agencies apply mitigation measures and conditions for development.		

Source: Newcastle FPD

The District has and continues to adopt Ordinances to mitigate issues related to fire and life safety. These Ordinances include adoption of the most current California Fire Code, Placer County Hazardous Vegetation Ordinance with an MOU for enforcement/abatement services, Fee schedules for plan review, approval, and inspection to ensure compliance with Ordinances.

K.6.2. Administrative/Technical Mitigation Capabilities

Table K-11 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the District.

Table K-11 Newcastle FPD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	In coordination with Placer County
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	Through Western Placer County Fire Chiefs Association, closest resources response agreement
Other	Y	Placer County Code Enforcement for abatement of hazardous vegetation
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	In coordination with Placer County
Floodplain Administrator	N	
Emergency Manager	Y	In coordination with Placer County
Community Planner	Y	In coordination with Placer County
Civil Engineer	Y	In coordination with Placer County
GIS Coordinator	Y	In coordination with Placer County
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	In coordination with Placer County
Hazard data and information	Y	In coordination with Placer County
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued cooperative planning and inspection processes to ensure all agencies apply mitigation measures and conditions to reduce risk.		

Source: Newcastle FPD

K.6.3. Fiscal Mitigation Capabilities

Table K-12 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table K-12 Newcastle FPD’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	From Impact Fees and Special Assessments
Authority to levy taxes for specific purposes	Y	Voter Approved
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Used for capital expenditures
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Not Used
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District will continue to seek grant monies from all sources in order to better protect residents and structures in District territories.		

Source: Newcastle FPD

K.6.4. Mitigation Education, Outreach, and Partnerships

Table K-13 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table K-13 Newcastle FPD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Greater Auburn Area Fire Safe Council, Placer County Fire Alliance. Evaluate risk and identify projects to reduce wildfire risk.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Updated web site, social media- Facebook, Twitter. To get safety messages out to public
Natural disaster or safety related school programs	Y	Through School Programs
StormReady certification	N	
Firewise Communities certification	Y	Through Placer County Fire Alliance and FIREWISE Coordinator.
Public-private partnership initiatives addressing disaster-related issues	N	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued participation with allied agencies and organizations and collaborate with single messaging on specific issues.		

Source: Newcastle FPD

K.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

The District is involved in a variety of mitigation activities including public education, fuels management projects, and other activities to reduce fuel loads and fire risk. These mitigation activities include:

- Public Education and Fire Safety
 - ✓ A variety of public outreach activities are conducted throughout the district on an ongoing basis.
 - ✓ The District has a program where they make address signs and provide them to the public at cost.
 - ✓ The District promotes the use of the County Chipper for local residents.

- Defensible Space
 - ✓ When staffing is available for program management, the District provides defensible space inspections for area residents upon request.
 - ✓ When staffing is available for program management complaint based inspections occur for vegetation management on private properties to be in compliance with the Hazardous Vegetation Ordinance.

- New Development
 - ✓ The District has a comprehensive review, approval, and inspection process for all new development within the Districts that address fire and life safety issues in addition to the Placer County development process.

K.7 Mitigation Strategy

K.7.1. Mitigation Goals and Objectives

The Newcastle FPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

K.7.2. Mitigation Actions

The planning team for the Newcastle FPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost,

and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Private roadway and driveway vegetation clearances.

Hazards Addressed: Drought and Water Shortage, Climate Change, Tree Mortality, Wildfire, Extreme Heat, Freeze and Snow (limb removal)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many private roadways and driveways throughout the fire district contain dense flammable vegetation along the shoulders of the roadway/driveway as well vertical clearances. This can impede fire resource response and somewhat limit access in the event of an emergency. During wildfire conditions this can pose significant risk to responders as well as civilians.

Project Description: Through inspection, identify those areas needing fuel reduction along private roadways and driveways. Optimal clearance is 10 feet from each shoulder and 15 vertical clearance. Inform property owners of the importance and their responsibility to create and maintain these accesses for emergency response and civilian evacuation. Implement the formal process of “Notice to Abate” as needed.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: All new constructed roads and driveways will be conditioned to create and maintain clearance through the plan review and approval process as a condition to develop.

Through inspection as well as emergency response to incidents, personnel will identify areas needing appropriate clearance. Once identified, a process will be initiated based on the Placer County Hazardous Vegetation Ordinance and local fire district adopted ordinance.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District staff officers and engine company personnel.

Cost Estimate: Currently the District has one part-time funded Fire Marshal position to manage this program. Additional funding will increase success in implementation. Property owners are responsible for implementing clearance requirements.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents and potentially increased ability of civilian evacuation. Reduce vegetation to reduce fuel loading and the risk of wildfire.

Potential Funding: Possible grant funding for large scale roadside clearing projects for project management and fuel reduction implementation.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 2. Address signage for residential and commercial structures.

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many structures throughout the District have either no addressing or limited addressing that is not consistent. Many structures were built at a time when there was no addressing standard in place. There is now a standard created by Placer County for consistent addressing in unincorporated areas of Placer County.

Project Description: Apply Placer County standard for addressing for all new construction throughout the fire district. Identify structures needing appropriate addressing and inform and educate property owners of a standard and consistent addressing means.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Addressing for new construction will be identified and implemented during the plan review and approval process as a condition

to develop. Through inspection as well as emergency response to incidents where addressing is lacking, inform and educate property owners of the value of appropriate addressing.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District staff officers and engine company personnel.

Cost Estimate: No costs identified, use of district personnel to implement. Costs for address signage will be the responsibility of the property owner. Estimated at \$40-\$60 dependent upon where obtained.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents. Can assist in incidents requiring evacuation and in pre-planning communities for major incidents.

Potential Funding: Possible grant funding for large scale “addressing project”. The Placer Hills Firefighter Association creates address signs for citizens as a fund raising project.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 3. Provide Advanced Life Support (ALS) services utilizing paramedics on the engine company.

Hazards Addressed: Multi-Hazard (Climate Change, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Currently the Newcastle Fire Protection District responds with two (2) personnel on the engine company and provides Basic Life Support (BLS) utilizing EMT’s. Approximately 80% of calls are medical related and providing ALS to the community would deliver a higher level of care to the sick and injured. Such services have been proven to provide life saving measures to those with the most serious injuries and sicknesses.

Project Description: Provide daily paramedic staffing on the engine company at all times; 24/7. Procure, maintain, and manage personnel certification and equipment related to ALS.

Other Alternatives: No other alternatives are identified at this time, BLS to remain the standard if ALS is not implemented.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Through advanced medical training, future new paramedic hires, and utilizing the Joint Operations Agreement (JOA) with Placer Hills Fire District personnel, ALS can be obtained as the standard level of care for medical emergencies.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District designated staff, under cooperative agreement with Placer Hills Fire District, will implement, and manage this program under the authority of the Sierra-Sacramento Valley EMS Agency.

Cost Estimate: The District is currently exploring all costs associated with providing ALS services. Costs associated with ALS services include training and certification of personnel, procurement of ALS equipment, medical supplies associated with ALS, billing and cost recovery, and record management systems. Currently there is one (1) paramedic qualified personnel in the Newcastle Fire District response system, a minimum of two (2) additional personnel are needed to fully deliver ALS services.

Benefits (Losses Avoided): Delivery of a higher level of medical care to the sick and injured of which can result in the saving of lives.

Potential Funding: Potential funding for personnel training and initial equipment purchase may be obtained through the Western Placer County Fire Chiefs Association EMS fund. This would be an anticipated one-time funding source at start up. The District is in the evaluation phase of implementing a “first Responder” fee of which would allow the District to collect fees for response of which may cover continued costs of an ALS program. Other grant opportunities will be explored to create and maintain this ALS program.

Timeline: Currently in process of collecting initial start-up costs and potential recovery fees needed to sustain an ALS program. Desirable to have an ALS program up and running in six (6) months. Ongoing

Project Priority (H, M, L): High

Action 4. Defensible space inspection and implementation throughout the District.

Hazards Addressed: Drought and Water Shortage, Climate Change, Tree Mortality, Wildfire, Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Most all of the District lies within High or Moderate Fire Severity Zones as identified by Cal Fire. The application of defensible space and home hardening are ways to reduce the risk of wildfire destruction. Although homeowners/business owners are aware of such risks, through an inspection process property owners can be better informed of what action they can do to reduce such risks.

Project Description: Through an inspection process, educate, inform, and make recommendation for property owners on what actions to take to reduce the risk of destruction from wildfire. Identify vegetation to remove, reduce, and maintain to achieve defensible space. Identify potential areas of home hardening to better prepare for wildfire. Conduct inspections on private properties to identify specific needs of that property to achieve defensible space.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: All new construction will be conditioned to create and maintain defensible space through the plan review and approval process as a condition to build. Through an inspection program, identify areas to conduct property inspections. The basis of the inspection program will utilize Public Resource Code (PRC), Placer County Hazardous Vegetation Ordinance, and local fire district adopted ordinance.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District designated staff will implement and manage this inspection program.

Cost Estimate: Currently the District has one part-time funded Fire Marshal position to manage this program. Additional funding will increase success in implementation. Property owners are responsible for implementing clearance requirements.

Benefits (Losses Avoided): Reduction of property loss due to wildfire may be obtained through such a program.

Potential Funding: Possible grant funding for fulltime and or additional personnel for project management and inspection. Potential of charging fee for inspection.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 5. Relocate and construct a new fire station for the Newcastle Fire Protection District.

Hazards Addressed: Drought and Water Shortage, Climate Change, Tree Mortality, Wildfire, Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The current Newcastle Fire Protection District fire station has been in service since 1922. It has been modified over the years to accommodate the needs of personnel and equipment and due to building issues, space issues, and location, is no longer suitable to operate as a fire response facility. This District has been planning for a new fire facility for a number of years and has a “special assessment” levied on district properties to go towards the construction of a new fire station. The district has secured the land for this facility and has developed plans and drawings for this facility as well as obtained costs for the project.

Project Description: Provide a new fire facility capable of supporting emergency response personnel with 24/7 operations, housing emergency response vehicles and equipment, and provide public access for conducting routine business associated with the fire district.

Other Alternatives: No other alternatives are identified; the current fire facility cannot be renovated to accommodate fire district needs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Newcastle Fire Protection District Board of Directors along with the Fire Chief and District Manager continue to further along the process of constructing a new fire facility. The Board has created a “New Fire Station Committee” that has spent a great deal of time over the years obtaining and completing all necessary measures to move forward with this project.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District Board and designated command staff are working with Planning, Building, and Finance agencies to implement this project.

Cost Estimate: Cost estimates continue to rise as the years go by. Currently the District is attempting to secure financial loan funding through different sources. Currently the District is in the process in obtaining loan funding through a USDA loan program and continues to work with Placer County Finance leaders as a potential alternative for funding. Current cost estimates for this project range from 4-5 million dollars.

Benefits (Losses Avoided): A fire facility capable of supporting personnel and equipment for emergency response to the Newcastle Fire Protection District and surrounding areas.

Potential Funding: Funding for this project will be through collected property taxes, current benefit assessments levied on district properties, and potential additional assessments levied on district properties. The district is currently in the process of obtaining loan funding through a USDA loan program. Additional grant and or loan funding are also being considered.

Timeline: The District is 3-4 years behind in this project due to securing funding to escalating costs associated with this project. It is necessary to begin construction on this project within 2021 to secure ownership of the land that will be used for the new facility. Ongoing with a project completion date within 12-18 months of securing loan funding.

Project Priority (H, M, L): High

Action 6. *Participate and collaborate with the Greater Auburn Area Fire Safe Council (GAAFSC) and contribute to the Community Wildfire Protection Plan (CWPP)*

Hazards Addressed: Drought and Water Shortage, Climate Change, Tree Mortality, Wildfire, Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Newcastle Fire Protection District is within the boundaries of the GAAFSC. Newcastle Fire Protection District has been involved with the GAAFSC throughout the years. The Fire Safe Council’s in Placer County contribute greatly to the CWPP. This is opportunity for local fire agencies to be involved in such a process.

Project Description: The Newcastle Fire Protection District participates in the GAAFSC. Continued participation and collaboration will occur on an on-going basis. Attending monthly meetings and participate in GAAFSC events.

Other Alternatives: No other alternatives have been identified that includes such collaboration

Existing Planning Mechanism(s) through which Action Will Be Implemented: Identify staff personnel to attend meetings and GAAFSC events.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District command staff.

Cost Estimate: No costs are associated with this action.

Benefits (Losses Avoided): Keep current on projects and public outreach campaigns. Develop a collaborative approach to the wildfire risks and reduction methods. Participate in the CWPP process.

Potential Funding: Possible grant funding through the GAAFSC to assist Newcastle Fire Protection District with fuel reduction and related projects.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 7. Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation

Hazards Addressed: Flood, Localized Flooding, Freeze and Snow.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: From time to time, the District experiences localized heavy rains that create minor flooding on streets and roads used for emergency response. In addition, freezing may occur occasionally. This natural occurrence of rain, and freeze can have an impact on response to emergencies.

Project Description: Obtain the most up-to-date information regarding adverse weather, predicted weather events, and related weather that may impact District response to emergencies.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Coordinate with Placer OES on specific predicted weather events. Plan response accordingly to specific event: alternate routes for flooded areas and apparatus with appropriate chains for ice. Notify Placer County Roads through Placer Dispatch for problem areas that include flooding; need for storm drain clearing, sanding of roads for ice and snow, and road closures.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District staff officers and engine company personnel.

Cost Estimate: No costs identified with this operational procedure.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents and safety of responding personnel.

Potential Funding: None identified for this mitigation.

Timeline: Ongoing

Project Priority (H, M, L): Medium



Annex L Northstar Community Services District and Fire Department

L.1 Introduction

This Annex details the hazard mitigation planning elements specific to Northstar Community Services District and Fire Department (NCSD & FD&FD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to NCSD & FD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

L.2 Planning Process

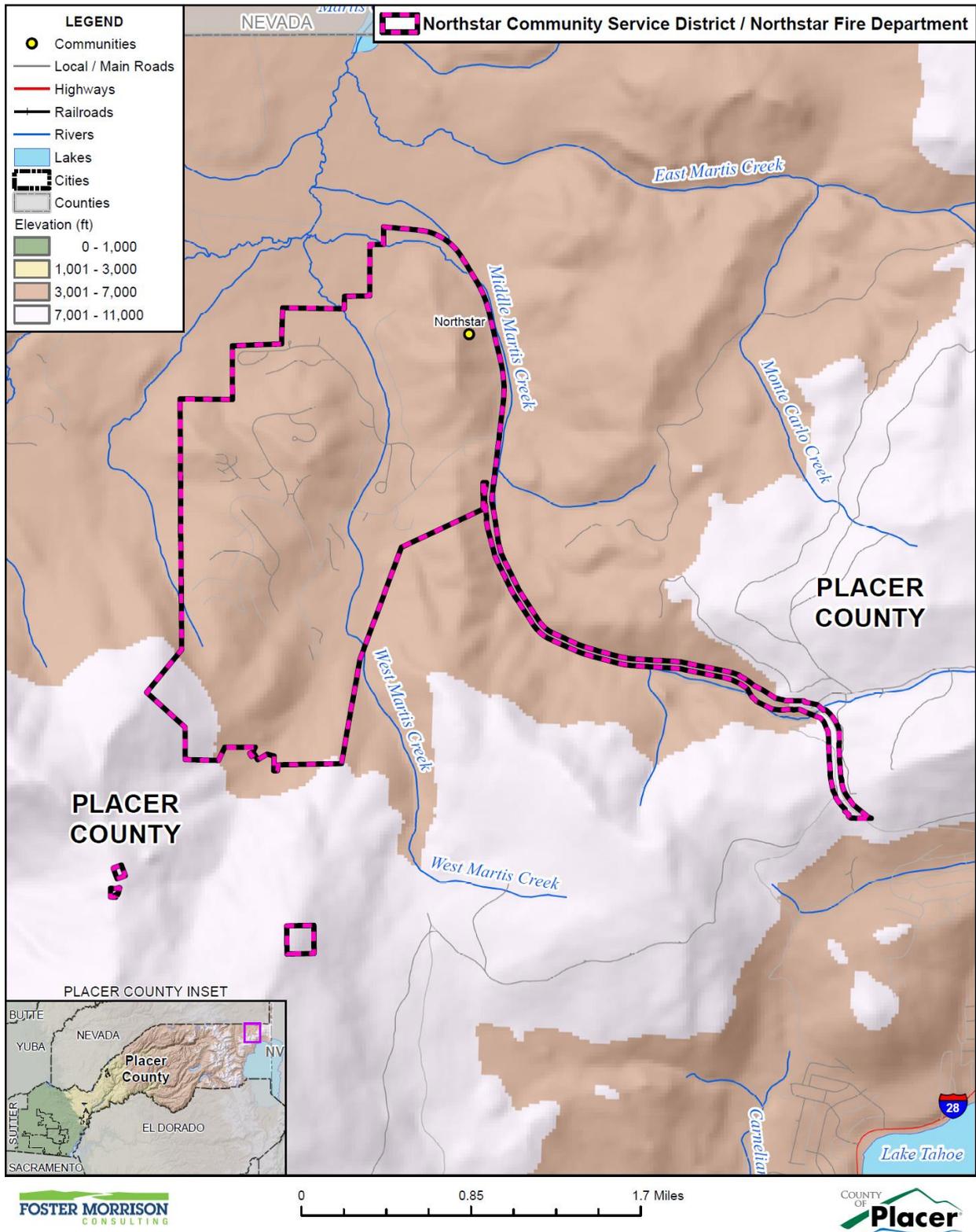
As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table L-1. Additional details on plan participation and District representatives are included in Appendix A.

Table L-1 NCSD & FD – Planning Team

Name	Position/Title	How Participated
Eric Martin	District Engineer	Plan Contributor
Joe Barron	Forester	Plan Contributor
Jason Gibeaut	Division Chief	Plan Contributor
Sean Bailey	Fire Chief	Plan Contributor
Jeff Botto	Fire Engineer	Plan Organizer

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table L-2.

Figure L-1 NCSD & FD



L.3.1. Overview and Background

In 1972, the Northstar Fire Department was formed as a Placer County Services Area governed by the Placer County Board of Supervisors. The Northstar Community Services District (NCSD & FD) was founded in 1990 under Government Code 61600 as a local government entity to serve the Northstar region with governmental services. The District currently provides water, sewer collection, solid waste management, recycling services, fire protection, fuels management, snow removal, road surface maintenance, and trail construction and maintenance. These services are supported by property taxes, the Measure E Parcel Tax, and water, sewer and solid waste user fees.

In the fall of 2015, after six years of operating the adjacent water system through a contract with Placer County Water Agency, the District acquired full ownership and operations of the Martis Valley Water System serving Lahontan, Martis Camp, Schaffer's Mill, and Hopkins Village. The District looks forward to continuing the highest level of service as we experience continued growth in our service area.

The NCSD & FD is governed by a five-person, elected Board of Directors composed of registered voters from the communities served by the District. The role of the Board of Directors is to provide responsible leadership by determining District policy while day-to-day operations are overseen by a board-appointed General Manager.

L.4 Hazard Identification

NCSD & FD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table L-3).

Table L-3 NCSD & FD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Significant	Unlikely	Negligible	Low	Medium
Climate Change	–	–	–	–	–
Dam Failure	Limited	Unlikely	Limited	Medium	Medium
Drought & Water Shortage	Extensive	Occasional	Negligible	Low	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Negligible	Low	Medium
Floods: Localized Stormwater	Significant	Occasional	Negligible	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure					Medium
Pandemic	Extensive	Occasional	Critical	Medium	Medium
Seiche					Medium
Severe Weather: Extreme Heat	Extensive	Unlikely	Negligible	Low	High
Severe Weather: Freeze and Snow	Extensive	Highly-likely	Negligible	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	–	–	–	–	Low
Tree Mortality	Significant	Highly Likely	Negligible	Medium	High
Wildfire	Extensive	Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

L.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

L.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section L.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table L-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

L.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the NCS&D & FD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table L-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. NCS&D & FD's physical assets, valued at over \$1.6 billion, consist of the buildings and infrastructure to support the District's operations.

Table L-4 NCS&D & FD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
267 Lift Station	Sewer Pump Facility	70 Hwy 267	\$1,750,000	Earthquake, Severe Weather: Freeze and Snow
Administrative/Engineering Office	Office Building	900 Northstar Dr	\$4,629,535	Earthquake, Severe Weather: Freeze and Snow, Wildfire, Pandemic
Former Administrative Office	Office Building	908 Northstar Dr	\$1,780,260	Earthquake, Severe Weather: Freeze and Snow, Wildfire, Pandemic
Tank #1/Res F	903 & 900 Road	903 & 900 Road	\$488,988	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Corp Yard Shop Building	Maintenance/Storage	51 Trimont Ln	\$1,630,864,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Fuel Enclosure	Fueling	51 Trimont Ln	\$157,830	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank D Pump Station	Water Pump Facility	Big Springs	\$1,210,009	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank #2/Res F	Water Storage	903 & 900 Road	\$670,779	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Corp Yard Equipment Bays	Equipment Storage	51-C Trimont	\$494,517	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank #2/Res C	Water Storage	Coyote Fork	\$1,735,561	Earthquake, Severe Weather: Freeze and Snow, Wildfire

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Northstar Drive Pump Station	Water Pump Facility	914 Northstar Dr	\$1,210,009	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank #2/Res D	Water Storage	Big Springs	\$488,988	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank #1/Res C	Water Storage	Coyote Fork	\$1,735,561	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Corp Yard Sand Barn	Storage	51 Trimont Ln	\$978,512	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Corp Yard Office	Office	49 Trimont Ln	\$1,183,691	Earthquake, Severe Weather: Freeze and Snow, Wildfire, Pandemic
TH-2 Well Building	Domestic Well	5999 North Shore Blvd	\$1,512,500	Earthquake, Severe Weather: Freeze and Snow
Tank #1/Res D	Water Storage	Big Springs	\$488,988	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Tank E	Water Storage	Highlands View	\$670,779	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Water Treatment Plant	Water Treatment	9150 Highlands View	\$4,173,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Indian Hills Lift Station	Sewer Pump Facility	Indian Hills	\$745,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire
TH-1 Well Building	Domestic Well	5959 Northshore Blvd	\$900,000	Earthquake, Severe Weather: Freeze and Snow
Retreat Lift Station	Sewer Pump Facility	Cross Cut Ct	\$530,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire
Station 31	Fire Station	910 Northstar Rd	\$4,500,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire, Pandemic
Station 32	Fire Station	9100 Highlands View	\$4,500,000	Earthquake, Severe Weather: Freeze and Snow, Wildfire, Pandemic
Total			\$1,667,398,507.00	

Source: NCSD & FD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. NCSD & FD serves an estimated population of 3,053 residents. In addition to permanent residents, NCSD & FD serves a substantial number of seasonal and part-time residents, hotel guest, short-term rentals, and day visitors. Seasonal influxes in population can vary by up to 20,000 persons.

Natural Resources

NCSD & FD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

NCSD & FD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

The District noted that Mountainside Builders, the main developer at Northstar is not taking on much at the moment. 5-10 new residences are expected in 2021. The District's Zone 4 Water System on the other hand is seeing increased activity in Martis Camp, Lahontan, and Schaffer's Mill.

Development since 2016

No District facilities have been constructed since 2016. The Administration Building was the last facility constructed and that was 2015. The District continues to have preventative maintenance on all facilities, but no major overhauls since 2016

Developers are currently building out the Highlands II Subdivision. 10G has an expected completion date of 2021. The developer has current entitlements that will continue development for the next 20 years and additional properties have been identified for future entitlements.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

L.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table L-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Dam Failure

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

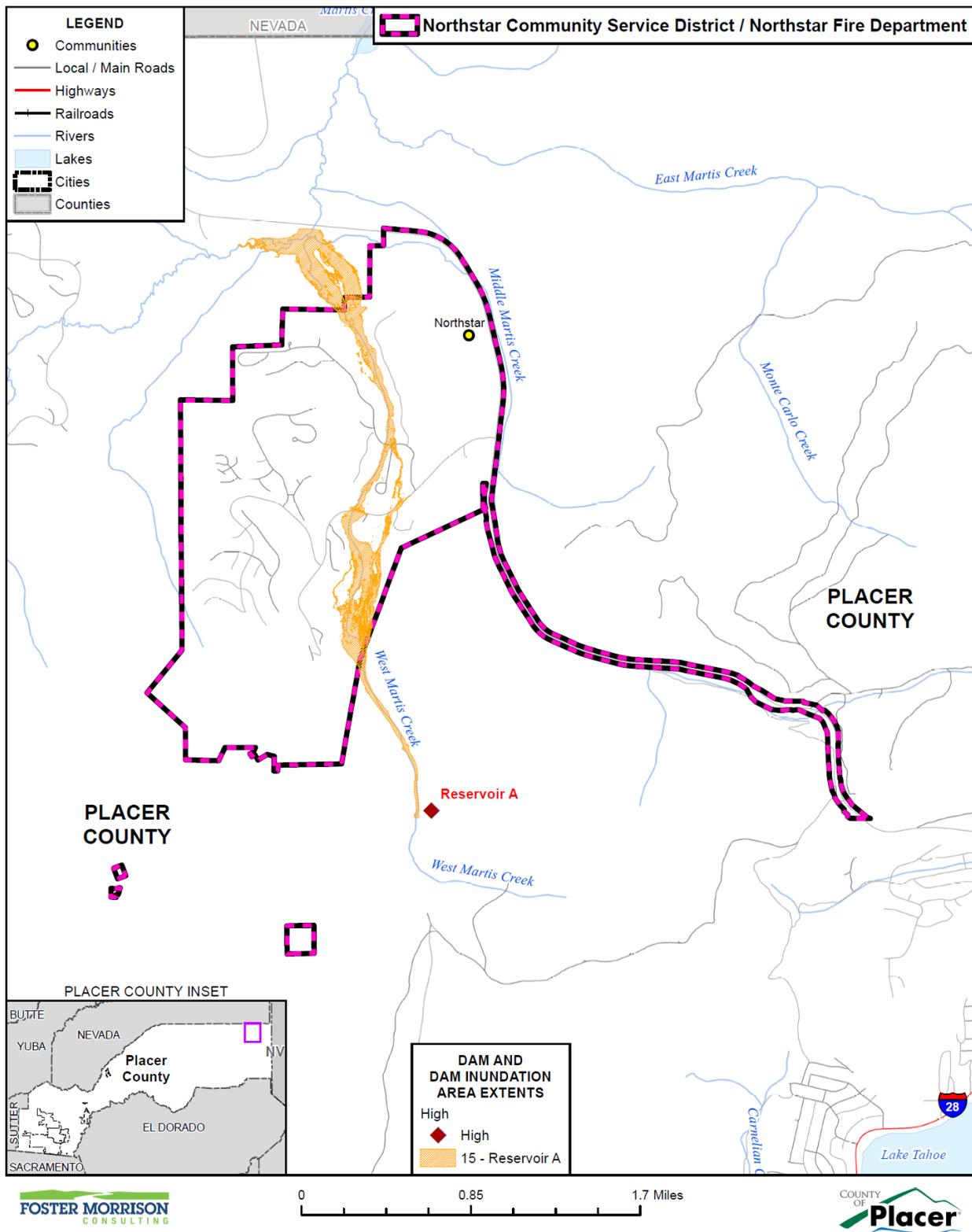
Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Dams inside the County that can affect the District can be seen on Figure L-2. The dam in question here is the Reservoir A dam that is owned by the NCSD & FD&FD.

Figure L-2 NCSD & FD – Dam Inundation Areas from Dams Inside the County



Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

The Reservoir A Dam (National ID No. CA01112) is owned by the Northstar Community Services District and has a ‘high’ hazard classification. The dam is primarily used for water storage and has no critical appurtenant structures. It is located on the north side of Reservoir A. The dam and reservoir are about 6.2 miles southeast of the town of Truckee in Placer county. The height of the earthen dam is 93 ft., while the length is 516 ft. There is a spillway on the north west corner of the dam. The reservoir capacity is 180 acre-feet. There are no upstream or downstream dams within the study area. Jurisdictions affected include the local county road maintenance department, local water purveyor, local county telephone, and PG&E.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

During dam failure, flow will travel north through West Martis Creek and it will inundate Highlands View Road, the first infrastructure impacted, which has a maximum conveyance of approximately 1,800 CFS. Northstar Drive and Basque Drive are also inundated before reaching State Route 267 (SR 267). Basque Drive has a corrugated metal pipe culvert that can only handle a small portion of peak flow; flood flows will overtop Basque Drive. From Basque Drive, flood flows will travel north through the Northstar Golf Course and the enter the Martis Creek Trail and Wildlife Area. Because of the large storage capacity of the Martis Creek Wildlife Area, only a peak flow of 2,360 cfs will pass through Martis Creek Lake and SR267 will not be overtopped.

Assets at Risk

No District assets (from Table L-4) are at risk from this hazard.

Earthquake

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth’s outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth’s crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and

levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismic shaking maps for the area show Placer County and the District fall within a moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer

construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The District noted that there are no URM or soft story buildings in the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The NCS&D is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

The District has never suffered a severe earthquake. However, if an earthquake were severe enough, there is potential to cause widespread destruction. This destruction would be in the form of damage to businesses, private residences, and critical infrastructure including District owned facilities that provide essential services. Since the community of Northstar is a resort community, the shutdown to businesses for long periods due to an earthquake would cause negative impacts to the economy.

Assets at Risk

All of the District assets (from Table L-4) are at risk from this hazard.

Pandemic

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table L-5.

Table L-5 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

In response to the initial outbreak of COVID-19 and subsequent shelter in place orders, District management quickly developed protocols to avoid the spread of disease. Due to the essential nature of the work the District performs, Safety personnel were required to continue to report for duty in person.

Operations staff worked on an adapted, rotating schedule until guidelines were in place to prevent the spread of COVID-19 and protect the health and safety of employees. Administrative staff moved to work from home full time, when possible. Administrative staff with an in-office requirement worked in rotating shifts. All in office staff has continued to adhere to cleaning, physical distancing and hand-washing guidelines.

In order to accommodate the shift from in-office to work from home, new in-house policies and procedures were quickly developed and implemented to allow the work processes to continue in an efficient manner and without disruption.

District Board meetings were adapted to a virtual environment via Zoom and the office was and remains closed to the public.

The evolving nature of the pandemic demanded flexibility and adaptability of staff. Pandemic-related policies have been implemented and updated on a continual basis since the onset of COVID-19 and in accordance with federal, state and local laws. This required dedication and attention to several authorities for information to properly communicate, inform and educate staff.

The rate of infection within the District was negligible and there have been no staff to staff transmissions as of April 2021. The fiscal impacts on the District have been insignificant. The District did not reduce staff or pay throughout the pandemic.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table L-6.

Table L-6 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Effects to the District from cold and freeze are limited as infrastructure and facilities were constructed with severe mountain environment in mind. Sustained winter power outages of several days have been experienced in the past due to storm activity. A Critical Power Interruption Emergency Response Plan was drafted in February 2020 to better identify and address backup power needs at facilities during extreme weather events.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Because the District is located within the Sierras freeze and snow is a normal occurrence. Over the years the District, its property owners and business owners have taken steps as part of normal everyday life to ease the potentially harmful effects of freeze and snow.

Freeze and Snow and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Assets at Risk

All of the District assets (from Table L-4) are at risk from this hazard. The Critical Power Interruption Emergency Response Plan adequately addresses the hazard.

Tree Mortality

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015. The District noted that there has been no direct property damage, there still remains the potential from a falling tree on residential, commercial, or other infrastructure. There was also the loss of 1-12 trees per acre. These trees (Conifers) can be considered merchantable timber for residential and commercial properties. Loss of potential revenue and aesthetic values to the community. Funding has been obtained by the Northstar Fire Department through federal, State of California, Placer County and private funding to slow to tree mortality to a manageable level.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

The District noted that tree mortality beyond a manageable level will occur until the following is achieved: 1) Stand density levels are at a historic level; 2) Species ratio is brought back to its historical component; and 3) Occurrence increase is dependent on climactic conditions. For example, consecutive drought years increases mortality. Also, tree mortality is dependent on existing species present. By manipulating the forest back to a pine/fir mix will help rectify the issue.

Assets at Risk

None of the District assets (from Table L-4) are at direct risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Likely
Vulnerability–High

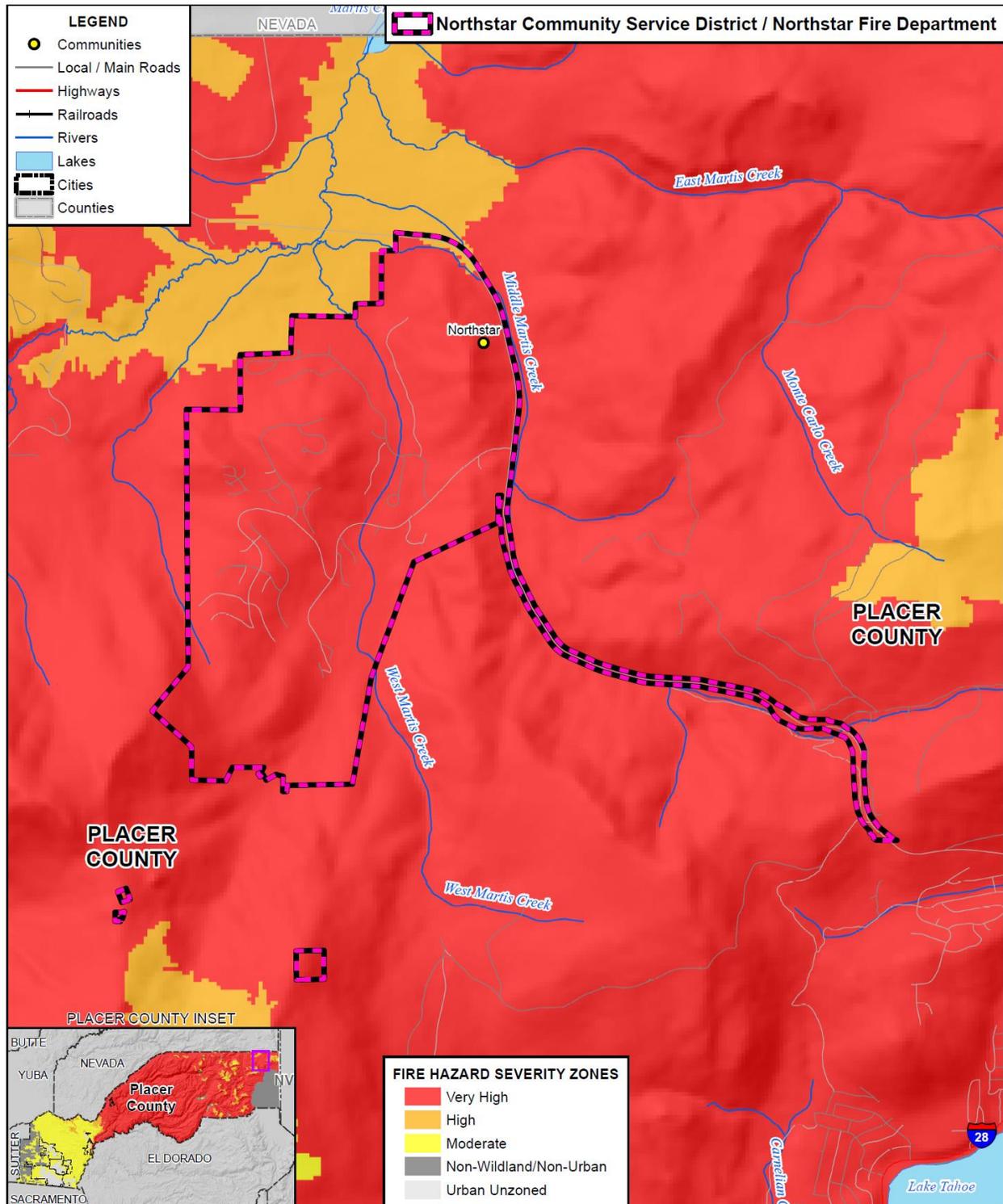
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the NCSD & FD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the NCSD & FD were created. Figure L-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from High to Very High.

Figure L-3 NCSD & FD – Fire Hazard Severity Zones



FOSTER MORRISON
CONSULTING

0 0.85 1.7 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table L-7.

Table L-7 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The District Forester’s records regarding wildland fire impacts date back to 1967. To his knowledge none of the fire’s listed above created a major impact nor damages to the District and neighboring communities.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat

of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District is located in the Sierra Nevada mountain range at the east end of Placer County. The community of Northstar is in a classic Wildland/Urban Interface area (WUI), which adds responsibility and demands to both structural and wildland firefighting. If the District were to experience a major wildland fire the limited emergency response resources would be severely taxed. Northstar is a popular year-round visitor destination, which causes the potential for traffic congestion and could prevent firefighting equipment or medical-emergency personnel from responding in a timely manner. Traffic congestion at peak times of summer could also impact the ability of residents to evacuate in the event of a large scale wildfire.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's energy companies (including PG&E and Liberty Utilities), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Assets at Risk

All facilities from Table L-4 except the TH-1 and TH-2 wells are at risk from this hazard.

L.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

L.6.1. Regulatory Mitigation Capabilities

Table L-8 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the NCSD & FD.

Table L-8 NCSD & FD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	NA	Placer County Authority
Capital Improvements Plan	N/N 2011	Does not address hazard projects identified within the mitigation strategy.
Economic Development Plan	NA	Placer County Authority
Local Emergency Operations Plan	NA	Placer County Authority
Continuity of Operations Plan	Y/N	Currently in process of being developed.
Transportation Plan	NA	Placer County Authority
Stormwater Management Plan/Program	NA	Placer County Authority
Engineering Studies for Streams	NA	Watershed Council Authority
Community Wildfire Protection Plan	Y/Y 2015	Plan addresses hazards and includes mitigation strategy and actions.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2013
Building Code Effectiveness Grading Schedule (BCEGS) Score	NA	Score:
Fire department ISO rating:		Rating: 3
Site plan review requirements	Y	Yes
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	NA	Placer County Authority
Subdivision ordinance	NA	Placer County Authority
Floodplain ordinance	NA	Placer County Authority
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Only wildfire. Yes, it is an effective measure and adequately administered.
Flood insurance rate maps	NA	Placer County Authority
Elevation Certificates	NA	Placer County Authority
Acquisition of land for open space and public recreation uses	NA	Placer County Authority
Erosion or sediment control program	NA	Placer County Authority
Other		

How can these capabilities be expanded and improved to reduce risk?

Regulatory mitigation capabilities are effective in mitigation and loss prevention. Capability expansion and improvement is unnecessary at this time.

Source: NCS&D & FD

As indicated above, the District, in conjunction with the County, has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Reservoir A Emergency Action Plan (2021)

The purpose of the Reservoir A Dam Emergency Action Plan (EAP) is to reduce the risk of loss of human life or injury and to minimize property damage in the event of a potential or actual emergency situation associated with Reservoir A Dam. These situations include, but are not limited to dam instability, sizable earthquakes, extreme storm events, major spillway releases, overtopping of the dam, outlet system failure, vandalism or sabotage, spillway gate failures, and failure of the dam. This EAP defines the responsibilities and provides procedures to identify and effectively address unusual and unlikely conditions that may endanger the Reservoir A Dam and nearby areas in time to take mitigating actions and notify the appropriate emergency management officials.

Capital Replacement Plan (2018)

With approximately \$191 million in assets, the District’s water, sewer, solid waste, fire, fuels, snow removal, road maintenance and trails services are very asset intensive businesses. The infrastructure, facilities and equipment comprising these assets are critical in ensuring the delivery of quality service. Comprehensive management of assets is a key goal of the District, and is core to the mission of sustainable, long term delivery of services. Part of the District’s asset management strategy is to develop a model forecasting the full lifecycle rehabilitation and replacement costs with a related funding program for its assets with the goal of ensuring consistent service in the most economical manner in balance with generational fairness.

The purpose of this Capital Replacement Plan (CRP), with supporting appendices, is to fully document the District’s facilities, equipment and infrastructure capital replacement needs over a modelled period of 100 years, and to provide a detailed financial analysis for each of the District’s service funds to assist in setting annual capital reserve account contribution goals.

The District has developed this CRP as a living document to set a foundation for fiscal stewardship. It is primarily derived from the District’s GIS based asset management system with a wide array of industry standard metrics and engineering solutions providing the guiding methodology for the model output. This data was used in conjunction with District policies to develop specific funding programs for each service.

Northstar Community Wildfire Protection Plan, 2015 (Being updated in 2021)

The objective of this Community Wildfire Protection Plan (CWPP) is to reduce or eliminate the loss of life, property and resources caused by a wildfire in the Northstar community. This will be accomplished through public input, planning and forest management practices. The first line of defense against a catastrophic wildfire in Northstar is to prevent as many fires as possible from starting or, in the event of a fire, to keep

it as small as possible. The second line of defense is to enforce defensible space requirements around structures and to manage fuels in common and boundary areas by creating firebreaks, safe escape routes and promoting a healthy forest ecosystem. The CWPP puts goals and actions together to reduce wildfire risk to residents in the Northstar community.

Ordinance 26-09 – Wildland Fire Prevention and Defensible Space

Fires pose a serious threat to the preservation of the public peace, health and safety, and are extremely costly. Since fires ignore civil boundaries, it is necessary that cities, counties, special districts, state agencies, and federal agencies work together to minimize the threat of fires and maximize the ability to extinguish them quickly. Preventive measures are therefore needed to insure the preservation of the public peace, health, and safety.

The purpose of this Ordinance is to:

- Classify lands within the District in accordance with whether a high fire hazard is present so that District officials and others with similar wildland fire prevention and suppression responsibility are able to identify measures that will retard the rate of spread and reduce the potential intensity of uncontrolled fires that threaten to destroy natural resources, life or property.
- Require that the measures be implemented in order to accomplish the following:
 - ✓ Set maintenance standards
 - ✓ Define penalties for violation of this Ordinance

The District hereby specifically and expressly finds that regulations contained herein are reasonably necessary because of local climatic, geological and topographical conditions unique to the Northstar area and are further required to reduce the possibility of a fire originating within the District from spreading to the adjacent Lake Tahoe Basin, an area of national importance and significance.

Future Construction in Wildfire Zones

Due to potential wildfire hazard, developers must follow an established ordinance that dictates that all new construction must have certain “buffer” zones. For example, the developer must construct a 300’ buffer zone (implementing fuels management operations) in and around development (both residential and commercial). Additionally, the developer must create a 5’ non-combustible buffer zone around developed property.

Ordinance 35-19 is an updated version of the ordinance above. It will be included in the annex packet.

Critical Power Interruption Emergency Response Plan

The District’s facilities and water and sewer systems are dependent on electrical power. Although all facilities have been designed to withstand the effects of short duration power losses, severe weather and Public Safety Power Shutoffs (PSPS) present a potential problem in that the power disruptions could last several days. This plan identifies all backup power systems for District facilities and provides considerations for keeping systems operational during extended outages.

L.6.2. Administrative/Technical Mitigation Capabilities

Table L-9 identifies the District department(s) responsible for activities related to mitigation and loss prevention in NCSD & FD.

Table L-9 NCSD & FD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	NA	Placer County
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	The maintenance of clearing drainage systems is the responsibility of Placer County. Northstar Community Services District works closely with Placer County to coordinate this effort.
Mutual aid agreements	Y	Northstar Fire Department is party to several mutual aid agreements.
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	NA	Placer County responsibility
Floodplain Administrator	NA	
Emergency Manager	NA	
Community Planner	NA	Placer County responsibility
Civil Engineer	Y FT	Staff is trained on regulation and mitigation. There is effective coordination between agencies and staff.
GIS Coordinator	Y FT	Staff is trained on regulation and mitigation. There is effective coordination between agencies and staff.
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	NIXLE, DOT Signage, Fire Danger Signs, Reverse 911, District Siren, Website with Emergency Updates/Postings
Hazard data and information	Y	Coordinated with Placer County Environmental Health
Grant writing	Y	Forester and one staff person are responsible for grant writing pertaining to Fuels Reduction Program, and fire operations.
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Administrative and technical mitigation capabilities are effective in mitigation and loss prevention. Capability expansion and improvement is unnecessary at this time. If in the future it becomes necessary, the District will work to expand its capabilities.		

Source: NCSD & FD

L.6.3. Fiscal Mitigation Capabilities

Table L-10 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table L-10 NCSD & FD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Capital improvement projects are typically projects that replace existing assets. Funding for mitigation projects is at the discretion of the Board of Directors.
Authority to levy taxes for specific purposes	Y	Yes. Measure "E" was used to fund fuels reduction and road improvements.
Fees for water, sewer, gas, or electric services	Y	District enterprise funds include water, sewer, and solid waste. The District is currently researching the potential to allocate a portion of these funds to fuels reduction.
Impact fees for new development	Y	The fire department assesses mitigation fees for new development.
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Up to this point, the incurring of debt has only been used to help fund the new Admin Building. Depending on the type of mitigation project special tax bonds and general obligation bonds could be utilized.
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	Federal grants have been awarded for past forestry projects that reduce forest fuels to prevent catastrophic wildfires.
State funding programs	Y	Forestry grants that reduce hazardous forest fuels and enhance water sheds.
Other		
How can these capabilities be expanded and improved to reduce risk?		
Forest fuels reduction is looking to potentially increase the parcel tax to help levy funds for additional "on the groundwork and fund a full time Forestry Assistant.		

Source: NCSD & FD

L.6.4. Mitigation Education, Outreach, and Partnerships

Table L-11 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table L-11 NCSD & FD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Homeowner's Newsletter - articles highlight fire safety, water conservation, and information important to the community. Annual Homeowner's Meetings presentations are given on fire safety, defensible space, and fuels reduction program. Fire Extinguisher training is offered by District employees multiple times throughout the year for local Annual Fire Prevention/Inspections of Commercial Properties – Inspections are provided within a focus on educating business owners of fire code requirements. District Water Conservation Program - A Conservation Ordinance has been adopted. There are educational efforts to all property owners on the benefits of water conservation, the District has installed smart meters so property owners can monitor water usage, the District has installed a conservation garden to encourage water wise landscape.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	Y	Recognized FireWise community
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Firewise is a nationally recognized program which benefits members of a community through fire education and participation. Additionally, Firewise assists in obtaining wildfire insurance/discounts and is beneficial in the grant application process.		

Source: NCSD & FD

L.6.5. Other Mitigation Efforts

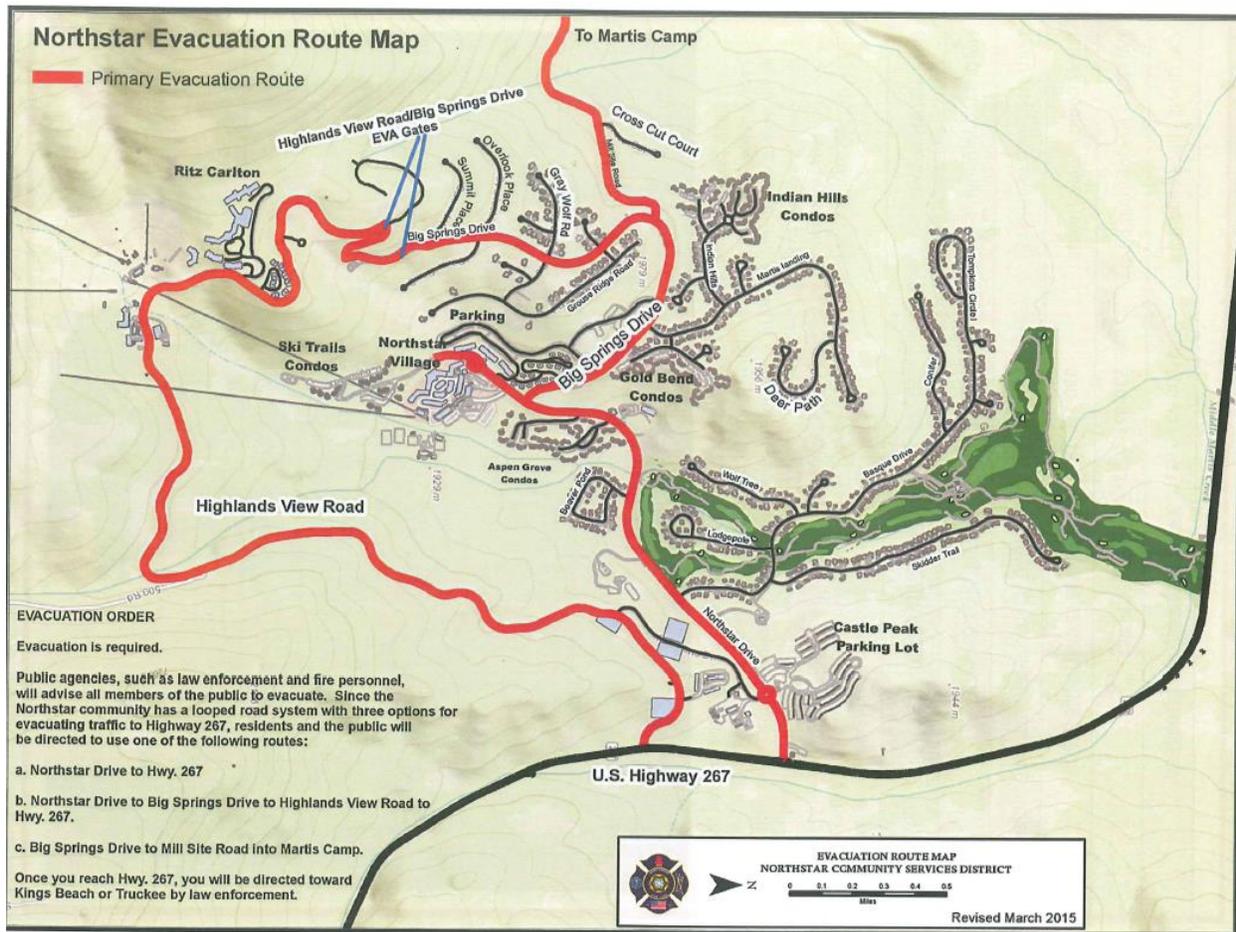
The Northstar Community Services District has many other mitigation efforts. Some of these were captured in the tables above, but are discussed in greater detail below.

- **Firewise Community:** The District became recognized as a Firewise Community in 2009. Since then, the NFD has continually worked with many of our community leaders towards maintaining such eligibility. The Firewise program is nationally-recognized. The NFD, in conjunction with Northstar Property Owners Association (NPOA), Condominium Association Management Company (CAMCO),

Vail Resorts, and Mountainside Partners are providing resources aimed at the reduction of fuels to create better defensible space within the Northstar area. There are many benefits to becoming a Firewise community; we gain an edge on securing grants and Federal funding for defensible space projects. The program is also recognized by certain insurance companies which offer a discount to property owners who reside within a Firewise community.

- Fuels Reduction Program: A program that is overseen by a full-time Forester that executes fuels management/forest health projects with the emphasis on reducing excess fuels, reduce the potential for insect and disease infestations and restore the forest back to healthy historical standards. The program offers the necessary resources and staffing for such projects. This program was created in order to meet the strategic initiatives found in our District's Community Wildfire Protection Plan (CWPP).
- Defensible Space Program: A program that is overseen by a full-time Fire Prevention Officer that requires all homeowners to maintain their property in compliance with Public Resources Code (PRC) 4291, California Code of Regulations (CCR) 1299 and Northstar Ordinance 35-19 guidelines.
- Fire Hydrant Maintenance Program: A program that seeks to keep all fire hydrants operable to the fullest measure. The program institutes annual inspections and maintenance involving flow/pressure testing, flushing, repairs and re-painting.
- Green Waste Recycling Program: A program created to help homeowners with defensible space compliance. This program is being revamped for 2021. The District has allocated \$25,000 annually to reimburse residents for 6-yd³ green waste dumpster rentals. In addition, 30-yd³ dumpsters will be provided on Memorial Day, July 4th and Labor Day for residents to dispose of green waste.
- With the ensuing development of the Highlands area, new roads were constructed (i.e. Highlands View Road and Shaffer Mill Road connector) – thus, allowing for additional means of ingress and egress in case of evacuation due to catastrophic events. This is shown in Figure L-4.

Figure L-4 Northstar CSD - Evacuation Routes



Source: Northstar CSD

- Deer Path Water Course Relocation Project. The original water course that day lighted above the Martis Landing homes was relocated to a new channel. The original drainage inlet was removed. A new inlet was installed further downstream, and all water tied into the larger storm water system.
- Wolf Tree Storm Water Extension. The original storm water system day lighted itself at the property line. This was problematic as it would wash out our sewer access road and find a water course through a lower residence on Basque. This storm water drainage was extended, and a culvert installed under the sewer access road. It now day lights above the golf course as a dissipater was installed to encourage sheet flow onto the golf course fairway.
- Easement Access Road Water Bar Maintenance and Replacement Program. Annually, the Utilities Department maintains the water bars on all of our access roads. An assessment of effectiveness is done at the same time. The purpose of the water bars is to encourage sheet flow and dissipate energy. Areas deemed to have unnecessary or ineffective water bars are terminated and areas deemed useful are added.
- Storm Water Drainage Inlet Maintenance. Technically, storm drainage inlets are Placer County's responsibility. Placer County is not always able to get all of our D.I.'s on an annual basis. And, in many areas, this is necessary. The Utilities Department ensures that all D.I.'s within the District boundaries are clean of debris and able to flow storm water in the case of a serious event. Such work is performed using the District-owned Vac-Con truck.
- Storm Events. During a storm event where the precipitation is in the form of rain (not snow), the Utilities Department uses part of its crew to clean D.I. grates to ensure water is flowing into its proper

channels. In some instances, water must be diverted to avoid it cutting its own course in a less desirable path. Equipment used for this task includes simple hand tools such as: shovels and rakes. However, the Vac-Con truck, backhoe, loaders or graders can be used when deemed necessary.

L.7 Mitigation Strategy

L.7.1. Mitigation Goals and Objectives

The NCS&D & FD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

L.7.2. Mitigation Actions

The planning team for the NCS&D & FD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Dam Failure
- Earthquake
- Pandemic
- Severe Weather: Freeze and Snow
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Tree Mortality

Hazards Addressed: Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Northstar Fire Department’s Forest Fuels Management Department has been working towards reducing tree mortality within and outside the District boundary. Tree mortality has accelerated from drought cycles, climate change, insects, and disease. Tree mortality has increased forest fuels accumulations and created a public safety/infrastructure hazard. Tree mortality can be identified as dead, dying, diseased or pest infected. In the last 10-years tree mortality has increased to a level that must be mitigated before tree mortality becomes at an epidemic level.

Project Description: The Forest Fuels Management tracks and identifies tree mortality on a year-round schedule. Once a tree is identified for removal it is prioritized based on the severity of mortality and the hazard it possesses. Tree mortality used to address in the spring and fall months with a fixed budget. Now tree mortality must be addressed year-round.

Other Alternatives: There are no alternatives being that this is a priority public safety/forest health project.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Wildfire Protection Plan, Forest Fuels Modeling, Field Reconnaissance

Responsible Agency/ Department/Partners: Northstar Fire Department/Forest Fuels Management

Cost Estimate: Has increased from \$25,000 annually to an estimated \$100,000.

Benefits (Losses Avoided): Public safety, structure protection, and protection of infrastructure

Potential Funding: District and grant funding

Timeline: 7-years to be in a maintenance mode

Project Priority (H, M, L): High

Action 2. Wildfire Mitigation

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Northstar Fire Department’s Forest Fuels Management Department has been reducing hazardous forest fuels within and outside the Northstar Community Services District (NCSD & FD) boundary since the inception of the program in 2008. To date the Forest Fuels Management program has treated a total of 1,458 acres within and outside the Northstar Community Services District Boundary. Project areas have received one or more treatments with the intention of having the entire NCSD & FD boundary in a “Maintenance Mode”. A total of 1.7 million dollars has been applied towards treatment through district, State of California, federal and Placer County funding.

The goal is to treat forested acres within and 300’ outside the district boundary to mitigate wildfire behavior to a level that firefighting can make a defensive stand, protect structures, safely evacuate a community and protect human lives.

Prioritization of project areas is guided by the Community Wildfire Protection Plan (CWPP), forest fuels modeling and field work. The main priority for forest fuels reduction is enhancing the main, secondary, and tertiary evacuation routes.

To reach the goal it is estimated that it will take another 7-years and adequate funding to accomplish this goal.

Project Description: This plan identifies prioritization of treatment areas for Forest Fuels Reduction based on guidance of the Community Wildfire Protection Plan.

Other Alternatives: There are no alternatives being that this is a priority public safety project.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Wildfire Protection Plan, Forest Fuels Modeling, Field Reconnaissance

Responsible Agency/ Department/Partners: Northstar Fire Department/Forest Fuels Management

Cost Estimate: \$2,100,000

Benefits (Losses Avoided): Public safety, structure protection, and protection of infrastructure

Potential Funding: District and grant funding

Timeline: 7-years to be in a maintenance mode

Project Priority (H, M, L): High

Action 3. Critical Power Interruption Emergency Response Plan

Hazards Addressed: Severe Weather: Freeze and Snow; Wildfire, Pandemic, Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The District's facilities and water and sewer systems are dependent on electrical power. Although all facilities have been designed to withstand the effects of short duration power losses, Public Safety Power Shutoffs (PSPS) present a potential problem in that the power disruptions could last several days. Liberty Utilities began implementing PSPSs in summer 2019 to protect public safety by reducing the threat of catastrophic wildfire when gusty winds and dry conditions are forecasted.

Public Safety Power Shutoffs have the potential to occur with regularity during the fire season (May through November). An analysis of the District's resistance to these events is necessary to identify potential power backup deficiencies as well as to plan for specific operational considerations to implement during the events. Sustained winter power outages of several days have also been experienced in the past due to storm activity, and further preparation for these disturbances is desired.

Project Description: This plan identifies all backup power systems for District facilities and provides considerations for keeping systems operational during extended outages.

Other Alternatives: No alternatives identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: N/A

Responsible Agency/ Department/Partners: NCSD & FD

Cost Estimate: Work to prepare plan was performed in-house at no outside costs.

Benefits (Losses Avoided): By identifying critical operational considerations for facilities with backup power, NCSD & FD is better equipped to mitigate the risk of extended power outages incurred during severe weather.

Potential Funding: Internal labor funded via Engineering allocation for district funds.

Timeline: Completed February 2020

Project Priority (H, M, L): High

Action 4. Emergency Action Plan – Reservoir A Dam

Hazards Addressed: Dam Failure

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The purpose of the Reservoir A Dam Emergency Action Plan (EAP) is to reduce the risk of loss of human life or injury and to minimize property damage in the event of a potential or actual emergency situation associated with Reservoir A Dam.

These situations include, but are not limited to dam instability, sizable earthquakes, extreme storm events, major spillway releases, overtopping of the dam, outlet system failure, vandalism or sabotage, spillway gate failures, and failure of the dam.

Project Description: The EAP defines the responsibilities and provides procedures to identify and effectively address unusual and unlikely conditions that may endanger the Reservoir A Dam and nearby areas in time to take mitigating actions and notify the appropriate emergency management officials.

The Department of Water Resources (DWR), Division of Safety of Dams (DSOD) has rated the Reservoir A Dam as “High” based on hazard classification. Because of its hazard classification, Northstar Community Services District developed the EAP in accordance with the requirements listed in California Water Code Sections 6160 and 6161 and Government Code Section 8589.5, following FEMA’s Federal Guidelines for Dam Safety: Emergency Action Planning for Dams (FEMA 64/July 2013).

Other Alternatives: No alternatives identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: N/A

Responsible Agency/ Department/Partners: NCSD & FD

Cost Estimate: Work to prepare the EAP and corresponding Inundation Mapping was recently completed for \$26,528

Benefits (Losses Avoided): By identifying affected areas, NCSD & FD is better equipped to mitigate the risk of dam failure.

Potential Funding: Funded via the District's water fund and in partnership with Vail Resorts.

Timeline: Completed March 2021

Project Priority (H, M, L): High



Annex M North Tahoe Fire Protection District

M.1 Introduction

This Annex details the hazard mitigation planning elements specific to North Tahoe Fire Protection District (North Tahoe FPD), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to North Tahoe FPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

M.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table M-1. Additional details on plan participation and District representatives are included in Appendix A.

Table M-1 North Tahoe FPD – Planning Team

Name	Position/Title	How Participated
Steve Leighton	Acting Fire Chief	High level oversight, review and approval of NTFPD’s LHMP update
Steve McNamara	Division Chief/Fire Marshal	Oversight for the update: Provided edits, updates and information related to past occurrences, vulnerability, capabilities, district information. Verified hazard id table, Guided updates to and development of new action items.
Sarah Lagano	Battalion Chief	Provide edits, updates and new information related to past occurrences, and mitigation actions related to GIS and IT.
Scott Sedgwick	Battalion Chief	Provide edits, updates and new information related to past occurrences, and mitigation actions related to Pandemic
Nikki Wagner	Captain	Provide edits, updates and new information related to past occurrences, and mitigation actions related to water infrastructure(hydrant) improvements
Brent Armstrong	Captain	Provided NFIRS incident data for use in this plan, and insights relating to wildland fire response.
William Marshman	Firefighter	Provide edits, updates and new information related to past occurrences, and mitigation actions related to communications, and radio systems

Name	Position/Title	How Participated
Eric Horntvedt	Forest Fuels Coordinator	Coordinate and lead NTFPD's LHMP update: Attend meetings, provide general edits and updates to past annex, hazard id table, mitigation actions, vulnerability and capability info, and map. Solicit additional information from NTFPD planning team members.
Erin Holland	Public Information Officer	Co-lead NTFPD's LHMP Update: Attend meetings, general edits and updates to past annex, mitigation actions, manipulate NFIRS data, solicit additional information from NTFPD planning team members

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table M-2.

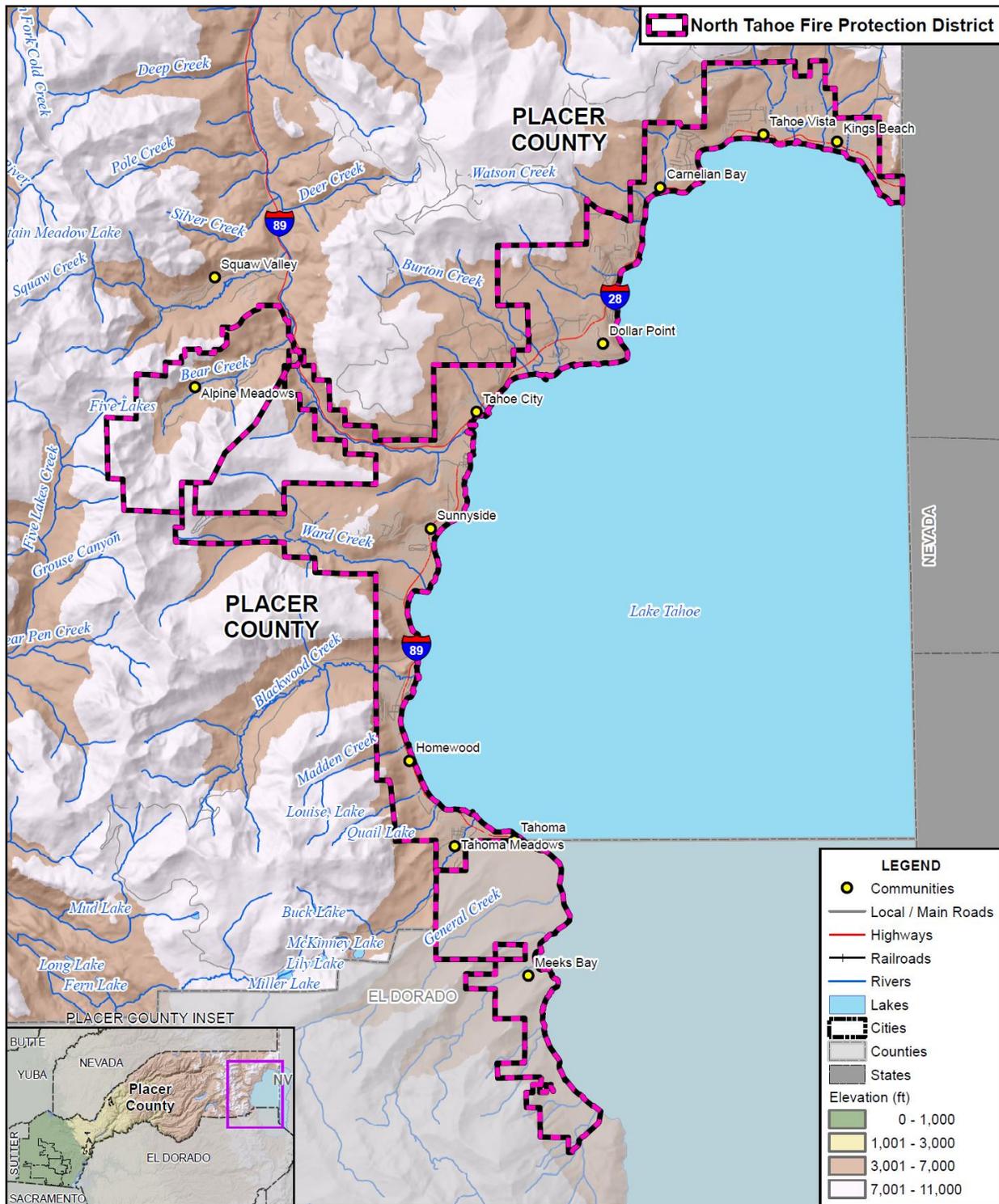
Table M-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
2015 Lake Tahoe Basin CWPP	Section 5.3.5 of the 2015 CWPP recognizes the inclusion of Local Hazard Mitigation Plans that have identified wildfire as a hazard and provide for mitigation actions to reduce the risk of catastrophic fire
Placer Emergency Operations Plan (2017)	The EOP used the LHMP as a basis for hazards to plan for.
DRAFT Lake Tahoe Climate Adaptation Action Portfolio (CAAP)	LHMP is not specifically addressed in the “Integrated Vulnerability Assessment of Climate Change in the Lake Tahoe Basin” but it was recommended to be included (along with CWPP) in the developing Climate Adaptation Action Portfolio to show agency commitments to mitigating the risks associated with natural hazards.
Pre-Attack Plans	LHMP is informally incorporated as Pre-attack plans are in place to plan for response to hazards.

M.3 District Profile

The District profile for the North Tahoe FPD is detailed in the following sections. Figure M-1 displays a map and the location of the District within Placer County.

Figure M-1 North Tahoe FPD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

M.3.1. Overview and Background

North Tahoe Fire Protection District (NTFPD) is an all-risk career fire district that protects various communities within two counties on the north and west shores of Lake Tahoe, North America's largest alpine lake. The district's service area covers over 40 square miles and over 20 miles of shoreline. The district is entirely within the unincorporated areas of Placer and El Dorado Counties. The district's mission is to provide the highest possible level of fire, rescue, and pre-hospital emergency medical services and ambulance transport, as well as prevention and education to the residents and visitors of the communities served.

NTFPD personnel are trained to respond to events such as structure and wildland fires, technical rescue operations, confined space operations, ice/swift water/back country rescues, and mitigation of hazardous materials incidents. NTFPD's service area consists of eight fire stations, five of which are staffed fulltime (24/7/365), and we are a career fire department with 51 uniformed Fire/EMS personnel and operate a daily minimum staffing of 12 firefighters. In addition to the District's formal service area, consisting of over 17,000 housing units and over 1,000 businesses spanning 27.5 square miles, the District provides service via long-term contract to the Alpine Meadows community, consisting of 750 housing units in Placer County, and the Meeks Bay community, consisting of 2,800 housing units spanning 14 square miles. The Meeks Bay community includes over 2,000 acres of state park and federal forest land. According to an audit-certified tax base valuation for 2020, District personnel protect an assessed valuation of \$9.3 billion dollars in our combined service area, \$8.1 billion of which is in Placer County.

The district's service area ranges from 6,000 feet – 9,000 feet in elevation, and at 80 miles from the county seat, is geographically isolated and vulnerable to natural disasters such as severe winter storms, avalanches, high mountain passes, flooding, landslides, and wildland fires, which leave the region dependent upon local agencies for emergency incident response on our two-lane roads that are frequently gridlocked with seasonal traffic.

Hotels, lodges, and vacation home rentals are located throughout our service area, resulting in our population increasing from 17,000 fulltime residents to over 75,000 people during peak seasons, nearly five times the resident population, which creates an additional 10-20% increase in calls for service daily. These numbers do not reflect the overall Lake Tahoe tourist population traveling through our community, whose safety is also impacted by these local hazards. An analysis performed by Stantec using cell phone data purchased from Air Sage for three months in 2014 — February, July, and August — arrived at a statistic of visitors entering the Tahoe Basin 24.4 million times. This number can range from 19.5–29 million visitors in any given year. The 2014 data also showed that winter and summer day use accounted for 42 to 43 percent of that figure, the balance of those entering staying at least one night.

The district is always available to supply personnel, equipment, and expertise to neighboring departments in California and Nevada. Through mutual and automatic aid agreements, the district assists other local, county, and federal agencies, indirectly covering more than 200 square miles and responding to an average of 200 out-of-district calls each year. As an example, in 2020 district staff responded to 14 major California wildfires that were declared federal disasters, including the North Complex/Zogg, the Red Salmon Complex, and the SCU Lightning Complex Fires.

M.4 Hazard Identification

North Tahoe FPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table M-3).

Table M-3 North Tahoe FPD —Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Highly Likely	Critical	Low	Medium
Avalanche	Limited	Highly Likely	Limited	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Unlikely	Critical	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	Medium	High
Earthquake	Extensive	Occasional	Critical	High	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	Low	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Seiche	Significant	Unlikely	Critical	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: High Winds and Tornadoes	Extensive	High Likely	Critical	High	Low
Tree Mortality	Extensive	Likely	Critical	High	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

M.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

M.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section M.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table M-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

M.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the North Tahoe FPD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition was refined by separating out three classes of critical facilities as further described in Section 4.3.1 of the Base Plan.

Table M-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. North Tahoe FPD's physical assets, valued at over \$93 million, consist of the buildings and infrastructure to support the District's operations.

Table M-4 North Tahoe FPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Headquarters Station 51	Essential	\$15.6 million	All
Station 52 Kings Beach	Essential	\$13.5 million	All
Station 53 Homewood	Essential	\$10.5 million	All
Station 54 Dollar Point District shop	Essential	\$8.5 million	All
Station 55 Carnelian Bay	Essential	\$8.5 million	All
Station 56 Alpine Meadows	Essential	\$8.5 million	All
Station 67 Meeks Bay	Essential	\$10.5 million	All
Station 68 Tahoma	Essential	\$8.5 million	All
Type 1 Structure Engines X 6	Essential	\$800,000 each	All
Type 3 Brush Engines X 3	Essential	\$500,000 each	All
ALS Ambulances X 6	Essential	\$150,000 each	All
Water Tenders x2	Essential	\$225,000	All
Rescue Vehicles x2 (UTV with Trailer)	Essential	\$50,000	All
Snowmobiles x2 (with trailer)	Essential	\$40,000	All
Loaders x2 (snow removal)	Essential	\$120,000	All
Snowblowers x 9	Essential	\$4,000	All
Generators x7	Essential	\$25,000	All
SCBA Air Trailer x1	Essential	\$35,000	All
Technical Rescue Trailer	Essential	\$8,000	All
Command Vehiclesx5	Essential	\$60,000	All
Utilities x17	Essential	\$40,000	All
Public Info/CERT Trailers x2	Essential	\$8,000	All
Sign Trailers x4	Essential		All
Trailer Chippers x2	Essential		All
Track Chipper x1 (Chipper and flatbed Trailer)	Essential		All
Chipper tow/dump truck x1	Essential		All
Placer Co. Sheriff Dispatch & Office	Essential	-	All
Highways, Bridges, Arterial Roads	Transport/ Lifeline	-	All
Utilities Power, Water, Gas, Sewer, Cell Towers	Transport/ Lifeline	-	All

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
CalTrans & Placer Co. DPW Facilities and Equipment	Transport/ Lifeline	-	All
Lake Tahoe Outlet Dam	High Loss	-	All
Schools and Shelter locations	High Loss	-	All
Groceries stores		-	All
Total		\$93,380,000	

Source: North Tahoe FPD

It is important to note that there are no hospitals within the North Tahoe Fire District boundaries. This becomes a significant vulnerability when the highways become impassable due to flooding, rock/mudslides, avalanches, and interstate closures.

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. North Tahoe FPD provides services to a wide variety of populations with different vulnerabilities. Between the Census and the SHMP, we have statistics showing a high concentration of persons over the age of 65, making for as much as 30% of our population. Approximately 5% of our population is over the age of 75, and with no assisted living facilities, these communities are heavily reliant on neighbors and public safety providers, and as many as 20% of our community are living with a disability. In some communities, as high as 24% of our population are below the poverty level. We have some communities with as high as 30% Limited English Proficiency. As much as 12% of our population are without any type of computing device, and as high as 16% are without internet access. Approximately 5% of our population are without access to a vehicle. In the northern portion of our service area, the community is ranked moderate to high on the Social Vulnerability Index, meaning they are likely to experience the greatest risks and challenges in the event of a disaster.

While this area is home to only about 17,000 residents, during high season some 75,000 people, on any given day, may be enjoying the vast recreational and tourist opportunities. This spike in population creates a unique vulnerability to the area, especially in the event highways become impassable due to flooding, landslides, avalanches, wildfire or gridlocks due to high visitor volume and extreme weather conditions. Even during the off-season, the lack of multiple transportation routes, if closed or compromised, can leave the resident and visitor population cut off from necessary, and potentially life-saving services.

Natural Resources

North Tahoe FPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan. Additionally, several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table M-5.

Table M-5 NTFPD – Summary of Special Status Species

Type	Number
Animals – Amphibians	3
Animals – Birds	13
Animals – Fish	5
Animals – Mammals	8
Animals – Invertebrates	1
Botanical Species	29

Source: Final Tahoe Program Timberland Environmental Impact Report Appendix E, December 2020

Historic and Cultural Resources

North Tahoe FPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan. Also see Section 3.7 - Archaeological, Historical, and Tribal Cultural Resources of the Tahoe Program Timberland EIR, available at <https://www.ntfire.net/tahoe-pteir>.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Population growth within the North Tahoe FPD continues but is not uniform throughout. The areas within and closest to the developed communities are growing fastest and have higher housing densities. The more rural, mountainous areas are experiencing limited growth, in part due to land ownership, lack of services, and overall rugged terrain. Unique to this part of Placer County is not the growth of full-time residents, but the influx of visitors and tourists to the area, especially during the peak summer and winter seasons. While this area is home to only about 17,000 full time residents, during high season some 75,000 people, on any given day, may be enjoying the vast recreational and tourist opportunities. Real estate volume did by increase 63% in 2020 during the pandemic and stay-at-home orders, and the change in remote work options may result in more growth in the longer term, however school enrollments are not increasing at the same level.

The District does not have a capital replacement plan, and 6 of 7 NTFPD Fire Stations are greater than 40 years old, and do not meet current seismic or building standards. Due to age of facilities and growth of community and organization, these are not meeting current needs.

Development since 2016

No District facilities have been constructed since 2016. As such, a change in vulnerability is unlikely. NTFPD Station 53 in Homewood did receive a complete interior remodel in 2020 to the expense of \$153,000 and there are ongoing capital expenditures for station.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. Most District facilities are old and in need of remodels or complete replacement. The District's shop is insufficient in size and height to work on some of the larger apparatus, and the Prevention and Forest Fuels Division is expected to increase in size and exceed office space at the current headquarter station. More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

M.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table M-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Avalanche

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Areas prone to avalanche hazards include hard to access areas deep in the backcountry and those in the more developed higher elevations of the County in the Tahoe basin. Avalanche hazards exist in eastern Placer County where combinations of the above criteria occur. The District is concerned about the Highway 89 corridor, Alpine Meadows, Ward Canyon, and Emerald Bay.

Past Occurrences

There have been no state or federal disasters in the County related to avalanche. The District noted the following avalanche past occurrences:

- In **1982** a large avalanche occurred in Alpine Meadows and a large avalanche in the 1200-1300 area of Sandy Way with major structural damage to several homes.
- In **1995**, an avalanche hit 2 homes in the 1300 area of Sandy Way, with no injuries and minimal damage to the two homes. We have had some mud slides in 1300 area of Sandy, as well as the 1700 block of Sandy over the years, blocking the road, no injuries or structural damage.
- Since 2015/2016, the District has not experienced any avalanches in Olympic Valley. The District did note an avalanche (thought to be in 2017) on Highway 89 south of Alpine Meadows road (North Tahoe District) that caught a few occupied cars.
- **March 2, 2018** – After heavy snowfall, an avalanche hit the Squaw Valley ski resort on Friday striking five people and sending two people to the hospital with injuries. Five guests were caught in the avalanche, two females and three males. One person had a serious lower body injury and was taken by firefighters to North Tahoe Forest Hospital. Another person was rescued and taken to a Truckee hospital and released a short time later. The other three were unharmed. A skier at the resort said at least three

of those people had to be dug out and that the slide started at the top of the Olympic Lady lift down to a run called Easy Street.

- **January 17, 2020** – A 34-year-old man was killed while skiing Friday morning and another was seriously injured when an avalanche unfurled a wave of snow on a run in the Alpine Meadows ski resort near Lake Tahoe.

Vulnerability to and Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

Assets at Risk

The NFPD Station 56 is located in Alpine Meadows as well as roads and ASCWD utilities.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and

HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

In addition to the above, the District noted it is anticipated that Tahoe could become a refuge for those looking to escape hotter conditions in the valleys

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate

water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table M-6.

Table M-6 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

The District is experienced a multi-year drought 2014-15 that was part of a much larger drought throughout the western United States. During the most recent drought, the most widespread impact to the District was reduced tree vigor, which lead to an increase in bark beetle populations, white pine blister rust proliferation and widespread tree mortality across primarily White fir, Sugar pine, and Jeffrey pine trees.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended.

Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Drought prolongs the wildfire season, which increases overtime costs and wear and tear on District equipment, and exacerbates wildland fire risk, frequency and severity by contributing to rapid consumption of tinder dry fuels, leading to increased rate of spread and fire intensity which can exceed initial attack response capabilities and have negative impact to life, property, and the environment.

The HMPC noted that the 2014-2015 drought had impacts in the District. Crop damages were widespread, wildfire risk was increased, and businesses had felt impacts from the drought conditions.

Potential effects of the 2014 multi-year drought included:

- Reduced water for domestic consumption and fire suppression.
- Stress on natural vegetation leading to increased disease and mortality.
- Drought stressed/dead vegetation contributes to increased fire danger and fire behavior, leading to larger more catastrophic wildfire incidents.

Assets at Risk

Water utilities would be the primary asset at risk since NTFPD relies on primarily municipal water supply during fire suppression operations. NTFPD is situated within the WUI intermix and WUI defense zone, so forest health and vigor would be another asset at risk where drought stressed vegetation and the lack of moisture contributes to increased fire danger and behavior and could lead to catastrophic wildfire conditions.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of significant magnitude can occur, so both magnitude and intensity of earthquakes are expected to be moderate. Seismic shaking maps for the area show Placer County and the District fall within a moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. According to the CGS, North Tahoe Fire's service area is at the highest risk from earthquake in all of Placer County, and is at the highest point on the index for Earthquake Ground Shaking Potential. All District Stations are vulnerable to earthquake. If damage were caused by an earthquake, it would impact the District's ability to respond and serve the community during the disaster. NTFPD has only one of seven fire stations that was built to seismic standards.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The North Tahoe FPD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life. No specific studies have been conducted in the local area in regard to the impacts of a large scale earthquake. In general, such an event would result in large scale widespread impacts on a regional level that could include:

- Structural collapse
- Transportation impacts
- Power and communications interruptions
- Structural and wildfire incidents
- Avalanches, mudslides, rock falls and landslides
- Dam failures and flooding
- Seiche Wave Events
- Loss of life and injuries on a large scale

- Economic impacts and business loss

Assets at Risk

All District Stations from Table M-4 are at risk from this hazard, as well as other critical infrastructure facilities.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The North Tahoe FPD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

5 of 8 NTFPD facilities are at risk to flooding and stormwater flooding:

- Station 52 (Griff Creek Floodplain and FEMA Flood Hazard Area)
- Station 53 (immediately adjacent to FEMA Flood Hazard Area)
- Station 55 (Adjacent to Carnelian Creek Floodplain)
- Station 56 (directly adjacent to Bear Creek & Truckee River Floodplain)
- Station 67 (Meeks Creek Floodplain)

Other areas of concern:

- HWY 89/Truckee River corridor
- Alpine Meadows and Bear Creek
- Griff Creek
- Watson Creek
- Dollar Creek
- Burton Creek
- Snow Creek Pond (Moon Dunes)
- Ward Creek
- Blackwood Creek

- Madden Creek
- McKinney Creek
- General Creek
- Meeks Creek
- Eagle Creek/Eagle Falls

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

- In **1997** the District experienced areas of flooding and landslides related to El Nino resulting in hazardous conditions and road closures. Impacts were to the Highway 89 corridor between Tahoe City and Truckee and the Ward Canyon area on the west shore of Lake Tahoe. Future such events could impact many areas of the district and surrounding areas.
- **2016/17** Winter - The 2016/2017 was a heavy winter, beginning with atmospheric river snow events as early as October, followed by wind events and flash flooding, seemingly nonstop through spring. The statistics are not available for 2016, however the first two months of 2017 saw North Tahoe Fire responding to 135 downed powerlines as a result of the storm/wind/flood cycle, and after just one of these storms, crews responded to at least three buildings, weakened or collapsed. In addition to flooding roadways, powerlines downed due to flood and winds may also be downed in a manner that blocks the roadways. Placer County had a state and federal declaration due to flooding in 2017.
- **2017/2018** Winter - January 2018 saw similar storm activity causing downed powerlines.
- **2018/19** Winter - December 2018 saw similar storm activity causing downed powerlines.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

District Stations are at risk to Localized flooding.

Pandemic

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table M-7.

Table M-7 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted.

The Covid 19 pandemic has affected North Tahoe Fire Protection District, but has not kept the District from providing 24 hour, 7 days a week emergency response to our community. Early in the pandemic we instituted Incident and Station Life Directives that were geared to lower exposure risk for all personnel. None of our staff contracted Covid 19 from an exposure while in the offices, stations or by transporting Covid 19 patients to the hospital. We closed our offices to the public, but we continued to meet the needs of our constituents and taxpayers remotely. Some of our administrative staff were able to work from home, our prevention staff was able to stagger shifts, work with proper PPE, and still carry-on essential Fire Prevention duties following all safety guidelines. All District stations remained fully staffed by firefighters and paramedics for emergency response. Going forward we will continue to assess our community's health and monitor our personnel to ensure every effort is being made to reduce our exposure to Covid 19.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities. During a pandemic the District would typically be considered essential which puts staff on the front line and at high-risk for exposure as they work to carry on the mission of the District and serve the community.

Seiche

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

U.S. Army Corps of Engineers defines seiche as:

- A standing wave oscillation of an enclosed water body that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric.

- An oscillation of a fluid body in response to a disturbing force having the same frequency as the natural frequency of the fluid system. Tides are now considered to be seiches induced primarily by the periodic forces caused by the sun and moon.
- In the Great Lakes area, any sudden rise in the water of a harbor or a lake whether or not it is oscillatory (although inaccurate in a strict sense, this usage is well established in the Great Lakes area).

Seiches can be generated when the water is subject to changes in wind or atmospheric pressure gradients or, in the case of semi-enclosed basins, by the oscillation of adjacent connected water bodies having a periodicity close to that of the seiche or of one of its harmonics. Other, less frequent causes of seiches include heavy precipitation over a portion of the lake, flood discharge from rivers, seismic disturbances, submarine mudslides or slumps, and tides. The most dramatic seiches have been observed after earthquakes and large landslide events.

Location and Extent

Within Placer County, locations with the highest probability of impact are shore areas of Lake Tahoe from 0 to 30 feet above mean lake water level. This falls in areas served by the District. Speed of onset of seiche is short. The duration of the event tends to be short as well, continuing until the waves naturally dissipate.

Past Occurrences

There have been no state or federal disasters in the County related to seiche. No events of past seiche have affected the District.

Vulnerability to and Impacts from Seiche

Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The two faults directly underneath the lake are considered capable of generating magnitude 7.1 earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point and the casinos in South Lake Tahoe. The seiche risk is potentially devastating as hundreds of houses are built along the lake and more than 17,000 people enjoy the Lake Tahoe shoreline every day in the summer.

In the District, a seiche could cause issues with low lying areas of the District.

Assets at Risk

District facilities, apparatus and personnel that are within low lying lakeside areas: Station 52, 53, 55, 67.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, trapping residents, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, propane lines and communication towers. Communications and power can be disrupted for days until the damage can be repaired, leaving residents at risk of freezing. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table M-8.

Table M-8 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that freeze and snow is a regional phenomenon; events that affected the eastern side of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Most notably, during the mid-80s, a gas main failure occurred in Carson City, Nevada, causing a major outage throughout the region. This also resulted in an overload of the power utilities in the District, causing failures lasting several days. The District estimates that such outages lasting several days during extreme weather events occur approximately every 2-3 winters.

According to the North Tahoe FPD planning team, major winter storms have routinely cut off transportation routes in the district for hours (as recent as March 2007) to over a week (back in the 1950s), stranding thousands and causing a major impact to services and supplies.

Freeze and snow events affect the District annually. Tahoe is known for major winter storms that cause adverse conditions, traffic delays, vehicle accidents, and temporary road closures annually. In 2017, North Tahoe Fire saw the snowiest January since 1952 in Tahoe City, with 135.5 inches in just one month, compared to the seasonal total from July 1, 2015 through June 30, 2016, which was 140 inches. That series of storms resulted in residents trapped in homes from such rapid snowfall, and 135 incidents of downed powerlines in January and February. On January 6, 2019, a snow event closed Interstate 80 from Colfax to the Nevada state line for the better part of a busy 3-day holiday weekend leaving roughly 70,000 motorists stranded in the greater Truckee-Tahoe area.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Freeze and snow events are a major concern to the District. Snow and winter weather conditions regularly result in utility outages and the closure of major transportation routes. During extreme winter events, response times to emergencies may also be extended. With altitudes ranging from 6,000 to 9,000 feet above msl, extreme cold/freezing temperatures can create significant problems. Of particular concern to the District is the vulnerability of the area to broken utilities and power failures during extreme weather events.

Assets at Risk

All District assets (from Table M-4) are at risk from this hazard.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

The High Sierras receive severe weather annually. Heavy rains, hail and lightning are known to create adverse conditions in the backcountry, within the communities and roads of the District. These Heavy rain events can lead to flash flooding, hail damage, and lightning caused ignitions within the District and surrounding ridges and peaks. The District is known to respond to vehicle accidents during periods of severe and heavy rain as well. The District responded to incidents labeled as “Severe Weather & Natural Disaster” since 2016 as follows:

- **2017:** 5 incidents, including windstorm, tornado/hurricane assessment
- **2018:** 6 incidents, including assess severe weather or natural disaster damage, and two lightning strikes with no fire.
- **2019:** 3 incidents, including one lightning strike, no fire.
- **2020:** 1 incident for a flood assessment.

Three lightning fires were reported in the USFS area adjacent to our service area in 2018, but are not in our statistics because the fires were extinguished by USFS and NTFPD resources were canceled prior to arrival.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning occur infrequently in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Inside the District, severe weather often occurs. The greatest damages often occur from high winds.

Assets at Risk

No District facilities are likely at direct risk; however, the District does respond to emergencies during severe weather events.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds are a primary factor in PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though extremely rare in the higher elevations of Placer County, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the fall and spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while extremely rare in Eastern Placer, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the higher elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

The HMPC noted recent events in December of 2014 where winds caused damage to power lines. The HMPC provided the information in Figure M-2. During this event, a structure fire occurred that was the direct result of a wind event in which a tree fell onto an occupied residence. Fortunately all occupants escaped the building without injury. Winds in the District were recorded as high as 80 mph that date with gust on the surrounding mountains in excess 130mph. High winds can fan the flames of wildfire in the District as well, increasing the size of wildfires very quickly.

Figure M-2 December 11, 2014 Wind Caused Damages

FDID	Incident ID	Inci Num	Exp Alm Date	Alm Time	Stn Inci	Type	Description	Addr Type	Addr Wild Number	St Pre
fix Street	Address	St Type	St Suffix	Addr 2	Xst Type	Xst Suffix	Rural			Apt Room
Xst Prefix	Xstreet									
31044_4TTS6BZLC	2014028592	0	12/12/2014	18:39:52	53	322	1	Motor vehicle accident with injuries	6937	
West Lake	6937 West Lake BLVD							N	6937	
31044_4TTS49WC5	2014028578	0	12/12/2014	14:39:47	51	321	1	EMS call, excluding vehicle accident with injury	925	3
North Lake	925 North Lake BLVD /3							N	925	
31044_4TTS1MNR	2014028557	0	12/12/2014	09:55:34	56	321	1	EMS call, excluding vehicle accident with injury	1960	
Squaw Valley	1960 Squaw Valley RD							N	1960	
31044_4TTS1MMZW	2014028550	0	12/12/2014	09:24:36	53	444	1	Power line down	3590	
West Lake	3590 West Lake BLVD							N	3590	
31044_4TTS0LLL7	2014028542	0	12/12/2014	07:08:56	52	324	3	Motor Vehicle Accident with no injuries		
	North Side Brockway Summit							N		
31044_4TTRWK2DU	2014028531	0	12/11/2014	23:08:58	52	611	1	North Dispatched & cancelled en route	8675	
North Lake	8675 North Lake BLVD							N	8675	
31044_4TTRV746W	2014028517	0	12/11/2014	19:59:50	56	700	1	False alarm or false call, Other	255	
Squaw Valley	255 Squaw Valley RD							N	255	
31044_4TTRRMSIU	2014028465	0	12/11/2014	11:37:51	53	631	1	Authorized controlled burning	2980	
Electric	2980 Electric DR							N	2980	
31044_4TTRRUQA2	2014028463	0	12/11/2014	11:06:31	52	813	1	Wind storm, tornado/hurricane assessment	8872	
Brook	8872 Brook AVE							N	8872	
31044_4TTRRITQW	2014028462	0	12/11/2014	10:56:59	52	445	2	Arcing, shorted electrical equipment		
Fox	Fox ST & Brook AVE							N		
31044_4TTRRITQY	2014028456	0	12/11/2014	10:17:55	53	444	1	Power line down	796	
Cascade	796 Cascade CIR							N	796	
31044_4TTRQ4JV7	2014028440	0	12/11/2014	08:55:05	51	813	1	Wind storm, tornado/hurricane assessment	1749	
Washoe	1749 Washoe WAY							N	1749	
31044_4TTRQCHNN	2014028438	0	12/11/2014	08:38:10	53	444	1	Power line down	5255	
West Lake	5255 West Lake BLVD							N	5255	
31044_4TTRRITOD	2014028437	0	12/11/2014	08:32:58	51	444	1	Power line down	350	
Woodview	350 Woodview CT							N	350	
31044_4TTRQ8IQS	2014028435	0	12/11/2014	08:21:55	52	461	1	Building or structure weakened or collapsed	365	
Snowflake	365 Snowflake AVE							N	365	
31044_4TTRRITNT	2014028428	0	12/11/2014	07:31:02	53	461	1	Building or structure weakened or collapsed	5549	
Lagoon	5549 Lagoon RD							N	5549	
31044_4TTSROOKE	2014028427	0	12/11/2014	07:28:08	51	111	1	Building fire	1770	
Washoe	1770 Washoe WAY							N	1770	

Source: North Tahoe FPD

Since 2016, the District was affected by the following:

- 2017: 1 windstorm, tornado/hurricane assessment
- 2017: 135 instances of downed powerlines referenced above

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

North Tahoe Fire received 42 Fire Weather Watch or Red Flag Warnings since the 2016 LHMP. There is a direct correlation between red flag/critical fire weather and catastrophic wildfire. Red flag warnings are now factored into triggering PSPS events because of the substantial increase in fire risk and risk of catastrophic wildfire when low humidity is combined with high winds.

The Emerald Fire occurred adjacent to the District's service area, burning 176 acres of forest in October 2016 during a red flag weather event. The District stood up our CERT team and our EOC to support the incident.

Assets at Risk

All District assets (from Table M-4) are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities.

During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas is shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead

trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees have become a concern for the District due to the exacerbation of fire risk, fuel loading and direct threat to life and property when hazard trees are located within falling distance of homes.

Assets at Risk

All District assets from Table M-4 are at indirect risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Extremely High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the North Tahoe FPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Wildfire and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of

outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power outages can be found in Section 4.3.2 of the Base Plan.

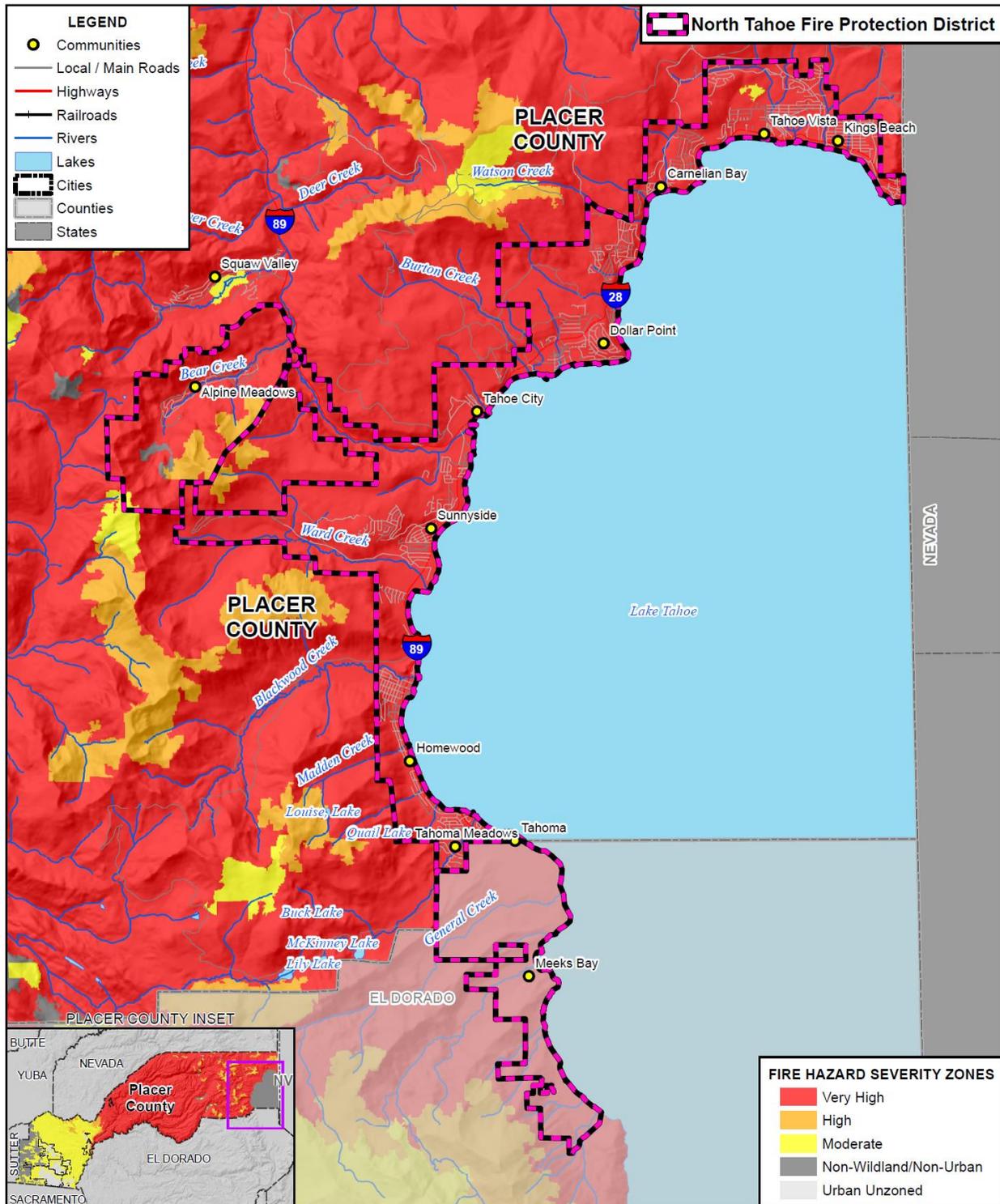
Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. Though the area is not served by one the three largest energy companies, Liberty Utilities can institute a PSPS if the CPUC calls for it. In partnership with fire weather experts, Liberty monitors real-time weather data and forecasts and regularly tests fuel moisture during the fire season. If it is determined that the forecasted conditions meet or exceed safety thresholds, Liberty will initiate a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the North Tahoe FPD were created. Figure M-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, the fire hazard severity zones within the District are in the Very High range.

Figure M-3 North Tahoe FPD – Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

0 2.5 5 Miles

COUNTY OF Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Fire Hazard Severity Zone (FHSZ) is a mapped area that designates zones (based on factors such as fuel, slope, and fire weather) with varying degrees of fire hazard (i.e., moderate, high, and very high). FHSZ maps evaluate wildfire hazards, which are physical conditions that create a likelihood that an area will burn over a 30- to 50-year period. They do not consider modifications such as fuel reduction efforts.

While FHSZs do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. FHSZs are meant to help limit wildfire damage to structures through planning, prevention, and mitigation activities/requirements that reduce risk. The FHSZs serve several purposes: they are used to designate areas where California’s wildland urban interface building codes apply to new buildings; they can be a factor in real estate disclosure; and local governments consider fire hazard severity in the safety elements of their general plans.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table M-9.

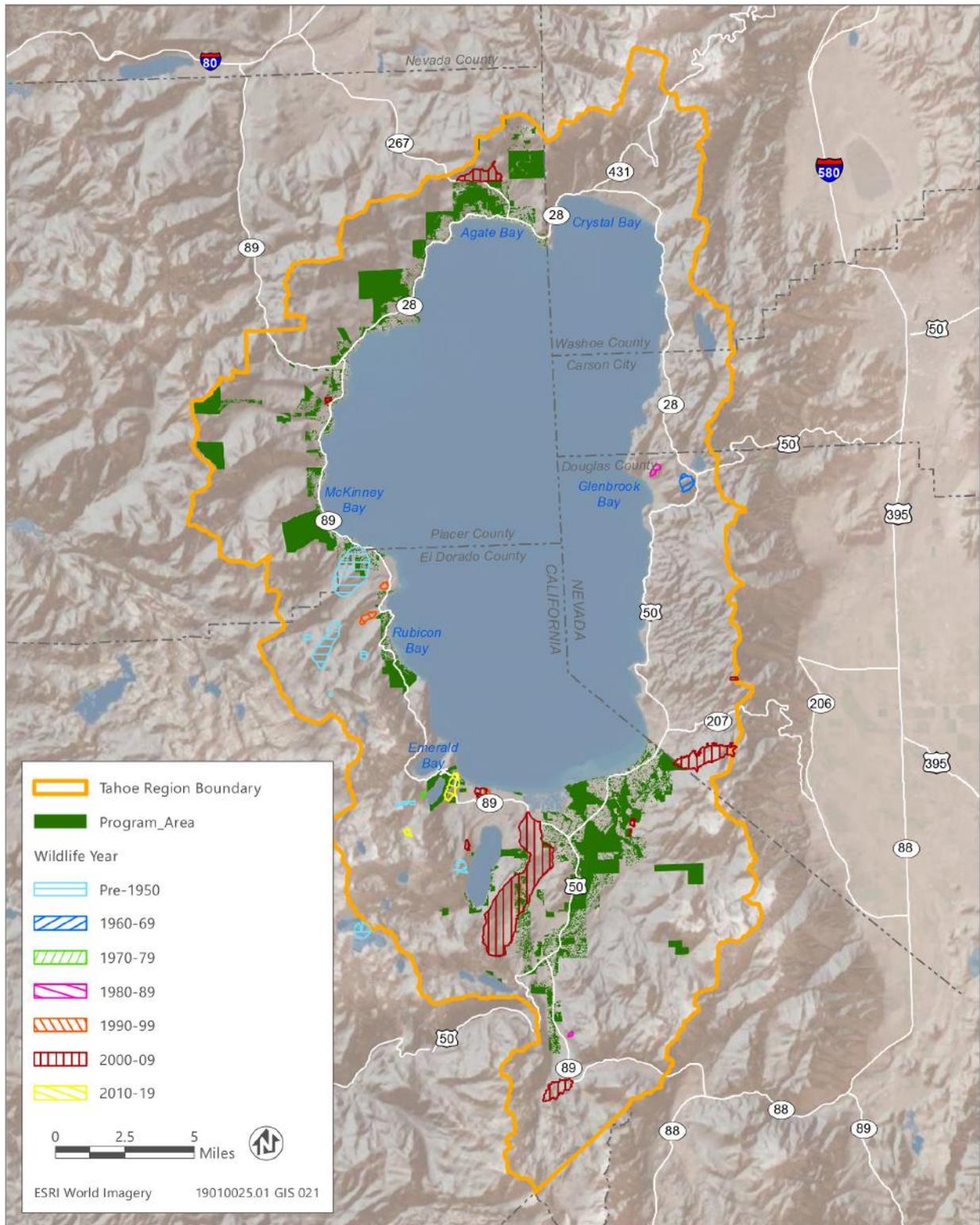
Table M-9 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Wildfire history in the North Tahoe area can be seen on Figure M-4.

Figure M-4 Tahoe Basin Wildfire History



Source: Draft Tahoe Program Timberland Environmental Impact Report 2020

A notable wildfire to impact the District was the Washoe Fire in August 2007. This fire occurred in the wildland urban interface area of Tahoe Park and Tahoe Woods subdivision, along the west shore of Lake Tahoe. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89 in West Lake was closed for a period of time.

Due to droughts in the North Tahoe FPD, widespread wildfires have occurred in or near District boundaries. In the first half of the 2010s, several large fires have impacted the Lake Tahoe Basin in various ways. The Angora fire burned over 300 structures and the King Fire burned almost 100,000 acres to the west of the basin and almost burned into the basin.

From 2016 - 11/17/2020 NTFPD responded to 115+ Wildland fire incidents. These include: Brush or brush and grass mixture fires, forest/woods/wildland fires, and natural vegetation fires. Almost all of these wildland fires required crews to establish fire lines, contain, and extinguish. Through mutual and automatic aid, NTFPD sent individual resources and strike teams out on the following large incidents in 2020.

Table M-10 NTFPD – Fires in 2020

Name of Fire	Dates	Personnel Assigned to Fire
Poeville	6/27-6/28	Chief STEN, B51 Captain, Engineer, 2 FF/P
Arrowcreek	7/21	Chief STEN, E52 Captain, Engineer, FF/P
Numbers	7/6-7/8	B52 Captain, Engineer, FF/P
Mineral	7/15-7/24	Fire Line Medic
Hog	7/19-7/29	STEN(t), B51 Captain, Engineer, 2 FF/P
Gold	7/24-7/30	Line Medic
North	8/2-8/5	B51 Captain, FF, F/P
Apple	8/3-8/14	Fire Line Medic
Red Salmon Complex	8/7-8/30	Fire Line Medic
Loyalton	8/14-8/30	BC STEN, STEN(t), B51 Captain, 2 FF/P
North Complex	9/3-9/17	Fire Line Medic
North Complex	9/3-9/18	Fire Line Medic
Creek Fire Fresno	9/9-9/25	Division Supervisor(t)
North Complex 4233C	9/13-9/29	B52 Captain, Engineer, FF/P, FF
North Complex/Zogg 4233C	9/29-10/6	B51 Captain, Engineer, 2 FF/P
Silverado 4235A	10/27-	E51 Captain, Engineer, 2 FF/P
Creek Fire Fresno	10/30-	Communications Technician(t)

Source: NTFPD

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

All communities within the District are listed on the National Fire Plan's "Communities at Risk" list as set forth in Section 4.3.2 of the main plan.

Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District's area is in the wildland urban interface with increasing residential development.

According to the North Tahoe FPD, the following areas of the District were prioritized for projects because of their population, values at risk, and fuel availability:

- Tahoe City
- Lake Forest
- Highlands

- Dollar Point
- Cedar Flats
- Carnelian Bay
- Agate Bay
- Tahoe Vista
- Kings Beach
- Alpine Meadows
- Kingswood
- Talmont
- Tahoe Park
- Pineland
- Timberland
- Skyland
- Tahoe Pines
- Tahoe Swiss Village
- Homewood
- Chamberlands
- Tahoma
- Meeks Bay
- Rubicon
- McKinney Estates.

As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires.

Currently, many of the communities in the District are limited to one route access and egress in the event of a major wildfire. Historically, these routes are closed during major events, stranding many people, including visitors, away from their families and homes. So far there has been no loss of life attributed to the limited evacuation routes, but it is likely only a matter of time before people are cut off and trapped by a major fire event.

Forest overgrowth due to the efficiency of modern firefighting techniques, and to society's current election to limit forest thinning and harvesting, is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding a kill off of trees similar to the kill off experienced by other national forests.

A notable recent wildfire to impact the District was the Washoe Fire in August 2007. This fire occurred in the wildland urban interface area of Tahoe Park and Tahoe Woods subdivision, along the west shore of Lake Tahoe. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89 in West Lake was closed for a period of time.

Due to recent droughts in the North Tahoe FPD, widespread wildfires have occurred in or near District boundaries. In the last few years several large fires have impacted the Lake Tahoe Basin in various ways. The Angora fire burned over 300 structures and the King Fire burned almost 100,000 acres to the west of the basin and almost burned into the basin. These are both described in the base plan in Section 4.2.17.

Wildland fires are a significant threat to regional power distribution systems. Power outages caused by wildland fires directly affect the safety of district residents, drastically restrict critical water system operations, and severely limit available water supplies for fire suppression.

Assets at Risk

All District assets from Table M-4 are at risk from this hazard. NTFPD is almost entirely classified as a Very High Fire Hazard Severity Zone in CAL FIRE FRAP maps

M.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

M.6.1. Regulatory Mitigation Capabilities

Table M-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the North Tahoe FPD.

Table M-11 North Tahoe FPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	Placer County and TRPA Authority
Capital Improvements Plan	N	
Economic Development Plan	N	Placer County and TRPA Authority
Local Emergency Operations Plan	Y	2017 Placer County Emergency Operations Plan
Continuity of Operations Plan	N	
Transportation Plan	N	Placer County and Tahoe Transportation District Authority
Stormwater Management Plan/Program	N	Placer County, TRPA, Tahoe RCD, Lahontan RWQCB Authority

Engineering Studies for Streams	N	Placer County and Lahontan Regional Water Quality Control Board Authority
Community Wildfire Protection Plan	Y	2015 Lake Tahoe CWPP: Addresses hazards and includes mitigation strategies and actions
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation):	Y	
Tahoe Program Timberland Environmental Impact Report (Tahoe PTEIR)	Y	The Tahoe PTEIR is a Program Timberland EIR developed to address a long-term program of forest management and fuel reduction; Addresses hazards and includes mitigation strategies and actions
Community Risk Assessment/Community Risk Reduction Plan	N	NTPFD has identified the need for a formal CRA/CRRP and has applied to FEMA-AFG-FP&S to fund this risk assessment project
2018 Standards of Coverage and Deployment Plan (SOC)	Y	Addresses hazards and includes mitigation strategies and actions
Lake Tahoe Climate Change Adaptation Action Portfolio (CAAP)	Y	The CAAP is nearing completion, and addresses hazards and includes mitigation strategies and actions
Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy		Addresses hazards and includes mitigation strategies and actions
Lake Tahoe Basin Forest Action Plan Lake Tahoe Basin Fuel Reduction and Wildfire Prevention Incident Action Plan		Addresses hazards and includes mitigation actions for that calendar year
Building Code, Fire Code, Local Ordinance, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	Placer County Authority
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire department ISO rating:	Y	Rating: 3/3Y
Site plan review requirements	Y	Yes
Local Fire Prevention Ordinance	Y	Yes, Adoption and amendment of the CA Fire Code
Defensible Space Inspection Program	Y	Yes, Defensible space enforced through: Placer County Hazardous Vegetation and Combustible Material Ordinance (6015-B), El Dorado County Vegetation Management and Defensible Space Ordinance (5101), Assembly Bill 38, CALFIRE, and for building permit finalization.

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts?
		Is the ordinance adequately administered and enforced?
Zoning ordinance	N	Placer County Authority
Subdivision ordinance	N	Placer County Authority
Floodplain ordinance	N	Placer County Authority
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Wildfire (local burning restrictions & noncombustible class a roof covering)
Flood insurance rate maps	N	Placer County Authority
Elevation Certificates	N	Placer County Authority
Acquisition of land for open space and public recreation uses	N	Placer County, USFS, California Tahoe Conservancy, TRPA Authority
Erosion or sediment control program	N	Placer County, TRPA, and Lahontan RWQCB Authority
Other		
How can these capabilities be expanded and improved to reduce risk?		
Expand capacity to implement these plans, codes and ordinances.		

Source: North Tahoe FPD

As indicated above, the District has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Tahoe Community Wildfire Protection Plan, 2015

In 2015 the Tahoe Community Wildfire Protection Plan was created (2015 CWPP). This plan encompasses all areas of the Alpine Meadows and North Tahoe FPD that are at risk and directly outlines hazards and mitigations needed to preserve lives and property in these areas in the setting of a wildland fire incident. It is incorporated by reference here in support of the 2015 update to this document (Tahoe FFT.org). This website is hosted by the Tahoe Living with Fire Organization.

Integrated Vulnerability Assessment of Climate Change in the Lake Tahoe Basin (2020)

Climate change is amplifying the background stressors on natural resources, infrastructure, and communities in the Lake Tahoe Basin (Basin). Land managers and policy-makers are increasing the Basin’s resilience and ability to adapt. Doing this now protects people and nature, and saves money. This vulnerability assessment provides residents, visitors, businesses, and public agencies with state-of-the-art information on how patterns of temperature and precipitation will change (called “impacts”), and how these

patterns will affect the things people care about (called “implications”). The common scenarios and analyses provided will help public agencies and stakeholder organizations anticipate climate change implications, and better design and maintain their future projects that improve the quality of life, land, and waters in Tahoe. This assessment is written for a technical audience, and will feed directly into a Basinwide adaptation action plan written for all audiences.

North Tahoe Fire Protection District and Meeks Bay Fire Protection District Standards of Coverage and Deployment Plan (2018)

This report serves as the North Tahoe Fire Protection District and Meeks Bay Fire Protection District Standards of Coverage and Deployment Plan. It follows closely the Center for Fire Public Safety Excellence (CPSE) Standards of Coverage model that develops written procedures to determine the distribution and concentration of a fire and emergency service agency’s fixed and mobile resources. The purpose for completing such a document is to assist the agency in ensuring a safe and effective response force for fire suppression, emergency medical services, and specialty response situations.

This report focuses on the area within the boundaries of the two fire districts. Although the districts serve a larger area, those areas are served by contract with other entities.

It is important to understand that there are no mandatory federal or state regulations directing level of service, fire service response times, or outcomes. The body of regulations for the fire service provides that if fire services are provided, it must be done with the safety of the firefighters and citizens in mind.

Creating a Standards of Coverage and Deployment Plan document requires that a number of areas be researched, studied, and evaluated. This report will begin with an overview of both the community and the agency. Following this overview, the plan will discuss topics such as community risk assessment, critical task analysis, agency service level objectives, and distribution and concentration measures. The report will provide analysis of historical performance and will conclude with policy and operational recommendations.

Lake Tahoe Basin Fuel Reduction and Wildfire Prevention Incident Action Plan (2019)

To protect lives, property and the environment of the Lake Tahoe Basin from wildfire by implementing prioritized fuels reduction projects and engaging the public in becoming a Fire Adapted Community. Goals of this Plan are:

- Create fire adapted communities.
- Restore and maintain fire resilient landscapes.
- Support effective and efficient wildfire response.

Objectives of this include:

- Develop and implement prioritized fuel reduction treatments across jurisdictions to address risks to ecosystems and communities, and to facilitate safer and more successful suppression.
- Develop and implement fuels reduction projects that provide multiple resource benefits, including the enhancement of water quality, wildlife habitat, forest vegetation, recreation and scenic resources, and carbon sequestration.

- Implement mitigation strategies and community action plans to create communities where citizens are engaged and active in preparing for wildfire.
- Provide consistent and coordinated messaging and public involvement that reinforce fire adapted community concepts.
- Coordinate projects to streamline planning, leverage resources, and increase efficiency and effectiveness.
- Support increased funding and capacity for forest management, wildfire prevention, and community engagement.
- Increase restoration byproduct utilization, including biomass.
- Measure progress and monitor outcomes to inform future TFFT activities.

Lake Tahoe Basin Forest Action Plan (2019)

The Forest Action Plan (Plan) contains three overarching strategies that support completing and maintaining all wildland-urban interface treatments, and implementing large-landscape restoration:

1. Scale up to match the scale of the solution to the scale of the threat.

- Develop and Implement Landscape Scale Initiatives
- Streamline Planning and Permitting
- Create Powerline Resilience Corridors

2. Build capacity for all phases of the forest landscape management cycle.

- Expand the Restoration Workforce
- Adapt for Organizational Efficiency
- Strategically Use Prescribed Fire
- Increase Restoration Byproduct Utilization

3. Leverage technology for rapid, large-scale, more efficient implementation.

- Launch the Technology Innovation Sprint
- Improve Decision Making through Better
- Data Management
- Enable Rapid Response through a Wildfire
- Camera Network

The Plan aligns with state and federal plans and mandates that call for increasing the pace and scale of forest management including Nevada’s Cohesive Strategy Implementation Plan and Forest Action Plan, California Executive Orders B-52-18 and N-05-19, and USDA Forest Service Region 5’s Ecological Restoration Leadership Intent. The Plan implements the Forest Health focus area of the Basin’s Environmental Improvement Program, the signature partnership to restore and protect Tahoe’s natural resources.

Tahoe Program Timberland EIR (Draft 2020)

The PTEIR has been prepared to support an increase in pace and scale of forest management activities on the California side of the Tahoe Basin to reduce the risk of loss of lives and property, reduce fire suppression costs, protect natural resources from wildfire, and improve forest health in and adjacent to the WUI on the

California side of the Lake Tahoe Basin. The project-by-project approach that has typically been used to comply with California Environmental Quality Act (CEQA), California Forest Practice Act (FPA), California Forest Practice Rules (CFPR), and other regulatory requirements can lead to inefficiencies, delays, excess costs, and inconsistencies in project planning. In addition, a project-by-project approach to fuel reduction planning and environmental review provides limited opportunities to analyze and understand the long-term and cumulative effects of forest management programs. The Tahoe PTEIR more efficiently and comprehensively evaluates the environmental effects of the proposed program to facilitate an increase in the pace and scale of fuel reduction treatments.

The statement of objectives below describes the underlying purposes of the PTEIR and expresses the role of vegetation treatment in implementing state policies and plans for wildfire risk reduction, greenhouse gas (GHG) reduction, and management of natural and working lands. The objectives of the PTEIR are to:

- reduce the risk of catastrophic wildfires that could damage Lake Tahoe Basin forests, watersheds, habitats, and communities;
- increase Lake Tahoe Basin forest resilience to effects of climate change, including prolonged drought, pest and disease outbreaks and increased tree mortality;
- protect and restore meadow and riparian ecosystems, and forest habitat quality in the Lake Tahoe Basin;
- develop and implement all-lands fuel reduction, forest health improvement, and restoration projects that deliver multiple community and ecosystem service benefits; and
- increase the pace and scale of fuel reduction projects to assist in achieving the goals of Executive Order B-52-18

Homewood Evacuation and Life Safety Report (2016)

This report was commissioned by the North Tahoe Fire Protection District for the purposes of providing an evaluation and clarification of Homewood's commitments and mitigation and to provide further details as needed for construction standards, fire safety measures, evacuation procedures and shelter-in-place concepts to insure that the Project will not result in any significant adverse impacts on wildfire evacuation risks on the West Shore during construction or operation and will not exacerbate any existing wildfire evacuation risks in the Lake Tahoe region given the changed circumstances in the Project Area since the County's and TRPA's approvals in 2011.

Furthermore, to accomplish the goal of not exacerbating current evacuation systems for neighboring residents and visitors, this report evaluates Homewood's commitment to providing areas of refuge to increase life safety protection in the event of a fire requiring regional evacuation, in which residents outside of the Project boundary can find refuge in a wildland fire scenario.

Codes and Ordinances

Avalanche

Placer County's avalanche management program defines Potential Avalanche Hazard Areas (PAHAs) where the minimum probability of avalanche occurrence is 1 in 100 per year or where avalanche damage has already occurred. According to the Placer County Avalanche Ordinance the following information must be disclosed in PAHAs:

- Identification that a structure is within a PAHA;
- A warning that avalanche control work is conducted in the area and avalanche warnings will be provided as feasible; and
- Identification of sources that provide weather information and general information on avalanches.

In addition, the County limits construction as necessary in PAHAs and will not issue a building permit for construction in a PAHA without certifying that the structure will be safe under the anticipated snow loads and conditions of an avalanche.

M.6.2. Administrative/Technical Mitigation Capabilities

The board is comprised of 5 members representing 5 regions within the Lake Tahoe basin and is selected by registered voters within the District. The board serves as the governing body for the District’s more than 22,000 residents. Members of the board are elected by geographical Division for 4 years. The Board of Directors approves District Rules and Regulations and, through the Fire Chief, ensures adherence to District policies. District policy and actions may be adopted by motion, or more formally, by resolution.

The North Tahoe FPD provides services through Eight fire stations: Alpine Meadows, Tahoe City, Homewood, Meeks Bay, Tahoma, Dollar Hill, Carnelian Bay, and Kings Beach. These fire stations are staffed by 60 to 65 uniformed and support personnel. The Assistant Chief oversees the operations division which includes service delivery, communications, apparatus repair, replacement, and purchasing. The Assistant Chief is responsible for engine company staffing, alarm response guidelines, and standard operating procedures.

North Tahoe FPD’s dispatch services are provided by the Grass Valley Emergency Command Center in Grass Valley, CA. The dispatch center uses computer aided dispatching to ensure optimal resource monitoring and management utilizing the closest resource backed up by station cover assignments in a multi-tiered alarm structure.

For apparatus maintenance and repair the District employs 1 full-time Fire Mechanic and two part-time assistants. The District pursues an aggressive vehicle replacement policy which refurbishes engines after 10 years, places them in reserve after 20 years and replaces them after 25 years. District ambulances are designed to have the ambulance module remounted on a new chassis every 5 years until replacement. The North Tahoe Fire Protection District maintenance and repair facility personnel ensure the District purchases only items of a specified quality at the least expense to the taxpayers. The District maintenance and repair facility personnel are charged with all tasks associated with providing a safe and reliable apparatus fleet at the lowest possible expense to the taxpayers. Table M-12 identifies the personnel responsible for activities related to mitigation and loss prevention in the District.

Table M-12 North Tahoe FPD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	Placer County
Mitigation Planning Committee	N	-

Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Forest Fuels Program
Mutual aid agreements	Y	Multiple in place and on-going with allied agencies
Other		
	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	-
Floodplain Administrator	N	-
Emergency Manager	N	1 Fire Chief, 3 Battalion Chiefs, 2 Division Chiefs and staff
Community Planner	N	-
Civil Engineer	N	-
GIS Coordinator	Y	GIS Program is developing
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Placer Count Sherriff 911, Caltrans message signs, NTFPD sign trailers, fire danger signs. Placer County Code RED, Emergency radio system 1630 AM, Website and social media. Alert Tahoe Cameras, CERT
Hazard data and information	Y	Occupancy pre-plan capabilities, MDT grant, Pre-attack plans, Tahoe PTEIR, Placer County Tree Mortality, FRAP FHSZ maps.
Grant writing	Y	Admin and Prevention staff
Hazus analysis	N	County GIS
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional grants and further program development.		

Source: North Tahoe FPD

M.6.3. Fiscal Mitigation Capabilities

Table M-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table M-13 North Tahoe FPD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	No. Yes.
Authority to levy taxes for specific purposes	Y	Yes, Special Tax and Tax Assessments have been used for operations and pre-hazard mitigation. Yes.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Fees for water, sewer, gas, or electric services	N	-
Impact fees for new development	Y	Yes. Community Facilities District and AB1600 Mitigation Fees for capital purchases. Yes
Storm water utility fee	N	-
Incur debt through general obligation bonds and/or special tax bonds	Y	No. Yes.
Incur debt through private activities	Y	No. Yes
Community Development Block Grant	Y	No. Yes
Other federal funding programs	Y	Yes: FEMA AFG, SAFER, PDM, GEMT, IGT, and BLM-SNPLMA have all been awarded for mitigation projects. Yes
State funding programs	Y	Yes. JAC, CalOES, CALFIRE, OTS for operations, training, equipment and personnel program grants. Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
On-going program management and opportunities.		

Source: North Tahoe FPD

M.6.4. Mitigation Education, Outreach, and Partnerships

Table M-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table M-14 North Tahoe FPD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	CERT, Fire Adapted Communities, Fire Safe Council, NFPA Firewise, Tahoe Fund, League to Save Lake Tahoe
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	2015 Emergency Preparedness and Evacuation Guide, Tahoe Living with Fire, portable message signs
Natural disaster or safety related school programs	Yes	Fire safety week for the schools program
StormReady certification	No	
Firewise Communities certification	Yes	Forest Fuels serves as a Firewise Regional Coordinator to expand the number of Firewise communities

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Public-private partnership initiatives addressing disaster-related issues	Yes	Tahoe Fund
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued program management and development of mitigation related programs.		

Source: North Tahoe FPD

The North Tahoe FPD has automatic aid agreements with bordering Districts and mutual aid agreements with other fire agencies throughout the area. The District relies heavily upon this aid from their neighbors. Due to the high costs that are associated with a resort-based economy, three-quarters of the North Tahoe FPD personnel live outside of the area served. This requires additional personnel from neighbors to respond and assist with incidents that are within the operational area.

The District is also a participating member of the Sierra Front WildFire Cooperators, a bi-state, multi-agency organization. The cooperators address numerous issues pertaining to wildfire suppression, prevention and public education.

The District also works with other agencies on wildfire-related matters. Working with professional fire experts from the U.S. Forest Service and California Department of Forestry and Fire Protection helps ensure that the District’s work complements state and federal work and is up to standard for controlling wildfires.

In implementing many of the fuels management projects, the North Tahoe FPD works closely with the Tahoe Fire and Fuels Team which consists of representatives of Tahoe Basin fire agencies, CAL FIRE, Nevada Division of Forestry and related state agencies, the Nevada Fire Safe Council, the Tahoe Regional Planning Agency, the USDA Forest Service, conservation districts from both states, the California Tahoe Conservancy, and the Lahontan Regional Water Quality Control Board. Coordination of fuels reduction projects in the Tahoe Basin is overseen by a Multi-Agency Committee (MAC) comprised of the above agencies.

The District participates in the Lake Tahoe West Restoration Partnership. The Lake Tahoe West Restoration Partnership (Lake Tahoe West) is a collaborative effort to restore the resilience of forests, watersheds, and communities on 59,000 acres of Lake Tahoe's west shore. Wildfire, drought, and insects and disease epidemics—pressures that are amplified by climate change—threaten forests, watersheds, and communities across the Lake Tahoe West landscape. The goal of Lake Tahoe West is to restore the resilience of the west shore's forests, watersheds, recreational opportunities, and communities to such threats. The planning area includes approximately 59,000 acres of federal, state, local, and private lands, from Emerald Bay to Squaw Valley. Lake Tahoe West is a multi-stakeholder collaborative initiative convened by California Tahoe Conservancy, U.S. Forest Service Lake Tahoe Basin Management Unit, California State Parks, Tahoe Regional Planning Agency, Tahoe Fire and Fuels Team, and National Forest Foundation. The District’s primary mitigation strategies and actions will be through implementation of vegetation management treatments consistent with the Tahoe PTEIR program.

M.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

The District is involved in a variety of mitigation activities including, public education, fuels management projects, and other activities to reduce fuel loads and fire risk. These mitigation activities include:

- Public presentations and defensible space inspections
- Working with Homeowner's Association's through Fire Adapted Communities, Living with Fire and encouraging NFPA's Firewise recognition program
- Public outreach via website, social media, local paper and school education programs
- Fire & Life Safety structural plan review program
- Forest Fuel's management program
- Advise and assist with water system infrastructure improvements
- Details on some of the recent, ongoing mitigation projects are noted below.

Fuel Reduction Projects

The North Tahoe FPD is a member of the Tahoe Fire and Fuels Team and has partnered with the Meeks Bay Fire Protection District and the North Lake Tahoe Fire Protection Districts in Incline Village, Nevada to develop and implement a Coordinated Fuels Management and Defensible Space Program.

These organization's fuels management personnel and resources are shared and can be utilized in Meeks Bay, North Tahoe and the North Lake Tahoe Fire Districts as determined by project priority and funding availability. The combined fuels reduction dedicated staff includes a 20 person Type 2-IA hand crew, a 10 person fuels reduction module, a three person chipping crew, a registered Forester, and a NWCG qualified Type 2 Prescribed Fire Burn Boss. The Fuels program continuously applies for multiple grants through federal and state sources to aid in the continuation of a comprehensive fuels management program.

- 2019 WUI Fuels Reduction:
 - ✓ FEMA – North Tahoe Fire Hazardous Fuels Reduction and Defensible Space Project treated 154 lots/27 acres of CTC lots in Kings Beach.
 - ✓ SNPLMA – North Tahoe CWPP Project treated 80 acres of hand thin and pile within NTPUD ownership (Gentry property and Regional Park)
- 2020 WUI Fuels Reduction:
 - ✓ FEMA – North Tahoe Fire Hazardous Fuels Reduction and Defensible Space Project treated 106 lots/30 acres of CTC lots in Tahoe Vista, Agate Bay, Carnelian Bay, Cedar Flat, Dollar Point, Lake Forest and Tahoe City
 - ✓ SNPLMA – North Tahoe CWPP Project treated 57 acres of hand thin and pile within NTPUD's Regional Park.

Fuels Reduction: Chipper Program

The North Tahoe FPD provides residential curbside chipping to assist with removal of biomass from defensible space work to all properties within the District's geographic boundaries. This program is equivalent to about 100-300 acres of treatment in the district annually. Chipping statistics from 1999 to 2020 are provided in Table M-15. The District chipping statistics vary greatly in availability by year and

in numbers reported as the reporting methods and funding mechanisms have varied over the years. The reason for the large increase in these numbers in 2007 was due to the Angora Fire in 2006 that resulted in an increased need for defensible space in the region as over 300 homes were destroyed that year. It resulted in a large increase in wildfire awareness and the need for better defensible space around homes and businesses in the area. In subsequent years the numbers have stabilized and decreased at times. 2008 to 2013 and 2016 were unavailable.

Table M-15 Chipping Stats 1999-2020

Season	Parcels Treated	Pounds or Cubic Yards Biomass Removed
2020	886	19,031 cubic yards
2019	760	6,001 cubic yards
2018	897	9,612 cubic yards
2017	674	3,791 cubic yards
2016	-	-
2015	437	152,000 pounds
2014	325	104,000 pounds
2008-2013	N/A	N/A
2007	1,323	807,500 pounds
2006	567	379,278 pounds
2005	634	353,450 pounds
2004	543	286,285 pounds
2003	636	285,100 pounds
2002	517	248,000 pounds
2001	716	427,840 pounds
2000	407	223,087 pounds
1999	546	299,277 pounds
Totals		
5,889 Lots = 1472.25 at ¼ acre per lot average.		

Source: North Tahoe FPD

M.7 Mitigation Strategy

M.7.1. Mitigation Goals and Objectives

The North Tahoe FPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

M.7.2. Mitigation Actions

The planning team for the North Tahoe FPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Avalanche
- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: Localized Stormwater
- Pandemic
- Seiche
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Avalanche: Risk Reduction, Response Plan, and Pre-Incident Training

Hazards Addressed: Avalanche, Severe Weather: Freeze and Snow

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. However, avalanches can lead to loss of life, damage to road and highway closures, and destroy structures and forests in their path of travel.

NTFPD has multiple potential avalanche hazard areas, and a history of past occurrences that have caused significant damage or resulted in the loss of life, property and environment.

Project Description: NTFPD to work directly with Placer County and other partner agencies to assist in the development of an Avalanche Risk Reduction and Response Plan and conduct Pre-Incident Training (sand table or mock avalanche) to ensure all responding agencies can efficiently and cohesively respond to avalanche events. NTFPD to conduct a review and update to their Avalanche Response Policy and a study to determine what apparatus and equipment purchases are needed to be well-equipped for response to this hazard.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Code 12.40 Avalanche Management Areas. NTFPD Lexipol Policy 319: Avalanche Response Policy.

Responsible Agency/ Department/Partners: Placer County / NTFPD/ Multi-Agency

Cost Estimate: Scalable, dependent on need to contract development of plan and purchase necessary equipment

Benefits (Losses Avoided): Life, Property, Environment

Potential Funding: Private, State, County, Local, Private

Timeline: 1 year to conduct Avalanche Risk Reduction and Response Plan. Ongoing pre-incident training exercises and purchase of necessary apparatus and equipment

Project Priority (H, M, L): H

Action 2. Communications: Upgrades, Development, Maintenance, and Enhancement of Interoperability Radio Systems

Hazards Addressed: Multi-Hazard (Emergency Response to Avalanche, Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Pandemic, Seiche, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Communications is a critical factor in the operations and daily functions of North Tahoe Fire Protection District. Radio communications is the primary source of dispatch for all fire

department operations. The current radio system is a complex network of fixed and mobile infrastructure that allows for fire resources to effectively communicate with dispatch and other public safety agencies to mitigate emergency and non-emergency incidents.

The need for effective communications, consolidated dispatch, technology updates, and multi-jurisdictional interoperability are critical to firefighter and public safety as well as property and environmental conservation. FCC P-25 is an unfunded mandate of significant expense that affects the local taxpayer and fire district budgets for many years. Radio Equipment has a limited-service life, requires consistent maintenance and upgrades, and is an expensive expenditure for the district. The District also has dead zones and has identified the need for repeaters, and repeater replacements for complete coverage.

Project Description: NTFPD will plan and implement communications related upgrades, developments, replacements, maintenance, and enhancement of current systems in order to meet cross-jurisdictional interoperability needs.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: NTFPD and the Lake Tahoe Regional Fire Chiefs Association solicited a Department of Homeland Security CISA Bi-state Communications Center assessment reports (Tahoe Regional Command Center Study & Communications Infrastructure) and the Federal Communication Commission (FCC) Standards and Specifications. State of California, Office of Emergency Services Standards and Specifications. State of California, CAL FIRE Standards and Specifications.

Responsible Agency/ Department/Partners: NTFPD and Emergency Service Partners

Cost Estimate: \$500,000+ for base, mobile, portable, and fix geographical repeater radios and systems. \$200,000 annually for Grass Valley Emergency Command Center contract and NTFPD Upgrades/Replacements/Repair/Maintenance needs. Pending results of DHS CISA studies it is anticipated that a multi-million dollar project will be needed to bring comms systems up to regional standards.

Benefits (Losses Avoided): Life, Property and Environment. Technology and equipment upgrades, Interoperability with multi -disciplinary emergency response agencies, use of a regional, multi-agency collaborated dispatch center, local regional partnerships between state & local public safety agencies with cost sharing of maintenance and development of critical infrastructure.

Potential Funding: Federal, State, County, Local, Private

Timeline: New projects are prioritized and completed as funding becomes available. Older equipment is replaced with new equipment that meets FCC guidelines, Department of Homeland Security, SAFECOM, 6 Levels of Interoperability as well as CAL FIRE and CalOES comms standards. Maintenance of current infrastructure is part of Fire District's annual budget and is supported by local taxpayers.

Project Priority (H, M, L): H

Action 3. *Community Wildfire Prevention Plan Implementation: Forest Management, Fuels Reduction, Defensible Space, Home Hardening, Curbside Chipping, Greenwaste Disposal, Tree Marking, Fire Adapted and Firewise Communities, Outreach & Education*

Hazards Addressed: Multi-Hazard: Wildfire, Tree Mortality, Climate Change, Severe Weather: High Winds

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Wildfire is inevitable in the Lake Tahoe Basin. In fact, many of the region’s plant and animal species are dependent on the natural disturbance caused by wildfires. The disturbance creates opportunities for new growth, cycles nutrients through soils, and maintains biological diversity. Such species are fire-adapted and have developed strategies to survive and thrive in the presence of wildfire. Wildfires become disasters when they threaten lives, burn homes, destroy infrastructure, and damage watersheds. Developing and implementing strategies to make human communities more fire-adapted can prevent or lessen the impact of such disasters. The Community Wildfire Protection Plan provides strategies that can be implemented by fire agencies, land managers, policy makers, community leaders, residents, visitors, and others that will make Lake Tahoe Basin communities better prepared for the next inevitable wildfire, as well as respond to tree mortality, and adapt to climate change.

Following widespread wildland fires in the summer of 2002, President George W. Bush proposed the Healthy Forests Initiative, which was enacted into law by the Healthy Forests Restoration Act of 2003 (Public Law 108-408). The Act encouraged thinning dense forests on federal, state, local, and private land to help protect communities from intense wildfires, improving fire suppression capabilities, and increasing forests’ resistance to destructive insects. Communities were also encouraged to create a Community Wildfire Protection Plan (CWPP) to collaboratively designate areas in the Wildland-Urban Interface that were the most in need of thinning.

Project Description: Implement the Lake Tahoe Multi-Jurisdictional Fuel Reduction & Wildfire Prevention Strategy, Lake Tahoe Basin Community Wildfire Protection Plan, and the Lake Tahoe Basin Forest Action Plan within communities that NTFPD serves.

Projects include but not limited to:

- Collaborate and plan projects and initiatives with all interested partners
- Prioritize Hazardous Fuel Reduction
- Restore & Maintain Fire-Resilient Landscapes
- Provide Effective & Efficient Wildfire Response
- Treat Structural Ignitability
- Defensible space inspections, education, assistance and enforcement
- Home Hardening and retrofit education and assistance
- Residential Chipping program, Greenwaste & Biomass utilization and disposal
- Tree Marking and Tree Removal Permits
- Create Fire Adapted Communities
- Coordinate Firewise USA recognition

- Encourage and provide effective and appropriate Forest Management and Fuels Reduction to act and adapt to a changing climate
- Implement the Tahoe PTEIR Program
- Provide robust public outreach and education
- Provide Community Assistance and Incentivization

Other Alternatives: Aggressive Fire Suppression which is not acceptable as a sole action to mitigate risk

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Lake Tahoe Multi-Jurisdictional Fuel Reduction & Wildfire Prevention Strategy
- Lake Tahoe Basin Community Wildfire Protection Plan
- Lake Tahoe Basin Forest Action Plan
- Tahoe Program Timberland Environmental Impact Report (Tahoe PTEIR)
- Lake Tahoe Climate Adaptation Action Portfolio
- Placer County Sustainability Plan
- California’s Climate Change Scoping Plan
- California’s Wildfire and Forest Resilience Action Plan
- CAL FIRE (NEU & AEU) Strategic Fire Plans

Responsible Agency/ Department/Partners: NTFPD/Partner Tahoe Fire and Fuels Team/Partners/Stakeholders/Community Members

Cost Estimate: \$1,000,000+ annually

Benefits (Losses Avoided): Life, Property and Environment

Potential Funding: Federal, State, County, Local, Private

Timeline: Ongoing

Project Priority (H, M, L): H

Action 4. GIS Technology, Equipment, Database and Mapping Improvements

Hazards Addressed: Multi-Hazard (Avalanche, Climate Change, Drought & Water Shortage, Earthquake, Floods: Localized Stormwater, Pandemic, Seiche, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Handle and manipulate information, statistical analysis, project planning and tracking, fire prevention, fuels management, parcel treatment, services provided:

- GIS/GPS interface for response routes, hydrant flow data and physical locations when covered by snow.
- Critical tool for many applications used in fuels management, prevention and emergency services.
- Sharing information with other agencies for project work; and
- Presentations for public education, evacuation routes, fuels management.

Project Description: Identify personnel to receive in-depth ArcGIS training and purchase all necessary GIS licensing and equipment to support the District’s GIS capabilities and needs. Retain an annual GIS budget to train current staff or consider contracting out in-depth GIS data analysis, map creation and geographic data entry needs.

Other Alternatives: None identified

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tahoe Basin Fire Commission Report, Recommendation #6. Identified inherent need to increase GIS capabilities

Responsible Agency/ Department/Partners: NTFPD

Cost Estimate: \$100,000 to train dedicated staff and purchase additional equipment

Benefits (Losses Avoided): Improve response times and availability of information on emergencies as well as improved regional information sharing

Potential Funding: Federal, State, County, Local, Private

Timeline: Ongoing

Project Priority (H, M, L): H

Action 5. Pandemic Preparedness and Response Plan

Hazards Addressed: Pandemic

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. Pandemics do not directly affect District facilities, but can affect District personnel who operate and manage District facilities and apparatus, including ambulances. During a pandemic the District would typically be considered essential, which puts staff on the front line and at immediate high-risk for exposure as they work to carry on the mission of the District and serve the community. Because there are no hospital facilities in the District, North Tahoe Fire must be adequately prepared not only to carry out their typical first responder duties, but also to transport patients who have become infected with the virus, while protecting other patients who have not been exposed or infected.

The 20th century saw three outbreaks of pandemic flu:

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics:

- 2009 Swine Flu (H1N1)
- 2019/2020/2021 COVID-19

As experienced during the COVID-19 pandemic and its multiple waves, closures and stay-at-home orders disrupted supply chains globally, and interrupted the delivery of basic services and essential supplies. A Pandemic Preparedness Response Plan is necessary for the District to be prepared for the next global pandemic, and its impacts to the services we provide. This includes priority access to PPE, Virus Testing and Vaccines, as well as a plan for reimbursement for the treatment and transport of viral patients, and a reimbursement of costs resulting from the response to the pandemic, including lost revenue.

Project Description: North Tahoe Fire has identified essential supplies, functions and services needed to sustain its mission and operations during a pandemic. In order to perform our mission, the District must have an adequate supply of PPE and disinfecting methodologies to protect staff, facilities and equipment in order to safely serve our community. The project reflects lessons learned from the response so far, and serves as a basis for continued preparedness and progress through and beyond the current pandemic.

A Pandemic Preparedness Response Plan includes an available cache of:

- Gloves
- Masks, Face Coverings, and N95s
- Face shields
- Booties
- Goggles
- Gowns
- PAPRs
- Disinfecting sprays/treatments
- Sterilizing equipment for ambulances, engines, equipment and facilities
- Material for vertical separations
- Virus Testing
- Vaccines

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District's "Response to Executive Order N-25-20" will serve as the planning mechanism for Pandemic Response, and to guide for Station and Personnel Directives, and Incident Directives.

Responsible Agency/ Department/Partners: North Tahoe Fire Protection District

Cost Estimate: \$200,000

Benefits (Losses Avoided): This project would specifically meet the tenets specified in the Public Assistance Program and Policy Guide - FP-104-009-2 / June 2020 by providing a plan for the District to fulfill its mission while preventing barriers to community lifelines that eliminate or lessen immediate threats to lives, public health, or safety in a cost-effective manner. The Plan helps foster better integration across the whole community since lifeline management transcends public and private sector boundaries.

Potential Funding: Federal, State, County, Local

Timeline: 5 years in conjunction with the LHMP

Project Priority (H, M, L): H

Action 6. Tahoe Emergency Notifications System (TENS)

Hazards Addressed: Multi-Hazard: Wildfire, Seiche, Avalanche, Earthquake, Severe Weather

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The region’s natural attributes are the biggest driver of its \$5billion annual economy, which is based on outdoor recreation and tourism. Cellular data shows that nearly ten million vehicles travel here annually which results, in part, because of Lake Tahoe’s central location in the Sierra Pacific Megapolitan Area, a corridor of growing metropolitan areas that extends from the San Francisco Bay Area to Reno. More than 14 million people live in this corridor, and many visitors drive to Lake Tahoe to enjoy its world-class recreation opportunities. Visitation can exceed 24 million annually with the peak visitation in summer when fire danger is high, and in winter when snow is at its heaviest. Peak visitor traffic causes significant congestion in community centers, at recreation areas, and at the six regional entry and exit points, which affects emergency response times.

With a large, centralized lake that crosses two states and five counties, a rugged mountainous landscape, and severe weather conditions, the area is susceptible to fire, avalanche, mudslide, and flooding, and climate change will only exacerbate these issues. High visitation rates in the area and an increase in vacation rentals result in a significant number of people present in the Basin who are unfamiliar with the regional evacuation protocols, limited egress routes, or where to access information.

The District has programmable mobile sign trailers, however public messaging is a challenge when visitors are not signed up to receive emergency alerts from any of the five counties they may visit during their stay.

Project Description: North Tahoe Fire Protection District, in partnership with the Tahoe Transportation District, will work with regional partners to build an interoperability situational awareness platform and associated public warning system that can support and integrate with regional dispatch systems, Nevada Dept. of Transportation (NDOT), Caltrans ITS systems, and the AlertTahoe System (<http://www.alertwildfire.org/tahoe/>). NDOT, Highway Patrol, and the Regional Transportation Commission (RTC) of Southern Nevada are implementing a “Software as a Service” platform that was integrated with the RTC’s ITS system, and Nevada is expanding the system statewide. Southern Nevada’s initial findings have shown an improvement of 10 to 15 minutes in incident response time in just a few months’ time. They are integrating fire incidents into the system and are expecting similar improved performance in fire response times. The system uses real-time data to provide automated incident identification through a multitude of sources, such as inductive loop traffic detectors, microwave vehicle detectors, on-board devices (OBD II), navigation apps, telematics, weather data, special events (Ticketmaster), dynamic warning signs, construction and road closure information, road camera feeds, traffic crashes and incidents (through crowd sourcing, such as Waze and the 911 systems), and public transit information. The demonstration system is now moving towards more predictive insights and early warnings for proactive crash prevention and dynamic traffic flow optimization.

The Utility and Infrastructure project, Tahoe Evacuation Notification System (TENS), will provide a cross-jurisdictional system that emergency managers will use to improve performance, while providing predictive insights and more connectivity between

first responders, traffic and transit operations, and the public. The system will integrate publicly available datasets to provide a better understanding of visitors in the Lake Tahoe Basin, including travel movements and duration of stay, emergency roadway issues

including closures or hazards caused by landslides, fires, toxic spills, avalanches, tree falls, downed power lines and power outages. These criteria will be considered for real-time detection and notification systems and reduction in secondary incidents.

As wildland fire is the biggest risk in the Tahoe Basin, further benefits will include early notification of wildland fire through the Alert Tahoe Camera system that will allow fires to be pinpointed and relayed back into the end warning system. Additionally, the application will provide location information to direct the public to defibrillators placed throughout public areas within the Basin. Smart streetlights will be utilized for housing a variety of warning systems and to provide input to public agencies for overall situational awareness that can influence disaster management and evacuations. Public notifications and overall public agency situational awareness input would include audio speakers, siren warning systems, dynamic message boards, outdoor acoustic sensors, weather sensors, camera systems, and lights to influence directional traffic flows in the event of evacuations. Although the intent of these devices is not to provide communications, they are built to communicate these disaster warnings and notifications back to the public, including a multi-lingual fashion if required by the demographic aspect of the communities.

Other Alternatives: No action alternative or business as usual

Existing Planning Mechanism(s) through which Action Will Be Implemented: Intelligent Transportation System (ITS) upgrades and traffic management are identified as priority projects in the Tahoe Regional Planning Agency 2020 Regional Transportation Plan. The Tahoe Transportation District utilizes Article IX of the Bistate Planning Compact and the adopted Regional Transportation Plan as its planning mechanism.

Responsible Agency/ Department/Partners:

- North Tahoe Fire Protection District
- Tahoe Transportation District
- Tahoe Regional Planning Agency

Cost Estimate: \$8,000,000.00

Benefits (Losses Avoided): This project would: 1) specifically meet the tenets specified in the Public Assistance Program and Policy Guide - FP-104-009-2 / June 2020 by providing community lifelines that; 2) eliminate or lessen immediate threats to lives, public health, or safety; and 3) eliminate or lessen immediate threats of significant additional damage to improved public or private property in a cost-effective manner that fosters better integration and communication across the whole community since lifeline management transcends public and private sector boundaries.

Potential Funding: Federal, State, County, Local, Private

Timeline: 3-5 years implementation, with ongoing support and maintenance.

Project Priority (H, M, L): H

Action 7. Water for Fire Suppression Collaborative

Hazards Addressed: Multi-Hazard: Wildfire, Severe Weather: Snow, Drought & Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NTFPD has identified the need to advise and assist with water system infrastructure improvements in order to increase the availability of water to support fire suppression operations year-round. The District is at risk to wildland fire during fire season, and severe winter storms and snowpack creates a unique challenge to locate and access fire hydrants during winter months when needed for structure fires. Climate change has also led to decreased snowpack and multi-year droughts that exacerbate wildfire risk and can lead to water shortages. There are over 1055 fire hydrants in the District serviced by 16 different water purveyors, with only 4 of those being public. Many of these small water purveyors have little to no funds available for infrastructure testing, inspecting, repairs and upgrades. Several of these systems were installed 50-100 years ago and were designed to only provide domestic water for season customers. NTFPD is faced with inadequate water supply, delivery, storage, and locations of fire hydrants. These infrastructural inadequacies have always existed within the District and have remained a top concern during the last two fire code adoption cycles. Adequate fire suppression infrastructure is a key component of community fire suppression capabilities. Allowing these inadequacies to exist without taking proactive steps to test, inspect and notify our various water purveyors has led to loss of property, threat to surrounding properties, damage to fire equipment, transmission into the wildland, and water-related inadequacies per The Fire Code for residential and commercial projects. The lack of adequate fire flow has a direct relation to life safety, environmental protection, property loss prevention and economic stability.

Project Description: North Tahoe and Meeks Bay Fire Protection Districts (NTFPD) will facilitate development of a collaborative "Water for Fire Suppression" partnership to inspect, test, paint, document data in GIS layer, and provide notifications in order to mitigate varying concerns and inadequacies with water delivery and storage on the California side of the Lake Tahoe Basin within District boundaries. This collaborative will allow NTFPD to interface with 16 water purveyors across 1055 fire hydrants in order to best serve 17,000 structures during fire season and winter weather alike.

Other Alternatives: No action alternative, Educate Water Purveyors. Neither will reasonably mitigate these hazards in the near-term

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District is currently developing a Community Risk Assessment and Community Risk Reduction plan that would include water-related inadequacies as a risk and directly link to risk reduction mitigation actions. Lake Tahoe Community Fire Prevention Partnership (bi-state collaboration to improve water distribution systems and regional interconnectivity to be prepared to respond to wildfire)

Responsible Agency/ Department/Partners: NTFPD and 16 Water Purveyors

Cost Estimate: \$750,000 for initial 3 to 5 year project to hire a District water supply officer, purchase equipment necessary for testing and winter snow removal, conduct inspections, painting and installation of snow markers of all hydrants. data entry, GIS updates, and noticing. Project is scalable into the multi-million dollars to include critical infrastructure vegetation management, hydrant risers, water infrastructure replacements, upgrades and enhancements, and purchase of a fire boat as a floating hydrant to enhance fire suppression capabilities.

Benefits (Losses Avoided): Loss of Life, Property and Environment. The number one threat to Lake Tahoe Basin is wildland fire. Lake Tahoe's Angora Fire in 2007 burned 3,071 acres, destroyed 254 homes, and incurred and estimated \$150,000,000 in property loss and \$12,000,000 in suppression costs. Couple the threat of catastrophic wildfire with an increasingly drier climate and forecasted climate change impacts, increasing the availability of water for fire suppression has a direct relation to life safety, environmental protection, property loss prevention and regional economic stability.

Potential Funding: Federal, State, County, Local, Private

Timeline: 3-5 years. This project will remain ongoing as annual hydrant testing, exercising and snow removal is priority and necessity

Project Priority (H, M, L): H



Annex N North Tahoe Public Utility District

N.1 Introduction

This Annex details the hazard mitigation planning elements specific to North Tahoe Public Utility District (NTPUD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to NTPUD, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

N.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table N-1. Additional details on plan participation and District representatives are included in Appendix A.

Table N-1 NTPUD – Planning Team

Name	Position/Title	How Participated
Suzi Gibbons	Contracts and Planning Coordinator	Attended meetings. Provided input on past hazards. Filled out hazard ID table. Provided information on capabilities. Provided information on past and future mitigation actions. Reviewed and provided information and edits to Annex. Provided logo and base map.
Joe Pomroy, P.E.	Engineering and Operations Manager	Provided input on hazard ID table. Provided information on capabilities. Provided information on past and future mitigation actions. Reviewed and provided information and edits to Annex.
Vanetta Van Cleave	Chief Financial Officer	Provided financial information.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table N-2.

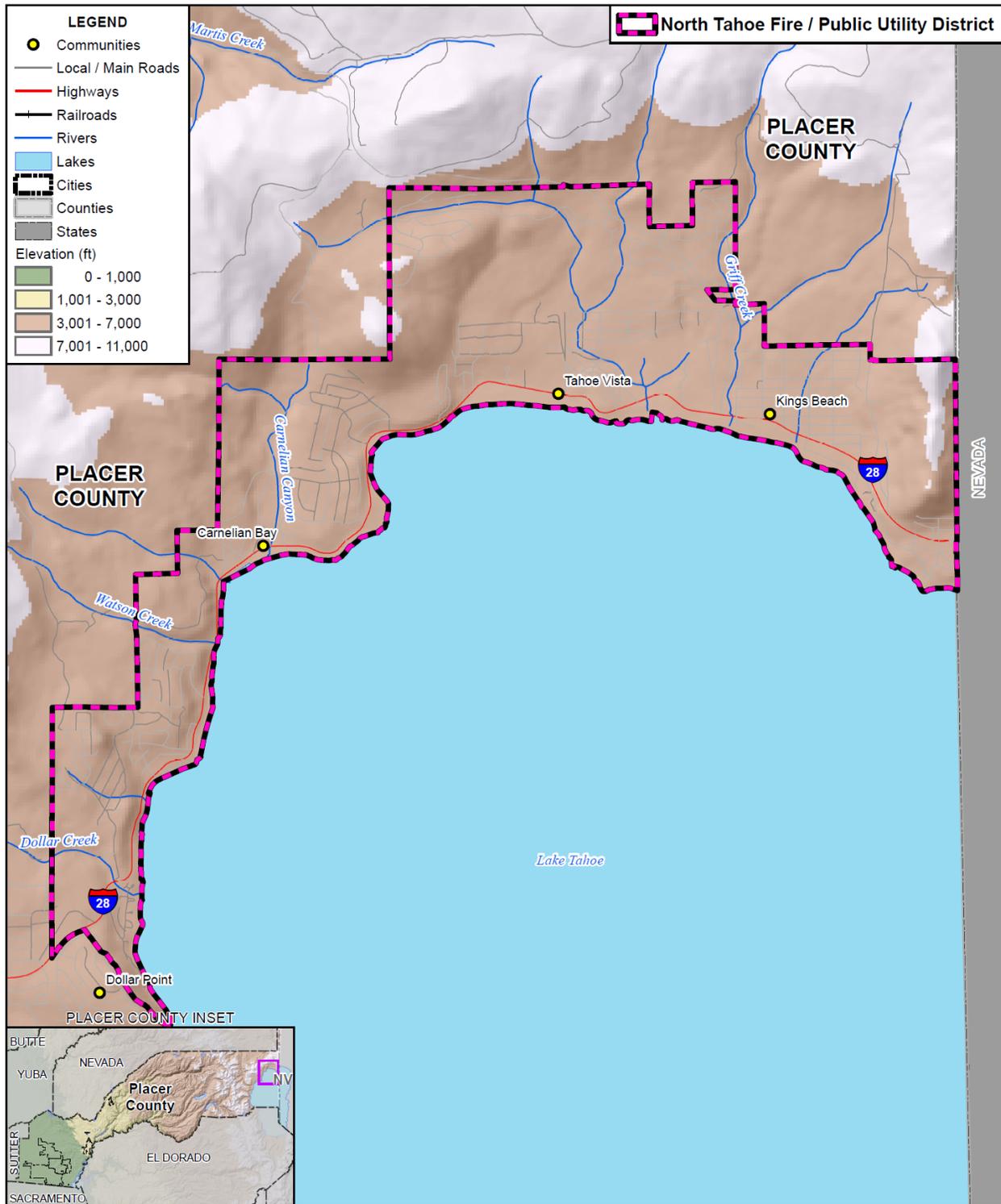
Table N-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No mitigation related planning mechanisms have been completed since 2016

N.3 District Profile

The District profile for the NTPUD is detailed in the following sections. Figure N-1 displays a map and the location of the District within Placer County.

Figure N-1 NTPUD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

N.3.1. Overview and Background

The North Tahoe Public Utility District (NTPUD) was formed in 1948 under the State of California Public Utilities Code to provide sewer services to the residents of the north shore of Lake Tahoe. The District's boundaries range from the Nevada state line in Crystal Bay to Dollar Hill. Our service area includes the communities of Kings Beach, Tahoe Vista, Brockway Vista, Carnelian Bay, Cedar Flat and Agate Bay.

In November of 1967, water services were added to the District's responsibility with the Recreation and Parks Department being created in 1968. The District manages and maintains most of the public beaches in our service area as well as the North Tahoe Regional Park in Tahoe Vista.

The North Tahoe Event Center is also owned and managed by the District. The District currently serves 5,467 sewer connections and 3,948 metered water connections.

N.4 Hazard Identification

NTPUD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table N-3).

Table N-3 NTPUD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Occasional	Negligible	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Significant	Likely	Critical	High	High
Earthquake	Extensive	Occasional	Critical	High	Low
Floods: 1%/0.2% annual chance	Significant	Unlikely	Limited	Medium	Medium
Floods: Localized Stormwater	Significant	Occasional	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Extensive	Occasional	Limited	Medium	Medium
Seiche	Limited	Unlikely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Limited	Unlikely	Negligible	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Heavy Rains and Storms	Significant	Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Limited	Occasional	Negligible	Low	Low
Tree Mortality	Significant	Likely	Limited	Medium	High
Wildfire	Significant	Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

N.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

N.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section N.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table N-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

N.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the NTPUD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table N-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. NTPUD’s physical assets, valued at over \$17 million, consist of the buildings and infrastructure to support the District’s operations.

Table N-4 NTPUD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Base Administration Facilities	District Operations Base	\$3,913,767	Severe Weather
National Avenue Water Treatment Plant	Potable Water Intake & Treatment Plant	\$1,617,000	Seiche Flood
Park Well	Potable Water Well and Emergency Generator	\$310,000	Wildfire Drought
Park Tank	Potable Water Tank	\$200,000	Wildfire
Carnelian Woods Well	Potable Water Well	\$206,000	Wildfire Drought
Carnelian Woods Tank I	Potable Water Tank	\$200,000	Wildfire
Carnelian Woods Tank II	Potable Water Tank & Booster Pump Station	\$400,000	Wildfire
Dollar Hill Tank	Potable Water Tank	\$225,000	Wildfire
Dollar Cove Water Intake (currently inactive)	Potable Water Intake & Pump House	\$100,000	Soil Bank Erosion Drought
Brockway Water Intake (currently inactive)	Potable Water Intake & Pump House	\$75,000	Soil Bank Erosion Drought Seiche
Kings Beach Tank	Potable Water Tank	\$200,000	Wildfire
Zone 1 Tank	Potable Water Tank & Booster Pump Station	\$450,000	Wildfire
Zone 2 Tank	Potable Water Tank	\$200,000	Wildfire
Kingswood West Water Tank	Potable Water Tank	\$400,000	Wildfire
Kingswood West Booster Pump Station	Potable Water Booster Pump Station	\$147,900	Wildfire
Secline Sewer Pump Station	Sewer Pump Station	\$385,000	Severe Weather Flood: Localized Stormwater Flooding Seiche

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
National Sewer Pump Station	Sewer Pump Station	\$675,000	Severe Weather Flood: Localized Stormwater Flooding Seiche
Carnelian Sewer Pump Station	Sewer Pump Station	\$505,900	Severe Weather Flood: Localized Stormwater Flooding
Dollar Sewer Pump Station	Sewer Pump Station	\$488,000	Severe Weather Flood: Localized Stormwater Flooding
S1, S2, N2, C1, D1, D2, D3, D4, D5, D6, D7 Satellite Sewer Pump Stations	Model 15 and Model 16 Satellite Sewer Pump Stations	Model 15: \$32,000/ea Model 16: \$101,350/ea	Severe Weather
N1 Satellite Pump Station	Model 16 Satellite Sewer Pump Station with Backup Generator	\$136,350	Severe Weather
N3 Satellite Pump Station	Model 16 Satellite Sewer Pump Station with Backup Generator	\$126,350	Severe Weather
C2 Satellite Pump Station	Model 16 Satellite Sewer Pump Station with Backup Generator	\$181,350	Severe Weather
North Tahoe Event Center	Community Conference Center & Emergency Evacuation Shelter	\$2,405,000	Severe Weather (wind) Seiche Flood
Tahoe Vista Recreation Area	Beach & Facilities, Boat Launch, & Parking Areas	\$289,000	Severe Weather Seiche Flood
Secline Beach Park	Park	\$10,000	Flood Seiche
North Tahoe Regional Park	Park with numerous amenities	\$1,913,559	Wildfire

Source: NTPUD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. NTPUD provides services to residential, commercial, and visitors to North Lake Tahoe. Services provided includes sewer collection and pumping, domestic water, and fire suppression facilities.

Natural Resources

NTPUD has a variety of natural resources of value to the District. These natural resources parallel that of the Tahoe area of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan

Historic and Cultural Resources

NTPUD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan. There is no growth occurring, therefore no expansion of facilities. There is infill development and redevelopment that is served by the existing infrastructure.

Development since 2016

No District facilities have been constructed since 2016. The District continues to rehabilitate existing facilities and improve fire suppression capabilities.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. There is no growth occurring, therefore no expansion of facilities. There is infill development and redevelopment that is served by the existing infrastructure. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

N.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table N-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table N-5.

Table N-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

As a public water purveyor, droughts and water shortages may have an impact on the District's well water levels during prolonged drought conditions. It is doubtful it would have an impact on the District's lake intake due to the length of the intake and the District's pumps are submersible.

Assets at Risk

Assets at risk from droughts are the Park Well and Carnelian Woods Well due to low groundwater levels.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismic shaking maps for the area show Placer County and the District fall within a moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. The District noted that there may be URM, but a seismic analysis would need to be completed to identify which structures. The only building identified so far is the Base Annex building which houses emergency response equipment.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The NTPUD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Assets at Risk

A seismic analysis would need to be completed to identify which structures may be at risk from Earthquakes. The only asset currently identified for retrofit is the Base Annex building which houses emergency response equipment; such as portable generators, portable pumps, and other emergency response equipment. The National Sewer Pump Station block building is being reinforced with a capital project in 2021. It is expected there could be substantial water pipeline and sewer pipeline breaks and failures as a result of ground movement which would have a high impact on service.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the NTPUD have been subject to historical flooding.

Location and Extent

The NTPUD has areas located in the 1% annual chance floodplain. This is seen in Figure N-2.

Table N-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table N-6 NTPUD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table N-7. These events also likely affected the District to some degree.

Table N-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

January 1997 – A USGS Report titled Flood of January 1997 in the Lake Tahoe Basin, California and Nevada (Fact Sheet FS-005-98) contained the following information on a January 1997 flood event: Northern California and western Nevada, including the Lake Tahoe Basin, were affected by floods during January 1-3, 1997. In the two California counties surrounding Lake Tahoe, El Dorado and Placer, about \$91 million in estimated damage was attributed to flood waters (Reno Gazette-Journal, May 30, 1997). Flooding in the Lake Tahoe Basin was mainly along the Upper Truckee River in the city of South Lake Tahoe (Tahoe Daily Tribune, January 7, 1997). In late December 1996, several storms produced a large snowpack (more than 180 percent of normal) in higher altitudes of the Sierra Nevada (Daniel Greenlee, Natural Resource Conservation Service, oral commun., 1997). Valleys along the eastern Sierra Nevada front were covered with a large snowpack as well. A subtropical storm system originating in the central Pacific Ocean near the Hawaiian Islands then brought heavy rain to the Sierra Nevada from December 30, 1996, through January 3, 1997. During this period, the Natural Resource Conservation Service recorded 27.7 in. (provisional data; Daniel Greenlee, oral commun., 1997) of precipitation at Squaw Valley, Calif. (8,200 ft above sea level), and the National Weather Service recorded 11.6 in. (Gary Barbate, oral commun., 1997) at Tahoe City, Calif. (6,230 ft). Rain falling below 10,000 ft depleted about 20 percent of the high-altitude snowpack between 7,000 and 10,000 feet and melted about 80 percent of the snowpack below 7,000 ft. The level of Lake Tahoe rose more than a foot during the storm, to 6,229.40 ft (Bureau of Reclamation datum), the highest elevation since 1917, and more than the maximum permissible by Federal Court decree (6,229.10 ft). The peak for the period of record (1900-97) for Lake Tahoe at Tahoe City, Calif, is 6,231.26 ft in July 1907.

December 2005/January 2006 – A very brief but productive storm period in early December and a much more prolonged wet and stormy period spanning Dec 17th through the 2nd of January 2006 brought copious rainfall to northern California, southwest Oregon, and western Nevada. Initially, the generally dry antecedent soil moisture conditions and the spacing between storms of mid to late December allowed rivers to rise and fall with only minor consequences. However, river flows ratcheted higher with each passing storm to the point where a larger storm occurring on the 28th of December and an even wetter New Year's Eve storm would drive several rivers to rise well above flood stages with high inflows into northern Sierra Nevada reservoirs. Advanced releases in anticipation of the heavy rains and weir flows into the bypass system allowed the major controlled river systems like the Sacramento, Feather, and American watersheds to weather the storm without major incidents. However, the smaller and quicker responding rivers such as the Russian and Napa Rivers were exposed to the direct impact of these storms and resulted in major flooding. Several rivers along California's north coast including the Klamath River and the Eel River rose several feet above flood stage and rivaled flows dating back to the December 1996 - January 1997 flood event. In addition, more localized flood damage occurred as many of the area's smaller creeks and streams overflowed into neighborhoods and streets, including the San Francisco Bay Area and greater Sacramento

area. The heavy rains also posed a major problem for area transportation with several road closures due to rock and mud slides. A mudslide on the 30th temporarily closed Interstate 5 north of the Oregon border and a large rockslide closed Interstate 80 near Floriston east of Truckee for about a day and a half. Westbound lanes of Interstate 80 in Fairfield, CA sat under four feet of water forcing the CHP to shut down the major thoroughfare between Sacramento and San Francisco on the 31st.

Vulnerability to and Impacts from Flood

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

The District has a number of critical sewer and water facilities near the shoreline of Lake Tahoe that may be subject to flooding during a 100/500 year storm. Floodwaters could inundate the sewer pump stations, making it difficult to keep up with pumping the sewage out of the Tahoe Basin. Likewise, the District's water treatment plant is on the shoreline underground, making it susceptible to flooding during a 100/500 year storm. Power outages would also affect the District's ability to keep sewer and water pump stations operational, which would have an impact on District customers.

For the most part, the larger sewer pumping and many of the small sewer pumping facilities are located adjacent to the shoreline of Lake Tahoe where flooding would be very minimal that could impact the facility, since it would all drain to the lake and the lake will not rise any measurable amount. The risk is from the inundation of flood waters into the sewer system that overwhelms the conveyance facilities. Water tanks are located along ridge lines and sited on prepared pads that keep them at low risk from floodwaters.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The NTPUD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

- From **December 31, 2005 to January 6, 2006**, severe flooding occurred in the North Tahoe PUD area. There was snow on the ground in the area at the time of a rain. The rain on snow event caused mild to moderate flood damage in the area. It was considered a 50-year flood event. State Highway 28 was closed due to flooding. Fortunately, schools were already closed for the Christmas holiday. The North Tahoe PUD received reimbursement of \$37,768 from State OES for staff time (regular and overtime) and equipment costs to keep sewer and water pump stations operational during power outages. The HMPC noted that there is a high likelihood of reoccurrence, depending on weather conditions. Additional/alternative fuel supplies should be considered for these types of catastrophic events. All local gas stations ran out of fuel (regular and diesel) and gas trucks were not able to get into the area due to week-long road closures on Interstate 80.

No events since 2016 were noted.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

The District has a number of critical sewer and water facilities near the shoreline of Lake Tahoe that may be subject to flooding during localized stormwater flooding. Floodwaters could inundate the sewer pump stations, making it difficult to keep up with pumping the sewage out of the Tahoe Basin. Likewise, the District's water treatment plant is on the shoreline underground, making it susceptible to flooding during localized stormwater flooding. Power outages would also affect the District's ability to keep sewer and water pump stations operational, which would have an impact on District customers.

For the most part the larger sewer pumping and many of the small sewer pumping facilities are located adjacent to the shoreline of Lake Tahoe where flooding would be very minimal that could impact the facility, since it would all drain to the lake and the lake will not rise any measurable amount. The risk is from the inundation of flood waters into the sewer system that overwhelms the conveyance facilities. Water tanks are located along ridge lines and sited on prepared pads that keep them at low risk from floodwaters.

Pandemic

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no

scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table N-8.

Table N-8 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

The District was not affected by the 2009 Swine Flu. During the 2019/2020 COVID 19 pandemic, the District closed the Administration building and North Tahoe Event Center to the public except by appointment only, began sanitizing work-stations and facilities several times each day, established remote working for office staff, instituted mandatory mask wearing and social distancing for all staff, closed all playgrounds, and cancelled all sporting and social events. The District has a CalOSHA Covid-19 Prevention Program.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-

19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted. Prisons may need to release prisoners to prevent significant outbreaks.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Seiche

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

U.S. Army Corps of Engineers defines seiche as:

- A standing wave oscillation of an enclosed water body that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric.
- An oscillation of a fluid body in response to a disturbing force having the same frequency as the natural frequency of the fluid system. Tides are now considered to be seiches induced primarily by the periodic forces caused by the sun and moon.
- In the Great Lakes area, any sudden rise in the water of a harbor or a lake whether or not it is oscillatory (although inaccurate in a strict sense, this usage is well established in the Great Lakes area).

Seiches can be generated when the water is subject to changes in wind or atmospheric pressure gradients or, in the case of semi-enclosed basins, by the oscillation of adjacent connected water bodies having a periodicity close to that of the seiche or of one of its harmonics. Other, less frequent causes of seiches include heavy precipitation over a portion of the lake, flood discharge from rivers, seismic disturbances, submarine mudslides or slumps, and tides. The most dramatic seiches have been observed after earthquakes and large landslide events.

Location and Extent

Within Placer County, locations with the highest probability of impact are shore areas of Lake Tahoe from 0 to 30 feet above mean lake water level. Speed of onset of seiche is short. The duration of the event tends to be short as well, continuing until the waves naturally dissipate.

Past Occurrences

There have been no state or federal disasters in the County related to seiche. No events of past seiche have affected the District.

Vulnerability to and Impacts from Seiche

Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The two faults directly underneath the lake are considered capable

of generating magnitude 7.1 earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point and the casinos in South Lake Tahoe. The seiche risk is potentially devastating as hundreds of houses are built along the lake and more than 17,000 people enjoy the Lake Tahoe shoreline every day in the summer.

Potential impacts of a seiche could affect sewer and water facilities in close proximity to the lake. A seiche may also impact the North Tahoe Event Center, which is the region's emergency shelter and evacuation center. The impacts could be severe if the wave compromises the control buildings and destroys electrical equipment, generators and communications equipment. The District does have an alternative groundwater supply that can provide for base water use. Emergency equipment can be set up for sewer bypass operations in case of failure of lakeside sewer pumping stations. There are significant Liberty Energy power lines along North Lake Blvd that could be impacted causing widespread power loss, which could impact District facilities.

Assets at Risk

District assets at risk due to a seiche are the National Avenue Water Treatment Plant, Secline Sewer Pump Station, National Avenue Sewer Pump Station, North Tahoe Event Center, Tahoe Vista Recreation Area, and Secline Beach Park. Loss of Liberty Energy power line along North Lake Blvd could cause widespread power loss and potentially affect every District facility.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least

50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 90°F during the summer and fall months. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts, including loss of life, are the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Assets at Risk

The District does not have any assets at risk from extreme heat. However, if during a PSPS event, the District has several assets at risk due to lack of permanent emergency generators. Those assets include the North Tahoe Event Center, water booster pump stations and satellite sewer pump stations. The District does have portable generators for the satellite sewer and water booster pump stations.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to

weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table N-9.

Table N-9 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3. A specific event was recalled by the District:

January 3 – 12, 2017 – Multiple days of heavy snow and power outages District-wide. Communities of Kings Beach, Tahoe Vista, and Carnelian Bay, CA. \$35,995 of damage was suffered by the District, as well as \$22,536 in economic impacts. Business/Economic Impacts cost is for Protective Measures (snow removal, generators, staff overtime, fuel, etc.) to keep critical infrastructure operational during the power outage. These costs were borne by FEMA. No deaths or injuries were recorded.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. Freeze and Snow can cause small water mains to break which affects water services in the surrounding neighborhood. Freeze and snow can also cause power outages which would affect the District’s ability to keep sewer and water pump stations operational, which would have an impact on District customers.

Assets at Risk

The District has several assets at risk due to lack of permanent emergency generators. Those assets include the North Tahoe Event Center, water booster pump stations and satellite sewer pump stations. The District does have portable generators for the satellite sewer and water booster pump stations.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015. No events of past tree mortality have affected the District.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure. Falling trees could damage District facilities in forested areas. They could also block access roads to these facilities. Dead and dying trees could also impact various facilities due to increased risk for catastrophic wildfires.

Assets at Risk

All of the District’s wells, water storage tanks, and the Kingswood West water booster pump station are at risk from Tree Mortality, mainly due to the increased risk of Wildfires and the impacts from them. Also at risk is the North Tahoe Regional Park. Fallen dead wood is a temporary impact.

Wildfire

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the NTPUD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the NTPUD were created. Figure N-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from High to Very High.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table N-10.

Table N-10 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage

and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District has several assets that would be at risk during a wildfire due to the location of existing wooden structures. These assets include the North Tahoe Regional Park, the Park Well building, Kingswood West Booster Pump Station building, and the Carnelian Well building. Wildfire would also cut off access to critical water infrastructure which could impact the District’s ability to provide safe drinking water and fire protection. Structure fires in other areas of the service area also put a large demand on water supplies that impact delivery of potable water to all customers.

Assets at Risk

All of the District’s wells, and Kingswood West water booster pump station and, to a lesser extent, water reservoirs are at a direct risk from Wildfires and the impacts from them. Also at risk is the North Tahoe Regional Park. The impacts that property damage can have on water and sewer assets is high. The destruction of the watershed has the potential of high impact to water quality and severely impacting the National Avenue Water Plant and the ability to provide potable drinking water.

N.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

N.6.1. Regulatory Mitigation Capabilities

Table N-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the NTPUD.

Table N-11 NTPUD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Sewer – 1991 Water - 1999	Can be used to implement mitigation actions, but needs to be updated. These are more planning documents
Capital Improvements Plan	2020	Five-year plan updated each fiscal year.
Economic Development Plan	n/a	County
Local Emergency Operations Plan	2005	The ERP addresses hazards and risks. Never adopted; will be updated in 2021.

Continuity of Operations Plan	No	The District does not have a formal plan. The ERP serves as the guiding document for continuity of operations.
Transportation Plan	n/a	County
Stormwater Management Plan/Program	n/a	County
Engineering Studies for Streams	n/a	County
Community Wildfire Protection Plan	n/a	Fire District
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Yes	Sanitary Sewer Management Plan Urban Water Management Plan
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:
Fire department ISO rating:	N/A	Rating:
Site plan review requirements	Yes	District Ordinances are adequately enforced for sewer & water
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	N/A	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	
Flood insurance rate maps	N/A	
Elevation Certificates	N/A	
Acquisition of land for open space and public recreation uses	N/A	
Erosion or sediment control program	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District does not have Planning and Development responsibilities. The District will be updating its Emergency Response Plan in 2021 after completing the risk and resilience assessment.		

Source: NTPUD

As indicated above, the District has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

5-Year CIP: The District has a rolling 5-Year CIP plan for sewer and water capital projects that is updated annually. The District has a rate structure in place to be able to do \$1,485,000 in sewer capital replacement projects and \$1,430,000 in water capital replacement projects each year.

Sanitary Sewer Management Plan (SSMP): As a requirement of the District’s State Water Resources Control Board Waste Discharge Permit, the Board has adopted an SSMP. The plan sets the goals to maintain the District’s sewer collection system.

The goals are to:

- Properly manage, operate, and maintain all parts of the wastewater collection system
- Provide adequate capacity to convey peak flows
- Minimize the frequency of SSOs
- Mitigate impacts of SSOs
- Justify appropriate funding levels to support the program objectives
- Meet all applicable regulatory notification and reporting requirements

Urban Water Management Plan (UWMP): The State of California Urban Water Management Planning Act (Act) requires each urban water supplier with 3,000 or more connections, or which supplies at least 3,000 acre-feet per year (AFY) of water, to submit UWMPs to the California Department of Water Resources (DWR) every five years. The District has approximately 3,948 water connections.

The UWMP Act requires urban suppliers to report, describe, and evaluate water deliveries and uses, water supply sources, efficient water uses, and demand management measures (DMMs), including implementation schedule and strategy. The purpose of developing an UWMP is to evaluate whether a water supplier can meet the water demands of its water customers as projected over a 20- or 25-year period. The UWMP Act directs water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future demands. This evaluation is accomplished through analysis of current and projected water supply and demand for normal or average conditions, as well as during water shortages.

N.6.2. Administrative/Technical Mitigation Capabilities

Table N-12 identifies the District department(s) responsible for activities related to mitigation and loss prevention in NTPUD.

Table N-12 NTPUD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N/A	County
Mitigation Planning Committee	N/A	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N/A	Operations Department
Mutual aid agreements	Yes	Mutual Aid agreement in place for Truckee-Tahoe area sewer and water agencies.
Other	N/A	

Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	N/A	
Community Planner	N/A	
Civil Engineer	Yes	Staffing is adequate; trained on sewer/water emergencies; coordination is effective.
GIS Coordinator	Yes	n/a
Other	N/A	
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	Yes	We have limited staff and time to write grants; but take advantage of grant opportunities as they arise.
Hazus analysis	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase staffing will give us the ability to improve in areas that pertain to NTPUD but are lacking.		

Source: NTPUD

N.6.3. Fiscal Mitigation Capabilities

Table N-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table N-13 NTPUD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Limited funding; adopted new rate structure in 2020 to increase Capital project funding; grants help with being able to do more Capital projects.
Authority to levy taxes for specific purposes	Yes	Limited capability; mostly for sewer and recreation.
Fees for water, sewer, gas, or electric services	Yes	Water and sewer fees are currently used for Capital improvements as funding allows.
Impact fees for new development	N/A	
Storm water utility fee	N/A	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through general obligation bonds and/or special tax bonds	Yes	We have incurred debt in the past with bonds and loans for Capital projects.
Incur debt through private activities	N/A	
Community Development Block Grant	N/A	
Other federal funding programs	Yes	Have received funds through the Lake Tahoe Restoration Act for fire protection. Funds have been limited in recent years.
State funding programs	Yes	Have received funds for various recreation projects. Funds are limited for mitigation actions.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District's rate setting process is designed to fully fund the utility over a multi-year planning horizon.		

Source: NTPUD

N.6.4. Mitigation Education, Outreach, and Partnerships

Table N-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table N-14 NTPUD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N/A	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	We have on-going public education and outreach programs in place for water conservation.
Natural disaster or safety related school programs	N/A	
StormReady certification	N/A	
Firewise Communities certification	N/A	
Public-private partnership initiatives addressing disaster-related issues	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
NTPUD does not provide hazard communications as a special District function.		

Source: NTPUD

N.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Fuels reduction in the North Tahoe Regional Park
- Constructed a 500,000 gallon water storage tank
- Constructed a 1.3 million gallon water storage tank
- Upsized the Carnelian Bay West water system from 2” water mains to 8” water mains and installed numerous hydrants for fire protection
- Rehabilitated 4 of the 4 main sewer pump stations
- Rehabilitated the 22” Dollar sewer force main for redundancy and to allow for maintenance of the 16” Dollar sewer force main
- Rehabilitated 3 water storage tanks
- Rehabilitated the Carnelian Sewer Pump Station and installed a new natural gas generator.
- Ongoing upsizing of small diameter water mains (2” or less) to 8” water mains and installation of numerous hydrants for fire protection in the Kings Beach grid neighborhood
- Rehabilitated approximately 7,000 linear feet of sewer main using trenchless methods (Cured in Place Pipe lining)
- Installed an emergency stand-by generator at the NTPUD Base Facilities, connecting the Administration, Shop, servers and communication, Annex buildings and fuel pumps to the generator through automatic transfer switches.
- Installed a new natural gas generator for the National Avenue Water Treatment Facility.
- Upgraded the District’s SCADA and telemetry systems.

N.7 Mitigation Strategy

N.7.1. Mitigation Goals and Objectives

The NTPUD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

N.7.2. Mitigation Actions

The planning team for the NTPUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Pandemic
- Seiche
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Tree Mortality

➤ Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Backup Generator Installation at Critical Facilities

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Seiche, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During power outages for various hazards, the NTPUD does not have backup generators for all critical water, sewer and evacuation center facilities. The critical facilities include:

- North Tahoe Event Center – This facility is a designated Emergency Shelter and Evacuation Center. There is no generator for this facility.
- Various Satellite Sewer and Water Booster Pump Stations

Project Description: Project includes electrical and civil design, permitting, and construction of backup generators and transfers switches.

Other Alternatives: No Project – There will be an impact to water and sewer service and facilities during power outages. The emergency evacuation center will not be fully functional during a power outage.

Existing Planning Mechanism(s) through which Action Will Be Implemented: NTPUD either has or will soon have the generators sized. Implementation would be within 6 months of grant approval.

Responsible Agency/ Department/Partners: NTPUD Engineering

Cost Estimate: \$200,000 per generator

Benefits (Losses Avoided):

- Emergency power to serve the community

- Avoid sanitary sewer overflow into Lake Tahoe
- Ensure potable water service

Potential Funding: Rate Revenue, ARB funds

Timeline: 1-3 Years

Project Priority (H, M, L): Medium/High

Action 2. *Fuels Reduction around Critical Infrastructure and Access Roads, and within the North Tahoe Regional Park*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NTPUD's water tanks, booster pump stations, and access roads are in heavily forested areas. Several of the water booster pump stations are in wooden structures. Hardened structures would reduce threat from wildfire and reduce impacts to the equipment.

The North Tahoe Regional Park (NTRP) is heavily wooded and NTPUD has a water well and tank within the NTRP.

Project Description: Identify hazards, design, permitting, and construction (vegetation and tree removal).

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: NTPUD; North Tahoe Fire Protection District

Cost Estimate: \$75,000 per year

Benefits (Losses Avoided): Minimize damage due to catastrophic wildfire

Potential Funding: None identified

Timeline: 5-10 Years

Project Priority (H, M, L): Medium

Action 3. *Increased Fireflow Capacity and Reliability for Dollar Cove and Carnelian Water Systems*

Hazards Addressed: Wildfire; Drought; Water Supply

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Dollar Cove and Carnelian water systems are located at the wildland urban interface and each system has approximately 300 residential and commercial customers. The two water systems are comprised of watermains ranging from 2 inches to 8 inches in diameter. The system is deficient in fire flows and in the number and spacing of fire hydrants and does not meet current fire codes

Project Description: This project proposes to rebuild approximately 10,000 lineal feet of water mains and install 20 fire hydrants in the two water systems..

Other Alternatives: No Project Continue to operate a water system that is deficient in supplying adequate fire flows.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Water system hydraulic modeling of watermains and hydrants has been completed for proposed project alternatives

Responsible Agency/ Department/Partners: NTPUD Engineering

Cost Estimate: \$4,000,000

Benefits (Losses Avoided):

- Ensure sufficient water supply for fire suppression. Adds additional protection at the wildland urban interface to reduce the probability of structure fires entering the wildland and wildland fires from entering the developed areas.

Potential Funding: Rate Revenue, State Revolving Fund, Placer County Water Agency

Timeline: 5-10 Years

Project Priority (H, M, L): High

Action 4. Cybersecurity Assessment and Improvements

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Seiche, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NTPUD's existing Information Technology (IT) and Operational Technology (OT) need continuous improvements to stay abreast of increasing sophisticated cybersecurity threats and attacks from bad actors. Ransomware and computer viruses can cause widespread disruption in utility control systems.

Project Description: Analysis of IT and OT through master planning and assessments through the Department of Homeland Security and the American Water Works association Cybersecurity Guidance Tool.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: American Water Works Association supports water agencies to assess cybersecurity risk.

Responsible Agency/ Department/Partners: NTPUD IT and Public Information Officer in coordination with other agencies in the Tahoe-Truckee region.

Cost Estimate: \$250,000

Benefits (Losses Avoided):

- Insure timely and appropriate response to emergencies
- Ensure water and sewer system controls are hardened for reliability
- Insure IT and OT are resilient to malevolent attacks

Potential Funding: Rate Revenue

Timeline: 3-5 Years and on-going

Project Priority (H, M, L): Medium

Action 5. Seismic Analysis and Retrofit of Critical Infrastructure

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Conduct a seismic evaluation of NTPUD's critical infrastructure and recommend improvements. Existing structures have been constructed and renovated to improve structural soundness during improvements project. This project would do a site specific analysis to improve reliability of facilities.

Project Description: Project includes seismic analysis of critical facilities, design, permitting, and construction.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None identified

Responsible Agency/ Department/Partners: NTPUD Engineering

Cost Estimate:

- \$100,000 for the study
- \$100,000 for each water tank retrofit
- \$100,000 for each main sewer pump station
- Unknown cost estimate for other unidentified facilities

Benefits (Losses Avoided):

- Prevent essential water service loss to community
- Prevent sanitary sewer overflows to Lake Tahoe due to infrastructure failure

Potential Funding: Rate Revenue

Timeline: 5-10 Years

Project Priority (H, M, L): Medium

Action 6. Sewer Main Replacements in Shorezone of Lake Tahoe

Hazards Addressed: Earthquake; Flood, Localized Flood, Heavy Rains and Storms, Seiche

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The NTPUD has approximately 5 miles of sewer mains that are within or immediately adjacent to the shore zone of Lake Tahoe. The NTPUD also has two main sewer pump stations and a number of small, satellite pump stations adjacent to the shore zone of Lake Tahoe. The long-term goal of the Lake Tahoe Basin Framework Study would be to relocate these facilities to the further in-shore where the risk of sanitary sewer overflows reaching Lake Tahoe would be better controlled. Other measures include providing underground passive storage to increase time for emergency response and installation of redundant critical pipelines.

Project Description: Project includes property acquisition, design, permitting, and construction of new sewer mains and underground storage structures in the public right of way, relocation and reconnection of existing services, and abandonment of facilities.

Other Alternatives: No Project.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lake Tahoe Basin Framework Study completed by the US Army Corps of Engineers

Responsible Agency/ Department/Partners: NTPUD Engineering

Cost Estimate: \$20,000,000

Benefits (Losses Avoided): Minimize sanitary sewer overflows to Lake Tahoe due to infrastructure failure that also impacts Lake Tahoe water quality which is the drinking water source for multiple public water systems located at Lake Tahoe

Potential Funding: None identified

Timeline: 20 Years

Project Priority (H, M, L): Low

Action 7. Water Booster Pump Station Rehabilitation/Replacement

Hazards Addressed: Wildfire, Tree Mortality, Drought and Water Shortage, High Winds and Tornadoes

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: NTPUD's water tanks, booster pump stations, and access roads are in heavily forested areas. Several of the water booster pump stations are in wooden structures. Hardened structures would reduce threat from wildfire and reduce impacts to the equipment.

Project Description: This project would include design, permitting, and construction to rehabilitate the existing wooden structures using fire resistant materials or replacing the wooden structures with either underground booster stations or concrete buildings.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Agency/ Department/Partners: NTPUD Engineering

Cost Estimate: \$250,000 per station

Benefits (Losses Avoided): Improve potable water service resiliency by improving fire protection of the existing facility.

Potential Funding: None identified

Timeline: 5-10 Years

Project Priority (H, M, L): Medium

Action 8. Water System Interties

Hazards Addressed: Drought; Water Supply

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The existing water system interties between the public and private water systems is insufficient to provide adequate, reliable potable water supplies in the event of impacts to water sources and water reservoirs.

Project Description: This project would either install intertie connections between water systems, or install larger diameter water mains (12-14 inches) in the State highway, or a combination of the two. Scope includes analysis, design, permitting, and construction of the selected approach.

Other Alternatives: No Project Continue to operate multiple water systems that are deficient in supplying adequate fire flows.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Water Agency Northwest Lake Tahoe Area Water System Master Plan Project. .

Responsible Agency/ Department/Partners: NTPUD, TCPUD, North Tahoe Fire District, PCWA, various private water companies.

Cost Estimate: \$5 - \$40 million, depending on approach

Benefits (Losses Avoided):

- Insure sufficient potable water supply during severe droughts .
- Insure sufficient water supply and flow for fire suppression.

Potential Funding: Rate Revenue; Placer County Water Agency

Timeline: 5-20 Years

Project Priority (H, M, L): High

Action 9. Joint Grant Application with North Tahoe Public Utilities District (NTPUD) for an Emergency Back-up Generator System at the North Tahoe Event Center (NTEC) located at 8318 North Lake Blvd, Kings Beach, CA 96143.

Hazards Addressed: Multi-hazard (Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Pandemic, Seiche, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During power outages, the NTPUD does not have back-up emergency power at the North Tahoe Event Center. This facility is designated by Placer County Office of Emergency Services as an Emergency Shelter and Evacuation Center for the residents and visitors of the North Shore of Lake Tahoe, as well as during Mutual Aid shelter and evacuation operations for the Truckee and Lake Tahoe basin. There is currently no back-up generator or provisions for emergency power at this facility. The addition of a generator would allow for expanded shelter operations including 24-hour operations, heating, air conditioning, and providing hot meals for evacuees. No other building in the region provides the flexibility for reconfiguration to accommodate shelter, food preparation, and services to local residents during a planned power outage or declared emergency.

Project Description: The integration of power disruption mitigation measures into this planned infrastructure project will provide tangible benefits to the community and its public works staff. This generator project will reduce Emergency Shelter and Evacuation Shelter downtime resulting from power failure by reducing the risks associated with planned and unplanned events. Without an Emergency Generator and appurtenances, the North Tahoe Event Center cannot operate as an Emergency Shelter or Evacuation Center during power outages, leaving the North Tahoe community at risk of traveling longer distances to an alternative shelter that has power, potentially causing over-crowded road and shelter

conditions and loss of life. Mitigation is most effective when it is part of the local community planning process and resilience by adapting to changing conditions and prepare for, withstand, and rapidly recover from disruption. This plan will allow for local jurisdictions to adapt, cooperate, and recover from multiple hazards. This project includes the installation of a complete UL 2200 listed, prototype tested, series produced 130kW Natural Gas generator set in a Level 2 acoustic locking weather enclosure, on site, as installed (no altitude derating) with engineered seismically-adequate reinforced concrete support pad and all conduit and wiring, with on-site load bank testing and startup services by vendor. It will provide all standard accessories including battery charger, Automatic Transfer Switch, block heater, battery charger, battery warming pads, protective traffic bollards. Approximate dimensions for generator is 12' L x 3' 6" W x 6' 6" H. There is adequate, paved areas that will be used for construction staging and parking. Water use will not be necessary as part of this project.

Other Alternatives: Trailer Mount Portable Generator System, Battery Back-up System

Existing Planning Mechanism(s) through which Action Will Be Implemented: North Tahoe PUD is preparing a joint agency grant application for submittal to the California Office of Emergency Services ("CalOES") for funding through the Hazard Mitigation Grant Program ("HMGP") for the acquisition and installation of a permanent Generator at the North Tahoe Event Center.

Responsible Agency/ Department/Partners: North Tahoe Public Utility District and Placer County

Cost Estimate: \$300,000

Benefits (Losses Avoided): Expanded shelter operations including 24-hour operations, heating, air conditioning, and providing hot meals for evacuees.

Potential Funding: Hazard Mitigation Grant Program

Timeline: Fiscal year FY2021/22

Project Priority (H, M, L): High

Action 10. Kings Beach Grid Watermain Replacement and Fire Hydrant Installation Project

Hazards Addressed: Wildfire; Drought; Water Supply

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Kings Beach grid water system was constructed in the early 1930's and the existing water distribution pipelines range in size from one (1) to twelve (12) inches in diameter and are routed in inaccessible backyards and in public rights of ways. The system is deficient in fire flows and in the number and spacing of fire hydrants and does not meet current fire codes.

Project Description: This project proposes to rebuild approximately 15,000 lineal feet of water mains and install 30 fire hydrants and all new water services and meters to the properties served.

Other Alternatives: No Project - Continue to operate a water system that is deficient in supplying adequate fire flows.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Kings beach Grid Waterline Replacement Project Preliminary Design Report is complete.

Responsible Agency/ Department/Partners: NTPUD

Cost Estimate: \$7,500,000

Benefits (Losses Avoided): Ensure sufficient water supply for fire suppression. Adds additional protection at the wildland urban interface to reduce the probability of structure fires entering the wildland and wildland fires from entering the developed areas.

Potential Funding: Rate Revenue, State Revolving Fund, Placer County Water Agency

Timeline: 5 years

Project Priority (H, M, L): H

Action 11. NTPUD Water System Infill and Fire Suppression Improvements Project

Hazards Addressed: Wildfire; Drought; Water Supply

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In the NTPUD service area there are numerous areas that were constructed as early as the 1930's and the existing water distribution pipelines range in size from one (1) to twelve (12) inches in diameter and are routed in inaccessible backyards and in public rights of ways. The system is deficient in fire flows and in the number and spacing of fire hydrants and does not meet current fire codes. Portions of these pipelines have been replaced but there are still non-contiguous segments of one (1) to four (4) inch diameter pipelines in various locations.

Project Description: This project proposes to rebuild approximately 5,000 lineal feet of water mains and install 12 fire hydrants and all new water services and meters to the properties served.

Other Alternatives: No Project - Continue to operate a water system that is deficient in supplying adequate fire flows.

Existing Planning Mechanism(s) through which Action Will Be Implemented: NTPUD Water System Infill and Fire Suppression Improvements Project assets are identified in the District's GIS and asset management system

Responsible Agency/ Department/Partners: NTPUD

Cost Estimate: \$2,500,000

Benefits (Losses Avoided): Ensure sufficient water supply for fire suppression. Adds additional protection at the wildland urban interface to reduce the probability of structure fires entering the wildland and wildland fires from entering the developed areas.

Potential Funding: Rate Revenue, State Revolving Fund, Placer County Water Agency

Timeline: 10 years

Project Priority (H, M, L): H



Annex O Olympic Valley Fire Department/Olympic Valley Public Service District

O.1 Introduction

This Annex details the hazard mitigation planning elements specific to Olympic Valley Fire Department/Olympic Valley Public Service District (OVFD/OVPSD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to OVFD/OVPSD, with a focus on providing additional details on the risk assessment and mitigation strategy for the District.

O.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table O-1. Additional details on plan participation and District representatives are included in Appendix A.

Table O-1 OVFD/OVPSD – Planning Team

Name	Position/Title	How Participated
Brandon Burks	Operations Manager	Planning, participant
Allen Riley	Fire Chief	Planning, participant

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table O-2.

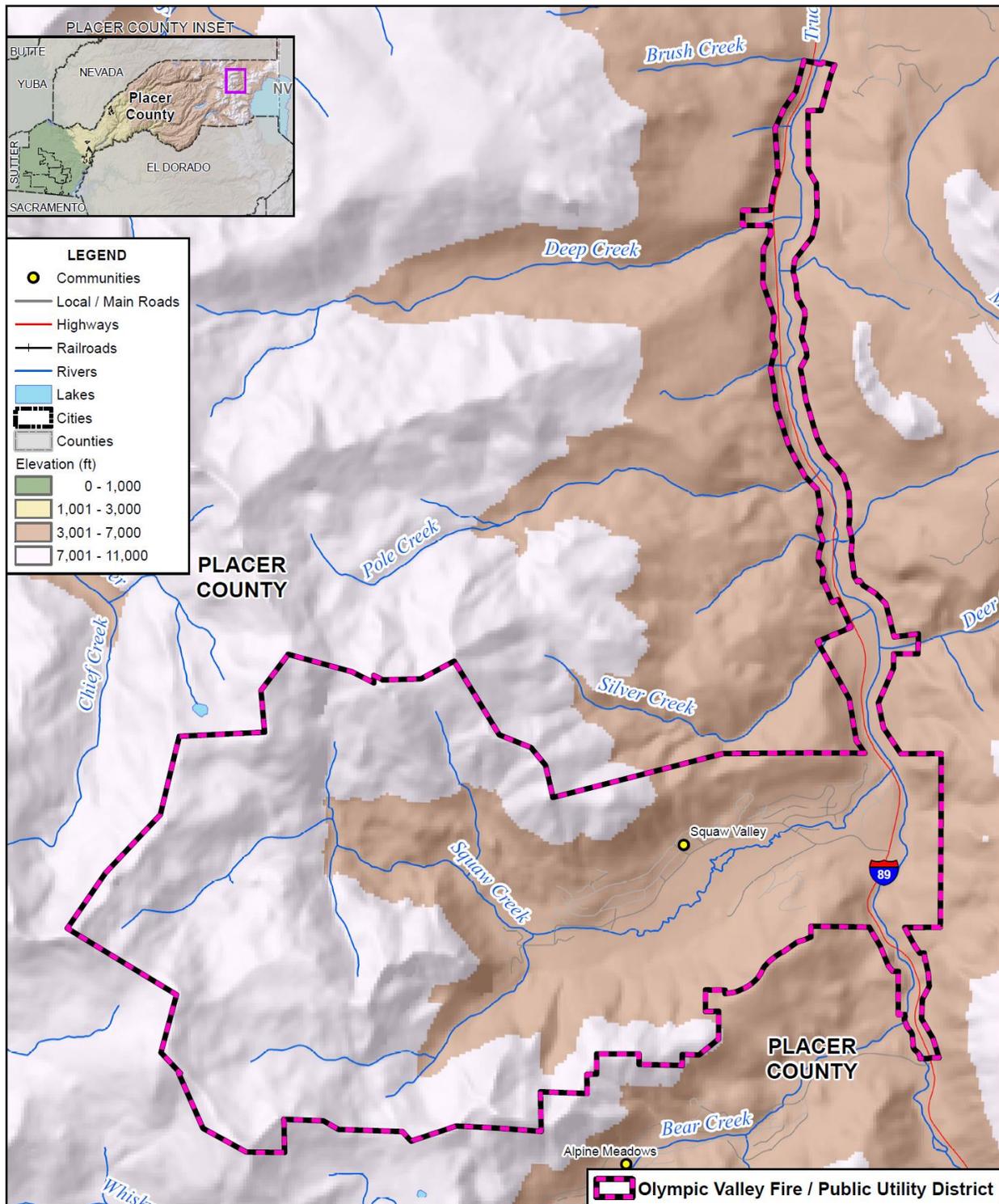
Table O-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No mitigation planning mechanisms have been completed since 2016.

O.3 District Profile

The District profile for the OVFD/OVPSD is detailed in the following sections. Figure O-1 displays a map and the location of the District within Placer County.

Figure O-1 OVFD/OVPSD



FOSTER MORRISON
CONSULTING

0 1 2 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

O.3.1. Overview and Background

The Olympic Valley Public Services District (OVPSD) serves the community of Olympic Valley in providing water, maintaining sewer Lines, contracting garbage service, and providing fire protection services to the community. The OVPSD encompasses approximately 5,350 acres within the Olympic Valley. Elevations within the District boundaries range from 6,100 to 9,000 feet above mean sea level.

The OVPSD serves a population of approximately 924 year-round residents, with a maximum overnight population of approximately 6,573. Both resident and visiting populations are housed in approximately 663 residential unit, 1,180 condominiums, and approximately 20 commercial entities consisting of private residences, ski resorts, hotels and supporting businesses.

The Olympic Valley is characterized by mild summers and cool, wet winters, with an average high temperature in July of 82 and 42 in January. Annual precipitation in the watershed varies from an average of 65 inches in the west to approximately 40 inches per year in the east. The majority of precipitation occurs as snowfall during the winter months. A relatively small amount of precipitation occurs as rain during the spring and summer months.

O.4 Hazard Identification

OVFD/OVPSD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table O-3).

Table O-3 OVFD/OVPSD —Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Significant	Likely	Limited	Medium	Medium
Climate Change	–	–	–	–	–
Dam Failure	Limited	Unlikely	Limited	Medium	Medium
Drought & Water Shortage	Significant	Occasional	Negligible	Low	High
Earthquake	Limited	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Limited	High	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Medium	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	–	–	–	–	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Limited	Occasional	Negligible	Low	High
Severe Weather: Freeze and Snow	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	–	–	–	–	Low
Tree Mortality	Extensive	Likely	Critical	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

O.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

O.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section O.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table O-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

O.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the OVFD/OVPSD ’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table O-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. OVFD/OVPSD’s physical assets, valued at over \$450 million, consist of the buildings and infrastructure to support the District’s operations.

Table O-4 OVFD/OVPSD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Squaw Ridge Booster and Vault	Essential	\$325,000	Earthquake, wildfire
Fire Station & Administrative Center	Essential	\$12.5 million	Earthquake, Landslide, Wildfire
Headquarters & Utility/Fire Station	Essential	\$7.5 million	Flood, Earthquake, Landslide
Pumphouse and Generator	Essential	\$1.6 million	Earthquake, flood
Utility Garage and Generator	Essential	\$575,000	Earthquake, landslide, Wildfire
SCADA System	Essential	\$210,000	Extreme Weather
Water Tank #1	Lifeline	\$1,100,000	Earthquake, Landslide
Water Tank #2	Lifeline	\$700,000	Earthquake, Landslide
Water Tank #3	Lifeline	\$300,000	Earthquake, Landslide
Convault Tank	Lifeline	\$40,000	Wildfire
Main Well #5	Lifeline	\$1.5 million	Earthquake, Flood
Well #2	Lifeline	\$250,000	Earthquake, Flood
Well #3	Lifeline	\$250,000	Earthquake, Flood
Well #1	Lifeline	\$250,000	Earthquake, Flood
Squaw Valley USA Resort	High Potential Loss	\$200 million	Wildfire, Avalanche, Earthquake, Landslide
Resort at Squaw Creek	High Potential Loss	\$80 million	Wildfire, Landslide, Earthquake
State Route 89	Transportation	Unknown	Avalanche, Landslide, Flood
Midway Bridge	Transportation	Unknown	Earthquake, Flood
SVPSD Water Distribution System	Lifeline	\$25 million	Earthquake, Flood, Landslide
OVPSD Sewer Collection System	Lifeline	\$25 million	Earthquake, Flood, Landslide

Name of Asset	Facility Type	Replacement Value	Hazard Info
Squaw Valley Mutual Water Company	Lifeline	\$10 million	Earthquake, Flood, Landslide

Source: OVFD/OVPSD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. OVFD/OVPSD provides services to a population of 1,366.

Natural Resources

OVFD/OVPSD has a variety of natural resources of value to the District. Several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table O-5.

Table O-5 Species of Concern in OVFD/OVPSD

Common Name	Scientific Name	CNPS3 Listing Federal Status	State Status
Carson Range rock cress	<i>Arabis rigidissima var. demote</i>	1B	
Oregon fireweed	<i>Epilobium oregonum</i>	1B	
Starved daisy	<i>Erigeron miser</i>	1B	
Nevada daisy	<i>Erigeron nevadincola</i>	2	
Donner Pass buckwheat	<i>Eriogonum umbellatum var. torreyanum</i>	1B	
American manna grass	<i>Glyceria grandis</i>	2	
Plumas ivesia	<i>Ivesia sericoleuca</i>	1B	
Long-petaled lewisia	<i>Lewisia longipetala</i>	1B	
Slender-leaved pondweed	<i>Potamogeton filiformis</i>	2	
Tahoe yellow cress	<i>Rorippa subumbellata</i>	1B	
Marsh skullcap	<i>Scutellaria galericulata</i>	2	
Munroe's desert mallow	<i>Sphaeralcea munroana</i>	2	
Fish, Amphibians, Birds			
Lahontan cutthroat trout	<i>Oncorhynchus clarkia benshawi</i>	FT	
Mountain yellow-legged frog	<i>Rana muscosa</i>	FE	CSC
Harlequin duck	<i>Histrionicus</i>	MNBMC	CSC
Cooper's hawk	<i>Accipiter cooperi</i>	MNBMC	CSC
Northern goshawk	<i>Accipiter gentiles</i>		CSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT; FPD; MNBMC	SE; CFP
Osprey	<i>Pandion haliaetus</i>		CSC
Yellow warbler	<i>Dendroica petechia brewsteri</i>	MNBMC	CSC

Common Name	Scientific Name	CNPS3 Listing Federal Status	State Status
Willow flycatcher	<i>Empidonax trailii</i>	MNBMC	SE
Sierra Nevada mountain beaver	<i>Aplodontia rufa californica</i>		CSC
California wolverine	<i>Gulo</i>		ST
Sierra Nevada snowshoe hare	<i>Lepus americanus taboensis</i>		CSC
Western white-tailed jackrabbit	<i>Lepus townsendi</i>		CSC
American pine marten	<i>Martes Americana</i>		
Sierra marten	<i>Martes Americana sierrae</i>		
Pacific fisher	<i>Martes pennanti (pacific) DPS</i>	FC	CSC
Long-legged myotis	<i>Myotis Volans</i>		
Sierra Nevada red fox	<i>Vulpes necator</i>		ST

Source: OVFD/OVPSD

Sensitive habitats in the District include the following:

- Lodgepole pine forest
- Red fir forest
- Montane chaparral
- Montane riparian
- Wet meadows
- Ponds
- Riverine/riparian

Historic and Cultural Resources

OVFD/OVPSD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Tahoe Area of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Squaw Valley has few residents that fit the category of special populations. The Village project identified below will seek an employee housing project; presently low income workers live mostly outside Squaw Valley.

Growth and Development Trends

Significant development is contemplated with expansion of the village at Squaw Valley; information may be obtained at Placer County under the Village at Squaw Valley Specific Plan. Additional projects on the near horizon include:

- PlumpJack Squaw Valley Inn: a plan to raze and rebuild an existing 61 unit hotel into a 60 unit hotel plus 34 condos. The project will include an underground parking garage that may be impacted by flooding on Squaw Peak Road.
- The Resort at Squaw Creek Phase II: A fully entitled project that would add a second tower and 18 Lakeside condos totaling 221 units, a parking garage and employee housing.

Projects in Planning include:

- The Palisades: Approximately 65 single family planned unit development currently being built.
- Carville Property Hotel and Residential Project- a boutique hotel and several homes

None of these projects pose a significant impact to existing hazards

Unique to this part of Placer County is not the growth of full time residents, but the influx of visitors and tourists to the area, especially during the peak summer and winter seasons. While this area is home to only about 924 full time residents, during high season, some 6,500 people, on any given day, may be enjoying the recreational and tourist opportunities. This spike in population creates a unique vulnerability to the area, especially in the event highways become impassable due to flooding, landslides, avalanches or gridlocks due to high volume and extreme weather conditions. Even during the off-season, the lack of multiple transportation routes, if closed, can leave the resident population cut off from necessary and potentially life-saving services.

It is important to note that given the high cost of housing due to the resort nature of the area, much of the work force resides outside of Squaw Valley. With limited access roads to the area, the work force may be isolated when most needed for disaster response.

Development since 2016

The District replaced its existing sewer siphon line under the Truckee River with a new dual siphon. Reducing the hazard of spilling sewage during flood events or other

Future Development

The District has no control over future development in areas the District services. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

O.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table O-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Avalanche

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Areas prone to avalanche hazards include hard to access areas deep in the backcountry and those in the more developed higher elevations of the County in the Tahoe basin. Avalanche hazards exist in eastern Placer County where the District is located where combinations of the above criteria occur.

Past Occurrences

There have been no state or federal disasters in the County related to avalanche. In 2001 during a winter storm generating 20 inches of fresh snow, a Class II avalanche occurred resulting in two fatalities. Other avalanches occur throughout each winter ski season, with most of these confined to out-of-bounds areas where damages are limited.

Residential areas subject to avalanche are located along Sandy Way at the base of steep slopes, most significantly in the area known as “the slide” above the 1200 block. The Shirley Lake Condominiums on Squaw Peak Way have been hit by small avalanches on several occasions. The Olympic Valley Fire Department may evacuate these areas during periods of known and extreme avalanche danger.

Vulnerability to and Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests and has potential to bury pipeline facilities in streets or easements

Ski resorts, due to their steep slopes, abundant snow, snowpack, and the presence of people moving throughout the area, are prone to avalanches. Placer County identifies the Olympic Valley area as vulnerable to avalanche activity.

Assets at Risk

All of those identified in Table O-4 with avalanche in the righthand column.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

The District also noted that, while inundation data was not available, the following dams are also a concern to the District. There are 7 surface water impoundments in Olympic Valley of about an acre or less in surface area contained behind small earthen or concrete dams. They are Hidden Lake, Gold Coast Snow Making Pond, Olympic Lady Pond, Shirley Lake, an old water supply reservoir on the South fork of Squaw Creek above the base area of the ski resort, and 2 ponds at the Resort at Squaw Creek golf course. These impoundments are known to overflow during extreme flood events such as the 1997 flood and would contribute a moderate surge of additional water if failure were to occur.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Assets at Risk

Flooding and overwhelming of sewer facilities downstream. Potential damage to bridges and access on Highway 89.

Earthquake

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where some earthquakes of significant magnitude occur. Seismic shaking maps for the area show Placer County and the District fall within a moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The OVFD/OVPSD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

The 2008 Draft Supplemental Environmental Impact Report for Water and Sewer Service Agreement for the resort at Squaw Creek: Phase II, indicates that six north-northwest, trending north-northeast dipping faults are located in the Olympic Valley watershed, four of which cross the valley floor. Of the four faults, only one has documented evidence of recent movement. However, because of the limited development in the area, and lack of un-reinforced masonry buildings, compared to a more urban setting, the OVFD/OVPSD service area would likely be of moderate vulnerability to damage from severe ground shaking.

Assets at Risk

All of those identified in Table O-4 with earthquake in the righthand column.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—High

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

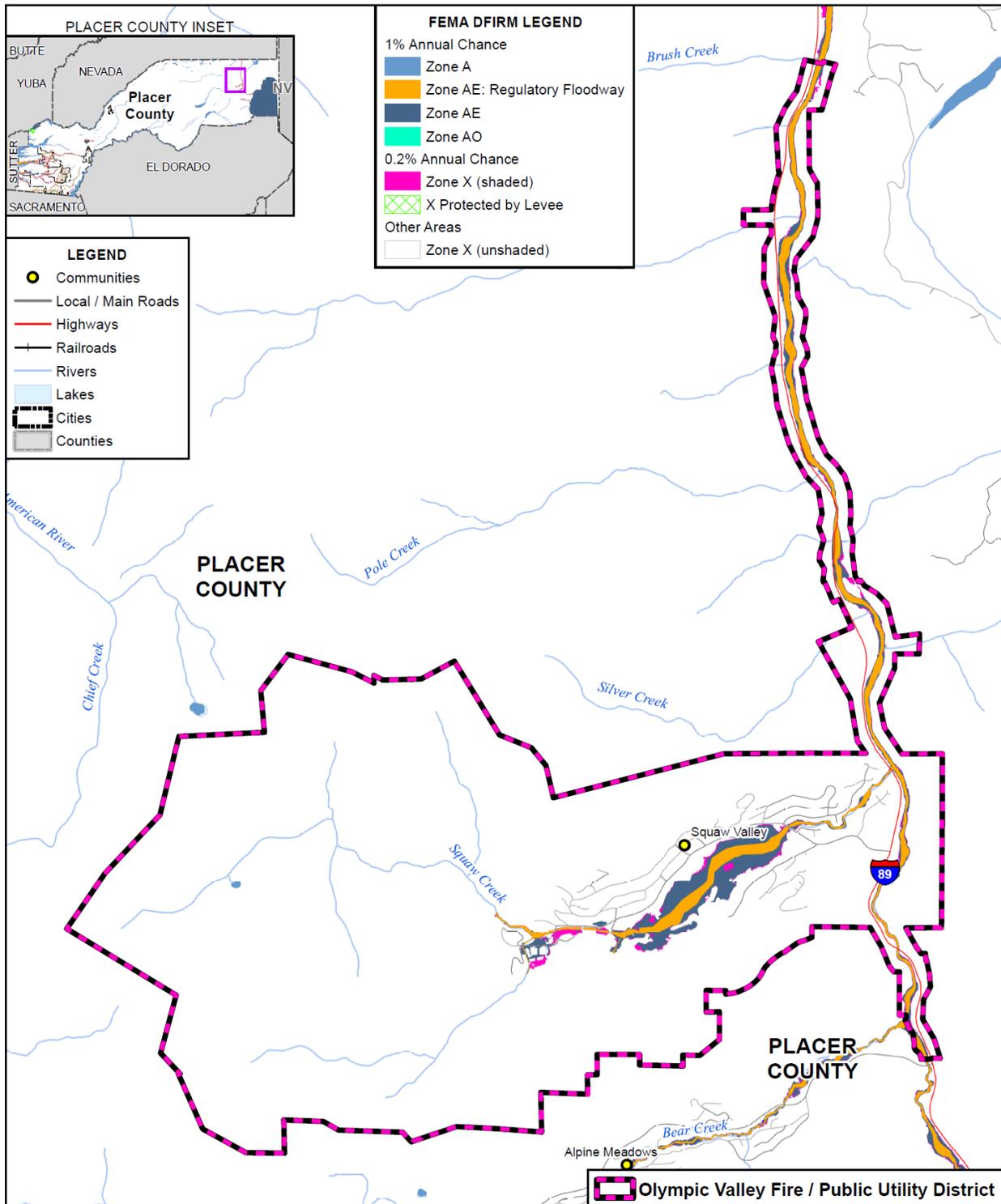
As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the OVFD/OVPSD have been subject to historical flooding.

Location and Extent

The Olympic Valley watershed is a small subalpine and alpine watershed covering an area of approximately 8.2 square miles. It is characterized by steep, mountainous slopes draining to and through the limited valley area. The watershed includes the drainages of the North Fork, the South Fork, and the main stem of Squaw Creek. Watershed elevations range from approximately 6,200 feet on the valley floor up to 9,000 feet on the highest peaks adjacent to the valley. Squaw Creek and its tributaries are the only significant surface water bodies in Olympic Valley. The two main forks converge in an area known as the confluence at the western end of the valley. The confluence is a wide gravel-filled portion of Squaw Creek that has been altered due to gravel mining. The primary source of Squaw Creek's annual flow is snowmelt. The snowmelt peaks in the spring and often continues through July and August when it starts to dry up.

The OVFD/OVPSD has areas located in the 1% annual chance floodplain. This is seen in Figure O-2.

Figure O-2 OVFD/OVPSD – FEMA DFIRM Flood Zones



FOSTER MORRISON CONSULTING

0 1 2 Miles

COUNTY OF Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table O-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table O-6 OVFD/OVPSD – DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table O-7. These events also likely affected the District to some degree.

Table O-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Areas impacted by previous flooding include the North and South forks of Squaw Creek, through the Squaw Valley Ski Area and commercial property, including PlumpJack (Squaw Valley Inn) and Squaw Valley Lodge, and running the entire length of Olympic Valley to its merger with the Truckee River.

A flood event impacting the District occurred in **January of 2006**. Heavy rains (estimated at over 10 inches in three days) were the primary cause of this flood event. This flooding of Squaw Creek (estimated as a 50-year event) caused erosion, inflow to sewer system, power failures, road closures (from mudslides), and impacts to local businesses cut off by the flooding. Unlike the **1997** flood, there was no damage to the District’s facilities or infrastructure.

The District noted the **January 2017** flood caused significant amount of work to protect infrastructure and keep up with flood water. Flood event resulted in overtime and equipment use.

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what

to do during floods. Other problems connected with flooding and storm water runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Flooding and soil erosion due to heavy rains and snow runoff have been a historical problem. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and flooding. Water flow can be high in peak runoff periods with historical downstream flooding. The primary impacts from flooding within the District include damage to roads, utilities, bridges; and flooding of homes, businesses and critical facilities. Historically, mud slides and washouts associated with flooding caused the most damages within the District. The south fork of the Squaw Creek is generally impacted the most. Road closures create difficulties in providing emergency services to areas cut off by flooding and limit the area's ability to evacuate.

Assets at Risk

All of those identified in Table O-4 with flood in the righthand column.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The OVFD/OVPSD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The District tracks localized flooding areas. localized flood areas identified by the OVFD/OVPSD are summarized in Table O-8.

Table O-8 OVFD/OVPSD – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Squaw Valley Road 2 locations	X			Tributary of Squaw Creek		X	
Squaw Peak Road	X			South Fork Squaw Creek			

Source: OVFD/OVPSD

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted no past occurrences of localized flooding since 2016.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

All of those identified in Table O-4 with flood in the righthand column.

Landslide, Mudslide, Debris Flows

Likelihood of Future Occurrence–Occasional

Vulnerability–Medium

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading,

debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Debris flows, can also occur in some areas of the County and the District. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows are also common during the rainy season in post fire areas.

Location and Extent

Landslides, mudslides, and debris flows can affect certain areas of the District. The CGS has estimated that the risk varies across the District and has created maps showing risk variance. This risk variance falls into multiple categories. These are discussed in Section 4.3.14 of the Base Plan. According to the District Planning Team, risk varies within the District range from moderate to high. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Past Occurrences

There have been no federal or state disaster declarations in the County from landslide. Given the geology, climate, and terrain of the District, landslides can be a significant concern. Notable landslides of record include the landslides occurring along the Truckee River, Squaw Creek and Bear Creek rivers associated with the 1997 flood event. These include the Wayne Road, Sandy Way, and Navajo Court landslides.

The Sandy Way mudslide area has had several significant releases – the first in about 1983 and the second in 1997. Following the 1983 event, the portion of the drainage just above Sandy Way was widened and deepened somewhat and a larger culvert installed. Debris was removed from the areas downhill of Sandy Way, but the stream channel was not altered significantly nor were improvements constructed. Following the 1997 event (which accompanied significant and widespread flooding and mudslides/debris flows in other areas) the Sandy Way improvements were cleaned out, with little change and without installation of further improvements. The area remains questionable today – it will very likely release again, given similar rainfall intensity and duration.

Vulnerability to and Impacts from Landslide

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of

wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity.

The District has identified several areas prone to landslides that were discussed in the Past Occurrences section above. Impacts in the District may be to structures, infrastructure, and to life safety

Assets at Risk

All of those identified in Table O-4 with landslide in the righthand column.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snow storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 209.0 days with 0.4 days falling below 0°F in eastern Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the eastern side of the County is 190.7 inches. Freeze and snow has a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, and the snow stays all winter in the eastern portion of the County, often with significant snow depths.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table O-9.

Table O-9 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

According to the District, major winter storms have routinely cut off transportation routes in the District for hours (March 2007) to over a week (back in the 1950s), stranding thousands and causing a major impact to services and supplies.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

The District noted that deep freezes with no snow cover can go deep enough into the ground to freeze pipelines and facilities. Heavy snow can limit access to pipeline or facilities if there were issues going at the same time as heavy snow.

Extreme Cold and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Assets at Risk

All of those identified in Table O-4 with freeze or snow in the righthand column.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding. Protection of District facilities can cause significant overtime and a chance of damages to facilities.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse,

or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding.

Heavy rains and severe thunderstorms have occurred frequently in Squaw Valley and are likely to occur annually. These events are known to cause localized flooding, erosion, and damage to utility infrastructure. High winds are associated with frequent power loss and although the District maintains 3 emergency generators, personnel responding are often confronted with travel delay due to road closures.

Assets at Risk

All of those identified in Table O-4 with weather or flood in the righthand column.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County

watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015. No events of past tree mortality have affected the District.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

The trees within the District are unnaturally dense due to fire suppression and previous logging practices, the area is showing signs of inter-tree competition and significant widespread pathogen outbreaks including tree fungal infections in the firs, and heavy mistletoe infections in lodgepole pine and Jeffery pine. Historically, this forest was open and ‘park-like’ with significantly fewer trees and dominated by large diameter pine species.

Assets at Risk

All of those identified in Table O-4 with wildfire in the righthand column.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

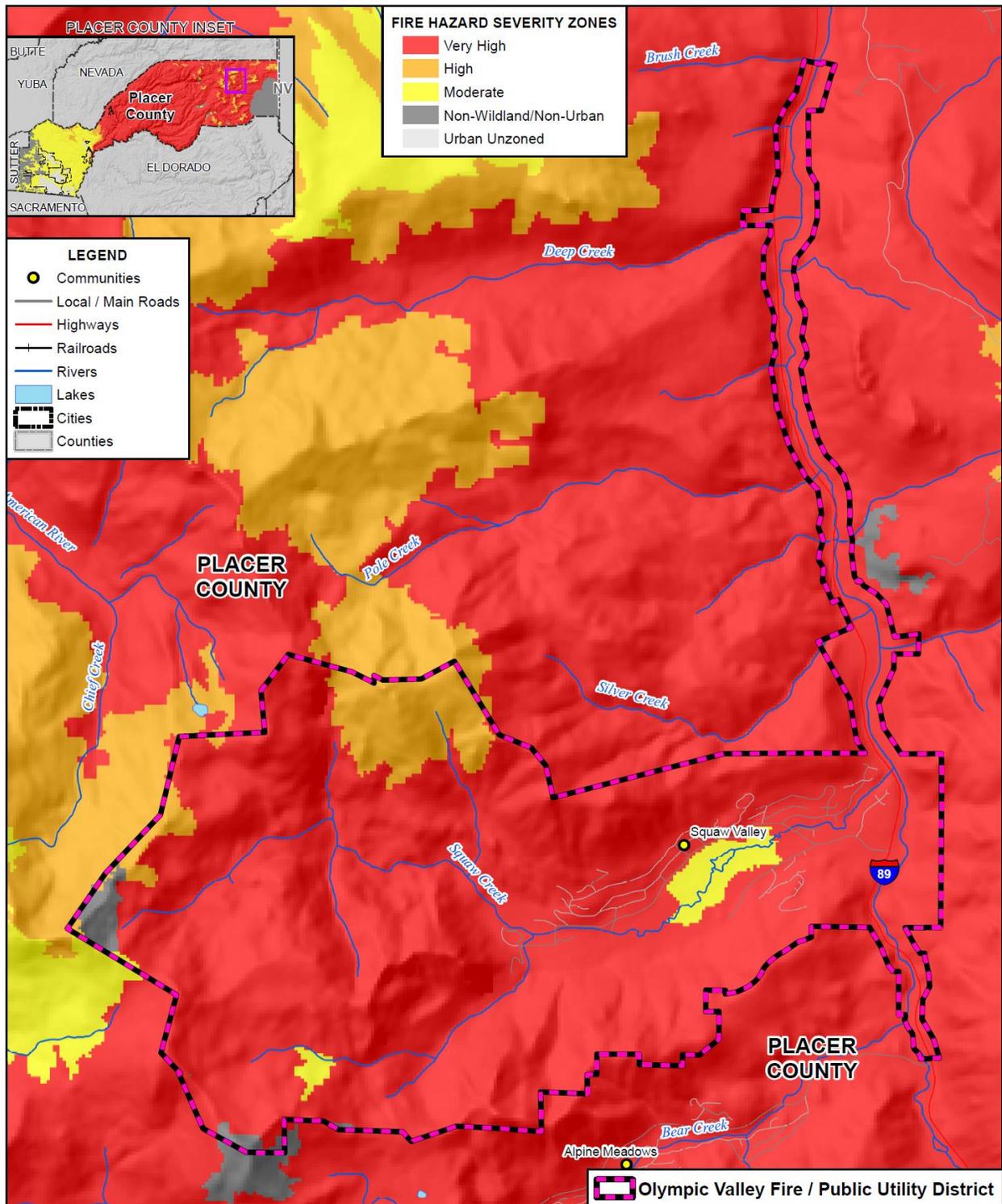
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the OVFD/OVPSD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the OVFD/OVPSD were created. Figure O-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs in the District range from High to Very High.

Figure O-3 OVFD/OVPSD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table O-10.

Table O-10 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The most recent major wildfires to impact the District were the Angora and Washoe Fires in 2007, in which over 260 homes were lost, and the 2014 King Fire. The king Fire grew to over 97,000 acres and burned within about 6 miles of the District boundary. It was particularly concerning because of the extreme fire behavior exhibited - including a ten mile run over the course of a few hours in the middle of the night – and it actually caused fire managers and scientists studying fire behavior to reconsider whether accepted norms of fire behavior needed to be reexamined. These are only a few examples of recent, larger wildfire events in the Lake Tahoe Basin and eastern Placer County. The District noted no other wildfires since 2016.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

As more people live in the area on a full-time basis and recreational uses and accompanying impacts increase, there will be more human-caused wildfire starts each year. Of greater concern is the increased number and value of homes developed within the WUI areas of the District. This adds greatly to the complexity and cost of fighting these fires – the ‘values at risk’ continue to escalate.

Olympic Valley has only one means of ingress and egress as a result of the configuration of the Valley, this will never change. Furthermore, a single road connects Olympic Valley to adjoining communities - California State Route 89 - this can never change because of the configuration of the Truckee River canyon. Evacuating the community or getting a large number of fire suppression resources to the Valley over a single road clogged with panicked residents trying to flee a wildland fire of significant size would be a daunting challenge indeed. Because of the steep terrain and dense forest immediately adjacent to the roadway, it is likely that these routes would have to be closed during a major event, stranding many people - including many visitors - away from their families and homes. To date there has been no loss of life attributed to the limited evacuation routes, but it is likely only a matter of time before people are cut off and trapped by a major fire event. The Valley has been isolated for days at a time by simultaneous avalanche and mudslide events on State Route 89.

Forest overgrowth due to the efficiency of modern firefighting techniques and to society’s current election to limit forest thinning and harvesting is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding significant tree mortality similar to that experienced in other mountain environments in Southern California and Colorado.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California’s three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E and Liberty Utilities to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended

period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

All of those identified in Table O-4 with wildfire in the righthand column.

O.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

O.6.1. Regulatory Mitigation Capabilities

Table O-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the OVFD/OVPSD.

Table O-11 OVFD/OVPSD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	1992 1994	Water& Sewer System Master Plans are being updated now and will be complete in 2022
Capital Improvements Plan	2007	Update as part of above master plan work
Economic Development Plan	N	Placer Co
Local Emergency Operations Plan	2016	
Continuity of Operations Plan	N	Water System Operations Plan is 80% complete Sewer System Management Plan 2020
Transportation Plan	NA	Placer Co
Stormwater Management Plan/Program	NA	Placer Co
Engineering Studies for Streams	2007	Placer County funded study by PWA
Community Wildfire Protection Plan	N	Defensible Space Program see 2010 plan description
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	Placer Co
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	NA	Version/Year: Placer Co
Building Code Effectiveness Grading Schedule (BCEGS) Score	NA	Score: Placer Co

Fire department ISO rating:	Y	Rating: 2 in Valley hydrant areas, 2Y in river corridor
Site plan review requirements	Y	
Is the ordinance an effective measure for reducing hazard impacts?		
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Placer Co
Subdivision ordinance	N	Placer Co
Floodplain ordinance	NA	Placer Co
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	Placer Co
Flood insurance rate maps	N	Placer Co
Elevation Certificates	NA	Placer Co
Acquisition of land for open space and public recreation uses	N	Placer Co
Erosion or sediment control program	N	Placer Co
Other		District Ordinances including Water Code, Sewer Code, and Fire Prevention Code
How can these capabilities be expanded and improved to reduce risk?		
The District will look at expanding our ordinances and partnering with other agencies (example we signed MOU w Placer County for Haz-Veg abatement)		

Source: OVFD/OVPSD

Olympic Valley Groundwater Management Plan, 2007

The Olympic Valley Groundwater Management Plan summarizes the plan process, existing groundwater and surface water conditions, and explores options for providing a sustainable water supply for current and future beneficial uses. An update of the Olympic Valley Groundwater Management Plan will be completed in 2016.

Codes and Ordinances

Avalanche

Placer County's avalanche management program defines Potential Avalanche Hazard Areas (PAHAs) where the minimum probability of avalanche occurrence is 1 in 100 per year or where avalanche damage has already occurred. According to the Placer County Avalanche Ordinance the following information must be disclosed in PAHAs:

- Identification that a structure is within a PAHA;
- A warning that avalanche control work is conducted in the area and avalanche warnings will be provided as feasible; and
- Identification of sources that provide weather information and general information on avalanches.

In addition, the County limits construction as necessary in PAHAs and will not issue a building permit for construction in a PAHA without certifying that the structure will be safe under the anticipated snow loads and conditions of an avalanche.

Olympic Valley Public Services District Codes and Permits

OVFD/OVPSD has enacted several codes:

- Water Code
- Sanitary Sewer Code
- Fire Prevention Code

In addition, the District has permit requirements specific to:

- Residential Construction
- Commercial Construction
- Multiple Dwelling Units
- Temporary Discharge into Sewer
- Temporary Fire Hydrant Connection

O.6.2. Administrative/Technical Mitigation Capabilities

The District is governed by a five-member Board of Directors elected to four-year terms. Registered voters within District boundaries are eligible to run for office. The Board of Directors approves District codes and policies. Placer County provides the District with the resources of a planner/engineer with knowledge of land development and management practices. The District also utilizes the services of a building official and GIS staff from Placer County. The District also participates in the County’s teleminder system for people residing with District boundaries. Table O-12 identifies the District department(s) responsible for activities related to mitigation and loss prevention in OVFD/OVPSD.

Table O-12 OVFD/OVPSD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	Placer Co
Mitigation Planning Committee	N	Placer Co
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Defensible Space program
Mutual aid agreements	Y	Tahoe Truckee Area Emergency Contingency Plan Fire Dept. Mutual Aid Agreement
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	Placer Co
Floodplain Administrator	N	Placer Co
Emergency Manager	N	
Community Planner	N	Placer Co
Civil Engineer	Y	General Manager Mike Geary

GIS Coordinator	Y	District Engineer Dave Hunt
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Everbridge
Hazard data and information	N	Placer Co
Grant writing	Y	Staff
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued updates to the capabilities identified above help improve the response and prevention of identified risks.		

Source: OVFD/OVPSD

O.6.3. Fiscal Mitigation Capabilities

Table O-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table O-13 OVFD/OVPSD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Squaw Creek Embankment Reinforcement Project
Authority to levy taxes for specific purposes	N	Restricted by Prop 218
Fees for water, sewer, gas, or electric services	Y	Water and Sewer Asset Replacement Plan
Impact fees for new development	Y	Fire Department Apparatus Asset Replacement Plan
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	
State funding programs	Y	Member of Tahoe Sierra Integrated Water Management Plan
Other		
How can these capabilities be expanded and improved to reduce risk?		
Identifying future funding opportunities will enable the District to pursue some of the mitigation projects that have been identified.		

Source: OVFD/OVPSD

O.6.4. Mitigation Education, Outreach, and Partnerships

Table O-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table O-14 OVFD/OVPSD 's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Biannual newsletter
Natural disaster or safety related school programs	N	Not known
StormReady certification	N	
Firewise Communities certification	Y	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District is completing a Community Wildfire Preparedness Plan (CWPP) to identify and prioritize programs such as those noted above, expected completion date of April 2022.		

Source: OVFD/OVPSD

The District attempts to work with the local community and solicit public comment and involvement in District programs, system improvements and upgrades. Considerable public outreach and participation was extended during the development and adoption of the Olympic Valley Groundwater Management Plan, preparation and certification of a Supplemental EIR for the Resort at Squaw Creek's Phase II Expansion, as well as numerous system upgrade projects.

O.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- In 2016 the District as part of a project to produce an Operations Plan updated the Emergency Response Plan
- In 2020 the District completed and adopted a Sewer System Management Plan
- In 2015 the District as part of the Village Master Plan completed a Water Supply Assessment funded by the developer. The WSA looked at projected growth over the next 25 years and modeled impacts to the Olympic Valley Aquifer during multiple drought years. The study shows the Olympic Valley Aquifer is not presently in overdraft and should sustain the growth proposed.

- The District is presently working on a study funded by DWR titled Redundant Water Supply Preferred Alternative Analysis. This study lays the groundwork for a system intertie with the Truckee Donner PUD & Northstar Community Services Districts

Squaw Creek Embankment Reinforcement Project: As a result of bank erosion from a 1986 flood event, the Olympic Valley sewer export line that runs adjacent to Squaw Creek was being threatened. In 1989, the bank was reinforced using boulder rip rap. In 2000, the District completed a \$400,000 plus project to armor a 400 foot reach of Squaw Creek where the 1997 flood threatened the Olympic Valley Interceptor sewer main, a pipeline that carries 100 percent of the valley's effluent.

Defensible Space Program: The OVFD/OVPSD has had a defensible space program for the past 20 years. This program entails a physical inspection of every property in the District's jurisdiction for compliance with California's defensible space laws. Properties that are not in compliance at the time of the first inspection receive follow-up visits and notices until they are brought into compliance. Every property complies with the defensible space regulations every year. The inspection checklist includes:

- Making sure the street address is visible from the street and contrasts with background—suggested 5" or 6" numbers.
- Cut grasses and mule ears 6" or shorter to 100' from house or to property line.
- Rake and remove pine needles to 100' from house or to property line—okay to leave 1-2" for mulch.
- Remove accumulated pine needles from the roof.
- Cut grasses, thin brush and other flammable vegetation to 100' from house or to the property line.
- Clear debris (slash, pine needle piles, construction debris and flammable storage) from around the structure.
- Clear vegetation to mineral soil around firewood storage piles.
- Remove brush, limbs, grass, needles and debris 10' in all directions from around propane tanks.
- Limb adult trees up to a minimum of 6' from the ground.
- Remove dead tree limbs touching or overhanging roofs and decks.
- Remove all tree limbs a minimum of 10' from chimneys and stovepipes.
- Remove all dead and dying trees from the property.
- Install a ½ inch mesh screen spark arrester on chimneys and stovepipes

O.7 Mitigation Strategy

O.7.1. Mitigation Goals and Objectives

The OVFD/OVPSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

O.7.2. Mitigation Actions

The planning team for the OVFD/OVPSD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Avalanche
- Dam Failure
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Landslides, Mudslides, and Debris Flows
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Community-Wide Emergency Notification System

Hazards Addressed: Earthquake, Avalanche, Dam Failure, Drought, Floods, Landslides, Severe Weather, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The population of Olympic Valley can increase more than ten-fold over the course of several hours on a Saturday morning. Presently, there is no way of effectively alerting most residents and visitors of a hazard and the actions to be taken in response.

A community-wide emergency notification system could be implemented with relative ease and cost-efficiency in a compact area like Olympic Valley. Permanent, changeable message boards located along Squaw Valley Road at the west and east ends of the Valley could be used to alert residents and visitors of a hazard and refer them to the frequency for a low-power FM transmitter that would transmit more detailed information and recommended courses of action.

Other Alternatives:

- No action
- Emergency siren/air horn

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Olympic Valley Fire Department

Cost Estimate: Approximately \$100,000

Benefits (Losses Avoided): Ability to notify a large number of people in the area of existing disaster or another emergency. Ability to direct people to tune their radio to a certain frequency to get further information and instructions.

Potential Funding: Potentially funded by a grant or combination of grants.

Timeline: Depending on funding

Project Priority: High

Action 2. Emergency Water Supply Interconnection to Martis Valley

Hazards Addressed: Contamination of sole source aquifer, loss of source wells due to disaster, earthquake, and drought. Wildland fire mitigation through increased fire protection services

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The community of Olympic Valley draws its drinking water from a single source aquifer that is very small, unprotected and is very sensitive. Source water travels rapidly through the aquifer making contamination of the supply of deep concern. Prolonged or extended drought consistent with changing global weather patterns could lead to overdraft of the limited supply.

Olympic Valley is geographically separate from outlying communities that may provide an emergency interconnection. A feasibility study conducted in 2009 determined that a connection to the Truckee Donner PUD or the Northstar CSD to be feasible with no fatal flaws in securing water rights, environmental constraints, or rights of way.

The purpose of the project is to provide a redundant source of supply that is geographically diverse with a reliable means of delivery. The delivery system will provide water service and fire protection to outlying areas while providing a utility corridor for natural gas and high speed communication.

Other Alternatives: The Redundant Water Supply Preferred Alternative Analysis, Farr West Engineering 2015 looked at alternatives in depth and determined that the connection to the Martis Valley Aquifer to be the best most reliable and feasible alternative

Existing Planning Mechanism(s) through which Action Will Be Implemented: The feasibility study and the alternatives analysis were funded by the California Department of Water Resources through Prop. 89. The District will seek additional funding through Prop. 1. The next phase of the project will be the environmental analysis under CEQA and securing permits.

Responsible Office/Partners: The Olympic Valley Public Service District is presently the lead agency for the project and has or is developing partnerships with the Placer County, Placer County Water Agency, Truckee Donner PUD, Northstar CSD, Tahoe City PUD, Alpine Springs CWD, Sudden Link Cable, Southwest Gas, and other state and local agencies

Cost Estimate: Planning level cost estimates range from \$23,520,000 to \$25,200,000 depending on the final alignment

Benefits (Losses Avoided): The project would provide an alternative water supply to multiple communities while bringing high speed fiber optics communication and natural gas to the area. The benefits of the project are increased fire protection along the Truckee River corridor between Truckee and Alpine Meadows where there currently is none. A partnership with Southwest Gas bringing natural gas to the area would lower fire danger by eliminating thousands of propane tanks and reducing on road transport by tanker trucks supplying propane. The project seeks to avoid loss of essential services during an emergency or natural disaster.

Potential Funding: Grants, partnerships, bonds, customer service fees

Timeline: CEQA and project permitting is the next phase. The timeline for permits ranges from 12 to 24 months with construction following final funding.

Project Priority: This project is a high priority

Action 3. OVPSD/Mutual Water Company Intertie

Hazards Addressed: Contamination of sole source aquifer, loss of source wells due to disaster, earthquake, and drought. Wildland fire mitigation through increased fire protection services.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The community of Olympic Valley has 2 water systems that provide drinking water to its residents. An intertie would enable both systems to support the other with water in case of an issue due to natural disaster or operational issues.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: OVPSD has worked to receive grant funding to help further design the intertie and do further hydraulic modeling to find the best locations for an intertie.

Responsible Office/Partners: OVPSD

Cost Estimate: Planning level cost estimates range from \$500,000 to \$600,000 depending on final locations.

Benefits (Losses Avoided): The project would help ensure both systems had access to drinking water during and after a natural disaster. It would also offer operational redundancy when either system has maintenance or upgrade projects going on.

Potential Funding: Grants, partnerships, bonds, customer service fees.

Timeline: Ongoing pursuit of grants for planning funding.

Project Priority: This project is a high priority.

Action 4. Squaw Creek Siphon

Hazards Addressed: Flood, Landslide

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During the 1997 flood the wastewater conveyance system in Squaw Valley was compromised due to erosion in multiple locations.

The Squaw Creek Siphon conveys wastewater from around 200 home across and under Squaw Creek where it ties into the Squaw Valley Interceptor. High velocity flood waters cut downward and eroded the creek bottom in the 1997 flood completely exposing the Squaw Creek Siphon. After the flood waters receded the District installed rock gabions upstream, downstream and over the Squaw Creek Siphon to protect the pipeline. The 1997 flood has been characterized by Placer County as a 50 year event, a similar or larger event would potentially damage or wash away the Squaw Creek Siphon causing wastewater to pollute Squaw Creek and the Truckee River.

The Squaw Creek Siphon Project seeks to replace the existing siphon with a redundant and larger siphon adjacent to and deeper than the existing siphon.

Other Alternatives: There are no feasible alternatives

Existing Planning Mechanism(s) through which Action Will Be Implemented: The OVPSD Sewer System Master Plan

Responsible Office/Partners: Olympic Valley Public Service District is the lead agency for the project

Cost Estimate: \$350,000 to \$400,000

Benefits (Losses Avoided): Avoids loss of critical facility and pollution of the environment

Potential Funding: Grants, loans, developer fees, service fees

Timeline: 5 to 10 years

Project Priority: Medium

Action 5. Water Tank Earthquake Retrofit Projects

Hazards Addressed: Earthquake, Landslide

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The District's East Tank (500,000 gal) was constructed in 1980 and is designed to withstand snow loads but not lateral stress from a substantial earthquake. The East tank is located up gradient from several single family homes that would be heavily impacted due to a tank failure.

The Mutual Water Company Steel Tank (300,000 gal) is located adjacent to a wash that sustained mud flows in the 1997 flood that caused significant erosion of the tanks earth foundation pad. Both Mutual Water Company Tanks are located up gradient from numerous single family homes that would be heavily impacted due to a tank failure.

The project would entail a seismic analysis by a qualified geotechnical firm of the Mutual water tanks and the Districts East Tank. Seismic retro-fit would be designed and employed if deemed necessary.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: OVPSD

Cost Estimate: \$50,000 to \$500,000 depending on scope of project.

Benefits (Losses Avoided): Property protection and loss of lifeline services due to earthquake or land subsidence which could result in catastrophic tank failure

Potential Funding: Funding for the project may come from grants, low interest loan, or from District and Mutual Water Company reserves if or when available.

Timeline: 2022 or beyond depending on funding.

Project Priority: Medium

Action 6. Easement Abatement/Maintenance of Emergency Access

Hazards Addressed: Multi hazard (Avalanche, Dam Failure, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Severe Weather: Freeze and Snow, Severe Weather: Heavy Rains and Storms, Tree Mortality, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: One way in and out of the valley

Other Alternatives: do nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency access/egress for wildland emergencies

Responsible Office/Partners: Placer County, State of California (Cal Fire), USFS

Cost Estimate: unknown

Benefits (Losses Avoided): avoid loss of life during wildland fire

Potential Funding: Grants and private partnerships

Timeline: unknown

Project Priority: High

Action 7. Towable Generator for Powering Booster Stations

Hazards Addressed: Wildfire, Earthquake, Floods, Dam Failure, Landslides, Severe Weather

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Olympic Valley PSD has a booster station that does not have an onsite generator. Currently a towable generator would be rented for a prolonged power outage. Purchasing a towable generator sized to run the booster station would increase resiliency of the water system through many kinds of disasters.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Olympic Valley Public Service District

Cost Estimate: Approximately \$50,000

Benefits (Losses Avoided): Ability to pump water into our highest zone during any kind of power outages. Continue to provide water during wildfire with the power out.

Potential Funding: Grants

Timeline: 2022 or 2023 depending on funding

Project Priority: medium

Action 8. Emergency Water Supply Interconnection to Martis Valley

Hazards Addressed: Contamination of sole source aquifer, loss of source wells due to disaster, earthquake, and drought. Wildland fire mitigation through increased fire protection services

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The community of Olympic Valley draws its drinking water from a single source aquifer that is very small, unprotected and is very sensitive. Source water travels rapidly through the aquifer making contamination of the supply of deep concern. Prolonged or extended drought consistent with changing global weather patterns could lead to overdraft of the limited supply.

Olympic Valley is geographically separate from outlying communities that may provide an emergency interconnection. A feasibility study conducted in 2009 determined that a connection to the Truckee Donner PUD or the Northstar CSD to be feasible with no fatal flaws in securing water rights, environmental constraints, or rights of way.

The purpose of the project is to provide a redundant source of supply that is geographically diverse with a reliable means of delivery. The delivery system will provide water service and fire protection to outlying areas while providing a utility corridor for natural gas and high speed communication.

Other Alternatives: The Redundant Water Supply Preferred Alternative Analysis, Farr West Engineering 2015 looked at alternatives in depth and determined that the connection to the Martis Valley Aquifer to be the best most reliable and feasible alternative

Existing Planning Mechanism(s) through which Action Will Be Implemented: The feasibility study and the alternatives analysis were funded by the California Department of Water Resources through Prop. 89. The District will seek additional funding through Prop. 1. The next phase of the project will be the environmental analysis under CEQA and securing permits

Responsible Office/Partners: The Olympic Valley Public Service District is presently the lead agency for the project and has or is developing partnerships with the Placer County, Placer County Water Agency, Truckee Donner PUD, Northstar CSD, Tahoe City PUD, Alpine Springs CWD, Sudden Link Cable, Southwest Gas, and other state and local agencies

Cost Estimate: Planning level cost estimates range from \$23,520,000 to \$25,200,000 depending on the final alignment

Benefits (Losses Avoided): The project would provide an alternative water supply to multiple communities while bringing high speed fiber optics communication and natural gas to the area. The benefits of the project are increased fire protection along the Truckee River corridor between Truckee and Alpine Meadows where there currently is none. A partnership with Southwest Gas bringing natural gas to the area would lower fire danger by eliminating thousands of propane tanks and reducing on road transport by tanker trucks supplying propane. The project seeks to avoid loss of essential services during an emergency or natural disaster

Potential Funding: Grants, partnerships, bonds, customer service fees

Timeline: CEQA and project permitting is the next phase. The timeline for permits ranges from 12 to 24 months with construction following final funding

Project Priority: Medium Priority



Annex P Placer County Flood Control and Water Conservation District

P.1 Introduction

This Annex details the hazard mitigation planning elements specific to Placer County Flood Control and Water Conservation District (PCFCWCD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to PCFCWCD, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

P.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table P-1. Additional details on plan participation and District representatives are included in Appendix A.

Table P-1 PCFCWCD – Planning Team

Name	Position/Title	How Participated
Brad Brewer	District Manager	Attended meetings. Provided: hazard ID table, update to previous mitigation actions, new mitigation actions, input on assets at risk, updates to vulnerability sections of the Plan update. Reviewed and updated 2016 Annex and provided input on flood section of Base Plan.
Ken Grehm	Executive Director	Provided overall management of review and input.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table P-2.

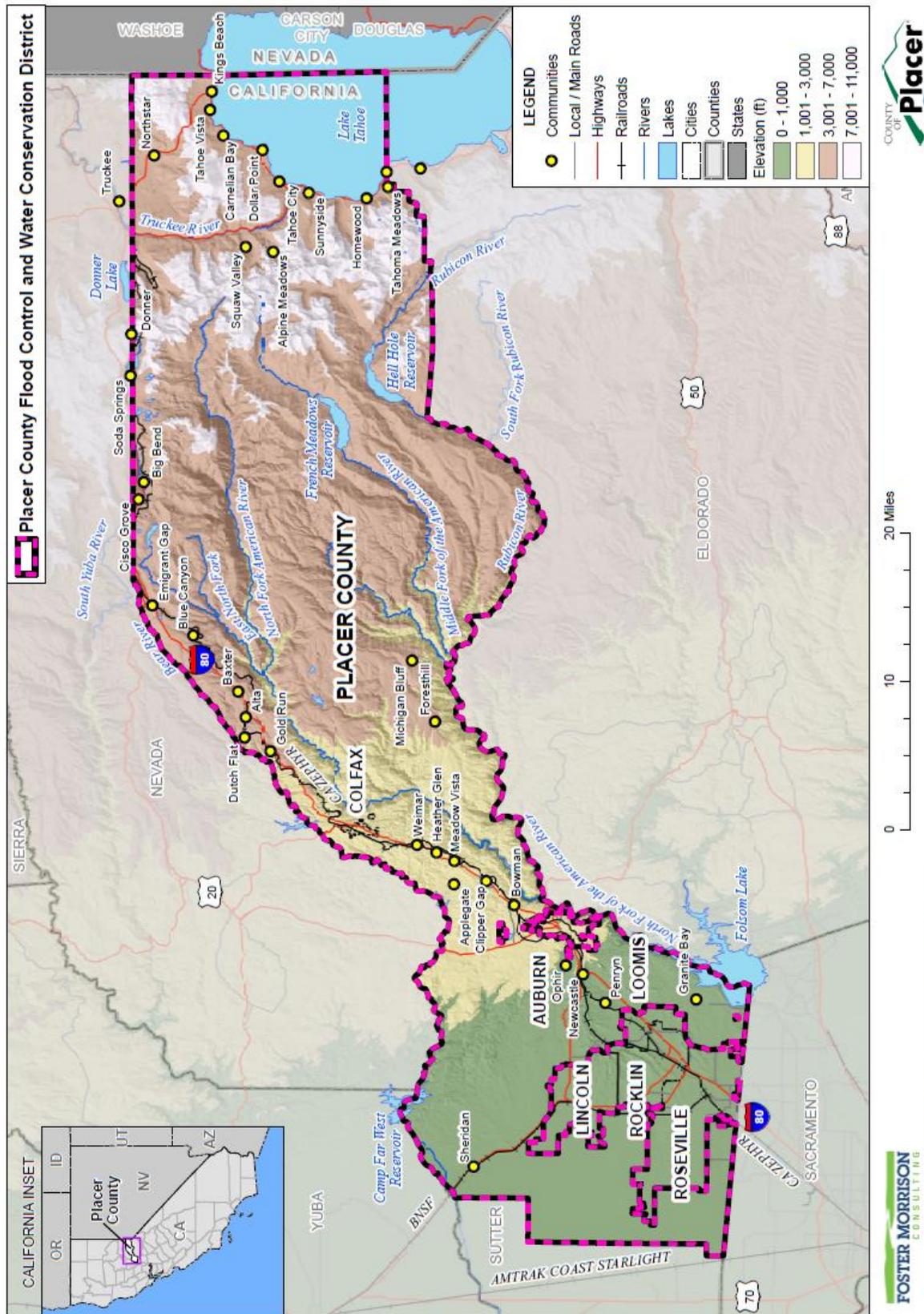
Table P-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
District’s Annual Short-term and Long-Term (5-year) Work Plans	Incorporated updates to previous mitigation actions and new mitigation actions. Include future updates to LHMP into Short-Term or Long-Term Work Plans as needed
Annual Updates to District’s Flood Response Handbook	Included updates to hazards, mitigation actions, assets at risk, and vulnerability from Plan update.

P.3 District Profile

The District profile for the PCFCWCD is detailed in the following sections. Figure P-1 displays a map and the location of the District within Placer County.

Figure P-1 PCFCWCD



P.3.1. Overview and Background

The Placer County Flood Control and Water Conservation District was established in 1984 by the State Legislature as a Special District, separate from County government, to address flood control issues arising with growth. District boundaries are the same as Placer County boundaries.

The primary purpose of the District is to protect lives and property from the effects of flooding by comprehensive, coordinated flood prevention planning. The District uses consistent standards to evaluate flood risk, and implements flood control measures such as requiring new development to construct detention basins and operation and management of a flood warning system.

The District:

- Implements regional flood control projects;
- Develops and implements master plans for selected watersheds in the County;
- Provides technical planning, support and information during times of flood and drought for the cities, the County, and the development community;
- Operates and maintains the County flood warning system;
- Reviews proposed development projects to see they meet District standards;
- Develops hydrologic and hydraulic models for County watersheds; and
- Provides technical support for Office of Emergency Services activities.

P.4 Hazard Identification

PCFCWCD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table P-3).

Table P-3 PCFCWCD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	–	–	–	–	Medium
Avalanche	–	–	–	–	Medium
Climate Change	–	–	–	–	–
Dam Failure	Significant	Unlikely	Critical	High	Medium
Drought & Water Shortage	Significant	Likely	Critical	Medium	High
Earthquake					Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Significant	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	–	–	–	–	Medium
Levee Failure	Significant	Unlikely	Limited	Medium	Medium
Pandemic	–	–	–	–	Medium
Seiche	–	–	–	–	Medium
Severe Weather: Extreme Heat	–	–	–	–	High
Severe Weather: Freeze and Snow	–	–	–	–	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	–	–	–	–	Low
Tree Mortality	–	–	–	–	High
Wildfire	Extensive	Highly Likely	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

Impacts of past events and vulnerability to specific hazards are discussed below (see Section 4.3 of the Base Plan for more detailed information about these hazards and their impacts on Placer County).

P.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

P.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section P.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table P-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

P.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the PCFCWCD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table P-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. PCFCWCD’s physical assets, valued at \$5 million, consist of the infrastructure to support the District’s operations.

Table P-4 PCFCWCD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Stream and rain gages	ALERT type gage (17 gages @\$12,000 each)	\$204,000	Theft, vandalism, damage due to flooding
Base station hardware	ALERT base station receiver/decoder and computer	\$22,000	Damage due to fire
Miners Ravine Off-Channel Detention Basin Facility and Dam	Regional Flood Control Facility	\$4,800,000	Damages due to flooding or dam failure
Antelope Flood Control Project, Upper Weir	Regional Flood Control Facility	\$2,400,000	Damages due to flooding
Total		\$7,426,000	

Source: PCFCWCD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. PCFCWCD provides services to 396,691 residents of Placer County (CA Dept. of Finance, May 2020) including Auburn, Colfax, Lincoln, Loomis, Rocklin, and Roseville.

Natural Resources

PCFCWCD has a variety of natural resources of value to the District. These natural resources parallels that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan

Historic and Cultural Resources

PCFCWCD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan. Future expansion will include expanding flood warning system to include additional ALERT flood warning gages.

Development since 2016

Three new flood warning gages were installed in FEMA Special Flood Hazard Areas since 2016. These include Clover Valley Creek at Rawhide Road, Miners Ravine at Auburn Folsom Road, and Linda Creek at Auburn Folsom Road. One flood warning gage previously operated and maintained by the District (Pleasant Grove Creek at Industrial Avenue) was transferred to the City of Roseville.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

P.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table P-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Dam Failure

Likelihood of Future Occurrence—Unlikely

Vulnerability—High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Dams inside the County that can affect the District can be seen on Figure P-2. Dams outside the County that can affect the District can be seen on Figure P-3.

Figure P-2 PCFCWCD – Dam Inundation Areas from Dams Inside the County

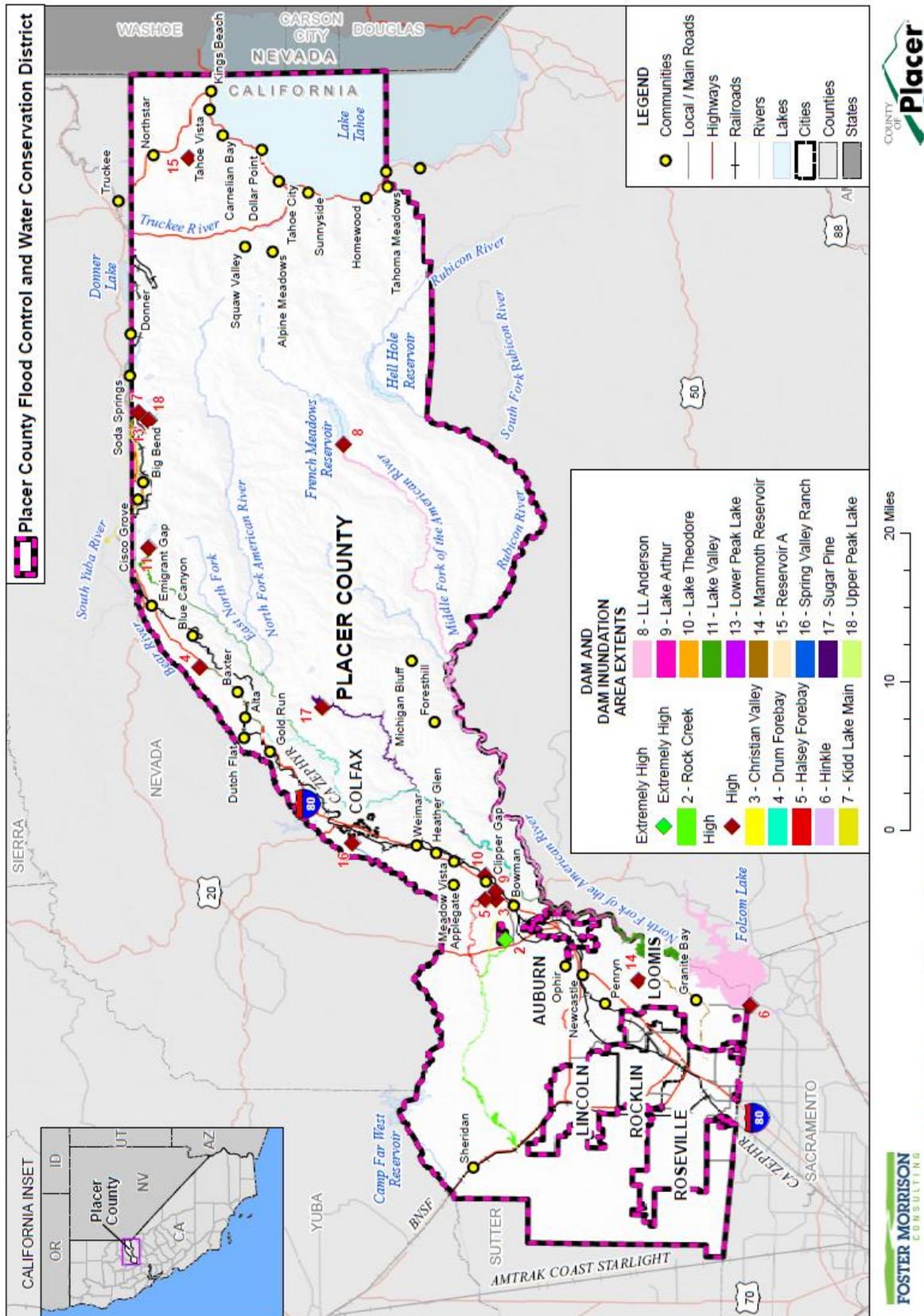
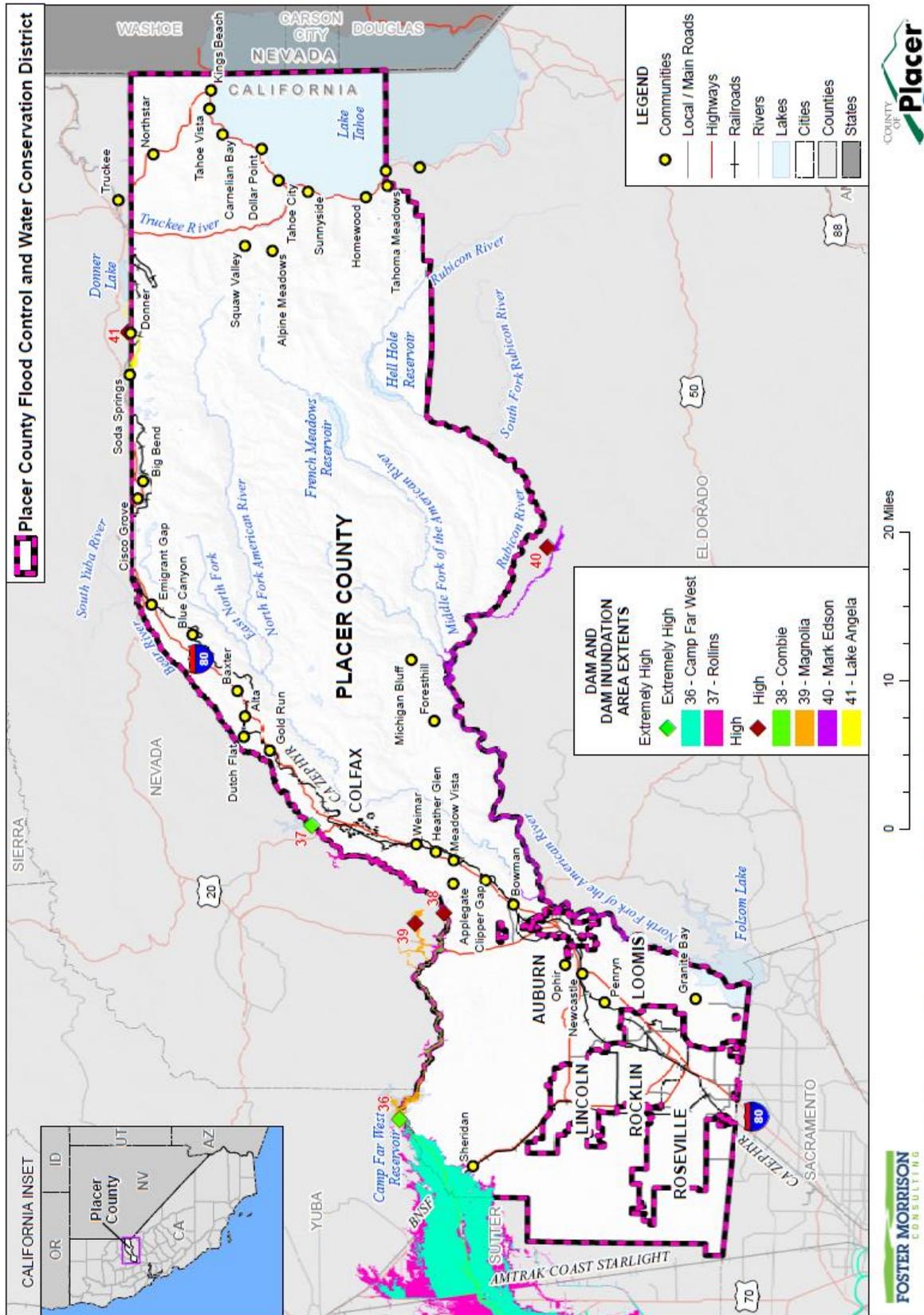


Figure P-3 PCFCWCD – Dam Inundation Areas from Dams Outside the County



Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

Vulnerability and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Assets at Risk

Those agency assets located within flood inundation areas are the most vulnerable to extensive flooding caused by a dam failure. These include the District's ALERT system of stream level and rain gages listed in Table P-4, as well as the land improvements associated with the District's Miners Ravine Off-Channel Detention Basin Facility and dam located at 7500 Sierra College Boulevard in Roseville, California. A specific dam failure analysis prepared for the State Division of Safety of Dams exists for the District's Miners Ravine Off-Channel Detention Basin Facility and dam as prepared by RBF Consulting in October 2004.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry

- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table P-5.

Table P-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

Flood warning system stream and rain gages, Miners Ravine Off-Channel Detention Basin Facility and Dam are at risk to this hazard.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—High

Hazard Profile and Problem Description

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the PCFCWCD have been subject to historical flooding.

Location and Extent

Since the PCFCWCD boundaries are the same as the County, the PCFCWCD has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure P-4.

Figure P-4 PCFCWCD – FEMA DFIRM Flood Zones

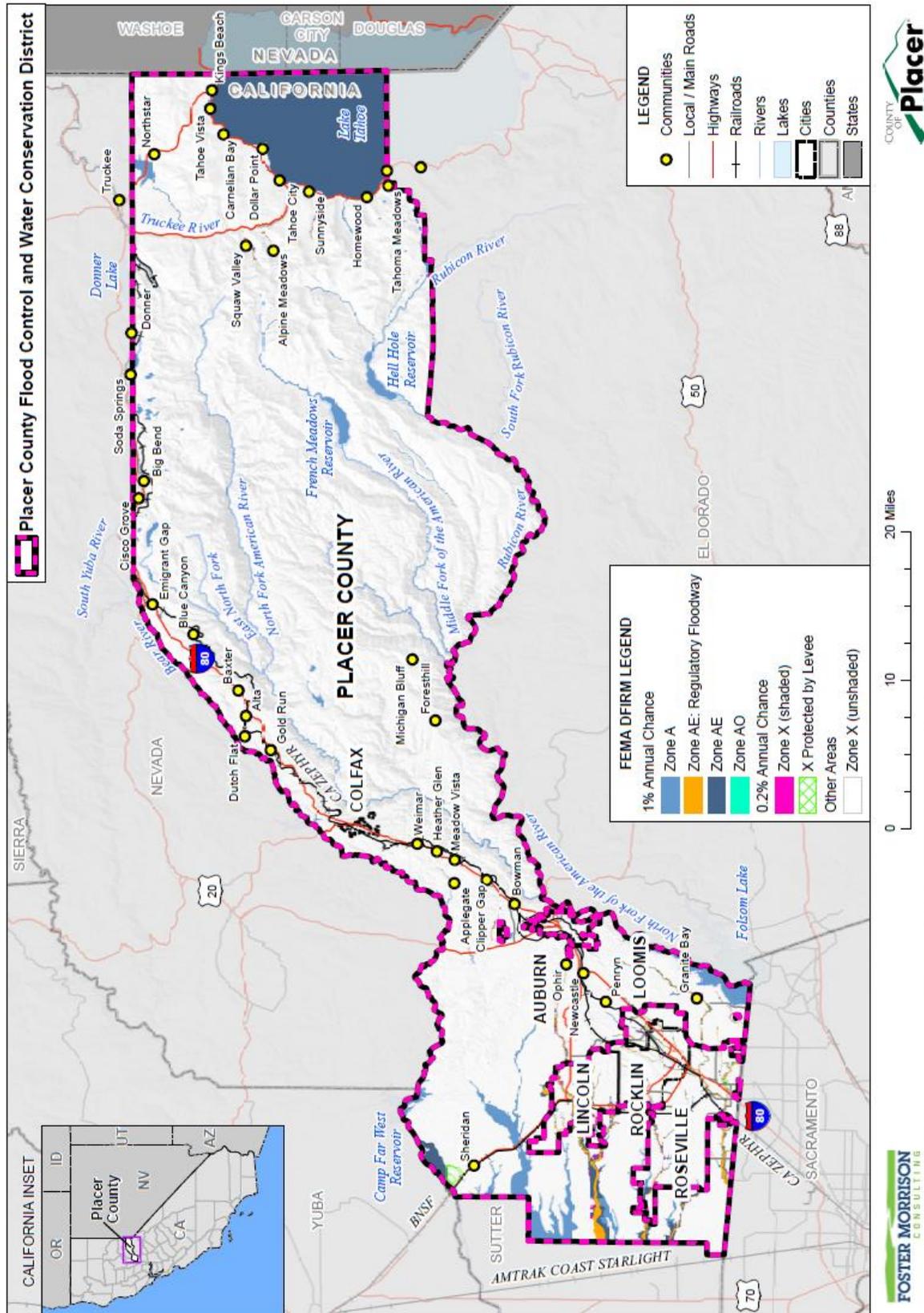


Table P-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table P-6 PCFCWCD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	X
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	X
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	X
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Flooding due to heavy rains and snow runoff has been a historical problem in the Placer County Planning Area. Abundant snowfall in the mountains combined with rain and steep terrain can mean rapid runoff and

flooding in the mountainous eastern section of the County. Of particular concern in this area of the County are rain-on-snow type events producing high runoff volumes. In the more heavily populated western portion of the County, flooding is often the result of heavy rains over lower permeability soils found within the relatively large Dry Creek and Cross Canal watersheds. Many of the small creeks within these watersheds respond quickly to heavy rains in the winter season producing peak flood flows within relatively short time frames. The historical practice of development within or in close proximity to floodplains has resulted in frequent and repeated flood losses in specific areas.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table P-7. These events also likely affected the District to some degree.

Table P-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Significant flooding events resulting in federal disaster declarations for Placer County occurred in 1986, 1995, and 1997, with the most substantial damages occurring within the Cross Canal, Dry Creek, and Truckee River watersheds. The primary impacts from flooding within the District boundaries include damage to roads, utilities, bridges; and flooding of homes, businesses and critical facilities. Road closures create difficulties in providing emergency services to areas cut off by flooding and limit the area’s ability to evacuate. 2017 saw significant flooding due to atmospheric river storms that occurred in January and February of that year. PCFCWCD staff helped staff the EOC and monitored the District’s flood warning system and ALERT gages. The 2017 event damaged the Morton Road culvert crossing over Canyon Creek that necessitated an emergency repair.

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Joe Rogers Road area adjacent to Miners Ravine and Cross Canal watershed/structures, residences, and/or roads inundated with flood waters are the areas most impacted by flooding.

Assets at Risk

With respect to District-owned assets, areas subject to stormwater flooding are the biggest concern. District assets at the greatest risk include those listed in Table P-4.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

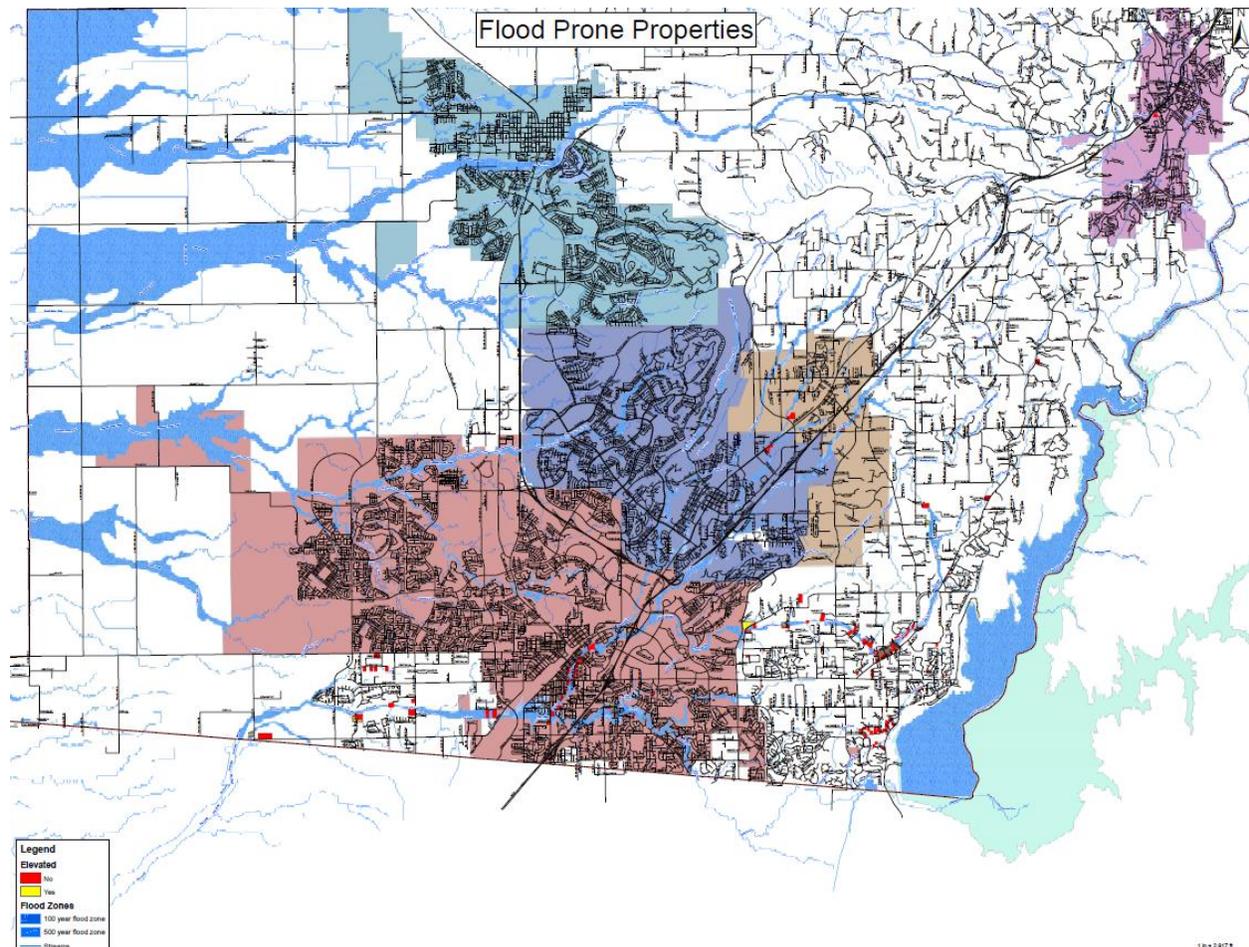
Location and Extent

The PCFCWCD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District has a map of flood prone properties. These are shown on Figure P-5.

Figure P-5 PCFCWCD – Flood Prone Properties



Source: PCFCWCD

The District noted the following past occurrences of localized flooding:

- Flooding within Western Placer County, Auburn, and the North Lake Tahoe area in 2017.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations.

Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Impacts to the District include damage to ALERT flood warning system gages and Miners Ravine Off-Channel Detention Facility.

Assets at Risk

The District noted that the flood warning system stream and rain gages, Miners Ravine Off-Channel Detention Basin Facility and Dam are most at risk from this hazard.

Levee Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees. Levees in the District were shown in Section 4.3.15 of the Base Plan.

Past Occurrences

There have been no federal or state disaster declarations from levee failure. The District Planning Team noted no past occurrences of levee failures.

Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

No District assets (from Table P-4) are at risk from this hazard.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

Significant events include the heavy rains occurring during December 2005 into January 2006. An estimated 2-year rain event in January 2008 resulted in approximately \$14,000 worth of hillside erosion and drainage repairs at the District's Miners Ravine Off-Channel Detention Basin Facility.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in Section 4.3.2 of the Base Plan.

District specific concerns is damage to ALERT flood warning system gages and Miners Ravine Off-Channel Detention Facility.

Assets at Risk

With respect to District-owned assets, areas subject to stormwater flooding caused by heavy rains and storms are the biggest concern. District assets at the greatest risk include those listed in Table P-4.

Wildfire

Likelihood of Future Occurrence—Highly Likely
Vulnerability—

Hazard Profile and Problem Description

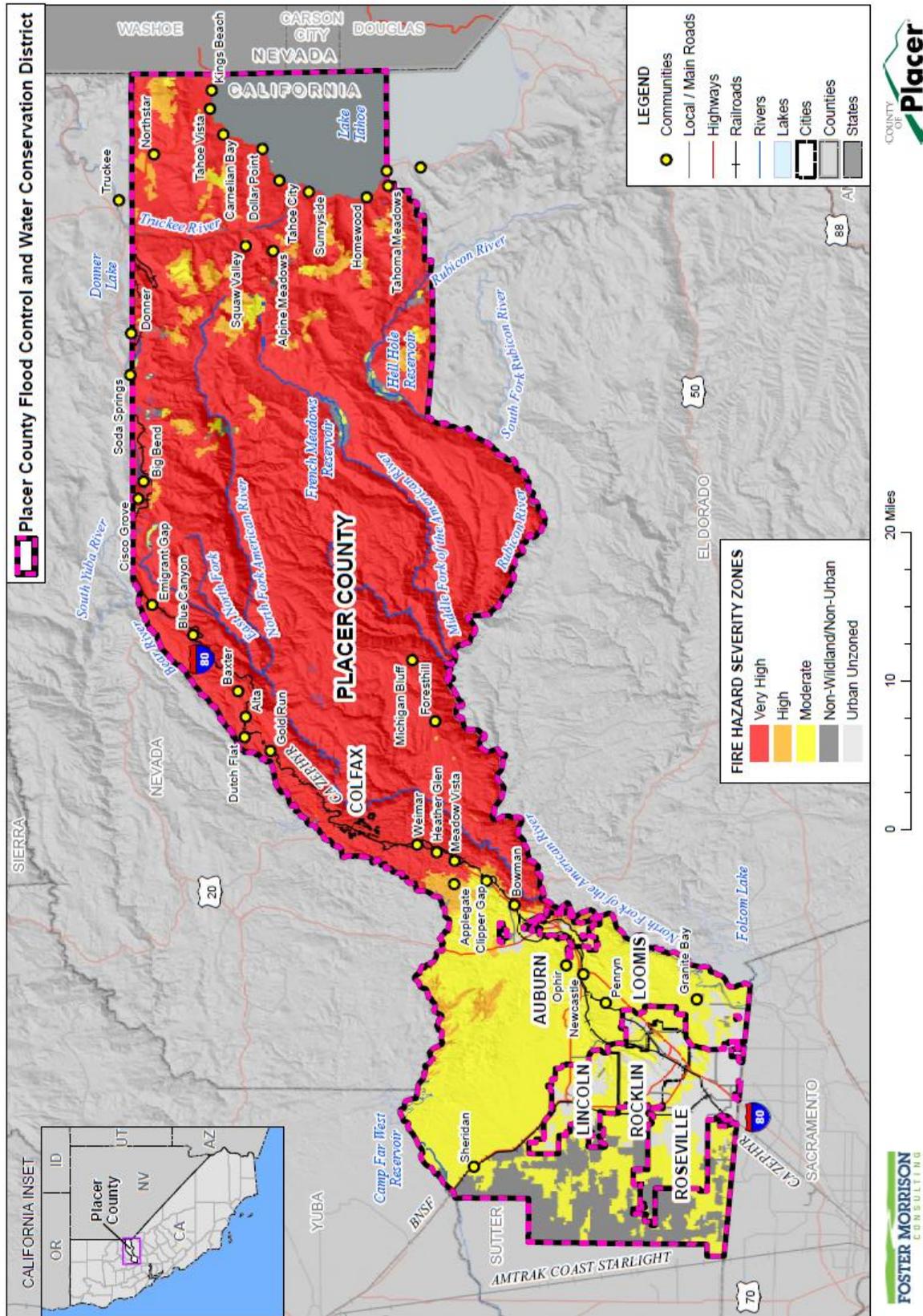
Wildland fire and the risk of a conflagration is an ongoing concern for the PCFCWCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the

ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the PCFCWCD were created. Figure P-6 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District range from urban unzoned to high.

Figure P-6 PCFCWCD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhsz06_1, Adopted 11/2007 - fhsz06_3_31, Recommended 12/2008 - c31fhsz06_3), Placer County GIS, Cal-Atlas, NVBLM, Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table P-8.

Table P-8 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Any smoke/air quality issues that coincided with operation and maintenance of the ALERT flood warning system that typically occurs in October and November of each year. Poor air quality makes it difficult for District and contractor staff to perform operations and maintenance.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater

services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District is concerned about damage to ALERT flood warning system gages and Miners Ravine Off-Channel Detention Facility. Debris flows in waterways following a wildfire can create culvert and bridge blockage causing damage to County road infrastructure.

Assets at Risk

Those Agency assets at greatest risk to wildland fire include the ALERT system of stream and rain gages listed in Table P-4.

P.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

P.6.1. Regulatory Mitigation Capabilities

Table P-9 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PCFCWCD.

Table P-9 PCFCWCD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N/A	N/A
Capital Improvements Plan	Y	Annual Short-term and 5-year Long-Term Work Plans; used to implement mitigation actions
Economic Development Plan	N/A	N/A
Local Emergency Operations Plan	Y	Annual updates to District's Flood Response Handbook; not used to implement mitigation actions
Continuity of Operations Plan	Y	Annual District Timeline of Operations
Transportation Plan	N/A	N/A

Stormwater Management Plan/Program	Y, 1990	District's Stormwater Management Manual (SWMM) and Amendments
Engineering Studies for Streams	Y, Varies	2011 Updated Dry Creek Watershed Flood Control Plan, 1992 Auburn Bowman Community Plan Hydrology Study, 1994 Placer/Sutter County Joint Study Auburn Ravine, Raccoon and Pleasant Grove Creeks
Community Wildfire Protection Plan	N/A	N/A
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N/A	N/A
Building Code, Permitting, and Inspections		
	Y/N	Are codes adequately enforced?
Building Code	N/A	Version/Year: N/A
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score: N/A
Fire department ISO rating:	N/A	Rating: N/A
Site plan review requirements	N/A	N/A
Land Use Planning and Ordinances		
	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	See Placer County Requirements
Subdivision ordinance	N/A	See Placer County Requirements
Floodplain ordinance	N/A	See Placer County Requirements
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	See Placer County Requirements
Flood insurance rate maps	N/A	See Placer County Requirements
Elevation Certificates	N/A	See Placer County Requirements
Acquisition of land for open space and public recreation uses	N/A	See Placer County Requirements
Erosion or sediment control program	N/A	See Placer County Requirements
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District is pursuing updates to outdated stream engineering studies such as for the entire Cross Canal watershed. This includes Auburn Ravine, Raccoon Creek, and Pleasant Grove Creek in addition to Curry Creek and Markham Ravine. These watershed study updates allow for the for the detailed evaluation of regional flood control and other mitigation projects along with the impacts and needed mitigation for development. The future update to the Stormwater Management Manual will help the District and agencies within Placer County better define engineering design standards.		

Source: PCFCWCD

As indicated above, the District has several programs, plans, policies, codes and ordinances in place. These include regional watershed wide flood control plans and a county-wide stormwater management manual. The District, working cooperatively with Placer County and other local agencies, developed three major flood control plans in the early 1990's which cover a majority of the watersheds within western Placer

County. In addition to the Plans listed below the District maintains and references a number of detailed local drainage studies from its library.

FEMA Floodplain Mapping

The Flood Control and Water Conservation District is collaborating with FEMA through the Cooperating Technical Partners (CTP) Program in order to maintain up-to-date floodplain mapping and other flood hazard information within Placer County. The main objective of the program is to provide new or improved 1 percent annual chance floodplain, or 100-year, mapping of major creeks within developing areas of the County. Through three CTP efforts, over 120 miles of new or updated mapping will be provided in urbanized areas of the County. The creeks to be studied were prioritized through the District Technical Advisory Committee (TAC) consisting of member agency staff that identified the need for new or updated areas of floodplain mapping.

The District often leads the initial hydrologic studies which serve as the basis for the updated or new mapping produced separately by FEMA's mapping contractors. District staff have been providing regular updates regarding the CTP process to the District Board and cooperating member agencies at public Board of Director meetings. Placer County is the first jurisdiction to receive the new FEMA Digital Flood Insurance Rate Map (DFIRM) format which replaces the current paper map format. The DFIRMs are being released simultaneous to the CTP mapping studies depicting the new or updated 1 percent annual chance floodplain.

Areas being studied for remapping include:

- Western Placer County
- Lake Tahoe Area

Stormwater Management Manual

For policy, guidelines, specific design criteria for the development and management of natural resources, drainage facilities, and infrastructure for stormwater management please download the current version of the Placer County Flood Control & Water Conservation District Stormwater Management Manual (SWMM) (a link to our SWMM is on the District's website page at www.placer.ca.gov). There is currently a planned update to the SWMM to meet Senate Bill 5 and Urban Level of Flood Protection (ULOP) requirements, amongst other necessary updates.

Dry Creek Watershed Flood Control Plan

The purpose of the 1992 Dry Creek Watershed Flood Control Plan is to provide the District and other governmental agencies in both Placer and Sacramento Counties with the information and policies necessary to manage flood waters within the Dry Creek Watershed, which includes Miners Ravine, Linda Creek, Secret Ravine, Antelope Creek, Cirby Creek, and Dry Creek. The Plan evaluates existing flooding problems and identifies flood management options as well as a funding mechanism to achieve Plan recommendations. The plan was first drafted in 1992 and updated for re-publication in 2011. This plan may be found on the District's website.

Placer/Sutter County Joint Flood Study Auburn Ravine, Coon and Pleasant Grove Creeks (Cross Canal Watershed Flood Control Plan)

The purpose of the 1994 Cross Canal Watershed Flood Control Plan is to provide the District and other governmental agencies in both Placer and Sacramento Counties with the information and policies necessary to manage flood waters within the Cross Canal Watershed, which includes Pleasant Grove, Auburn Ravine, Markham Ravine, and Raccoon Creek. The Plan evaluates existing flooding problems and identifies flood management options as well as a funding mechanism to achieve Plan recommendations.

Auburn/Bowman Community Plan Hydrology Study

The purpose of the 1992 Auburn Bowman Community Plan Hydrology Study is to provide the District and other governmental agencies in Placer County with the information and policies necessary to manage flood waters within the study area, which includes Auburn Ravine, Mormon Ravine, Dutch Ravine, and many other tributaries. The Plan evaluates existing flooding problems and identifies flood management options as well as a funding mechanism to achieve Plan recommendations.

Antelope Creek Flood Control Project

The District is working on a regional flood control project, which includes the addition of two fish-friendly, on-channel weirs across Antelope Creek. The first weir or "Upper Weir" was completed in February 2018. The District is seeking grant funding to complete the second "Lower Weir". Features of this project include:

- Slight increase to the footprint of the existing FEMA recognized 100-year floodplain limits
- Provides substantial mitigation for increases in urban runoff and peak flood flow increases due to new and existing development in the watershed
- Provides as much as 800 cubic feet per second of 100-year peak flow decrease in downtown Roseville
- Includes stream channel and habitat restoration components
- Includes removal of non-native plants and re-planting with natives
- Includes improved public access and educational opportunities for the public along the existing multi-use recreational trail
- Funded through grants from the State Department of Water Resources (DWR), Proposition 84 IRWM program, the DWR Urban Streams Restoration Program and watershed mitigation fees collected within the Dry Creek Trust Fund

Countywide Grading Ordinance, 2000

A countywide grading ordinance was completed in 1988. It has since been adopted by the County and cities and last updated in 2000 as Article 15.48 of the County Code.

Placer County Flood Damage Prevention Regulations

Placer County has adopted Flood Damage Prevention Regulations, Article 15.52 of the County Code, which have as its purpose "to promote public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas." The regulations provide specific construction and development standards for flood hazard reduction in areas of special flood hazard.

Flood Response Handbook with Flood Hazard Awareness Maps

The District, in conjunction with its member agencies, has developed a Flood Response Handbook (FRH) that includes Flood Hazard Awareness Maps of the unincorporated area and all cities. The FRH details roles, responsibilities, and processes for responding to a flood event.

Flood Hazard Awareness Maps (FHAM) have been created by the District for the purposes of identifying areas of the western County where flood hazards from local creeks are known to exist. The maps delineate the established FEMA 100-year and 500-year floodplains (where established) including a 250 foot setback limit from the 100-year floodplain. The setback limit was selected to assist emergency responders and planners in identifying local flood hazard areas, but is not a regulatory limit. Critical emergency response facilities including police and fire stations are shown as are other facilities which may be useful during a flooding event including hospitals, schools, churches and miscellaneous public facilities. Street crossings potentially impacted by flooding are also highlighted in red and the locations of sand bags for flood fighting purposes are also shown. The District intends to update these maps periodically as new information becomes available.

Placer County Flood Prone Map

The District and its member agencies have developed a database and GIS mapping of both residential and commercial structures that are subject to damage from repeat flooding events. The database on these properties has been developed over the years beginning with the 1986 flood event and is helpful in identifying these properties and general flood hazard areas. The database includes information (where available and recorded) on high water, finished floor elevations, previous flooding impact, and whether or not the structure had been elevated or not through a FEMA sponsored HMGP grant program. A GIS based mapping of these flood prone properties has been created and is color coded to indicate structures that have already been elevated versus those that have not. The mapping is useful in identifying flood hazard areas where it can be expected that most of the flood fighting and emergency response efforts will be focused. It is also useful in planning future flood mitigation strategies, elevation projects and regional flood control projects.

Flood Response Handbook

The District has also created, and annually updates its own Flood Response Handbook (FRH). The FRH addresses emergency communication procedures, emergency material supplies and equipment availability, technical resources, and data to help predict flooding events, and State level emergency operations manuals. The FRH also contains countywide GIS based Flood Hazard Awareness Mapping including areas of known flooding, locations of critical facilities such as police and fire stations, government centers, schools, nursing homes, and hospitals. Roads subject to flooding closures and preferred evacuation routes are also identified. This mapping is also posted at the County's Emergency Operations Center (EOC) and distributed to our member agencies.

P.6.2. Administrative/Technical Mitigation Capabilities

The District is governed by a nine-person board of directors. Members include a representative from each of the six incorporated cities in Placer County, two representatives from the Board of Supervisors and one member-at-large appointed by the Board of Supervisors.

The Cities, the County and the District have adopted a formal coordination agreement to identify responsibilities. There are two District Advisory Committees. The Policy Advisory Committee (PAC) has seven voting members - the six city managers of the incorporated cities and the County Executive Officer. The PAC provides guidance on policy and program issues that affect all jurisdictions. The Technical Advisory Committee (TAC) is composed of representatives of Placer County, incorporated cities, Placer County Resource Conservation District, Placer County Water Agency, Sacramento County Water Agency, Nevada Irrigation District, Sutter County Flood Control and Water Conservation District, and the Reclamation District 1001. The TAC is relied on for technical analysis and interpretation of ideas, policies, and programs.

The State legislation creating the District allows Placer County employees to act as District employees. There are three District staff members: the District Manager; the Development Coordinator; and the District Secretary. The Placer County Director of Public Works serves as the Executive Director of the District. Table P-10 identifies the District department(s) responsible for activities related to mitigation and loss prevention in PCFCWCD.

Table P-10 PCFCWCD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N/A	N/A
Mitigation Planning Committee	N/A	N/A
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	District staff manage the County's annual stream channel maintenance program
Mutual aid agreements	N/A	See Placer County Requirements
Other	Y	District Board of Directors and Technical Advisory Committee
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N/A	Utilize resources of Placer County
Floodplain Administrator	N/A	Utilize resources of Placer County
Emergency Manager	N/A	Utilize resources of Placer County
Community Planner	N/A	Utilize resources of Placer County
Civil Engineer	Y	District Manager and Development Coordinator have Civil Engineering backgrounds with hazards and mitigation training. Staff coordinate effectively with other agencies within Placer County and utilize additional staff resources from Placer County

GIS Coordinator	N/A	Utilize resources of Placer County, Development Coordinator provides internal GIS support
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Everbridge flood warning system, ALERT system of precipitation and stream level gages
Hazard data and information	Y	District's Flood Response Handbook – Updated Annually
Grant writing	Y	District has received FEMA CTP grants, State DWR Prop 84 IRWM grants, DWR Flood Corridor Protection Program grant, DWR Flood Emergency Response Project grant, and DWR USRP grant
Hazus analysis	N	N/A
Other		
How can these capabilities be expanded and improved to reduce risk?		
Expansion and update of ALERT flood warning system will help to better monitor and respond to flood events. Continuing to pursue flood inundation forecasting software systems will allow for better flood emergency planning and response.		

Source: PCFCWCD

P.6.3. Fiscal Mitigation Capabilities

Table P-11 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table P-11 PCFCWCD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	District's General Fund
Authority to levy taxes for specific purposes	N	N/A
Fees for water, sewer, gas, or electric services		N/A
Impact fees for new development	Y	Dry Creek Trust Fund; used for regional flood control projects within the watershed
Storm water utility fee	N	N/A
Incur debt through general obligation bonds and/or special tax bonds	N	N/A
Incur debt through private activities	N	N/A
Community Development Block Grant	N	N/A
Other federal funding programs	Y	FEMA CTP program for floodplain mapping studies

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
State funding programs	Y	State DWR Prop 84 IRWM grants, DWR Flood Corridor Protection Program grant, DWR USRP grant, and DWR Flood Emergency Response Project grant
Other		
How can these capabilities be expanded and improved to reduce risk?		
The impact fees for new development can be expanded to develop new impact fees on development within the Cross Canal Watershed area. This could be used to fund regional flood control projects, which would reduce flooding risk. Continued pursuit of FEMA CTP grants will help reduce risk by identifying risks through updated and new floodplain mapping. Continued pursuit of State funding will help reduce risk through funding of additional flood control projects and flood warning system expansion and upgrades.		

Source: PCFCWCD

P.6.4. Mitigation Education, Outreach, and Partnerships

Table P-12 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table P-12 PCFCWCD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	American Basin Watershed Council; District staff attend monthly meetings
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N/A	Utilize resources of Placer County
Natural disaster or safety related school programs	N/A	Utilize resources of Placer County
StormReady certification	N/A	N/A
Firewise Communities certification	N/A	N/A
Public-private partnership initiatives addressing disaster-related issues	Y	FEMA Flood Mitigation Assistance Program (FMA) to assist with residential and commercial building elevation projects
Other		
How can these capabilities be expanded and improved to reduce risk?		
Public outreach can be continued through participation in local citizen groups and non-profit organizations. This will help to reduce risk through the active engagement of stakeholders to identify risks and hazards. Public educational efforts regarding the FMA can be expanded when there is additional interest in elevation projects. These projects provide mitigation by making structures more resilient to flood hazards.		

Source: PCFCWCD

The District boundaries are the boundaries of Placer County. District programs are accomplished through a cooperative effort involving Placer County and all of the municipalities in the County which include: the City of Auburn, City of Colfax, City of Lincoln, Town of Loomis, City of Rocklin, and City of Roseville. In addition, cooperative agreements have been established with Sacramento and Sutter Counties for addressing issues in commonly shared watersheds, and other governmental agencies, such as Reclamation District 1001, the Nevada Irrigation District, and the Placer County Water Agency who also participate in District programs.

The cities and County formally adopted a Coordination Agreement in February 1986, which was also reaffirmed with minor changes in 1997. The agreement identifies mutual responsibilities and established the Technical Advisory Committee and the Policy Advisory Committee as forums for formulating standards, policies, and programs to be recommended to the Board of Directors.

P.6.5. Other Mitigation Efforts

The District is involved in a variety of mitigation activities including public outreach and project activities. These mitigation activities include:

- Provides information and support to the public on flood and drought related issues
- Collects and interprets data from a network of stream and precipitation gages operated by the District and others
- Collects data and coordinates with the National Weather Service
- Performs annual stream maintenance on the Dry Creek Watershed
- Provides technical support to the cities, county, and private sector by reviewing plans for public and private lands and for policy issues in flood control, drainage, and related areas
- Develops and implement master plans for key watersheds
- Supports regional floodplain management, including coordination with the NFIP
- Participates on special flood control and drainage projects.

Specific accomplishments of the District since the 2005 LHMP include:

2004: Land acquisition is completed for the 26 acre Miners Ravine off-channel basin project in Roseville. Major consulting contract for the Miners Ravine off-channel basin facility including planning, permitting, design, and construction oversight is awarded and begun. Land acquisition negotiations begin for proposed Secret Ravine floodplain restoration site in Rocklin. A study of remaining alternative regional detention sites in the Dry Creek Watershed is completed with no viable sites found. ALERT system software upgrades and three new gage installations are completed. An electronic version of the District's Stormwater Management Manual (SWMM) as well as Board meeting agenda/minutes are posted to the web. Biennial audit is completed. Work on development of the County's Local Hazard Mitigation Plan per the Disaster Mitigation Act of 2000 is completed.

2005: The District is awarded \$300,000 from the State Department of Water Resources under the Urban Streams Restoration Program and the District procures a consultant to perform planning, design, permitting, and construction oversight of the Secret Ravine floodplain restoration project. A new five-year MOU with the Department of Fish and Game is finalized for continued Dry Creek watershed stream channel maintenance activities. Planning and design of the Miners Ravine off-channel detention basin project

reaches a 95 percent level of completion. An update of the District's Flood Response Handbook is completed and distributed.

2006: District staff respond to the New Year's Day flooding event by helping activate the County's emergency operation center and by providing technical assistance as necessary. The Board approves all CEQA related documents and construction bid documents for the Miners Ravine Off-Channel Detention Basin Facility. Construction bids are received, all necessary permits are obtained, a construction contract is awarded, and construction commences on the Miners Ravine Facility in August. Construction reaches an approximate 70 percent completion level prior to winterization of the Miners Ravine site in early November. Planning and design of the Secret Ravine Floodplain restoration project begins and reaches an approximate 30 percent completion level by the end of the year. The District's ALERT flood warning software system is upgraded to the web-based Contrail system and plans are approved to install up to seven new gages.

2007: Construction of the Miners Ravine Off-Channel Detention Basin Facility is completed and the start of long-term operations and maintenance activities begins. A five year long vegetation and debris maintenance contract is executed with the California Conservation Corps (CCC) for the Miners Facility. The Secret Ravine Floodplain Restoration Project is placed on hold and an existing grant with the Department of Water Resources (DWR) is terminated due to easement acquisition difficulties and limited benefits of the proposed project. A \$2.8 million grant application for the Scilacci Farms Flood and Conservation Easement Project on Raccoon Creek is submitted to the DWR Flood Protection Corridor Program. Six new ALERT stream level and precipitation gages are purchased, installed and made operational within the District's ALERT system of gages. A professional services agreement is awarded to complete an update to the 1992 dated Dry Creek Watershed Flood Control Plan.

2008: Significant progress is made towards completing the update to the 1992 dated Dry Creek Watershed Flood Control Plan. The District's Miners Ravine Off-Channel Detention Basin Facility wins an award for engineering excellence and long term operations, maintenance, and monitoring activities continue at the facility. The Scilacci Farms Flood and Conservation Easement project is submitted to the State of California Department of Conservation grant program for consideration. FEMA coordinates with District to release results of 60 miles of creek study revisions and digitized floodplain mapping.

2010: The updated Dry Creek Watershed Flood Control Plan is released for public and agency review and presentations to our Board and the public are made. Coordinated with PCWA to submit a joint grant application under the State DWR Prop 84 IRWM program for the Antelope Creek Water Efficiency and Flood Control Project. Adopted the 2010 update to Placer County's Local Hazard Mitigation Plan. Coordinated with FEMA and our member agencies in the release and review of the Digital Flood Insurance Rate Maps (DFIRMS). Approved billing rates and methodology for reimbursement of all District staff time spent on development review submittals. Completed job classification studies of the District staff positions.

2011: The District receives a \$741,000 grant award under the State DWR Prop 84 IRWM program to assist with Phase 1 of the Antelope Creek Water Efficiency and Flood Control project and procures professional consulting services to assist with the project. The District Board accepts the 2011 Update to the Dry Creek Watershed Flood Control Plan as final and directs staff to move forward with the required financial nexus study and compliance under CEQA. The District receives a \$300,000 federal grant award through a FEMA

Cooperating Technical Partnership and begins detailed floodplain mapping studies of six creeks in Placer County. Major upgrades to the District's website are completed. The District updated the DCWS plan. It was finalized in 2011.

2012: The District begins work on the preliminary design, permitting and flood easements for the regional Antelope Creek Flood Control project. Considerable progress is made towards completion of a filing under CEQA and financial nexus studies for the 2011 Update to the Dry Creek Watershed Flood Control Plan. The District and its consultant make considerable progress towards completion of the FEMA Cooperating Technical Partnership project including detailed floodplain mapping studies of six creeks in Placer County. FEMA completes additional LIDAR topographic surveys for remaining portions of County. Staff provide information to member agencies regarding local legislative impacts of newly adopted State Department of Water Resources Central Valley Flood Protection Plan and Senate Bill 5 requirements.

2013: CEQA is completed for the Antelope Creek Flood Control Project and the project planning and design reaches a 65% level of completion. The City of Roseville and Placer County enter into a MOU to provide an additional \$400,000 of funding for this project. A major land acquisition for a flowage easement across private property is also executed for this project. The Board approves of the financial nexus study and revised fee structure recommended from the 2011 Updated Dry Creek Watershed Flood Control Plan. A second Cooperating Technical Partners agreement is entered into with FEMA wherein the District will provide specific duties during the public outreach phase and release of final floodplain mapping of six creeks in Placer County.

2014: Planning and design activities for the Antelope Creek Flood Control Project reach a 100% level of completion in advance of the start of construction anticipated in summer 2015. Required agency permit applications are submitted and additional required flowage easements on both private and publicly held lands are acquired. A grant application is prepared and submitted under the DWR Urban Streams Restoration Program for additional funding necessary to complete the construction of this project. All hydrologic modeling work on the first CTP agreement with FEMA is completed and preliminary floodplain mapping activities begin. A multi-agency Flood Emergency Response planning project gets underway including flood forecasting, flood inundation mapping and emergency response plan updates.

2015: Assisted affected member agencies with meeting the legislative requirements of the State Department of Water Resources new Urban Level of Flood Protection or ULOP (a 200-year protection standard) required by Senate Bill-5. Provided technical assistance during the development of Placer County's reverse 911 type public mass notification system utilized during flood events. Planning, design and permitting activities for the Antelope Creek Flood Control Project continued including processing of an amendment to the CEQA filing and finalizing the purchase of seven flowage easements from the City of Roseville. Final permitting and land acquisition activities associated with the Antelope Creek Flood Control Project continued but delayed the start of project construction until June 2016. FEMA produces preliminary FIRM maps for six new floodplain mapping studies of creeks in western and eastern Placer County. Work on the multi-agency Flood Emergency Response planning project continues including flood forecasting, flood inundation mapping and emergency response plan updates.

2016: Coordinated the public release of preliminary FEMA floodplain maps, including four public outreach meetings. Received a \$500,000 award from FEMA under the existing CTP agreement to restudy and map

an additional 50 miles of creeks within the County. Received a \$400,000 grant award from Department of Water Resources Urban Streams Restoration Program to be utilized towards the construction of the Antelope Creek Flood Control project. Obtained nearly all necessary agency permits and access agreements (excepting the Corps of Engineers 404 permit) necessary to go to construction bid for the Antelope Creek Flood Control project. Completed a 5-year update to our District's annex within the County's Local Hazard Mitigation Plan. Began the work of entering into a 12-year long Routine Maintenance Agreement with the State Department of Fish and Wildlife for permitting relating to the annual stream channel maintenance program. Continued planning and design efforts for an ALERT 2 type upgrade to the District's flood warning system of gages.

2017: Final permits and approvals to begin construction of the Antelope Creek Flood Control Project, Upper Weir were obtained in early 2017. The project went to bid and construction began in June 2017. Construction was substantially completed by the end of December 2017. Staff coordinated closely with FEMA and our local affected member agencies on floodplain mapping studies and the release of new digital FIRM maps under our existing Cooperative Technical Partnership (CTP) with FEMA. Work continued on efforts to enter into a 12-year long Routine Maintenance Agreement with the State Department of Fish and Wildlife for permitting relating to the annual stream channel maintenance program. Continued planning, design, and installation efforts for an ALERT 2 type upgrade to the District's flood warning system of gages.

2018: Construction of the Antelope Creek Flood Control Project, Upper Weir was accepted as complete on February 7, 2018. A professional consulting firm was procured and began work under a five-year agreement to provide long term mitigation, monitoring and reporting services for this project. The District was awarded a grant from the Department of Water Resources to act as the lead agency to complete the ALERT 2 type upgrades to our ALERT system of flood gages. Staff coordinated with the State Department of Fish and Wildlife to obtain a 12-year long Routine Maintenance Agreement to allow the County's annual stream channel maintenance program to continue. The District was awarded a third CTP grant from FEMA to perform floodplain mapping studies on an additional 60 miles of streams, a consultant was procured and work began on this new study. New floodplain maps produced under the second CTP project were presented to the public, finalized, and became effective on November 2, 2018.

2019: The District coordinated with the City of Roseville to complete the multi-year effort upgrading the District's ALERT flood warning system base station, software, and one gage location to ALERT 2 protocol. These upgrades were made possible through Round 2 of the Department of Water Resources Flood Emergency Response Project (FERP) Grant managed by the City of Roseville. Two new ALERT stream level and precipitation gages were also installed and made operational within the Districts ALERT system of gages as part of this project.

The Scilacci Farms Flood and Conservation Easement project is approved by the State of California Department of Conservation grant program and executed in January.

2020: The District submitted a Notice of Intent for a fourth CTP grant from FEMA to perform floodplain mapping studies on an additional 33 miles of streams. Coordinated the submittal of the floodplain mapping study information to FEMA for the third CTP grant project.

Annually - Stream Channel Maintenance Program - Placer County annually removes vegetation from selected creek channels to improve flood flows.

P.7 Mitigation Strategy

P.7.1. Mitigation Goals and Objectives

The PCFCWCD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

P.7.2. Mitigation Actions

The planning team for the PCFCWCD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Dam Failure
- Drought and Water Shortage
- Flood: 1%/0.2% Annual Chance
- Flood: Localized Stormwater Flooding
- Levee Failure
- Severe Weather: Heavy Rains and Storms
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

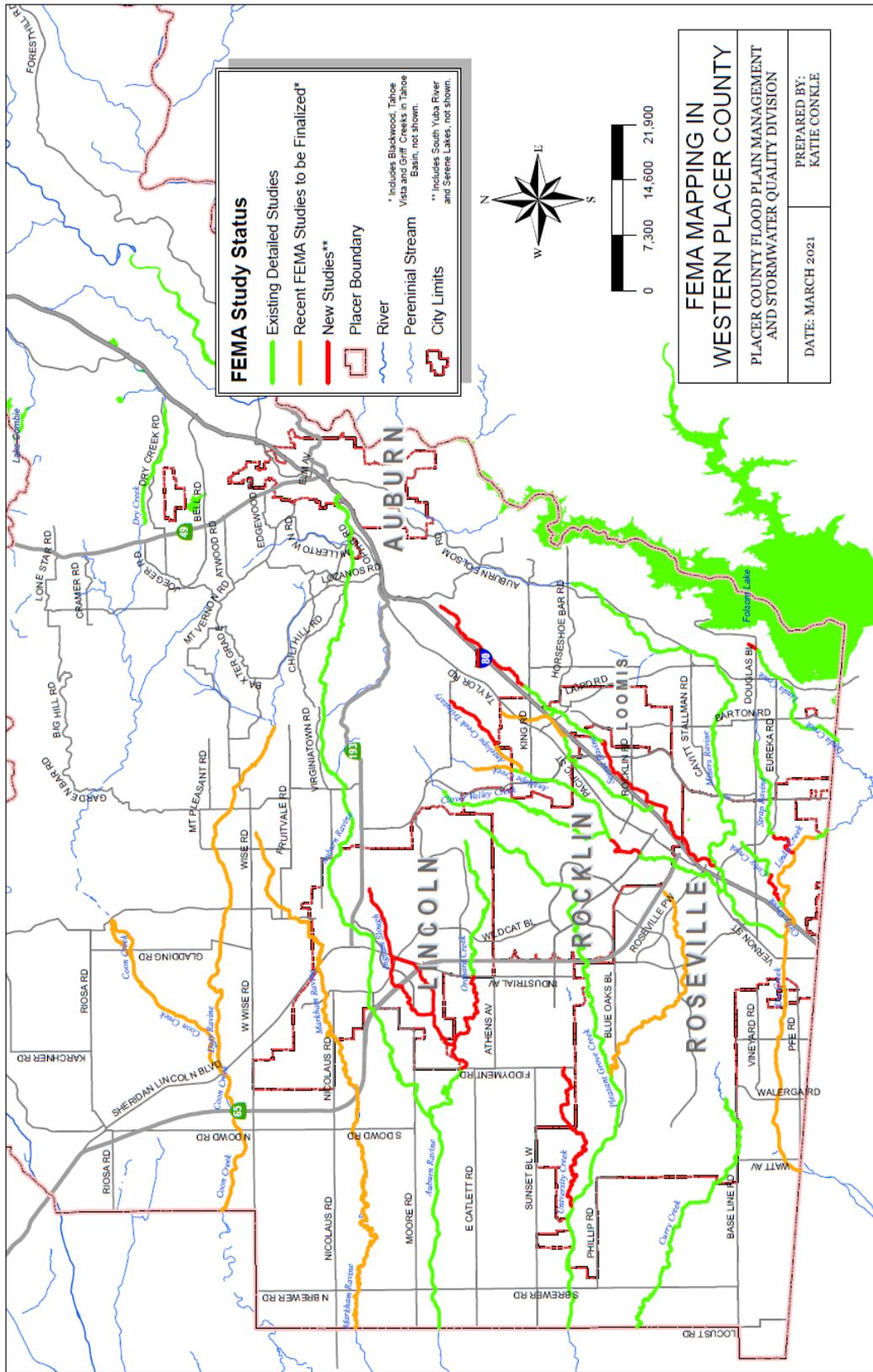
Action 1. FEMA CTP DFIRM Mapping Study

Hazard Addressed: Dam Failure, Flood, Localized Flooding, Levee Failure, Heavy Rains and Storms (indirectly would address drought and water shortage and wildfire, as drought can cause fire, which can cause flooding from the burn scar)

Goals Addressed: 1, 2, 3, 4, 5, 7

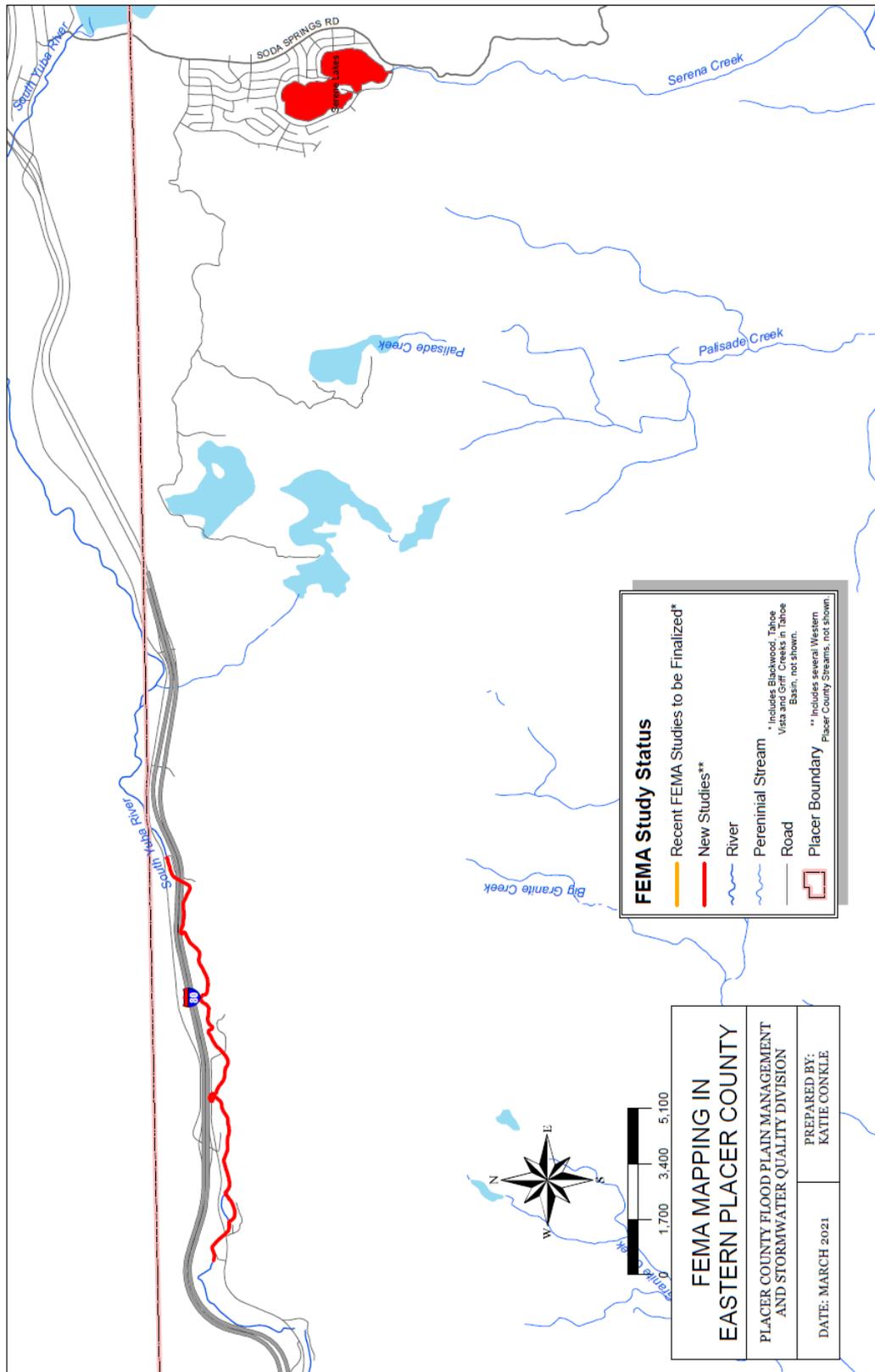
Issue/Background Statement: The Placer County Flood Control and Water Conservation District (District), coordinating closely with local member agencies, has prepared a list of additional study areas within Placer County recommended to be considered for the next round of Risk Map (CTP No. 4) floodplain mapping studies. Eleven areas were identified as priority stream limits, with consideration given to communities at flood risk, population growth, new development, peak flow increases, recent flooding history and changes to special flood hazard areas. A significant portion (approximately 15 miles) of the remaining un-mapped Zone A areas within the County, Roseville, and Lincoln was included in the request. The total length of proposed new study area, including all existing A and AE zone reaches amounts to approximately 33 miles. The map provided below depicts the FEMA FIRM mapping status and proposed new mapping/study reaches for Placer County. This effort would provide hydrologic modeling and data sufficient for FEMA’s contractor to utilize this information to produce future updated DFIRM mapping. The proposed new mapping study areas are shown in Figure P-7 and Figure P-8.

Figure P-7 FEMA CTP Mapping – Western Placer County



Source: PCFCD

Figure P-8 FEMA CTP Mapping – Eastern Placer County



Source: PCFCD

Additional and more accurate DFIRM mapping of new study areas will enable the County to better manage their floodplains and reduce flood risk.

Other Alternatives: No action; maintain current mapping

Existing Planning Mechanisms through which Action Will be Implemented: FIS/DFIRM

Responsible Office: Placer County Flood Control District, FEMA

Priority (H, M, L): High

Cost Estimate: As a Cooperating Technical Partner, the District would be able to cost-share by providing in-kind professional labor services, existing hydrologic models, topographic field data (LIDAR), and other background information on the proposed study areas as has been done in the past.

Benefits (Losses Avoided): Increased understanding of flood risk in the County. Better mapping to prevent citizens from building in the floodplain and reducing resulting NFIP flood claims.

Potential Funding: FEMA CTP, District General Fund

Schedule: The CTP No. 3 preliminary mapping will be completed in 2021. Update of the physical DFIRM maps will occur several years later. The CTP No. 4 project is anticipated to begin in 2022.

Action 2. *Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds*

Hazard Addressed: Dam Failure, Flood, Localized Flooding, Levee Failure, Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background Statement: Historically, flooding in the Dry Creek and Cross Canal watersheds has been a major concern. Placer County is not only concerned with existing flooding problems, but with future problems resulting from increased growth and development in the area. Specifically, this action recommends projects be pursued for regional detention and retention within the Dry Creek and Cross Canal watersheds. Implementation of the regional Antelope Creek Flood Control Project is currently the highest regional priority project for the District. This site was identified within the updated 2011 Dry Creek Watershed Flood Control Plan prepared for the District. The first phase of the Antelope Creek Flood Control Project (i.e., the upstream weir of two proposed) was completed in 2018. Implementation of regional detention and retention projects will reduce future flood-related losses. It is recommended the District continue to attempt to partner with Placer County regarding a possible regional retention project on the Scilacci Farms project in the Cross Canal watershed, along Raccoon Creek.

Other Alternatives: No action.

Existing Planning Mechanisms through which Action Will be Implemented:

Responsible Office: Placer County Flood Control and Water Conservation District, in conjunction with its member agencies.

Priority (H, M, L): High

Cost Estimate: \$20 million +

Benefits (Losses Avoided): Life safety; reduction in property loss.

Potential Funding: HGMP, PDM, Dry Creek Trust Fund, other grants (federal, state).

Schedule: Within ten years.

Action 3. Update the Flood Control Plan for the Cross Canal Watershed

Hazard Addressed: Dam Failure, Flood, Localized Flooding, Levee Failure, Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background Statement: The flood control plan for the Cross Canal watersheds is outdated having been performed in 1993. Rapid urbanization within this watershed has occurred and is projected to continue with significant impacts to creeks within the watershed due to increasing amounts of impervious surfaces and altered land uses. Updated hydrology and hydraulic models are now available for most creeks within this watershed and can be referenced for both flood control and land use planning purposes.

Other Alternatives: Continue to review urbanization projects with outdated models.

Existing Planning Mechanisms through which Action Will be Implemented:

Responsible Office: Placer County Flood Control and Water Conservation District and its member agencies.

Priority (H, M, L): High

Cost Estimate: \$500,000

Benefits (Losses Avoided): Improved flood control and land use planning capabilities throughout western Placer County.

Potential Funding: Placer County Flood Control District reserves, PDM, State Planning Grants

Schedule: Immediate and ongoing.

Action 4. Upgrade Flood Warning System to ALERT 2, Add Additional Gage Locations and Flood Forecasting Capabilities

Hazard Addressed: Dam Failure, Flood, Localized Flooding, Levee Failure, Heavy Rains and Storms (indirectly would address drought and water shortage and wildfire, as drought can cause fire, which can cause flooding from the burn scar)

Issue/Background Statement: The Placer County Flood Control District, in conjunction with OES, has installed an ALERT flood warning system in the County consisting of 18 precipitation and stream level gages. The regional system, including ALERT gages owned and operated by the City of Roseville and Sacramento County, consists of approximately 102 rain gages and 84 stream gages. Additionally, the District monitors several rain and stream gages in the Truckee River Watershed. These ALERT gages provide the District with real-time rainfall amounts and stream level data. An upgraded system to include ALERT 2 type improvements, as well as real time flood warning gages and flood forecasting capabilities for flood-prone areas would increase the warning time for implementation of effective mitigation measures and necessary evacuations. The ALERT 2 type upgrades are being funded by the State DWR FERP program. The ALERT 2 base station improvements were implemented in 2019 with Round 2 of the FERP grant managed by the City of Roseville. The individual site upgrades will occur over the next two years under Round 3 of the FERP managed by the District.

Other Alternatives: No action – continue with current plan

Existing Planning Mechanisms through which Action Will be Implemented:

Responsible Office: Placer County Flood Control District and Placer County Office of Emergency Services

Priority (H, M, L): Medium

Cost Estimate: \$100,000

Benefits (Losses Avoided): Life-safety, reduction in property loss, improved warning, increased lead time.

Potential Funding: PDM, HGMP, District reserves.

Schedule: Within two years

Annex Q Placer County Resource Conservation District

Q.1 Introduction

This Annex details the hazard mitigation planning elements specific to Placer County Resource Conservation District (PCRCDD or District), a new participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to PCRCDD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

Note: PCRCDD participated in the original 2005 Placer County LHMP. A copy of that document could not be located by PCRCDD, Placer County, or Cal OES. Additionally, staff turnover in the past 16 years has reduced institutional memory of that 2005 Plan. It can be assumed that none of PCRCDD's proposed mitigation actions were completed, PCRCDD's mitigation priorities at that time are unknown, and that the 2005 Plan was not incorporated into any PCRCDD planning mechanisms. Development in the District since 2005 was described by PCRCDD as minimal since the District owns no fixed assets, and a general description of more recent development in the District is included in Section Q.5.2 of this Annex.

Q.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table Q-1. Additional details on plan participation and District representatives are included in Appendix A.

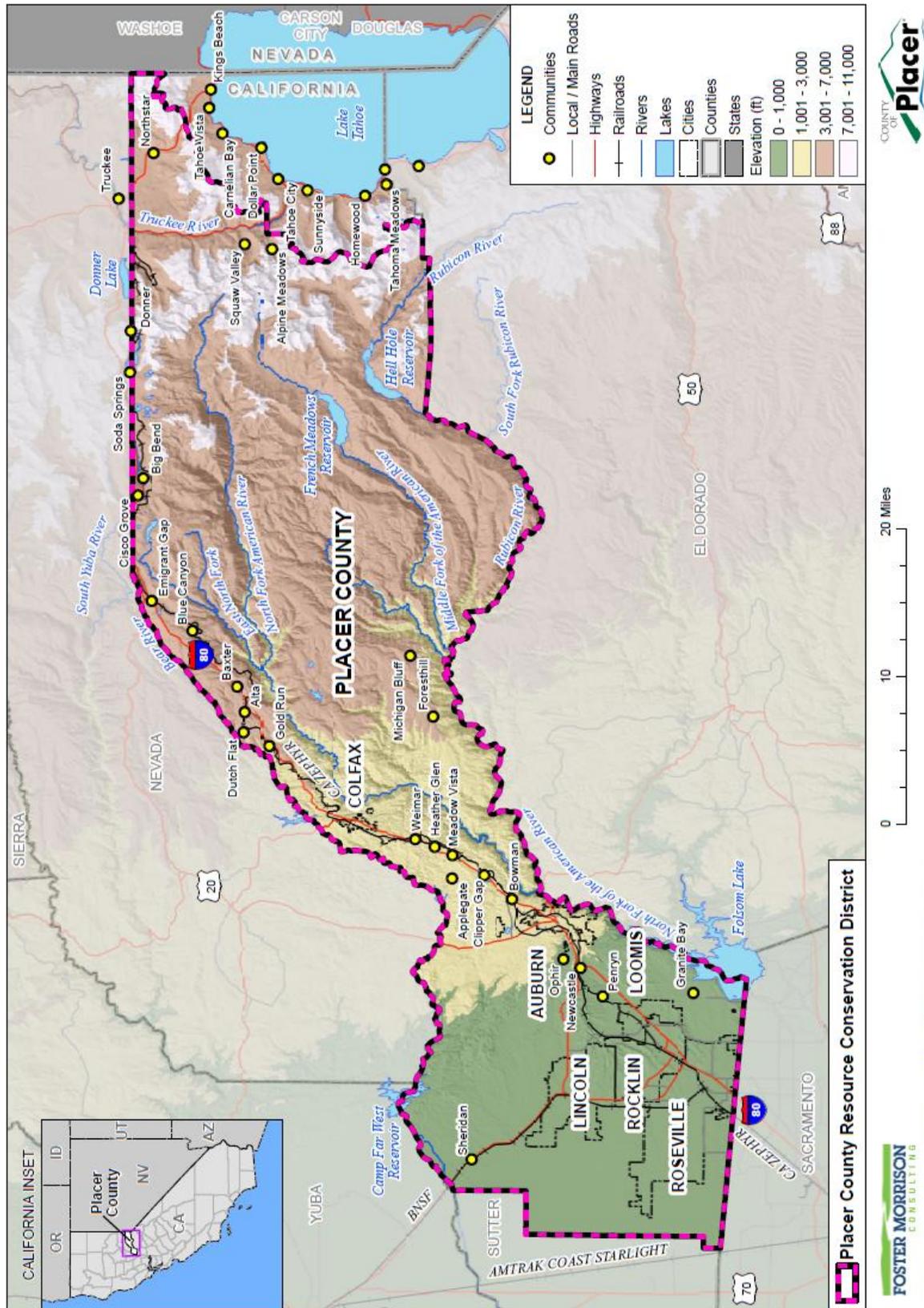
Table Q-1 PCRCDD – Planning Team

Name	Position/Title	How Participated
Sarah Jones	Executive Director	Participated in Placer County Hazard Mitigation Planning meetings, developed PCRCDD annex
George Alves	Program Administrator	Participated in Placer County Hazard Mitigation Planning meetings, provided input on PCRCDD annex

Q.3 District Profile

The District profile for the PCRCDD is detailed in the following sections. Figure Q-1 displays a map and the location of the District within Placer County.

Figure Q-1 PCRCD



Q.3.1. Overview and Background

The Placer County Resource Conservation District is an independent, self-governing body organized in 1946 and dedicated to the conservation of natural resources. The PRCD develops and enables programs in partnership with others that assist private landowners and public agencies to accomplish the goal of conserving natural resources. Our District develops, plans and implements programs, services and activities to effectively address current and emerging conservation and natural resource priorities in Placer County.

The RCD encompasses all of the County of Placer except for the Tahoe Basin and covers approximately 1,400 square miles of diverse stakeholders, habitat, and elevation, from the Sacramento Valley floor over the crest of the Sierra down the eastern slope to the Nevada State line.

District boundaries match Placer Counties other than the Tahoe Basin which falls under the Tahoe Resource Conservation District. The PRCD handles natural resource environmental work, so any environmental hazard that can be mitigated would fall under the District's purview – habitat restoration, forestry, wildfire, erosion control, invasive weeds, watershed health, stormwater etc.

The Placer RCD mission is dedicated to supporting wise natural resource management and conservation, providing education and technical assistance or direction to private landowners/operators, local and regional entities independently and in collaboration with other local, state, and federal agencies and organizations. The RCD implements plans, programs, holds land easements and endowments to conserve and enhance the natural resources of the District while inspiring and mobilizing public conservation awareness and involvement. Placer RCD shares many common natural resource management goals with Placer County and partners with them to achieve our mission. Our participation in the plan is imperative to achieve shared goals of natural resource conservation and preservation for lands in Placer County.

Q.4 Hazard Identification

PCRCD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table Q-2). It should be noted that the rankings here are the same as for Placer County as a whole, with the exception of seiche (which occurs outside the boundaries of the PCRCD).

Table Q-2 PCRCO—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Significant	Highly Likely	Critical	Medium	Medium
Avalanche	Limited	Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	High	–
Dam Failure	Significant	Occasional	Critical	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	Medium	High
Earthquake	Significant	Occasional	Critical	Low	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	Low	Medium
Floods: Localized Stormwater	Limited	Occasional/ Highly Likely	Limited	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Low	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	Low	Low
Tree Mortality	Extensive	Likely	Limited	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

Q.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

Q.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section Q.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table Q-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

Q.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the PCRCDD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

The PCRCD owns no facilities or properties.

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. PCRCD provides services to all landowners within the District boundary and populations served align with that of Placer County.

Natural Resources

PCRCD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

PCRCD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

Q.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table Q-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Agriculture Hazards

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Before its rapid population growth in the 1970s and 1980s, Placer County was known as an agricultural and timber-producing county. Agriculture and timber production are still important sectors of the County's economy; however, manufacturing, recreation, and service industries have increased in economic importance. Agricultural lands continue to be at risk to development based on population growth projections for the County. In western Placer County, land traditionally used for agricultural purposes lies near existing cities and is expected to accommodate much of this population increase. While its agricultural land is threatened, Placer County retains a significant amount of agricultural land where the economy is intact and where farmers are a real presence in the community.

According to the HMPC, agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. Wildfire and other hazards can also affect agricultural lands. The 2018 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

In addition to severe weather, invasive species can affect the agricultural industry in the County. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard addresses the issues related to invasive pests including that pose a significant

threat to the agricultural industry and are therefore a concern in the Placer County Planning Area. This hazard does not address pests and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Location and Extent

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: insects, weeds, severe weather, as well as downturns in commodity prices. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Insects and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

There have been no state or federal FEMA disasters in the County related to agricultural hazards. There have been multiple USDA Secretarial Disaster Declarations, as shown on Table 4-6 of the Base Plan. Past occurrences regarding natural resources align with those of Placer County.

Vulnerability to and Impacts from Agricultural Pests and Diseases

According to the USDA, every year natural disasters, such as droughts, extreme heat and cold, floods, fires, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. More specific impacts by hazard were listed in Section 4.3.6 of the Base Plan.

In addition to threats to agriculture from weather and other natural hazard events, agriculture in the County is at risk from insects, pests, and noxious weeds. Establishment of an invasive species would be detrimental to the agricultural industry of Placer County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem.

In addition, invasive weeds can increase fire risk in the County.

Assets at Risk

The PCRCDD owns no facilities or properties that could significantly be impacted by notable hazard events. Hazards would not significantly impact the District's ability provide service unless it was so overwhelmed with landowner service requests that additional staff would need to be hired.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased soil erosion
- Increased wildfire

Assets at Risk

The PCRCD owns no facilities or properties that could significantly be impacted by notable hazard events. Hazards would not significantly impact the District’s ability provide service unless it was so overwhelmed with landowner service requests that additional staff would need to be hired.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table Q-3.

Table Q-3 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Placer RCD provides landowner assistance to landowners affected by drought, the impact is therefore an increase in requests for chipping services, technical assistance regarding irrigation, water and crop management and tree mortality

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

This may affect service requests for agriculture assistance and tree mortality (increase wildfire risk) in the District.

Assets at Risk

The PRCD owns no facilities or properties that could significantly be impacted by notable hazard events. Hazards would not significantly impact the District's ability provide service unless it was so overwhelmed with landowner service requests that additional staff would need to be hired.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state

of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

Tree mortality issues align with those of Placer County and result in an increased need for wildfire fuel reduction and mitigation. The Placer RCD offers technical assistance to landowners who experience tree mortality and help landowners apply for cost-share funds to remove dead and dying trees on their property through our partnership with the Natural Resource Conservation Service.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Requests for chipping services increased by 80% over the last several years resulting in longer wait times for service.

Assets at Risk

The PRCD owns no facilities or properties that could significantly be impacted by notable hazard events. Hazards would not significantly impact the District’s ability provide service unless it was so overwhelmed with landowner service requests that additional staff would need to be hired.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the PCRCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where

there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the PCRCD were created. Figure Q-2 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from Urban Unzoned to Very High.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table Q-4.

Table Q-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

No direct impact on RCD from wildfires, but wildfires may affect landowners negatively, this may result in an increase of technical assistance provided by the District.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat

of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

The PCRCO owns no facilities or properties that could significantly be impacted by notable hazard events. Hazards would not significantly impact the District’s ability provide service unless it was so overwhelmed with landowner service requests that additional staff would need to be hired.

Q.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

Q.6.1. Regulatory Mitigation Capabilities

Table Q-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PCRCO.

Table Q-5 PCRCO Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N/A	
Capital Improvements Plan	N/A	
Economic Development Plan	N/A	
Local Emergency Operations Plan	N/A	
Continuity of Operations Plan	N/A	
Transportation Plan	N/A	
Stormwater Management Plan/Program	N/A	
Engineering Studies for Streams	N/A	
Community Wildfire Protection Plan	Y	2021 Placer County (Western Slope) CWPP
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N/A	

Building Code, Permitting, and Inspections		Y/N	Are codes adequately enforced?
Building Code	N/A	Version/Year:	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:	
Fire department ISO rating:	N/A	Rating:	
Site plan review requirements	N/A		
Is the ordinance an effective measure for reducing hazard impacts?			
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?	
Zoning ordinance	N/A		
Subdivision ordinance	N/A		
Floodplain ordinance	N/A		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A		
Flood insurance rate maps	N/A		
Elevation Certificates	N/A		
Acquisition of land for open space and public recreation uses	N/A		
Erosion or sediment control program	N/A		
Other			
How can these capabilities be expanded and improved to reduce risk?			
<p>The 2021 Placer County (Western Slope) Community Wildfire Protection Plan is the result of a community-wide planning effort. These efforts include input from five individual Fire Safe Council, two addition Fire Protection District, and bordering County, State, and Federal landowners. Field data gathering, compilation of existing documents, geographic information, and analysis provide recommendations designed to reduce the threat of wildfire-related damages to values at risk. Each assessment portion of the CWPP has identified hazards and values at risk associated with wildland fire in proximity to the Wildland-Urban Interface (WUI) areas. Each section of the CWPP has identified projects that address fuels mitigation, public education, and safety. Wildfire related mitigation efforts will be sought to be expanded through this CWPP.</p>			

Source: PCRCDD

Placer County Resource Conservation District Long Range Strategic Plan (2016)

Placer County Resource Conservation District (RCD) is a public body or unit of government (Special District) of the State of California organized under Public Resources Code Division 9. The Placer County RCD is self-governed by a seven member Board of Directors who are appointed by the Placer County Board of Supervisors. The Directors guide programs and set policies consistent with local conservation goals and priorities. The day to day operations are carried out under the leadership and supervision of the Executive Director.

The purpose of the organization is to make available technical, financial and educational resources, whatever their source, and focus or coordinate them so that they meet the needs of the local land manager with conservation of soil, water and related natural resources.

In order for the organization to be effective, internally and externally, a management scoping system will be utilized to filter, develop, plan, budget, administer, monitor, evaluate and communicate the work of Placer County RCD. This plan lays out goals for that purpose.

Q.6.2. Administrative/Technical Mitigation Capabilities

Table Q-6 identifies the District department(s) responsible for activities related to mitigation and loss prevention in PCRCD.

Table Q-6 PCRCD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N/A	
Mitigation Planning Committee	N/A	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N/A	
Mutual aid agreements	N/A	
Other		
		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Staff	Y/N FT/PT	
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	N/A	
Community Planner	N/A	
Civil Engineer	N/A	
GIS Coordinator	N/A	
Other	Y	Executive Director and Program Administrator are trained in mitigation.
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N/A	
Hazard data and information	N/A	
Grant writing	Y	PRCD does not enforce regulations. We have a part-time grant writer to acquire funding for District activities. The coordination with between staff and partners is effective- however this position would be more effective as a full-time position.
Hazus analysis	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
By hiring a full-time grant writer PCRCD would be more effective at acquiring funding to address natural resource hazards in Placer County.		

Source: PCRCDD

Q.6.3. Fiscal Mitigation Capabilities

Table Q-7 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table Q-7 PCRCDD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs	Y	Federal funding is utilized for PRCD activities related to forestry and agricultural landowner technical assistance and watershed health projects.
State funding programs	Y	State funding is utilized for PRCD activities related to fuel reduction, tree mortality, landowner technical assistance and conservation education and outreach
Other		
How can these capabilities be expanded and improved to reduce risk?		
Placer RCD primarily depends on and grant funds and contractual agreements to fund District operations. In FY 2019-20 out of a \$5.5M annual budget our allocation of tax revenue from Placer County, was approximately \$400K which is considered our base funding and only reliable and stable source of funding. The remaining funds were all acquired mostly through grant funding. If grant funding or other sources of state and federal funding are not available, it greatly impacts our ability to fund operational costs, provide services and complete projects. Additional funding from Cal OES, DWR, FEMA or other entities will allow the District to complete additional mitigation related projects.		

Source: PCRCDD

Q.6.4. Mitigation Education, Outreach, and Partnerships

Table Q-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table Q-8 PCRCDD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Placer RCD is a core member of the Placer County Firesafe Alliance who works closely with FireWise Communities and Fire Safe Councils to disseminate information regarding emergency preparedness and education and outreach regarding fire prevention and safety measures.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Placer RCD has a Firewise Trailer Program that assists community organizations in neighborhood clean-up days by loaning out tools and equipment, and providing educational resources regarding defensible space and home hardening.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional funding would allow these programs to expand by providing more outreach materials and staff time to organize events and work with the public.		

Source: PCRCDD

Q.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

CALFED North Fork American River Sediment Dynamics Study

A consortium of stakeholders including Placer County RCD, the Placer County Water Agency, the US Forest Service, Sierra Pacific Industries, CA State University-Sacramento, and the North American River Watershed Coordinator, with support from Sierra College, have stewarded a study, funded by CALFED through the CA Department of Water Resources (DWR) which is due to be completed by mid-2007. One outcome of this effort is expected to be Best Management Practices for erosion reduction and reduced water quality degradation.

CALFED Working Landscapes Grant

This grant funds the development of a GIS-based American Basin Working Landscape Strategy, implementation of three specific riparian and wetland restoration projects, and preparation of the applicants to purchase up to four wildlife friendly agricultural easements.

Agricultural and Natural Resource Land Inventory

The Agricultural and Natural Resource land Inventory was developed using a number of sources. The basis for development was the parcels obtained from the County of Placer (2019). The purpose for the use of the parcels as a base was to provide a consistent and updatable GIS based record that also provide important base information such as owners and addresses. The final inventory contains only those lands identified as natural resources or agricultural lands.

Prescribed Burning on Private Lands (white paper draft)

Development of a programmatic framework that increases the use of prescribed fire on private lands through interagency collaboration. This document is being created in tandem with case study burns that will help identify realistic solutions to common roadblocks, allowing local agencies and organizations to appropriately serve landowners in low-risk/low-complexity prescribed burns. Prescribed burning on private lands will protect life, property, and ecological resources and prevent large-scale greenhouse gas emissions from catastrophic wildfire. Current State and Local programs are neither designed for, nor facilitate, burning on small private parcels of land. Approximately 40% of California’s forestlands are privately owned, creating an exciting opportunity to improve forest health engaging with and empowering our community to become more resilient to wildfire.

Other Projects

Other projects for the District are shown on Table Q-9.

Table Q-9 PCRC D Projects

Program Area	Name	Funder	Hazard Area(s)	Description
Watershed / Stream Restoration	Red Sesbania Removal	Sacramento Area Flood Control District	Climate Change, Floods: Localized stormwater	Removal of the invasive plant Red Sesbania in Dry Creek watershed
	Atwood Conservation Easement	Auburn Recreation District		11 acre conservation easement - conduct biological surveys and make resource management recommendations
	Storm Water Management	Placer County	Climate Change, Floods: Localized stormwater	Stormwater management services provided to Placer County under a cooperative agreement.
	Dry Creek Restoration (SLEWS project)	United States Fish and Wildlife Service	Climate Change, Floods: Localized stormwater	Implementation of watershed health projects in the Dry Creek.
Forestry / Fuels Reduction	Forestland Stewardship Newsletter & Forestry Committee	CALFIRE / United States Forest Service	Climate Change, Wildfire, Tree Mortality	Develop and distribute the Forestland Steward Newsletter tri-annually.

Program Area	Name	Funder	Hazard Area(s)	Description
	Placer County Chipper Program	CALFIRE	Climate Change, Wildfire, Tree Mortality	Low cost chipping service to resident of Placer County.
	Auburn Shaded Fuelbreak	CALFIRE	Climate Change, Wildfire, Tree Mortality	300- acre shaded fuel break in the Auburn State Recreation Area.
	Placer Co. Coordinated Fuelbreak - Phase 1	CALFIRE	Climate Change, Wildfire, Tree Mortality	350 acre shaded fuelbreak in the Applegate community
	Sacramento HQ Agreement	CALFIRE	Climate Change, Wildfire, Tree Mortality	Fuel reduction work prioritized by CALFIRE throughout Placer County
	Prescribed Burning on Private Lands Pilot Program	CALFIRE	Climate Change, Wildfire, Tree Mortality	Develop a white paper outlining a framework for implementation of prescribed burning on private lands
	NRCS Forestry 2 Agreement	US Natural Resource Conservation Service (NRCS)	Climate Change, Wildfire, Tree Mortality	NRCS Cooperative Agreement enabling RCD contractors / staff to assist NRCS with data collection, outreach, and technical assistance for private landowners with forest health concerns and cost-share programs.
	Regional Conservation Partnership Program- Tree Mortality Program	CARCD / NRCS	Climate Change, Wildfire, Tree Mortality	Program specific to the Sierra Nevada Region to help private landowners remove dead and dying trees through technical assistance and providing cost-share funds.
Soil / Ag	Soil Health Tech. Asst.	NRCS	Climate Change, Agricultural Pests and Diseases, Drought and Water Shortage	NRCS Cooperative Agreement enabling RCD contractors / staff to assist NRCS with data collection, outreach, and technical assistance for private landowners with soil health concerns and cost-share programs (rangeland, pasture, crops). Submitted a letter requesting an extension in early May.
	Urban Agriculture Technical Assistance	National Association of Conservation Districts	Climate Change, Agricultural Pest and Diseases, Drought and Water Shortage	Provide landowner technical assistance to urban agricultural producers with an emphasis on underserved communities
	Carbon Farm Planning	Carbon Cycle Institute	Climate Change, Agricultural Pest and Diseases, Drought and Water Shortage	Provide Carbon Farm planning to increase carbon sequestration program for farmers and ranchers in Placer County

Program Area	Name	Funder	Hazard Area(s)	Description
Education / Outreach	Ag Day	District-led	Climate Change, Agricultural Pest and Diseases, Drought and Water Shortage	Annual Agricultural educational field day for Placer County students (3rd-5th grade).
	Ag Tour (virtual)	Placer County	Climate Change, Agricultural Pest and Diseases, Drought and Water Shortage	Annual event for county officials and the public to gain exposure to ag related issues affecting local producers.
	FSTEP (Fireline Safety Training and Education Program)	District-led (fee for service program)	Climate Change, Wildfire, Tree Mortality	Fireline Safety Awareness for the Hired Equipment Vendors courses that are required annually for private equipment operators / vendors to be admitted onto CALFIRE / USFS led fire suppression events. Demand varies, but 8-12 classes (40 students each) are typically hosted by Placer RCD.
	Firewise Trailer Program	California Fire Foundation, Listos	Climate Change, Wildfire, Tree Mortality	Outreach program providing residents to access of tools for fuel reduction and education regarding defensible space, home hardening and wildfire prevention and safety
	Fire Prevention Education	CALFIRE	Climate Change, Wildfire, Tree Mortality	Developing outreach material for homeowners regarding wildfire safety and prevention in partnership with Placer County and CALFIRE.

Source: PCRCD

Q.7 Mitigation Strategy

Q.7.1. Mitigation Goals and Objectives

The PCRCD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

Q.7.2. Mitigation Actions

The planning team for the PCRCD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Agriculture Pests and Diseases
- Climate Change
- Drought & Water Shortage
- Tree Mortality

➤ Wildfire

Though initially considered a priority hazard, due to the difficulty in the District in having direct mitigation actions for drought, it was dropped as a hazard for mitigation planning purposes. The hazards addressed below still include drought, as its effects are mitigated by these actions.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Fuel Breaks – Wildland Urban Interface (WUI)

Hazards Addressed: Wildfire, Tree Mortality, Climate Change, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The purpose of a Shaded Fuel Break within the WUI is to minimize destruction to communities from wildfire and to protect and enhance natural resources, watershed and habitat of western Placer County. When complete, these projects will help protect the community’s identified as “Communities at Risk from Wildfire” and identified as communities with the WUI, listed in the CWPP. These are important especially in times of drought. Shade in these areas conserves moisture.

This practice applies to all communities within the WUI where protection from wildfire is needed. These Shaded Fuel breaks are planned thinning of dense vegetation in an area approximately 300 feet wide where fire does not easily move from the ground into the overhead tree canopy and to allow fire resources to utilize such a location to increase probability of success during fire suppression activities. Fuel break width will be dependent upon the fuels and topography in any given area.

For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP WUI, for that specific Fire Safe Council.

The Placer County Fire Safe Alliance and Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop shaded fuel breaks to protect specific communities and watersheds within the WUI.

Project Description: Fuel reduction work is subject to specific terrain and environmental conditions and treatments may include removal of trees and vegetation by hand crews, chipping, mastication, grazing, herbicide or prescribed burning.

Other Alternatives: Rely on the individual property owner or land managers within the WUI to develop fuel breaks to protect resources and assets from fire that may spread from the wildland into urban areas.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement shaded fuel breaks identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County Resource Conservation District, Placer County, Stakeholders, & Landowners

Cost Estimate: The costs for the individual projects are identified in the Western Slope CWPP Project Planning Worksheets.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and cities within the County.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): High

Action 2. Fuel Break – Large Strategic

Hazards Addressed: Wildfire, Tree Mortality, Climate Change, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Large Strategic Fuel Break projects will provide landscape scale community protection in our area. When complete, these projects will help protect the communities identified as “Communities at Risk from Wildfire” listed in the National Fire Plan.

This practice applies to all communities where protection from wildfire is needed. These Strategic Fuel breaks are planned and located on the landscape as part of a conservation management system for a land unit where there is a need to control the risk of the spread of fire into our communities as well as to protect watersheds, critical infrastructure, and commerce traveling on our freeways and railways. Typically, they break up large, continuous tracts of dense natural fuels, thus limiting uncontrolled spread of fire, and are commonly associated with firebreaks (permanent or temporary strips of bare or vegetated land planned to retard fire). For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP for that specific Fire Safe Council area.

The Placer County Fire Safe Alliance and Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop large strategic fuel breaks to protect specific communities and watersheds within the County.

Project Description: Fuel reduction work is subject to specific terrain and environmental conditions and treatments may include removal of trees and vegetation by hand crews, chipping, mastication, grazing, herbicide or prescribed burning.

Other Alternatives: Rely on the individual property owner or land managers to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement strategic fuel breaks identified in the Western Slope CWPP. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County

Cost Estimate: The cost for the individual projects is identified in the Western Slope CWPP Project Planning Worksheets

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and cities within the County.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): H

Action 3. Defensible Space Programs (Placer County Chipper Program)

Hazards Addressed: Wildfire, Tree Mortality, Climate Change, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: These projects address the ongoing need to manage fuels in and around privately owned homes, businesses and communities, freeways and roadways, and “Assets at Risk” in Placer County. Small communities, individual property owners and infrastructure assets can be impacted by roadside fire starts and fire starts moving into or out of private property.

Project Description: Fuel reduction work is subject to specific terrain and environmental conditions and treatments may include removal of trees and vegetation by hand crews, chipping, mastication, grazing, herbicide or prescribed burning.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. Spread from fire starts within their property can only be prevented or contained by the fire prevention and fuel management work done by the owner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Responsible Agency/ Department/Partners: Placer County Resource Conservation District, Placer County

Cost Estimate: The cost for the individual projects is identified in the Western Slope CWPP Project Planning Worksheets.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and cities within the County. Loss of assets at risk can have significant impact on those outside of the County. Communication links and interstate transportation can be significantly impacted by wildfire along the Interstate 80 corridor.

Potential Funding: County, State, and Federal funding

Timeline: These projects are ongoing. Each project within the Western Slope CWPP is reviewed annually and updated as needed or removed if completed.

Project Priority (H, M, L): H

Action 4. Landowner Technical Assistance (Healthy Soils/ Carbon Farm Management Program)

Hazards Addressed: Climate change, Agricultural Hazards

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: Placer County is located in the northern region of the Sierra Nevada foothills, between El Dorado and Nevada counties. The elevation of this county ranges from approximately 570 feet in the valley to over 9,000 feet in the Sierra Nevada mountain range on the eastern side. In 2016, Placer County experienced the second highest population growth in California at 1.8%, according to the California Department of Finance. In the same report, it was noted that Rocklin, the second largest city in Placer County, grew a staggering 4.5% in 2016, the second highest of all cities in California.

These details start to showcase the diverse, rural - yet rapidly developing - landscape of Placer County. Consequently, there is an elevated need for conservation entities in this area to help educate about and implement ecologically sound practices, especially in the current state of concern with our changing climate. Now, more than ever, is the time to promote carbon sequestration practices and other soil-health enhancing activities.

While there is an expanding urban population in this area, many residents maintain or are beginning farming and ranching enterprises. The majority of these agricultural operations are small in terms of acreage and scope, but vital to preserve as working lands to enhance watershed protection and increase carbon sequestration. The location of the lands within Placer County affords unique and valuable opportunities for carbon sequestration activities due to a considerable gradient in ecosystems types (wetlands, rangelands, riparian corridors, mixed oak woodlands, montane hardwood forests, temperate coniferous forests, agriculture, etc.), in addition to plentiful and reliable access to water within most of the county.

The implementation of climate-smart practices through a carbon sequestration lens enables both Placer RCD and CCI to further the mission of our organizations. Placer RCD is enthusiastic to establish the groundwork necessary for carbon farming activities to be successful in our foothills region. With the creation of a Carbon Management Program, we will be primed and equipped to execute robust Carbon Farm Plans with interested landowners in Placer County.

Project Description: Provide technical assistance the private landowners to improve soil health and increase carbon sequestration. The following practices may be implemented depending on site specific assessment and development of conservation/carbon farming plans.

- Mulching
- Compost application
- Residue and Tillage Management, No Till/Strip Till/Direct Seed
- Multi-Story Cropping
- Windbreak/Shelterbelt Establishment
- Forage and Biomass Planting
- Crop Rotation
- Alley Cropping
- Riparian Herbaceous Cover
- Range Planting
- Critical Area Planting
- Tree/Shrub Establishment
- Vegetative Barrier
- Grassed Waterway
- Hedgerow Planting
- Conservation Cover
- Wetland Restoration
- Contour Buffer Strips
- Riparian Restoration

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Sustainability Plan, Climate Plan

Responsible Agency/ Department/Partners: Placer County Resource Conservation District, Placer County, Carbon Cycle Institute, National Association of Conservation Districts, National Resource Conservation Service

Cost Estimate: \$100,000 annually

Benefits (Losses Avoided): Carbons sequestration

Potential Funding: Currently funding includes grants from Carbon Cycle Institute, National Association of Conservation Districts, Natural Resource Conservation Service

Timeline: Ongoing

Project Priority (H, M, L): H



Annex R Placer County Water Agency

R.1 Introduction

This Annex details the hazard mitigation planning elements specific to Placer County Water Agency (PCWA or Agency), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the Agency. This Annex provides additional information specific to PCWA, with a focus on providing additional details on the risk assessment and mitigation strategy for this Agency.

R.2 Planning Process

As described above, the Agency followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the Agency formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table R-1. Additional details on plan participation and Agency representatives are included in Appendix A.

Table R-1 PCWA – Planning Team

Name	Position/Title	How Participated
Andy Fecko	General Manager	MS Teams access for documents and collaboration.
Brent Smith	Dir. Technical Svs.	MS Teams access for documents and collaboration.
Jay L'Estrange	Dir. Power Generation	MS Teams access for documents and collaboration.
Tony Firenzi	Dir. Strategic Affairs	MS Teams access for documents and collaboration.
Darin Reintjes	Dir Resource Mgt.	MS Teams access for documents and collaboration.
Dan Kelly	Counsel	MS Teams access for documents and collaboration.
Daryl Hensler	Dir. Field Svs.	MS Teams access for documents and collaboration.
Matt Young	Dir. Customer Svs.	MS Teams access for documents and collaboration.
Joseph Parker	Dir. Finance	MS Teams access for documents and collaboration.
Michael Willihnganz	Dir. Admin. Svs.	MS Teams access for documents and collaboration.
Ryan Cline	Dir. Energy Mkt.	MS Teams access for documents and collaboration.
Linda Higgins	Deputy Dir. CS	MS Teams access for documents and collaboration.
Keith Brintnall	Maintenance Coord.	MS Teams access for documents and collaboration.
Sean Loman	Maintenance Coord.	MS Teams access for documents and collaboration.
Rodney Lake	Maintenance Coord.	MS Teams access for documents and collaboration.

Name	Position/Title	How Participated
Randy Cox	Water Mgt. Specialist	MS Teams access for documents and collaboration.
Richard Vorous	Hydro Engineer II	MS Teams access for documents and collaboration.
Jeremy Shepard	Deputy Dir. Eng.	MS Teams access for documents and collaboration.
Aaron Sullivan	Engineering Svs. Mgr.	MS Teams access for documents and collaboration.
Kyle Dushane	Hydro Engineer II	MS Teams access for documents and collaboration.
Ed Horton	Consultant	Review of mitigation list and suggestions
Peter Cheney	Risk & Safety Mgr.	Internal and external liaison, meetings and editing.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the Agency integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the Agency incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table R-2.

Table R-2 2016 LHMP Incorporation

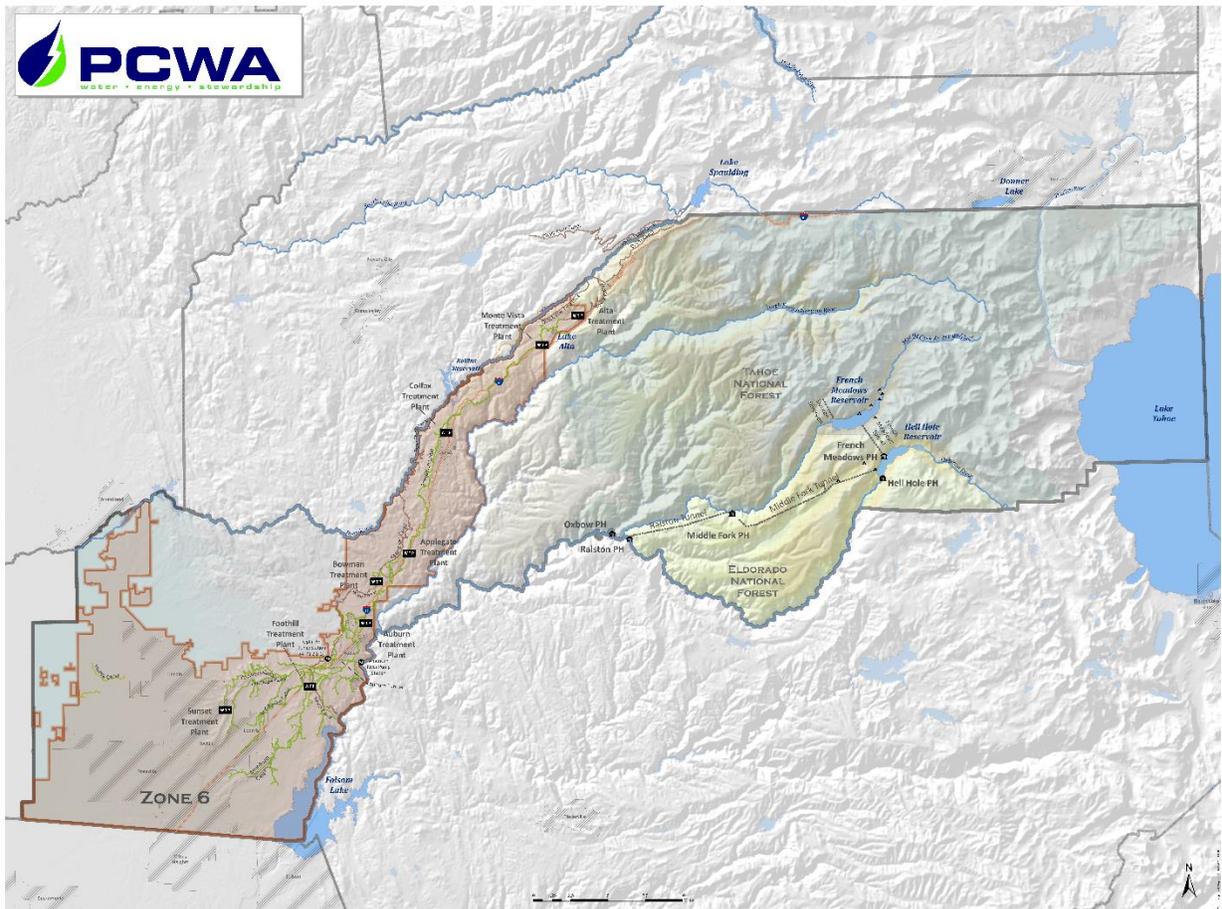
Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Canal Gunite Projects – Soil bank erosion and water conservation for drought.	Ongoing in capital planning budgets and operations. \$1M per. year.
Canal Gunite Middle Fiddler Green & Pulp Mill	FEMA Claims & internal funding for continued service
Hillside Slope Stabilization. Rockfall anchors and netting at Interbay Road	Insurance funded loss, repair prevents /limits additional loss. Ongoing Capital Plans
Hell Hole Dam Core Raise	Capital Project increasing storm water capacity and storage.
French Meadows Forest Fire Restoration Project	Community partnership and funding to reduce high-severity wildfires and watershed restoration.
Replace wooden flume structures to prevent wildfire and hazardous materials service interruptions.	Capital plan and spending. Piped Long Ravine, Secret Town, Penryn #1 Fumes put into pipe.
American River Pump Station hardening & repair after 2017 flooding/storms.	FEMA Claims & internal funding for continued service
LL Anderson Dam Spillway Modification.	Completed Capital Project for storm water management.
Multiple water system inerties increasing redundancy of water supply. 2017-2019	3 Capital Projects completed with Nevada Irrigation District, Mt. Vernon, Locksley Lane and the Live Oak Intertie
Vegetation Management & Brushing Maidu Field Office Canyon Fire Resiliency Project	2020 Agency Capital funding in conjunction with
Vegetation Management & Brushing below American River Pump Station power lines.	2020 Agency Operational Funding
Vegetation Management & Brushing	2019 Monta Vista Treatment Plant, Operational Funding and partnership with Cal Fire
Vegetation Management & Brushing	2015 Lake Arthur 33-Acres, partnership with Cal-Fire
Vegetation Management & Brushing	2016/17 Lake Theodore 78-Acres, Partnership with Cal Fire

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Vegetation Management & Brushing	2018 Bill Francis Drive project with Cal-Fire
Debris, sedimentation de-silting projects for dam safety and water storage	Ralston Afterbay, North & South Fork Diversions 2016, 17, and 18 Capital and Emergency Projects
Dam management Mammoth reservoir low level outlet replacement	Capital project replacing

R.3 Agency Profile

The Agency profile for the PCWA is detailed in the following sections. Figure R-1 displays a map and the location of the Agency within Placer County.

Figure R-1 PCWA



R.3.1. Overview and Background

The Placer County Water Agency (PCWA) encompasses the entire, 1,500-square-mile boundary of Placer County, ranging from the rim of the Sacramento Valley on the west to the Sierra Nevada and Lake Tahoe

on the east. PCWA is headquartered in Auburn, the County seat of Placer County, nestled into California's Gold Country. The Agency is self-governed with policy and regulatory decisions determined by an independently elected five-member Board of Directors.

The Placer County Water Agency was created under its own state legislation entitled the "Placer County Water Agency Act," adopted in 1957 by the California State Legislature. PCWA carries out a broad range of responsibilities including water resource planning and management, retail, and wholesale supply of irrigation, drinking water and production of hydroelectric energy.

PCWA is actively involved in various watershed areas including the American River, Yuba and Bear rivers, the Lake Tahoe/Truckee River system, the Central Valley Project, and Bay/Delta system.

Water Supply

The PCWA Water System supplies irrigation and treated water in four service zones in Central and Western Placer County, generally located along the Interstate 80 corridor between Roseville and Alta.

The Agency operates an extensive raw water distribution system that includes 170 miles of canals, ditches, flumes and several small reservoirs. Raw water feeds the drinking water treatment plants and a significant amount of Agency raw water irrigates agricultural land and golf courses. Drinking water is produced through a network of eight water treatment plants. About 20 percent of the water supplied by PCWA is retail treated drinking water; about 80 percent is for irrigation and some portion thereof for wholesale transfer. More than 150,000 people depend on PCWA for drinking water.

Other water purveyors in Placer County include PG&E, Alpine Meadows Water Association, Applegate Community Water Association, Central Eden Valley, Christian Valley Community Service District, Dutch Flat Mutual, Eden Valley Line, Foresthill Public Utility District, Heather Glen Community Services District, Meadow Vista County Water District, Midway Heights Community Water District, North Eden Valley Water Association, The Weimar Institute, and The Weimar Water Company.

Treated Water

Surface water supplied by PCWA originates in the Sierra snowpack. Sources for PCWA treated water systems include the Yuba-Bear and American River watersheds. The source water for the treatment plants is supplied by a network of canal systems operated and maintained by PCWA and PG&E. The PCWA treated water systems supply consumers through more than 616 miles of PCWA maintained pipe to over 36,529 service connections. We estimate that PCWA serves more than 150,000 people with clean potable water.



Photograph 1 Foothill Water Treatment Plant

The PCWA's seven treated water systems including Alta, Applegate, Bianchi, Auburn/Bowman, Colfax, Foothill-Sunset, and Monte Vista. Six of the water systems are supplied through water treatment plants that treat surface water supplied via the PCWA canal system. The Bianchi system serves surface water purchased by the City of Roseville.

Fire Hydrants

The Agency provides water to 5,454 fire hydrants over some 51 Fire Service zones through the treated water system. This critical service does not include drafting from canals, rural locations, or reservoirs. Treatment and distribution operators monitor water usage and adjust for large multiple alarm fires and wildfire extinguishing water consumption.

Irrigation

About two thirds of the water supplied annually by PCWA is used for irrigation on the farms, ranches, landscapes, parks and golf courses of Placer County. The Agency operates 170 miles of canals, flumes reservoirs, and diversions to supply customers with untreated “raw” water. Approximately 4,283 irrigation water customers purchase water directly off from the canal system. The irrigation season normally runs from April 15 through October 15; however, many customers purchase water year-round. The irrigation season typically begins two weeks later in the higher elevation service areas around Colfax. Canal repair outages are typically scheduled in the early fall, between the irrigation season and heavy rains.

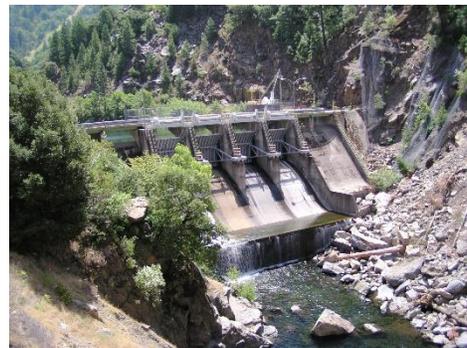
The PCWA irrigation water system also provides water for wildlife, riparian habitat, fire protection, recreation and scenic beauty. The Agency is very active in protecting the watershed and the quality of its source water.

Wholesale Water

PCWA wholesales both treated and untreated water to at least 14 other water companies, agencies, or districts locally and regionally. We estimate that wholesale raw water serves another 98,741 consumers for a total end user customer base of 248,835 people.

Power System

The PCWA Power System operates the Middle Fork American River Project (MFP), which is the eighth largest public power project in California. Completed in 1967 the MFP includes two major reservoirs, Hell Hole and French Meadows, seven dams, five hydroelectric power plants, and 24 miles of tunnels and related facilities. The project also includes recreational opportunities and facilities located adjacent to the high mountain reservoirs.



Photograph 2 Interbay Dam

On average (since 2013) The Middle Fork Project has produced an average of 1,100 Gigawatt hours of energy per year, which is enough clean, hydroelectric energy to power more than 165,000 homes. PCWA’s power output is distributed through Pacific Gas & Electric Company lines to the power grid, where the energy is sold on the open Cal-ISO power market.

R.4 Hazard Identification

PCWA identified the hazards that affect the Agency and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to Agency (see Table R-3).

Table R-3 PCWA—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Significant	Occasional	Critical	Medium	Medium
Avalanche	Limited	Occasional	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	High	–
Dam Failure	Significant	Unlikely	Catastrophic	High	Medium
Drought & Water Shortage	Extensive	Highly Likely	Critical	High	High
Earthquake	Limited	Likely	Limited	Low	Low
Floods: 1%/0.2% annual chance	Extensive	Occasional	Limited	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Significant	Likely	Critical	High	Medium
Levee Failure	Limited	Occasional	Critical	Low	Medium
Pandemic	Extensive	Likely	Critical	Medium	Medium
Seiche	Significant	Unlikely	Catastrophic	Low	Medium
Severe Weather: Extreme Heat	Significant	Highly Likely	Negligible	Low	High
Severe Weather: Freeze and Snow	Limited	Occasional	Negligible	Low	Medium
Severe Weather: Heavy Rains and Storms	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Significant	Highly Likely	Limited	Low	Low
Tree Mortality	Extensive	Likely	Critical	Medium	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

R.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the Agency's hazards and assess the Agency's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the Agency is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the Agency. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

R.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section R.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table R-3) affects the Agency and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

R.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the Agency's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the Agency. This data is not hazard specific, but is representative of total assets at risk within the Agency.

Assets at Risk and Critical Facilities

This section considers the PCWA's assets at risk, with a focus on key Agency assets such as critical facilities, infrastructure, and other Agency assets and their values. With respect to Agency assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table R-4 lists critical facilities and other Agency assets identified by the Agency Planning Team as important to protect in the event of a disaster. PCWA’s physical assets, valued at over \$3.2 billion, consist of the buildings and infrastructure to support the Agency’s operations.

Table R-4 PCWA Critical Facilities, Infrastructure, and Other Agency Assets

PCWA Water System		Facility Criticality		
Asset type	Class	Replacement Value	Employees	Hazard Specific
Water Conveyance	Class 2 & 3	\$ 933,285,736	68	Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Misc.	Class 2 & 3	\$ 1,818,975		Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Offices	Class 2 & 3	\$ 21,518,518	110	Earthquake, Heavy Rains & Storms, Wildfire, Pandemic and Hazardous Material Exposure
Pump Stations	Class 2 & 3	\$ 39,754,605		Earthquake, Water Shortage, Flood, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Water Tanks	Class 2 & 3	\$ 18,176,851		Earthquake, Water Shortage, Flood, Landslide, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Water Treatment Plants	Class 2 & 3	\$ 380,728,064	38	Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire, Hazardous Material Exposure, and Pandemic
Grand Total		\$ 1,395,282,748	216	
PCWA Power System				
Asset Type		Replacement Value	Employees	Hazard Specific
Dams/Reservoirs	Class 2 & 3	\$ 1,005,509,000		Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Misc Infrastructure	Class 2 & 3	\$ 1,746,000		Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Office Residential	Class 2 & 3	\$ 15,748,000		Earthquake, Dam Failure, Water Shortage, Landslide, Heavy Rains & Storms, Wildfire.
Power Systems	Class 2 & 3	\$ 766,466,000		Earthquake, Dam Failure, Water Shortage, Flood, Landslide, Levee Failure, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure, Freeze & Snow, High Winds, Tree Mortality
Tunnels	Class 2 & 3	\$ 37,597,000		Earthquake, Dam Failure, Flood, Landslide, Heavy Rains & Storms, Wildfire and Hazardous Material Exposure
Grand Total		\$ 1,827,066,000	35	

Source: PCWA

Populations Served

PCWA serves both incorporated and unincorporated areas of the County. Out of the more than 380-thousand people in Placer County, PCWA is by far the largest water supplier with some 37-thousand treated water accounts. More than 4-thousand untreated water accounts (Agricultural) and 14 wholesale water distribution accounts where water is provided to other water service areas.

Natural Resources

PCWA has a variety of natural resources of value to the Agency. These natural resources parallel that of Placer County as a whole. Additionally, PCWA is actively involved in various watershed areas including the American River, Yuba and Bear rivers, the Lake Tahoe/Truckee River system, the Central Valley Project, and Bay/Delta system.

Historic and Cultural Resources

PCWA has a variety of historic and cultural resources of value to the Agency including the old State Route Highway 40 Memorial and Heritage Farmhouse at 10681 Ophir Road. Additionally, many of the flumes in the canal system have local cultural significance and are beloved by the community. The Agency has ties to both the gold mining and agricultural history of the area.

Growth and Development Trends

General growth in the Agency somewhat parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Specific Agency Planning and Development

In 2017 PCWA completed an update to the Water Connection Charge Cost Study which proposed a list of forty infrastructure projects that included the Ophir Water Treatment Plant (WTP), 24 miles of pipelines, six storage tanks, emergency standby power generation at the American River and Ophir Road Pump Stations, and three groundwater wells. The Ophir Water Treatment Plant Program is based on 30 million gallons a day (mgd) and is planned to be constructed in 10 mgd phases as demands develop in Placer County. The 2017 capital plan has provisions for capacity beyond this development horizon of 30 MGD of capacity from Ophir WTP. One of these provisions includes oversizing of the transmission pipelines from Ophir WTP towards west Placer County. The Ophir WTP will be designed to the building codes to adequately address seismic activity and will include back generators at the plant and all other critical facilities built under this program. Since 2016, three of these projects have been completed and three other projects are currently under construction in 2021. The Ophir Program considered the available general plans for Placer County, the Town of Loomis, City of Lincoln, and City of Rocklin when determining how to serve future growth in the region.

R.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table R-3 as high or medium significance hazards. Impacts of past events and vulnerability of the Agency to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the Agency to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. Vulnerability is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Agriculture Hazards

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Before its rapid population growth in the 1970s and 1980s, Placer County was known as an agricultural and timber-producing county. Agriculture and timber production are still important sectors of the County's economy; however, manufacturing, recreation, and service industries have increased in economic importance. Agricultural lands continue to be at risk to development based on population growth projections for the County. In western Placer County, land traditionally used for agricultural purposes lies near existing cities and is expected to accommodate much of this population increase. While its agricultural land is threatened, Placer County retains a significant amount of agricultural land where the economy is intact and where farmers are a real presence in the community.

According to the HMPC, agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. Wildfire and other hazards can also affect agricultural lands. The 2018 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

In addition to severe weather, invasive species can affect the agricultural industry in the County. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard addresses the issues related to invasive pests including that pose a significant

threat to the agricultural industry and are therefore a concern in the Placer County Planning Area. This hazard does not address pests and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Location and Extent

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: insects, weeds, severe weather, as well as downturns in commodity prices. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Insects and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

There have been no state or federal FEMA disasters in the County related to agricultural hazards. There have been multiple USDA Secretarial Disaster Declarations, as shown on Table 4-6 of the Base Plan.

Vulnerability to and Impacts from Agricultural Pests and Diseases

According to the USDA, every year natural disasters, such as droughts, extreme heat and cold, floods, fires, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. More specific impacts by hazard were listed in Section 4.3.6 of the Base Plan.

In addition to threats to agriculture from weather and other natural hazard events, agriculture in the County is at risk from insects, pests, and noxious weeds. Establishment of an invasive species would be detrimental to the agricultural industry of Placer County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem.

In addition, invasive weeds can increase fire risk in the County.

While PCWA does not have any direct agricultural risk as far as crops, approximately 2/3 of the water supplied by the agency is used for agricultural and the Agency is highly involved with water conservation and planning for the agricultural Industry. About 11% of employment is attributed to Agriculture in Placer County, with marked growth in small farms and “farm to fork” operations. The loss of PCWA’s ability to provide water through our canal system would be devastating to agriculture in the County. The loss of Agriculture in the Western part of the County would equate to a significant revenue loss for the Agency.

Assets at Risk

Financial and economic community assets are at risk

Avalanche

Likelihood of Future Occurrence–Occasional

Vulnerability–Low

Hazard Profile and Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited.

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Areas prone to avalanche hazards include hard to access areas deep in the backcountry and those in the more developed higher elevations of the County in the Tahoe basin. Avalanche hazards exist in eastern Placer County where combinations of the above criteria occur. The Avalanche hazard is low, but exists as a challenge for access to the Middle Fork Power Project on the Eastern side of the County.

Past Occurrences

There have been no state or federal disasters in the County related to avalanche. No events of past avalanche have affected the Agency.

Vulnerability to and Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes (located in the eastern portions of the County) and where wind-blown snow is common. Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

The Power operations in the Southeastern part of the County are located in wilderness areas and most of the operations are at elevations between 2,000 and 5,000 feet. Assets and transportation routes can be profoundly impacted by snow and avalanche. While the Agency owns four snowcats, safety and mobility can be significantly impacted by snow. This is further compounded by the remoteness of the area and spotty communications. This hazard may be a life safety and operational issue for staff, but is not likely to result in a long-term catastrophic property loss to the Agency.

Assets at Risk

Agency assets at risk include staff, facilities and routes of access to the Middle Fork Power Project.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Specifically, climate change in relation to water (too much, or too little) directly impact natural resources, water management, Agency operations and facilities. In 2017 a historic winter the American river rose and severely damaged the American River Pump Station, inundating rains caused the Pulp Mill and Middle Fiddler Green canals to erode and fail, as well as other road and property damage from high waters. Storms in 2017 and 2018 caused rockslides on the Blacksmith Flat Road and Interbay Road to be inaccessible. There were additional communication and power lines that failed due to storm damage. This can be contrasted with the historic Drought between 2014 and 2017 where historic levels of low precipitation and snowpack were compounded by hot days, bark beetles killing off trees and epic wildfires. Ecological issues occur with river temperatures warming and more water is needed to prevent the salination of rivers as the oceans rise. Crops with high moisture requirements were abandoned including some nut tree crops that

take years to restore. Ground water well pumping increased in the agricultural areas depleting and sometimes collapsing groundwater stores. Ultimately California has an imbalance of available fresh water to meet the long-term future demand.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the Agency, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has not been directly cited as a specific declared disaster hazard, but is often used to explain the amplification of severe weather hazards. The Agency and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires, drought, and tree mortality. Storm magnification has led to flooding, landslides, increasing severe weather patterns. With increased storm a precipitation there is potential for the increased probability for future levee and dam failure.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the Agency and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Agricultural Hazard
- Temperature increases
- Decreased precipitation
- Dam & Levee failures
- Drought and water shortage
- Flooding
- Landslides & Debris Flows
- Increased or severe precipitation or weather events
- Reduced snowpack

- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Tree Mortality
- Wildfire
- Public Safety Power Shutoff – energy reliability

Assets at Risk

All Agency assets are at risk from climate change in relation to water being the principal function and purpose of the Agency and in which all production is derived. Additionally, increased temperatures impact water use, and availability. Amplified weather patterns put facilities are risk from severe weather hazards of all kinds and secondary hazards and exposures such as wildfire.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The danger would continue for as long as the flood waters from the dam failure took to drain downstream. However, the damage to the Agency operations could be catastrophic. While dam failure inundation maps indicate much of the inundation area is rural undeveloped land, there are bridges and PCWA assets that would potentially suffer severe damage.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The only known dam failure for the Agency occurred in 1964 When torrential rains caused a failure of the Hell Hole Dam that was under construction and only 20% completed at the time. There were several small bridge failures and a bridge failure at the American River Confluence.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the Agency from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Evacuations and associated economic losses could also be significant.

The Power Division has four dams and three smaller diversions. A dam failure at the top of the Watershed theoretically could cascade through various facilities downstream causing additional loss or failures. Life safety concerns include gold claims and recreational use downstream, however immediate downstream exposure does not include densely populated residential areas. Large property concerns include bridges close to the American River Confluence that could be affected. Folsom Lake would be affected proportionately. Dam failure could lead to a catastrophic operational loss for the agency. The Division of Safety of Dams (DSOD) rates the Power Division dams in the following categories: (2) extremely high downstream hazard, (1) significant downstream hazard and (1) a low downstream hazard.

The Water Division has nine lakes/reservoirs used for water storage and control. One of which is completely dry and abandoned. All have small dams or flow control. The Division of Safety of Dams (DSOD) rates the Water Division dams as: (1) a high downstream hazard, (3) significant downstream hazard and (1) a low downstream hazard. Most are in rural modestly populated areas.

PG&E also operates at least four dams or reservoirs that significantly impact our water supply and service area.

Assets at Risk

Downstream assets such as powerhouses, other dams and water intake structures are at risk from dam failure. Other public infrastructure assets such as bridges are immediately in the downstream inundation area.

Drought & Water Shortage

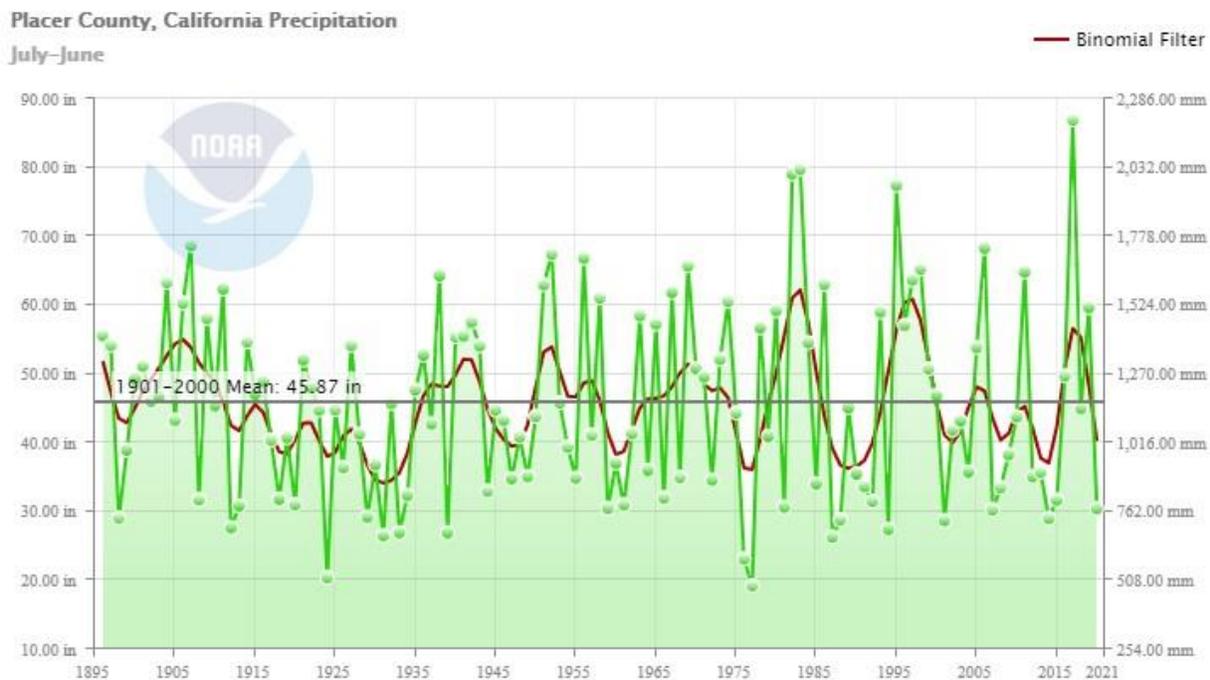
Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Historically, California has experienced as many as twelve droughts, since being formally recorded in the mid-1800s. Typically a drought will last from two to seven years. Perhaps the worst was between 1912 and 1934 (as shown on Figure R-2) where over a span of twenty-two years there was only five years of above average precipitation. California having a population of more than 39-million people, and as a major agricultural producer can suffer severe economic and environmental impact. Drought may be amplified by weather conditions; economic or political actions; and/or population and farming. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for environmental sustenance, agriculture, manufacturing, tourism, recreation, and commercial and domestic consumption. As the population in the area continues to grow, so will the demand for water.

Figure R-2 Placer County Precipitation



Source: NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published April 2021, retrieved on 3/29/2021 from <https://www.ncdc.noaa.gov/cag/>

Location and Extent

Drought and water shortage is normally a regional phenomenon. The County, as well as the Agency, is at risk and water supplies impact the remainder of the State. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which is not likely to impact water storage carry over. Alternatively, a drought may extend for years depleting water storage and availability and creating a water crisis, potentially extending throughout the State and severely impacting agriculture and the economy as a whole. Current drought conditions in the Agency and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table R-5.

Table R-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014-2017	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the Agency are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

The historic drought between 2012 and 2016 resulted in a reduction in the local water supply; however, the drought resulted in more significant demand reductions forced by regulatory mandates. In general, summer water use in 2015 had been cut by over 30% relative to 2013 levels. Economically the drought has impacted water sales reducing revenues for the Agency. When prolonged drought occurs it impacts capital improvement plans and operations over time. Agriculture in the region suffered a significant economic impact from reductions. The most significant threat to local economy is the concern of major populations not being adequately served from Folsom Lake due to the water surface going below the intake level. There was great risk of this occurring in both 2014 and 2015. However, Folsom Lake operations were modified (just in time) to prevent this crisis. The issue is complex statewide water management problem beyond the scope of just Placer County. Droughts can bring on conservation and control measures by the State Water Resources Control Board that impact both water consumption and Agency revenues.

Figure R-3 Folsom Lake in 2014



Source: PCWA

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the Agency, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, geopolitical, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more contentious. Climate change may create additional impacts to drought and water shortages in the County and the Agency.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Wildfire Section below, as well as in Section 4.3.2 of the Base Plan.

Placer County Water Agency is fortunate to be at the top of the watershed with plentiful water storage under normal circumstances. However; the State Water Resources Control Board can implement conservation regulation and control that can severely impact the local conditions and use of water.

Assets at Risk

Economically the entire Agency is impacted. Power generation is reduced and revenues from water sales are decreased. The result is that capital projects may be postponed for delivery infrastructure - increasing the potential for system failures. Additional effort must go into water management, public awareness and political involvement. Ultimately cascading impacts include increased risk of wildfire, energy disruption and economic challenges.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—High

Hazard Profile and Problem Description

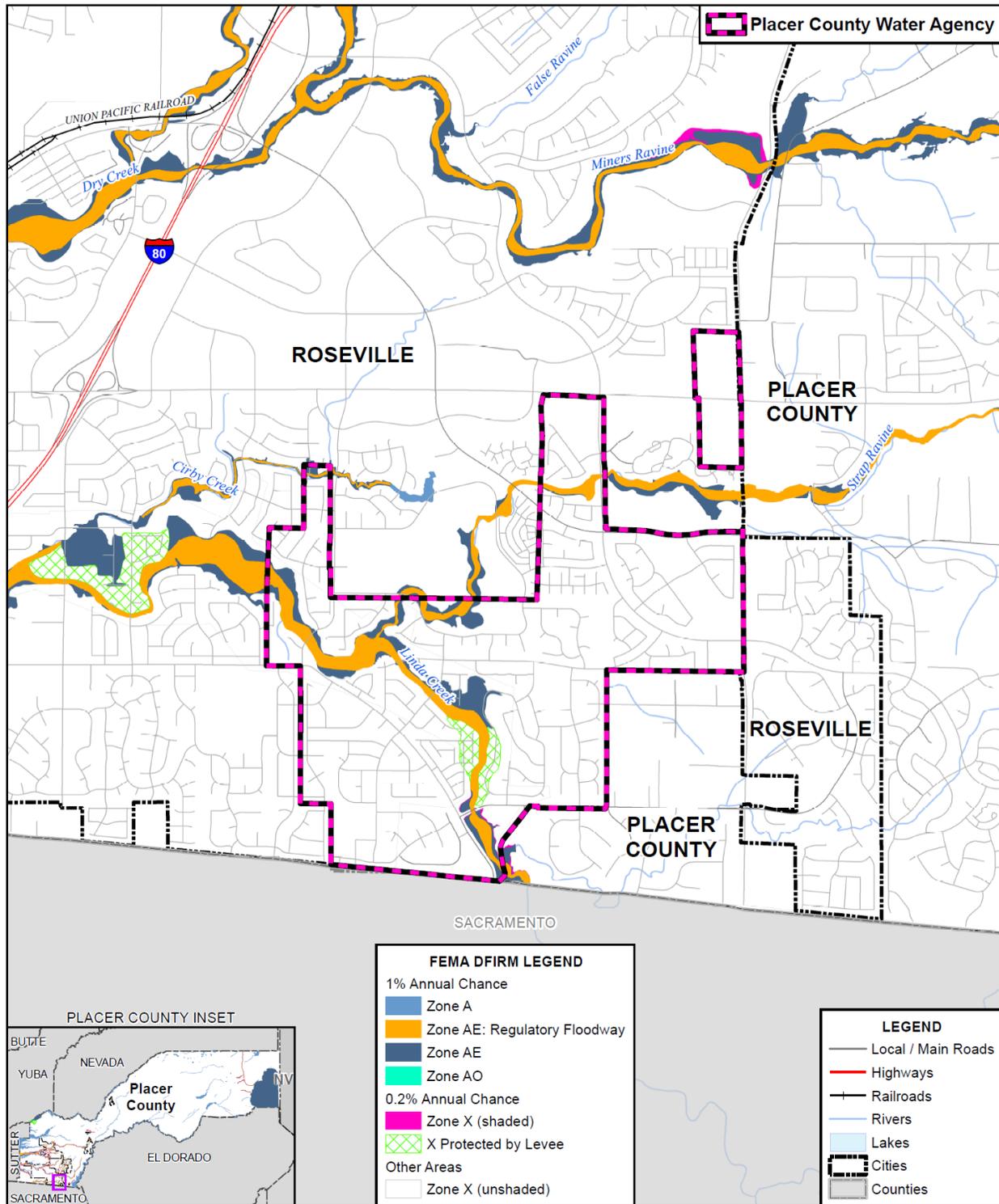
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or within the Agency and have caused damages in the past. Historically, the Agency has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the PCWA have been subject to historical flooding.

Location and Extent

The PCWA has service areas located in the 1% annual chance floodplain. This is seen in Figure R-4.

Figure R-4 PCWA – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table R-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the Agency.

Table R-6 PCWA– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the Agency
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the Agency vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the Agency tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the Agency tends to have a shorter speed of onset, due to the amount of water that flows through the Agency’s service area.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table R-7. These events also likely affected the Agency to some degree.

Table R-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Historical amounts of precipitation fell in January and February of 2017, along with antecedent conditions from a wet October and December led to high river levels with many forecast points along the major rivers reaching monitor or even flood-stage and above. Some rivers reached record or near-record levels and there was flooding along many creeks and streams. ([CNRFC - Storm Summaries - Jan and Feb 2017 \(noaa.gov\)](#)) Local and State and Federal disasters were declared. PCWA suffered more than one-million dollars in losses to six Agency facilities with the American River Pumpstation Intake structures being completely submerged at a bend in the river. Additional difficulties and claims from canal run-off and spills were managed within the Agency.

Figure R-5 American River Pump Station



Source: PCWA

Vulnerability to and Impacts from Flood

Floods have been a part of the Agency’s historical past and will continue to be so in the future. Dam safety plans anticipate historical flooding, and operations adjust to rising storm water. As seen by the Afterbay Dam gates on the Middle Fork of the American River on Figure R-6. The gates are in the full-open position and there was ample capacity for 2017 storm waters. One of the Agency challenges brought on by storm waters is managing debris and sediment both of which have been increased by wildfires. Sediment decreases the reservoir capacity, and debris endangers the dams and physical structures. Managing these two issues can be dangerous during a storm and lead to tens of millions of dollars of remediation that can last years later, after the storm.

Figure R-6 Afterbay Dam



Source: PCWA

Heavy rains and storms also create canal management issues. Debris washed, blown and fallen into the canal system create over topping of the canals in unintended areas. The over topping of the canals can lead to erosion, landslides, and ultimately a failure of the canal. Spillways for the management of the canals have always existed, but with increasing development the heavy spilling of the canals can surprise landowners who are in the spill channel. The greater the storm runoff, the more spillways and excess water must be released.

Figure R-7 Pulp Mill Canal 2017



Source: PCWA

During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread

structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens water management structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Placer County Water Agency does not handle storm water systems or reclaimed water. The storm exposures mainly arise from open water supply systems including canals and flumes. During major storm events water storage being released into the canal system is restricted and the agency opens spillway relief systems to allow for extra capacity. The main hazard that remains is debris swept into the canal system that potentially collects to block free flowing water. This can cause overtopping. Crews regularly patrol during storms to prevent debris build up at trash-racks and culverts.

The American River Pump Station has some degree of vulnerability during a 200 to 500 year storm due to its location along the Middle Fork of the American River.

The Power Project has potential storm exposure from over topping of dams at the top of the Middle Fork Project and to power plants along the river through descending elevations. Past forest fires compound watershed hazards with increased sedimentation causing water levels to rise. Additionally, floating forest-fire debris can enter into the watershed and cause damage and potential destruction to dams, diversions and related facilities along the river.

Assets at Risk

The majority of operational hazards are at or along rivers or canal systems. All Agency assets with the exception of business offices would at some degree of risk from flooding.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Heavy snowpack with unseasonably warm high altitude temperatures can also create rapid snow melt and extreme run off conditions.

Location and Extent

The PCWA is subject to localized flooding throughout the Agency. Expected flood depths in the Agency vary by location. Flood durations in the Agency tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. California is prone to atmospheric rivers that dump copious amounts of rain over short periods of time. Localized flooding in the Agency tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Typical locations of concern are the management of dams, levies, and canal systems where debris or sedimentation have created areas of blockage or decreased capacity. As in the above 1%/2% flood years canal systems can be overtopped in low areas when there is intense rain in combination with fall debris. Overtopping can erode the embankments jeopardizing the integrity of the canal. Guniting the canal system can enhance the stability of earthen canals and the Agency budgets a million dollars a year to repair or guniting earthen canals.

As the County becomes more increasingly populated, and a run of dry years has become a collective memory; the active use of historic spillways can be surprising to those that may have just moved to the area or who have repurposed land in a spillway that may have been dry for years. It is critical that structures or uses of spillway land be restricted.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The Agency noted the following past occurrences of localized flooding:

- Winters of 2016, 2017, and 2019 all saw above average precipitation levels each with incidence of atmospheric rivers or narrow corridors of intensely concentrated moisture hitting the Placer County area.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the Agency and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams

overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

Water management assets such as canal systems dams/reservoir and water side assets or access routes are all vulnerable to flood or flood debris, damage or resulting land or mudslides caused by flooding. Water damage liability claims and repairs may occur.

Landslide, Mudslide, Debris Flows

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Debris flows can also occur in some areas of the County and the Agency. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows are also common during the rainy season in post fire areas.

Location and Extent

Landslides, mudslides, and debris flows can affect certain areas of the Agency. The CGS has estimated that the risk varies across the Agency and has created maps showing risk variance. This risk variance falls into multiple categories. These are discussed in Section 4.3.14 of the Base Plan. According to the Agency Planning Team, risk varies within the Agency range from moderate to high. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to creep and fail. Catastrophic landslide duration is usually short, though digging out and repairing landslide areas can take extensive effort with continued instability being problematic. Known problematic areas that are considered high risk are surveyed and monitored by the Agency, but this cannot be geographically all encompassing.

The Agency has identified several locations where rockfall is problematic and have installed deep anchors for slope stabilization and rockfall nets to protect critical assets and equipment. An example is shown in Figure R-8 above the Hell Hold Dam Road.

Figure R-8 Rockfall Netting Above Hell Hole 2016



Source: PCWA

Recent slides have blocked asset roads and hampered operations by prolonging access and endangering those crossing or working in the area.

Past Occurrences

There have been no federal or state disaster declarations in the County from landslide. However, the Agency Planning Team noted three recent incidences of landslides. Figure R-9 shows a photo of the Blacksmith Flat Road. This was a slide that started in the winter of 2017. Blacksmith Flat Road is a Forest Service Road (FR-23.) The slide continues to hamper access to the upper reaches of the Middle Fork Project. It is considered an unpassable road and a safety hazard. As of the writing of this annex in early 2021, it is unsure when this road will be reopened.

Figure R-9 Blacksmith Flat Road Landslide 2017



Source: PCWA

Figure R-10 is a photo from the January 25, 2018 rockslide/landslide. I-Bay road was unsafe and blocked by slide debris, there was minor damage to an intake structure and the rock face had to be secured before opening the roadway. Interbay Road is owned and was repaired by the Agency under an insurance claim. Insurance coverage for access roads is no longer available to the Agency. The specific area is now secured by rock fall netting, but similar geology is present in multiple areas throughout the County. There are many bucolic roads that may have slide issues compounded by fires and big weather.

Landslide and debris flow hazards (not included in the Power System Project stated above under Flood Hazards) are under study or have not been specifically identified. The Water system does have eight smaller dams, reservoirs and levees. Many of the canal land and water easements are also located along slopes and in mountainous areas and are potentially susceptible to a damaging landslide event.

Figure R-10 Interbay Road Slide



Source: PCWA

Vulnerability to and Impacts from Landslide

Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity. Canal systems were often built on hillsides with flumes crossing valleys. Failure points can occur with unstable soils, human encroachment into the embankment, rodent activity and/or may be triggered by storm systems, water inundation and organic materials that make their way into the canal system.

Impacts from landslide, mudslides and debris flow may include structures, infrastructure, and impacts upon life safety. When a canal system fails from landslide the damage ranges from a variation in water supply

for drinking water and firefighting, to crop failure from lack of irrigation. While the agency considers and builds in redundancies, canal system failures are considered extremely serious. In addition to Agency managed canals, canals from other operators such as PG&E and Nevada Irrigation District have delivery points into our water systems and are considered critical within the water supply chain.

Past Occurrences

Past occurrences include the Pulp Mill Canal in the winter of 2017 where a three-hundred and fifty foot section of a lined canal was damaged by erosion creating voids underneath the canal, causing leaks, instability of the canal, and ultimately a landslide failure undermining the canal and creating the entire section of the canal to slide down the hillside.

Figure R-11 Pulp Mill Canal 2017



Source: PCWA

In 2017, the Boardman canal had a slide in an unlined section of the canal that occurred above the canal. The slide blocked the flow of the canal as earthen debris from the slide ended up in the water way. Such a slide during major storms compounds water management with storm runoff only being controlled by spillways above the slide. This situation could compound additional failures and a loss of water supply.

Figure R-12 Boardman Canal



Source: PCWA

During the same winter a section of the Middle Fiddler Green canal had a two-hundred foot section of the lined canal start to erode away from the gunite lined edge of the canal. Any earth movement, sliding or erosion can create cracking and storm water infiltration into the supporting hillside.

This type of slide can be particularly concerning to homeowners in the area around the canal systems. Both failure and water from spill management can impact life safety, structures and infrastructure in the area.

While dams, reservoir, and levy failures have not occurred recently from slide damage, this does not mean that slides from above the bodies of water, and into water storage facilities could not occur. The Agency inspects and manages dams reservoirs and levies to known best practices and follow State Dam Safety requirements.

Assets at Risk

Much of the topography where Agency assets are located are on, above or below hillsides. Additionally the majority of operational hazards are at or along rivers or canal systems. All Agency assets with the exception of business offices would at some degree of risk from slides.

Pandemic

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causing serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the Agency, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu that by some estimates infected one-third of the population. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table R-8.

Table R-8 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

Placer County Water Agency responded to the pandemic by following National, State and Local requirements for notifications, social distancing, cleaning, mask wearing and employee management including disease testing, leave policies, quarantine, and adapting workplace configurations up to and including the closure of certain non-essential facilities. The Agency leveraged technology setting many employees up to be able to work from home and setting up software for virtual meeting and collaboration space. While Agency employees were not considered amongst the food and agricultural section of critical employees for receiving vaccinations, the Agency understood that water is a critical resource that sustains life and the Agency is prepared to continue operations under pandemic circumstances.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic has not affected the buildings, critical facilities, or infrastructure in the Agency. Pandemic can have varying levels of impact to employees, and the Agency customer base depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted.

Assets at Risk

Pandemics do not typically destroy physical facilities, but can affect Agency personnel who operate Agency facilities. Additional deep cleaning and regular sanitization procedures were introduced following standard industrial hygiene practices. The operation of physical assets could be impacted as there is a level of knowledge for the operation of treated water, raw water, and water treatment plants as well as operation and maintenance of hydro-electric facilities. Inspections, maintenance, and capital investment may have been arrested to varying degrees and unknown impact on physical facilities. A loss of institutional knowledge can occur from death or retirements.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Storms in the Agency occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Agency falls mainly in the fall, winter, and spring months in the western side of the County and primarily in the fall and spring in the eastern side of the County.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the Agency. All portions of the Agency are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the Agency can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, can be an annual occurrence in the Agency. This is the cause of many of the federal disaster declarations related to flooding.

Big Storms years with atmospheric rivers occurred in 1982, 1983, 1995, 1997, and 2017. Storms in January and February of 2017 caused damage to multiple Agency facilities with the Flooding and Landslide Hazards listed above. In addition, damage to private property occurs from canal and water way overflows. This is

not accurately captured as it is considered “weather,” and an “Act of God” type of loss that falls on private insurance carriers when coverage is purchased by the citizenry.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the Agency. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the Agency.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

Water conveyance, pumpstations and water treatment plants can be the hardest hit by winter storms.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however, conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas,

and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
 - Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015. No events of past tree mortality have affected the Agency. Tree mortality most often presents losses through damaged or falling trees during high winds or more significantly through wildfire size and intensity of Wildfire. See the Wildfire Hazard summary.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface with the forest. Trees in these interface areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Tree mortality impacts the Agency in various ways. Wildfire intensity and size cannot be ignored. The Agency has almost two hundred properties in its property portfolio and additional easements and assets along 786 miles of delivery system. Not only do we have assets exposed, but the water supply system itself, is critical for fighting fire. The Agency maintains a strong presence with adjacent landowners, naturalist groups, forest services and the firefighting community.

In Power Systems, the dead trees and debris makes its way from the watershed into the rivers creating debris and large log hazards for dams and increased silt and sedimentation of the water ways. Large storms exacerbate tree mortality periods by increasing the hazards for dams and complicating water management.

Dead trees shed, fail, or die in place threatening the canal system or other assets with water blockages or canal failures. The dead trees can become an issue of contention between landowners and the Agency complicating easements and good will.

Assets at Risk

All Agency physical assets are at risk and as learned from the Camp Fire even underground water delivery systems can be damaged by the extreme heat of a wildfire. Most likely assets to sustain damages are dams, buildings, flumes and canal systems impacted by tree failure, debris or wildfire.

Wildfire

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the PCWA. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. In the past, the fire season extended from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. A large part of the Agency service area is in the WUI.

Extreme Heat/Wildfire and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal

agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Accidents to power distribution lines can occur from weather conditions or at random. One such random event of power failure struck the Agency on October 22, 2020. A vehicle struck a power line near Newcastle. The Agency was able to avoid major issues but noted that damages could have been extensive if the water treatment and distribution system ran dry. Without electricity the Agency cannot treat water. Fire services and potable water could have been adversely impacted.

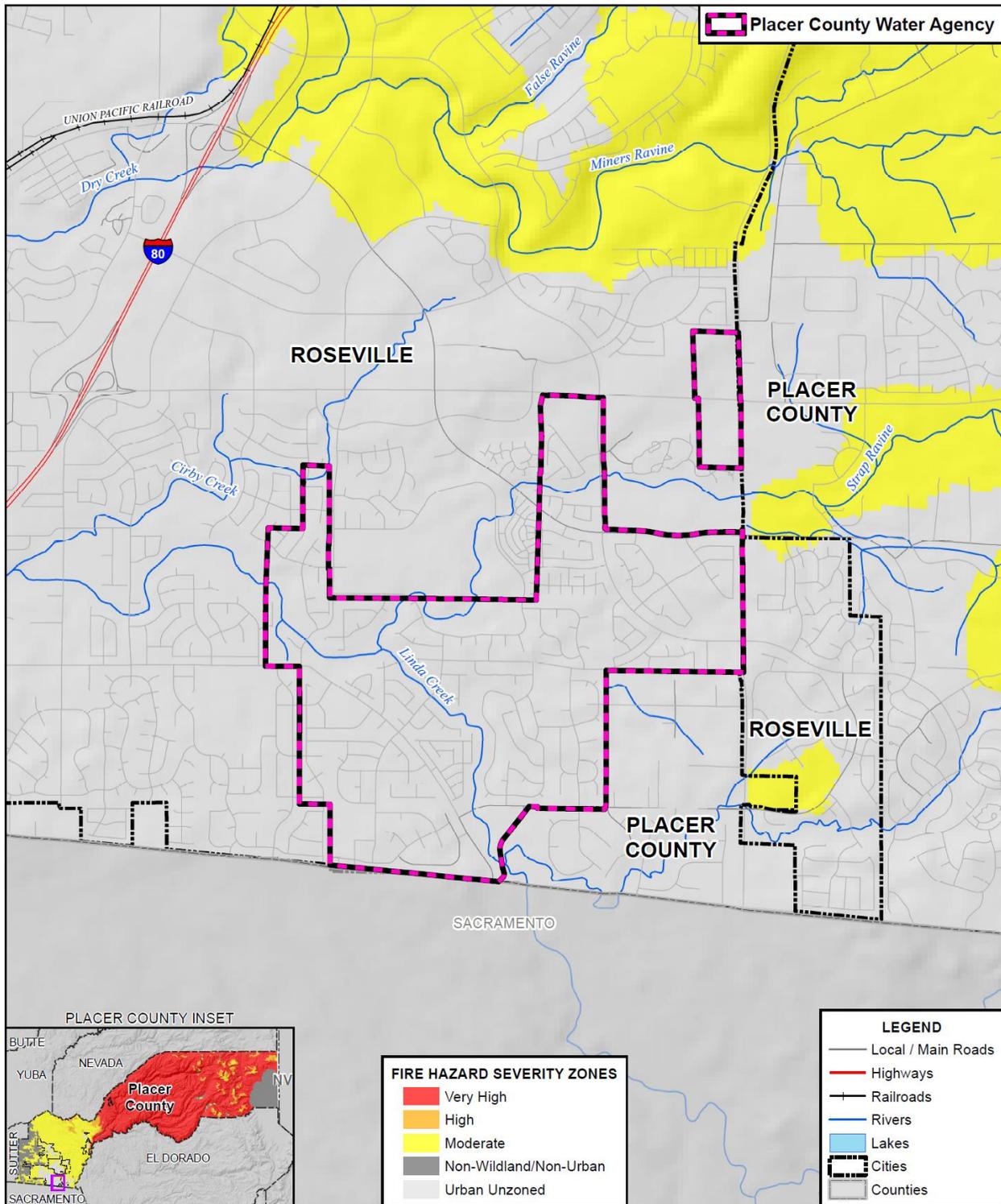
Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a Public Safety Power Shutoffs (PSPS.) More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan. PSPS events are becoming common in the fall during high wind events. The Agency noted it have been affected by PSPS on September 8th and 9th of 2020; September 26th through September 28, 2020; October 25, 2020; and October 28, 2020. While the Agency has many backup systems, unintended consequences can occur when migrating to the backup system. Furthermore the general public has turned to small generators which create additional fire danger and pollution.

Location and Extent

Wildfire can affect all areas of the Agency. CAL FIRE has estimated that the risk varies across the Agency and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the PCWA were created. Figure R-13 shows the CAL FIRE FHSZ in the Agency. As shown on the maps, fire hazard severity zones within the Agency range from Non-Wildland/Non-Urban to very high hazardous wilderness areas on the Eastern side of the map.

Figure R-13 PCWA – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of high wind, drought or during or after hot dry summer months. Fires can burn for a short period of time or may have uncontrolled durations lasting for weeks or longer. Smoldering materials can last for months.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table R-9.

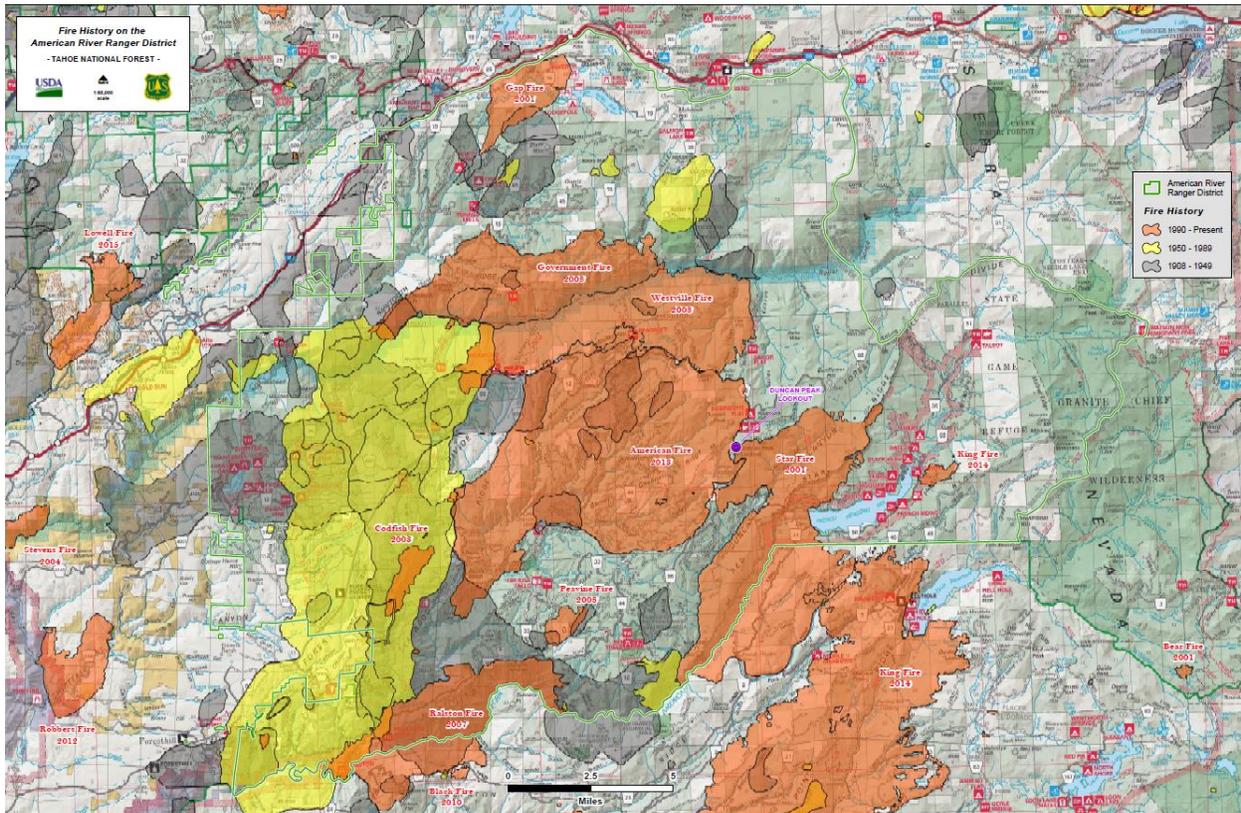
Table R-9 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The Agency provided a map of fires that have occurred in and around PCWA territory. This is shown on Figure R-14.

Figure R-14 PCWA – Area Fires



Source: US Forest Service

The Agency also noted it was affected by a fire on September 8, 2020. A fire occurred in the El Dorado National Forest. Evacuations occurred in the area. Distribution power lines were shutdown which led to an electrical generation shut down. Damage values have not been fully calculated. The Agency noted that in the long term, wildfire debris, erosion and waterway damage typically plague the Agency years into the future.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the Agency from wildfire is of significant concern, with some of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with developed land and increasing population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As adverse climate changes and development continues throughout the County, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries, damage to structures and other improvements, the loss of natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the Agency. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Agency by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality smoke and air pollution from wildfires can be a severe health hazard impacting the citizenry and employees.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The top of the water shed (water supply system) is located in an area prone to wildfire. Assets include canals, flumes, treatment plants and water storage facilities. While flumes are typically “big timber” (see Figure R-15) they range in age and condition and could limit the flow of water through the water supply system. Emergency Services should give special consideration to water facilities because of the symbiotic working relationship. It is recommended that Emergency Services immediately work with the Agency during emergency situations.

Figure R-15 Traditional Big Timber Flume



Source: PCWA

The Power Project is in a wilderness area that is prone to wildfire. Facilities have been intelligently planned and have survived multiple fires but are still susceptible to damages that can be caused by wildfire. Primary weaknesses include access, communications, and power lines. Dorms, housing, campgrounds and recreational facilities are also more likely to combust. Water resources are used to assist with firefighting where applicable. Wildfire is a great risk for both water and power production.

Assets at Risk

The majority of Agency assets are in rural or wildland-urban interfaces (WUI,) areas which have historically taken the brunt of wildfires. The Agency would consider all assets at high risk of wildfire.

R.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

R.6.1. Regulatory Mitigation Capabilities

Table R-10 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PCWA.

Table R-10 PCWA Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y 2021	Strategic plan approved by the Board considers sustainability and reliability of the Agency and system. Yes
Capital Improvements Plan	Y Annual	Capital Improvements are included in the Budget process and include risk and replacement annually. Yes
Economic Development Plan	N	See Placer County.
Local Emergency Operations Plan	N	See Placer County.
Continuity of Operations Plan	Y 2020	AWIA/FERC Emergency Action Plans.
Transportation Plan	N	See Placer County.
Stormwater Management Plan/Program	N	See Placer County.
Engineering Studies for Streams	N	See Placer County.
Community Wildfire Protection Plan	N	See Placer County.
Agency Rules and Regulations	Y	Rules, regulations, rates and charges governing the distribution and use of water.
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year: See Placer County
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score: See Placer County
Fire department ISO rating:	N	Rating: Varies by property location.
Site plan review requirements	Y	Technical Services/Engineering for “water availability.”
Agency Rules and Regulations	Y	Rules, regulations, rates and charges governing the distribution and use of water.
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N	See Placer County
Subdivision ordinance	N	See Placer County
Floodplain ordinance	N	See Placer County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	See Placer County
Flood insurance rate maps	N	See Placer County
Elevation Certificates	N	See Placer County

Acquisition of land for open space and public recreation uses	Y	The Agency maintains recreation land as a part of the FERC Licensing Agreement.
Erosion or sediment control program	Y	Dam and asset inspection and monitoring.
How can these capabilities be expanded and improved to reduce risk?		
Regular risk assessment, planning and implementation of risk reduction measures are incorporated into various aspects of operations. The Agency has multiple cooperative partnerships to leverage these activities. Perhaps additional grant funding could accelerate risk reduction, but there is limited staff availability for grant writing.		

Source: PCWA

As indicated above, the Agency, in conjunction with Placer County, has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these Agency-specific elements are described in more detail below.

Placer County Urban Water Management Plan, 2015

PCWA has prepared the Urban Water Management Plan (UWMP) to comply with the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers. This UWMP addresses PCWA’s water management planning efforts to ensure adequate water supply to meet demands over the next 30 years. The 2015 UWMP specifically assesses the availability of supplies to meet future demands during normal, single-dry and multiple dry years. The plan takes in consideration catastrophic interruption and drought. This plan can be found on the Agency website at: Environmental Planning & Compliance | pcwa.net

Placer County Water Connection Charge Plan (and Development Process)

The Water Connection Charge Plan facilitates development and standard specifications for residential and commercial water system design in the PCWA service area. Connection charges and water sales are administered per the plan. It can be located on the PCWA website: New Development Process | pcwa.net

R.6.2. Administrative/Technical Mitigation Capabilities

The Agency is governed by a five-member Board of Directors, elected to four-year terms by voters residing within five geographical areas of Placer County. The Board of Directors meets twice monthly in regular session and holds special meetings as needed.

The Board employs a General Manager to administer all Agency activities, services and employment, and in-house counsel to advise the Agency on legal and regulatory matters and retained counsel specific to advising the Board of Directors. The Agency staffs 230 full-time employees in total. About 74-employees work out of the Auburn Business Center. Departments include Administrative Services, Resource Development, Technical Services, Customer Services, and Financial Services. The Agency participates in the Placer County Local Hazard Mitigation Plan, the Placer County Emergency Operations Plan, and has a room set up to activate as an Agency Emergency Operation Center with radio, telecommunications, satellite phone service and A/V capabilities.

The Power Systems Office is located in Foresthill where operations are conducted for the Middle Fork Project. 35-employees manage the engineering, maintenance and operations of the hydro-electric system

which includes 4 dams, 3 diversions, 5 powerhouses and associated tunnels, penstocks and facilities. There are up-to-date Emergency Management Plans, FERC Emergency Action Plans, and a FERC Security Plan for the operations.

Drinking Water Operations are coordinated from offices located on Ferguson Road, across from the Business Center but utilize various treatment plants and water storage facilities. Drinking Water Operations consists of 38-employees who are directly involved in the production and distribution of treated drinking water. A team of water plant operators coordinate operation of eight water treatment plants. Water quality personnel interpret public health laws, monitor water to ensure its safety, perform necessary reporting to the USEPA and California Department of Health Services. Water treatment plant maintenance personnel maintain and repair all the water quality facilities including the treatment plants, pump sites and well sites. Water distribution operators route water through pipeline systems and manage a network of tanks, pumps and pressure-control stations. Drinking Water Operations maintains the Hazardous Materials Business Plan. The Risk Assessment and Emergency Response Plans meeting the America’s Water Infrastructure Act were completed in 2020.

Field Service has 68-employees who maintain 165-miles of canal and 616-miles of drinking water delivery systems. The Field corporate yard is located on Maidu Ave close to the edge of the American River Canyon. This yard houses the materials and heavy equipment required to maintain the raw and drinking water delivery systems.

Customer Services has a staff of 19-employees who provide a range of services including assisting the customer with all service related issues, service installations, new accounts, billing, payment processing, collections and water use efficiency. The department coordinates customer notifications during schedule maintenance projects and when water system emergencies arise (outages). Customer Services maintains an Agency Emergency Response Plan and an Interactive Voice Response (IVR) system for emergency notifications to the customer base.

The meter services crew conducts the agency’s meter reading, testing and replacement programs. Other activities include a cross-control program that prevents the reverse flow of water from private services back into the public water system and the constructed conveyance program that assists canal water customers in obtaining alternate water supplies for in-home use.

Table R-11 identifies the Agency department(s) responsible for activities related to mitigation and loss prevention in PCWA.

Table R-11 PCWA’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
County Wide Master Plan – Financial Assistance Program	Y	Loans or grants provided to districts for conservation and development of eligible water supplies and Facilities. Yes.
Placer County Urban Water Management Plan	Y	Addresses water demand and water supply
Water Connection Charge Plan	Y	Connection charges and development requirements.
Planning Commission	N	See Placer County

Mitigation Planning Committee	N	See Placer County
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	See Cal-Fire, Operations, Maintenance and cooperative agreements.
Mutual aid agreements	Y	The Agency has mutual aid agreements with other water/power entities for employees and equipment in the event of a disaster.
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	See Placer County
Emergency Manager	N	See Placer County
Community Planner	N	See Placer County
Civil Engineer	N	See Placer County
GIS Coordinator	N	See Placer County Coordinated with the Agency GIS Staff
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	See Placer County
Hazard data and information	N	See Placer County
Grant writing	N	See Placer County
Hazard analysis	N	See Placer County
Agency Customer IVR Reverse Notification System	Y	Agency system, effective for customer base notifications, adequately trained and staffed.
How can these capabilities be expanded and improved to reduce risk?		
The Agency has a close working relationship with the County for governance planning and emergency services.		

Source: PCWA

R.6.3. Fiscal Mitigation Capabilities

Table R-12 identifies financial tools or resources that the Agency could potentially use to help fund mitigation activities.

Table R-12 PCWA's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	Extensively used in projects described.
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Used in Placer County for conservation.
Impact fees for new development	N	
Storm water utility fee	Y	Check?

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	N	
State and Federal Hazard Mitigation Grants	Y	Used for Prevention, hardening or replacing infrastructure.
Facility Agreements	Y	Used for accepting compliant water infrastructure from development.
Insurance	Y	Used for replacement and stabilization of existing hazard conditions after loss.
How can these capabilities be expanded and improved to reduce risk?		
Many grant projects require expensive pre-planning for qualification. In some cases, this pre-work prevents acceptable grant applications. Grant applications and work require additional staffing in a very lean organization.		

Source: PCWA

R.6.4. Mitigation Education, Outreach, and Partnerships

Table R-13 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table R-13 PCWA's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Sierra-French Meadows Forest Restoration Partnership	Y	See items below this table.
Mountain Counties Water Resource Association	Y	See items below this table.
Urban Water Management Plan	Y	See items below this table.
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	See items below this table.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	See items below this table.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	Y	See items below this table.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other	Y	See items below this table.
How can these capabilities be expanded and improved to reduce risk?		
The Agency maintains many active partnerships and participates in a variety of strategic planning and outreach and will continue to do so. Some of this outreach is outlined below. Other things such as the joint Fire and Water annual community service publication focused on wildfire preparedness and water and forest conservation.		

Source: PCWA

PCWA has several partners in carrying out Agency objectives. These include:

Sierra-French Meadows Forest Restoration Partnership - The Sierra-French Meadows Forest Restoration Partnership Includes PCWA, Placer County, The U.S. Forest Service, the Nature Conservancy, The Sierra Nevada Conservancy, The American River Conservancy and UC Merced SNRI all working together to make the forest healthy and more resilient. Located in the headwaters of the Middle Fork American River, in the Tahoe National Forest, the Project aims to restore forest health by reducing high-severity fires across 28,000 acres of critical watershed, and to study the effects of forest treatments on ecosystem health. [FrenchMeadowsLessons_2019.pdf \(scienceforconservation.org\)](#)

Mountain Counties Water Resource Association – The Mountain Counties Water Resource Association seeks to educate state, local and federal decision-makers on the issues facing water agencies in the region. These issues include long-term sustainability through many of the hazards within this plan. [Mountain Counties Water Resources Association](#)

Urban Water Management Plan – The Urban Water Management Plan (UWMP) unifies planning for California watersheds into watershed area plans, considering the entire watershed and the more geographically far-reaching impacts of water.

River Arc – River Arc seeks to improve water reliability in the Sacramento region using surplus water from the American River and sustaining ground water reserves to refill groundwater basins during wet years in collaboration with area water providers. [www.riverarcproject.com](#)

Regional Water Authority – The RWA is a joint powers authority, formed to serve and represent regional water supply interests and to assist its members in protecting and enhancing the reliability, availability, and quality of water resources. A part of the mission is to address the impact of climate change on water supplies and kickstart the Sacramento Regional Water Bank for sustainable water storage and recovery. The Authority is comprised of both public and private partners. PCWA is a member and supporter of RWA. [RWA \(rwah2o.org\)](#)

Water Education Foundation – The Water Education Foundation is an impartial non-profit organization which develops and implements education programs leading to a broader understanding of water issues and to the resolution of water problems. The Agency supports the Foundation and its mission.

County of Placer – PCWA is a supporter of the Placer Legacy program. The Agency has been asked by the US Fish & Wildlife Service to participate in the development of an HCP/NCCP “Natural Communities Conservation Plan” in part to mitigate for the potential secondary impacts of the growth that could be enabled by the continued development of the Agency’s existing water rights.

Sacramento River Watershed Program – The SRWP represents a wide coalition of stakeholders who care about the quality of the water and quality of life in the Sacramento River Watershed. Areas of emphasis include monitoring toxic pollutants, public outreach and education, and biological and habitat preservation. The Agency is studying the feasibility of a Sacramento River diversion in exchange for an equal release of its water right water in the American River. The Agency’s proposed Sacramento River diversion project would be consistent with the SRWP goals and objectives. [Sacramento River Watershed Program \(sacriver.org\)](http://sacriver.org)

The United States Forest Service – Is a Federal Agency under the US Department of Agriculture responsible for administering National Forests and Grass Lands which include the Tahoe and El Dorado Forest. PCWA enjoys a strong relationship working alongside the Forest Service as our facilities and watersheds are intermingled.

The United States Bureau of Reclamation – Is a Federal Agency under the US Department of the Interior which oversees water resource management specifically as it applies to the oversight and operation of diversion, delivery and storage and hydroelectric projects. The USBR still has an interest in the American River at the former site of the Auburn Dam.

The State Department of Parks & Recreation – Auburn State Recreation Area – The Auburn State Recreation Area is a part of the California Department of Parks and Recreation. They are responsible for the conservation and management of approximately 20-miles of park along the confluence of the American River.

Federal Energy Regulatory Commission (FERC) – Is an independent government agency that regulates the generation and transmission of energy, and more specifically licenses the Middle Fork Hydroelectric Project.

Pacific Gas & Electric Company (PG&E) – PG&E is a utility company delivering energy services to Northern and Central California. PG&E has multiple land, operational and watershed connections with PCWA.

Cal-Fire – Is a major incident management responder, providing varied emergency services. Cal-Fire has both State and Local responsibilities and is a primary responder to wildland fire in the Placer/El Dorado Area. PCWA has a working relationship with Cal-Fire that includes water and the sharing of with other Agency resources.

Protect American River Canyons (PARC) – PARC is a community-based non-profit organization located in Auburn that is dedicated to building American River community through collaboration and protection of the natural, recreational and historical resources for the North and Middle Forks of the American River Watershed.

Department of Water Resources – DWR’s mission is to manage the water resources in California in cooperation with other agencies, to benefit the State’s people, and to protect, restore, and enhance the natural and human environment. PCWA coordinates with DWR on groundwater monitoring in west Placer County, interstate water resource negotiations regarding the Truckee River system, and on other regional issues.

Water Forum – The Water Forum was a collaborative process of a diverse group of business and agricultural leaders, citizens groups, environmental interests, water managers and local governments in Sacramento County, Placer County, and El Dorado County, with the co-equal objectives to (a) provide a reliable and safe water supply for the region’s economic health and planned development to the year 2030, and (b) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River. Implementation of the Water Forum Agreement will continue under the WF Successor Effort for many years.

Regional Water Authority – The RWA is a joint powers authority, formed to serve and represent regional water supply interests and to assist its members in protecting and enhancing the reliability, availability and quality of water resources. PCWA is a member and supporter of RWA.

City of Roseville – PCWA provides water from its Middle Fork American River Project (MFP) to the City. PCWA also has several interconnections between its treated water system and the cities that enable each to help the other in emergencies.

San Juan Water District – PCWA provides water from its MFP to the Agency to supply its customers within Placer County. PCWA also has several interconnections between its treated water system and the San Juan’s that enable each to help the other in emergencies.

Nevada Irrigation District – NID and PCWA have common watershed and multiple interconnections that can be used to support water service.

R.6.5. Other Mitigation Efforts

The Agency is involved in a variety of mitigation activities including public outreach and project activities. These mitigation activities include:

- Public Service Advertisements www.pcwa.net
- Water Conservation (public outreach) program www.pcwa.net
- Website Newsletters to the general public www.pcwa.net

The Agency Water Conservation Program includes residential programs and rebates for: high efficiency clothes washing machines, high efficiency toilets, hot-water recirculation systems, point of use hot water heater, new lawn replacement pilot program, free mulch distribution, and water wise house calls. Commercial programs include customer recognition for conservation (Flume Awards) and rebates including high efficiency toilet rebate program, waterless urinal rebate program, water wise business calls & large landscape irrigation survey for information on these and other programs customers may visit the PCWA Web site and visit the Customer Service section for the Water Use Efficiency pages at www.pcwa.net.

Field Services Canal Guniting Projects – Lining earthen canals with gunite prevents soil bank erosion and water loss from seeping into the ground. Cracks and repairs to gunite have to be maintained as roots and earth movement cause areas of entropy. This work conserves water loss and is increasingly important during prolonged drought. Ongoing in capital planning budgets and operations. one-million per year.

Emergency guniting was done for the Middle Fiddler Green & Pulp Mill canals when 2017 Storms caused heavy losses this was paid from FEMA Claims & internal emergency funding.

Hillside Slope Stabilization to prevent landslide - Rockfall anchors and netting were installed at Interbay Road in January of 2018 when a slide blocked safe access to the Middle Fork Powerhouse. Insurance funded preventative actions and repair of the area so that the road could be reopened. PCWA has spent some \$4-Million in rock fall mitigation over the last 7-years.

Hell Hole Dam Core Raise - In 2020 PCWA raised the impervious core of the Hell Hole Dam to increase water capacity, for drought and flood control, and to strengthen the dam against catastrophic storm failure. The project was an internally funded Capital Project.

French Meadows Forest Fire Restoration Project - Is a community partnership founded to reduce high-severity wildfires and promote watershed restoration. The French Meadows partnership restored forest health to 1,066 acres of critical headwaters in the first year of the French Meadows Forest Restoration Project reducing stand density by over 30% and harvesting over 3 million board feet of timber. This prevented a loss of unique wet meadow habitat critical for reducing the intensity and spread of wildfire.

Wooden Flume Replacement – Flumes are a critical part of the canal system carrying water across valleys and ravines in a gravity fed canal system. The Agency seeks to replace wooden flume structures where practical to prevent wildfire and hazardous materials service interruptions. Long Ravine, Secret Town, Penryn #1 Fumes put into pipe through internal Capital plans and spending.

American River Pump Station – The American River Pump Station allows the Agency to draw water from the American River that is a critical supply in drought conditions. The intake and lower structures were severely damaged by the 2017 flooding/storms. The area and structures needed both hardening against future damage and repair. This was funded by FEMA Claims & internal funding for continued service.

Water System Interties – Multiple water system Interties increased redundancy of water supply should any of the hazards cause disruption to the water treatment or delivery system. Between 2017-2019, three Capital Projects were completed in conjunction with the Nevada Irrigation District. The Mt. Vernon, Locksley Lane and the Live Oak Interties are all functional interties between water systems.

Vegetation Management & Brushing – Vegetation Management and brushing has taken on a higher priority due to the frequency, intensity and prolonged wildfire season. Multiple projects have been completed with operational funding, capital funding and community partnerships with Cal-fire assistance.

- ✓ Vegetation Management & Brushing of the surrounding area of the Maidu Field Office through the Canyon Fire Resiliency Project 2020 Agency Capital funding and partnership
- ✓ Vegetation Management & Brushing below American River Pump Station power lines was funded by 2020 Agency operational funding

- ✓ 2019 Monta Vista Treatment Plant was thinned and brushed in cooperation with Cal-Fire and adjacent landowners to ensure water storage would be safe from wildfire and treefall. This was accomplished with operational funding and partnership with Cal Fire.
- ✓ In 2015, 33-acres around Lake Arthur were cleared and brushed in partnership with Cal-Fire and local landowners.
- ✓ 2016/17, 78 acres around Lake Theodore were cleared and brushed in partnership with Cal Fire and local landowners
- ✓ A Vegetation Management & Brushing project was completed on a large plot of un-developed Agency Land on Bill Francis Drive. The project was completed with a Cal-Fire partnership.

Debris, sedimentation de-silting projects – Debris, sedimentation and de-silting projects are important for dam safety enhancing the water storage capacity and removing debris that can cause problems for the safe operation of the dam. In addition, the de-silting adds water capacity for water storage and drought management. In 2016, 2017 and 2018 Emergency and Capital projects were completed for Ralston Afterbay, and the North & South Fork Diversions.

Dam management - The Mammoth reservoir low level outlet was replaced with an automated valve in 2020. The replacement allowed for automated operation to enhance water management for storms and water storage. This was an Agency capital project.

R.7 Mitigation Strategy

R.7.1. Mitigation Goals and Objectives

The PCWA adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

R.7.2. Mitigation Actions

The planning team for the PCWA identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Agriculture Pests and Diseases
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Landslides, Mudslides, and Debris Flows
- Pandemic
- Severe Weather: Heavy Rains and Storms

- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Develop Operable Dam Spillway Gates at Hell Hole Reservoir

Hazards Addressed: Dam Failure, Severe Weather, Flooding and Drought Water Supply

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: This project will improve Hell Hole’s currently uncontrolled spillway. The improvements will allow capture of approximately 6,000 acre-feet of additional water that would otherwise escape over the spillway. This project increases the water storage and allows greater control of reservoir water levels during severe weather, flooding and drought conditions as well as adding a level of dam safety through management of the spillway.

Project Description: The project will install operable gates on the currently fixed spillway at Hell Hole Reservoir. Being able to keep the gates lowered during winter will preserve the current mode of safe reservoir operation during winter. Raising the gates in spring will allow capture of spring runoff that would otherwise escape over the spillway.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The project was identified when preparing PCWA’s new license application for the Middle Fork American River Hydropower Project. Construction, operation, and maintenance will be performed by Placer County Water Agency (PCWA).

Responsible Agency/ Department/Partners: PCWA

Cost Estimate: \$5,000,000

Benefits (Losses Avoided): Impounded water will be available to users first within the county and secondarily outside the county. During droughts this water will bolster the supply.

Potential Funding: Middle Fork Finance Authority Capital

Timeline: Completion in 2025

Project Priority (H, M, L): High

Action 2. Alternate Intake for Alta Water Treatment Plant

Hazards Addressed: Severe Weather: Heavy Rains & Storms, Freeze & Snow, Drought & Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: The Alta Water Treatment Plant receives its source water from the PG&E Alta Powerhouse Intake and is susceptible to spills within the intake structure house, oil, solvents and other chemicals that may be in the building. Also, in the event of a fuel spill that impacts the Towle Canal, water needs to flow from the canal, through Alta Forebay, then to the PG&E powerhouse intake, a process that may take several days. Alta forebay is also susceptible to freezing, impairing water flow to the treatment plant.

Project Description: This project will install a structure and piping to allow for the raw water inflow to the treatment plant to come from Towle Canal, near the point where the canal enters Alta forebay.

In the event of a fuel, or other contamination in the Towle canal, raw water supply can be restored to the treatment plant after the water in Towle canal has been deemed safe, a much shorter time period than waiting for the contamination to be removed from Alta forebay.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services. PG&E

Cost Estimate: \$ 450,000

Benefits (Losses Avoided): Restoration of water supply to Alta WTP in a shorter period of time; water supply in the event of the forebay freezing over, water supply in the event there is an issue with the PG&E intake structure.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Undetermined, unfunded.

Project Priority (H, M, L): Medium

Action 3. Canal Access for Fire Fighting and water source

Hazards Addressed: Wildfire, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The area east of the City of Auburn is comprised of many rural communities, receiving water from small water systems, PCWA canals, or wells.

In many of these areas, fire equipment cannot cross canal to access or escape fires. This project will work in conjunction with local fire agencies and Cal-Fire to determine locations along the canal where having the ability to access with fire equipment to cross the canals, or access the canals as a source of water for fire suppression.

Project Description: This project will cooperate with local fire agencies and Cal-Fire to determine locations where canal crossings are desired, and locations that are suitable as a water source for fire suppression equipment.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$500,000

Benefits (Losses Avoided): Fire equipment will have designated locations to cross canals, reducing the potential of causing damage to the canals, hence reducing the water supply to PCWA and private WTP's. Further, fire personnel will know where and how to access a reliable water supply, minimizing the potential of contaminating the water within the canal.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Undetermined, not studied or funded

Project Priority (H, M, L): M

Action 4. Back-up and Stand-By Power Generation for critical community drinking and fire suppression water supply.

Hazards Addressed: Mukti-hazard (Agriculture Pests and Diseases, Avalanche, Climate Change, Dam Failure, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslides, Mudslides, and Debris Flows, Pandemic, Severe Weather: Heavy Rains and Storms, Tree Mortality, and Wildfire). Natural or intentional interruption of primary power supply to critical facilities providing community drinking and fire suppression water.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: After the 2018 Camp Fire, the most destructive and deadly wildfire in California history, PG&E and other electrical utilities implemented Public Power Safety Shutoffs (PSPS) to help prevent wildfires during high, dry, wind events that typically occur in the fall, from arcing or downed power lines.

For PCWA, these PSPS events typically occur during PG&E fall maintenance activities on their canals and powerhouses, effectively eliminating the PG&E water supply to PCWA.

PCWA utilizes pumping from the American River during these maintenance outages to supplement and/or replace this water supply.

PG&E has told PCWA that they will not be creating micro-grids or provide mobile power generation to keep critical PCWA water supply facilities powered during PSPS events.

Project Description: Project will identify the critical PCWA facilities that do not have stand by power generation and determine the best solution to provide power during any power interruptions.

Other Alternatives: None. These facilities are critical for the continued, uninterrupted, water supply for the PCWA service area, and when available, water supply for adjacent water suppliers

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital budgets and grant funding.

Responsible Agency/ Department/Partners: PCWA Technical Service and Drinking Water Operations, and coordination with PG&E

Cost Estimate: \$5,000,000

Benefits (Losses Avoided): Uninterrupted water supply to the PCWA service area, including PCW's largest service area supplying water to 161,750 persons and fire hydrants

Potential Funding: PCWA and grant funding

Timeline: 2 to 10 years

Project Priority (H, M, L): High

Action 5. Lake Arthur Pumping Station

Hazards Addressed: Flooding, Drought & Water Shortage, Severe Weather, Wildfire. Increases reliability of water supply

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: In the event of a PG&E canal failure west of the Lake Arthur, the primary water supply to PCWA from PG&E is eliminated or significantly reduced. Fuel spills from vehicles or trains that enter PCWA and/or PG&E canals can also reduce the water supply to PCWA.

Water supplies to PCWA are also reduced during annual maintenance activities on PG&E canals.

Project Description: The Boardman canal traverses the hillside approximately 40 feet above and 100 feet away from Lake Arthur. The installation of one or more pumps will provide access to more than 80 acre feet of water into the Boardman canal, hence the Auburn, Foothill and Sunset water treatment plants.

Other Alternatives: Release water from Lake Arthur into Rock Creek Reservoir for potential release into the PG&E canal system, if available.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$ 850,000

Benefits (Losses Avoided): Access to additional water supply at a location that would benefit the upper PCWA raw water system and Auburn WTP.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Unknown, not currently funded

Project Priority (H, M, L): Medium

Action 6. Monte Vista Spill Improvements and Cedar Creek Canal Encasement in Pipe

Hazards Addressed: Severe Weather, Flooding, Landslide prevention of canal failure,

Goals Addressed: 1, 2, 3, 4, 5, 7

Issue/Background: With climate change, precipitation events are expected to increase in intensity and in amounts of precipitation in the form of rain. The Cedar Creek Canal intercepts sheet flows and debris from these precipitation events and conveys them to the Monte Vista spill; automation of this spill will regulate the amount of flow allowed to continue within the Cedar Creek Canal, releasing excess flows to Canyon Creek. Automation will also remove large debris from the water, preventing the debris from entering the Gold Run pipe, potentially causing a blockage in the pipe, causing water to backup and overflow at the pipe inlet.

Cedar Creek Canal in an open canal traversing a sheer cliff above interstate 80 and alongside the Union Pacific Railroad, if debris become lodged in the open canal, or on the trash rack at the head of the Gold Run Pipe, water can back up, overtopping the canal, eroding the cliff onto interstate 80 or impairing the Railroad.

Project Description: This project will automate the Monte Vista Spill to regulate the flows into the spill and into the Gold Run Pipe. The project will also encase the Cedar Creek canal between Monte Vista Spill and the head of the Gold Run Pipe, approximately 1,900 feet. A detailed description of the project can be found in the 2019 FEMA pre-disaster mitigation grant application.

Other Alternatives: None that will provide the same results as what is proposed above.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$3,006,000

Benefits (Losses Avoided): Interruption of traffic on West bound interstate 80 for an unknown period of time to clear debris and restore canal connectivity; interruption to commerce and travel on the nearby railroad tracks; elimination of the raw water supply to four PCWA and several private water treatment plants.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Unknown, 50% design of pipeline portion, not currently funded.

Project Priority (H, M, L): High

Action 7. Pulp Mill Canal Pipeline Encasement

Hazards Addressed: Drought, Severe Weather, Wildfire, Landslide.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The northern section of the Pulp Mill Canal traverses the side of a hill below the Southern Pacific Railroad tracks. After two prolonged, heavy precipitation events in 20xx and 20xx, the hillside became saturated, causing the soils under the canal and flumes to slip out, resulting in canal failure. The canal could not be repaired until the water content of the soils allowed for construction equipment to access the area and gunite placed.

Project Description: This project would eliminate the north section of the Pulp Mill canal by connecting a new pipeline to the existing pipeline on the south side of interstate 80, continue west along Casa Loma Road, turn north at the Interstate 80 underpass for Alta Bonneybrook Road, and continue to Lake Alta.

Other Alternatives: Pipe the existing Pulp Mill Canal from exit of the existing Interstate 80 undercrossing to Lake Alta. This alternative does not mitigate the potential of the hillside failing from over saturation during large precipitation events that are expected to occur with increasing frequency due to climate change.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$2,500,000

Benefits (Losses Avoided): Eliminates the potential of canal failure, reduces potential of damage from train derailment and associated fluid spill from train.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Unknown, unfunded.

Project Priority (H, M, L): H

Action 8. Permanent Pumps in Rock Creek Reservoir (PG&E Reservoir)

Hazards Addressed: Drought, Severe Weather, Dam Safety, Drought, Water reliability

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Currently, water can only be pumped from Rock Creek Reservoir by installing temporary pumps into the Wise Canal below the reservoir outlet. Reservoir outlet flow must be adjusted to match the temporary pump capacity to prevent flows from continuing in the Wise canal, affecting downstream activities.

These pumps take time to rent, install, and adjust, installation of permanent pumps will provide a ready water supply at any time needed.

Project Description: Project would install three to four pumps of varying capacity or variable speed, into a deep section of Rock Creek Reservoir, pumping water into the PCWA Middle Fiddler Green Canal, providing a water supply to NID and PCWA canals and potentially to the PCWA Foothill and Sunset water treatment plants. A fish exclusion screen would also be installed at the suction of each pump.

Other Alternatives: Purchase temporary pumps and crane system to allow for the pumps to be lowered into Wise Canal in a shorter time period than the current method.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Technical Services Capital Improvement Plan

Responsible Agency/ Department/Partners: PCWA Technical Services, Field Services, Drinking Water Operations. Partners with NID, PG&E, FERC, and CDFW

Cost Estimate: \$5,000,000

Benefits (Losses Avoided): Additional water source in the event of a PG&E or PCWA canal failure, Drought, PG&E water reductions, severe weather

Potential Funding: HGMP or State grant funding, PCWA CIP

Timeline: Unknown, concept and temporary practice currently.

Project Priority (H, M, L): H

Action 9. Vegetation Management at PCWA Wooden Flumes

Hazards Addressed: Wildfire, Tree Mortality, Severe Weather, water reliability.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The PCWA raw water conveyance system east of the City of Auburn, generally along the Interstate 80 corridor. Water is conveyed across ravines and small valleys using flumes with timber frame understructures. Many of these flumes are in heavily wooded, brushy, remote areas.

In the event of a wildfire, there is the potential that the understructure of the flumes could be damaged, causing the canal to spill its contents, potentially creating additional damage to the surrounding area. Further, the water supply to PCWA and private treatment plants is reduced or eliminated, reducing treated water storage, hence water supply to fire hydrants.

Project Description: This project would significantly reduce the amount vegetation within 200 feet of the flume, then remove less vegetation an additional 300 feet to either side of the flume and 1,000 feet up and downstream of the flume, along the alignment of the canal. There are 17 timber frame flumes for this project. A project description available upon request.

Other Alternatives: Remove only vegetation within 10 feet of the canal. No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$500,000

Benefits (Losses Avoided): At the conclusion of the project, each flume will have a defensible space that firefighting efforts can be implemented with minimum hazard to the flume and personnel. Water supplies to PCWA and private treatment plants remains uninterrupted.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Ongoing

Project Priority (H, M, L): High

Action 10. Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas.

Hazards Addressed: Drought/Landslide-Debris/Hazardous Materials/Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In 2011 a PG&E's Canal failed sliding off a hillside and causing water rationing and irrigation water shortages. Unlined dirt canals also lose water through seepage intensifying drought situations. Rodents can cause earthen canal failures through burrowing. Canals can be damaged by wildfire with more of a tendency to slide. Firefighting is also dependent on a consistent water supply.

Project Description: PCWA has an on-going capital improvement fund for lining canals, but there are more than 177 miles of canal with most originating in the 1800s. The Agency funds \$1-million a year to gunite a little less than two miles a year.

Other Alternatives: Some sections are put into pipe.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Ongoing operational maintenance, improvements, and capital spending.

Responsible Agency/ Department/Partners: PCWA

Cost Estimate: Approximately \$96 a foot on average

Benefits (Losses Avoided): Water shortages impacting water supply, operations and revenue. Canals intersect highways and rail-lines where a disruption failure could cost millions per hour in delayed commerce.

Potential Funding: Agency capital and operational budgets, grants to supplement?

Timeline: Annually complete approximately two miles or 10,560 feet a year

Project Priority (H, M, L): High

Action 11. *Wildfire prevention or Wildfire firefighting enhancements.*

Hazards Addressed: Wildfire and first responder enhancements

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: PCWA has operations spanning across multiple state, local and federal forests with a history of wildfire. There has always been a strong interest in being a cooperative agency in conjunction with fire and emergency services.

Project Description: There are multiple concepts that can potentially be developed for fire prevention or fire suppression support including: transformer-yard fire barriers or extinguishment, additional locations for fire cameras, water access enhancements, wildfire or emergency evacuation-areas, equipment staging areas, public emergency communications enhancements and aviation and rescue enhancements. (landing areas.)

Other Alternatives: Unknown

Existing Planning Mechanism(s) through which Action Will Be Implemented: Some ideas are internal to the Agency others may be cooperative partnerships.

Responsible Agency/ Department/Partners: Dependent of specific projects and stakeholders

Cost Estimate: Unknown, unstudied

Benefits (Losses Avoided): Life safety and wildfire prevention or

Potential Funding: Unknown at this point

Timeline: Unknown at this point

Project Priority (H, M, L): M

Action 12. Replace Wooden Flume Structures

Hazards Addressed: Wildfire and Drought

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Wooden flumes are subject to destruction from natural elements and wildfire. The flumes are critical connections in a gravity fed canal system running through valleys and from hill to hill. Flumes are critical for the stability of the water supply for both domestic water and irrigation water.

Project Description: Canals run into pipe rather than flumes have less of a probability of failing and have a greater chance of surviving wildfire.

Other Alternatives: Undergrounding pipe and pumpstations

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital budgets as priorities allow. Three flumes have been piped or encased, 30 more exist as wooden structures.

Responsible Agency/ Department/Partners: PCWA

Cost Estimate: \$12-million plus

Benefits (Losses Avoided): \$2.7-million in replacement value at risk without considering subsequent losses including water supply and firefighting.

Potential Funding: Agency Capital funding & grants

Timeline: One every five years? 150 Years?

Project Priority (H, M, L): High

Action 13. Reservoir - dam capacity and water management improvement projects.

Hazards Addressed: Dam Failure, Flooding, Drought, Severe Weather and Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Agency has 16-reservoirs of varying size and hazard, all with water regulating appliances such as a dam, spillway, checkboard system or low-level outlet for the control of water. Over time reservoirs collect sedimentation displacing storage capacity and creating challenges rising water levels or water management devices. Almost any reservoir improvement quickly becomes a large capital project. Particularly hazardous is debris from wildfires that threaten the dams or spillways.

Project Description: Sedimentation removal, dam or spillway projects or maintenance, improving capacity or increasing safety, water management, and water storage.

Other Alternatives: Accept the risk of severe outlying hazards beyond current experience.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital improvement projects.

Responsible Agency/ Department/Partners: PCWA in partnership and cooperation of DSOD and FERC

Cost Estimate: Many of the projects are undetermined and require study.

Benefits (Losses Avoided): Improved dam safety and water management

Potential Funding: Capital Improvement Funds

Timeline: Undetermined, may arise from inspections, and requires study and project specifications

Project Priority (H, M, L): M

Action 14. Rockfall anchoring, stabilization, rockfall netting and slide debris mitigation.

Hazards Addressed: Landslides, mudflows & debris flow. Severe Weather and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Agency has had multiple slides blocking access routes to operational and wilderness recreational areas or areas where existing roads have fallen off the mountainside. While we have done extensive geological studies and stabilized hillsides above many of our assets, wildfires and extreme storms create dynamic slide conditions. There are areas where existing slides that have destroyed or blocked roadways and need to be cleaned up for emergency and fire access.

Project Description: Continue to study and identify locations where roads and facilities may be at risk for earth movement and address with anchoring, stabilization and rockfall netting. Where roadways are

blocked, clear debris from roadways and stabilize the remaining hillside. In some cases the hillsides below roadways need to be stabilized.

Other Alternatives: Do nothing and spend money clearing roadways after a slide.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing Blacksmith Flat Road, Mosquito Ridge Road slide could be done in cooperation between the Forest Service and perhaps facilitated with grant funding.

Responsible Agency/ Department/Partners: Arrangements with the roadway owners, Forest Service and others along with grants and Capital funding for PCWA owned roadways.

Cost Estimate: Typically, one to fifteen million per location

Benefits (Losses Avoided): Increases access for fire services, recreation, and Agency operations

Potential Funding: Depends on the roadway ownership.

Timeline: As studied, identified, and needed.

Project Priority (H, M, L): Priority assigned dependent on the criticality of the area. Existing slides are H.

Action 15. Zone 3 Automation

Hazards Addressed: Severe Weather, Flooding Canal failure, and reliability of water supply,

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: With climate change, precipitation events are expected to be more intense for shorter periods of time, with the canals intercepting increased run off and debris, that may lodge in the canal perimeter, inlets to flumes, or piped inlets, causing the canal to overtop, potentially causing canal failure, or failure of a hillside below the canal, interruption the PCWA water supply to PCWA and Private water treatment plants.

Project Description: This project will install automated headgates at each of the spills (controlled release points) to regulate the flows downstream of each automated headgate into the canal and releasing excess flows, up to the historical maximum(s), into the spill channel, measuring each of these flows for record keeping and planning.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services

Cost Estimate: \$ 2,000,000

Benefits (Losses Avoided): During large precipitation events, only the amount of water needed to meet demands is allowed to remain in the canal, all other water is released in a controlled manner, reducing the potential for damage to the canal and the spill way. Further, the automated headgates adjust to changing conditions in real time.

Adding the automated headgates to the SCADA systems also allows for remote control and monitoring of the canal system, allowing the operators to narrow areas that may need to have operator intervention to restore flows in the canal, or narrow where there may be an issue with the canal.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Unknown, Concept stage of planning.

Project Priority (H, M, L): Medium

Action 16. Pumps at Halsey Forebay

Hazards Addressed: Drought, Severe Weather, Water supply reliability.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In the event of the Bear River Canal is out of service, or water is unavailable to the PCWA Upper Bowman Canal to provide water to the Bowman Canal, hence the PCWA Bowman and Christian Valley water treatment plants, storage in PG&E Halsey Forebay may be available as an alternate water supply.

Project Description: This project will install permanent pumping facilities, either electric, diesel powered, or both, at PG&E Halsey Forebay, connecting to existing piping under Christian Valley Road, to supply water to the Bowman Canal for use at the PCWA Bowman and Christian Valley WTP's.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services, PG&E

Cost Estimate: \$500,000

Benefits (Losses Avoided): Additional/supplemental water supply to the PCWA Bowman and Christian Valley water treatment plants.

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: Unknown, concept.

Project Priority (H, M, L): M

Action 17. Backup Electrical Generation at American River and Ophir Road Pump Stations

Hazards Addressed: Drought, Severe Weather, Water supply reliability, power interruptions.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Since 2018, PG&E and other California power suppliers have used Public Power Safety Shutoffs (PSPS) to reduce the potential of wildfires that may occur due to high winds and dry weather that may damage power lines. These PSPS event generally occur during the same time period when PG&E performs maintenance activities on their hydroelectric canal system, Reducing the primary water supply for PCWA by 90%.

During these PG&E maintenance activities, PCWA utilizes a backup water supply from the American River, a PSPS event during this time effectively eliminates the entire PCWA water supply, hence treated water to over 200,000 persons and businesses.

To deliver water to the PCWA treatment plants, water must first be pumped from the American River into a tunnel under the City of Auburn, then pumped from the tunnel to an adjacent canal, or pumped again directly to at PCWA treatment plant.

Project Description: This project will install sufficient diesel-powered electrical generation, providing and un-interrupted water supply from the American River during PSPS or other electrical interruptions that occur during the same time as a reduction in water supply.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement

Responsible Agency/ Department/Partners: PCWA Technical Services, PG&E

Cost Estimate: \$8,000,000

Benefits (Losses Avoided): Uninterrupted water supply to PCWA treatment plants, hence treated water supply to over 200,000 persons and businesses

Potential Funding: HGMP grant funding, State grant funding, PCWA CIP budget

Timeline: 3 years

Project Priority (H, M, L): H

Action 18. Sierra Forest Restoration Partnerships

Hazards Addressed: Forest fire & Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Wildfires are growing in frequency, size and severity. This project aims to reduce high severity wildfires and restore forest health by studying and treating forest ecosystems in the American River Watershed.

Project Description: Multiple partners have found shared interests in the American River Watershed and have sponsored, and are working the project to thin overgrowth and restore natural meadows as firebreaks. The work is creating healthy, forests resistant to wildfire. The wildfire fuels are being harvested for energy and raw material use. Scientific study is ongoing.

Other Alternatives: Single interest entities have not been able to implement viable alternatives.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Sierra French Meadows Partnership is an ongoing and collaborative partnership forwarding the goals of the Project.

Responsible Agency/ Department/Partners: PCWA, Placer County, The U.S. Forest Service, the Nature Conservancy, The Sierra Nevada Conservancy, The American River Conservancy and UC Merced SNRI.

Cost Estimate: \$5-20-Million

Benefits (Losses Avoided): Indirect costs are not calculated, but potential cost for emergency debris and sedimentation removal may exceed \$13-million. Timber, recreation loss and grazing land values are not calculated here.

Potential Funding: Grants and continued funding from the partners.

Timeline: Ongoing

Project Priority (H, M, L): H

Action 19. Colfax to Applegate Water Reliability Project

Hazards Addressed: Drought and Water Shortage and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Climate change is projected to increase the frequency of droughts and water shortages. Wildfires are growing in frequency, size, and severity. Limited fire hydrants along the I-80 corridor create challenges to fight fires that may spark and spread into large devastating events.

Project Description: This project would construct a new water treatment plant north of the Colfax City limit and associated transmission facilities along an 8-mile stretch of the I-80 corridor. This would provide small and underfunded water providers between Colfax and Applegate with a supplemental secure source of potable water supply during dry periods. Additionally, fire hydrants would be located along the transmission pipeline as a source of water supply to aid in firefighting activities of wildfires that could spark or move to within the area.

Other Alternatives: None identified.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Placer County Water Agency is currently preparing the Colfax to Applegate Water Reliability Project to serve as a guiding document to address this hazard over a planning horizon of 30 years.

Responsible Agency/ Department/Partners: Placer County Water Agency. Possible partners/cooperators include Placer County Fire, Placer Hills FD, and Cal Fire

Cost Estimate: \$38,000,000

Benefits (Losses Avoided): Indirect costs are not calculated, but potential cost for drought and water shortage impacts and losses due to catastrophic fires to the regions would be in the tens of billions of dollars.

Potential Funding: SWRCB and DWR grants and not interest loans, FEMA grants and continued funding from the PCWA Financial Assistance Program.

Timeline: The new water treatment plant is planned for construction start in 2023 with completion in 2025. The transmission facilities associated with this project would be phased and built as funding becomes available.

Project Priority (H, M, L): H

Action 20. Emergency Evacuation / Transit Priority Lane Infrastructure – Highways 89 and 267

Hazards Addressed: Increasing emergency vehicle access and evacuation capacity on major roadways in the North Lake Tahoe region of eastern Placer County.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Existing State Routes (SRs) 267 and 89 are the only continuous roadways that connect the Lake Tahoe region and its communities of Placer County to the Interstate 80 corridor (4-lane roadway) to the north accessed through the Town of Truckee in Nevada County. The distance on SR 89 between Tahoe City and Truckee is approximately 12 miles, and similarly, the distance on SR 267 between Kings Beach and Truckee is approximately 12 miles. Both SR 267 and SR 89 are two-lane highways with discontinuous paved shoulders. In the event of a wildfire or other emergency requiring a large-scale evacuation, the two highways could become congested and also impact emergency vehicle access.

Project Description: As part of enhancing and encouraging travel in the area using public transit, Placer County is planning to add a third travel lane to both highways for use by public transit and high occupancy vehicles only. Funding for this type of infrastructure will require several years to secure. The third lane could be used by emergency vehicles and/or evacuation purposes in the event of a large-scale emergency. This type of infrastructure should be considered the highest priority to help become fully prepared in eastern Placer County for mitigating the potential impacts of a catastrophic event requiring evacuation to help prevent casualties

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Resort Triangle Transportation Plan (RTTP), Sacramento Area Council of Governments (SACOG), Placer County Transportation Planning Agency (PCTPA), Tahoe Regional Planning Agency (TRPA), and Caltrans

Responsible Agency/ Department/Partners: Placer County / Department of Public Works / Caltrans

Cost Estimate: \$500M

Benefits (Losses Avoided): Improved emergency access and large-scale evacuation corridors to help prevent loss of life and limb.

Potential Funding: Placer County (Transient Occupancy Tax), Federal (FHWA, FTA and FEMA), State (Caltrans and OES)

Timeline: Planning from 2020 to 2022, Design from 2022 to 2024, Implementation from 2024 to 2030

Project Priority (H, M, L): H



Annex S Placer Hills Fire Protection District

S.1 Introduction

This Annex details the hazard mitigation planning elements specific to Placer Hills Fire Protection District (PHFPD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the PHFPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

S.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table S-1. Additional details on plan participation and District representatives are included in Appendix A.

Table S-1 Placer Hills FPD – Planning Team

Name	Position/Title	How Participated
Ian Gow	Fire Chief	Review and approval of information provided
Gillian Lofrano	District Manager	Provided data and information
Mark D'Ambrogi	Fire Marshal	Participated in meetings, completed required information

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table S-2.

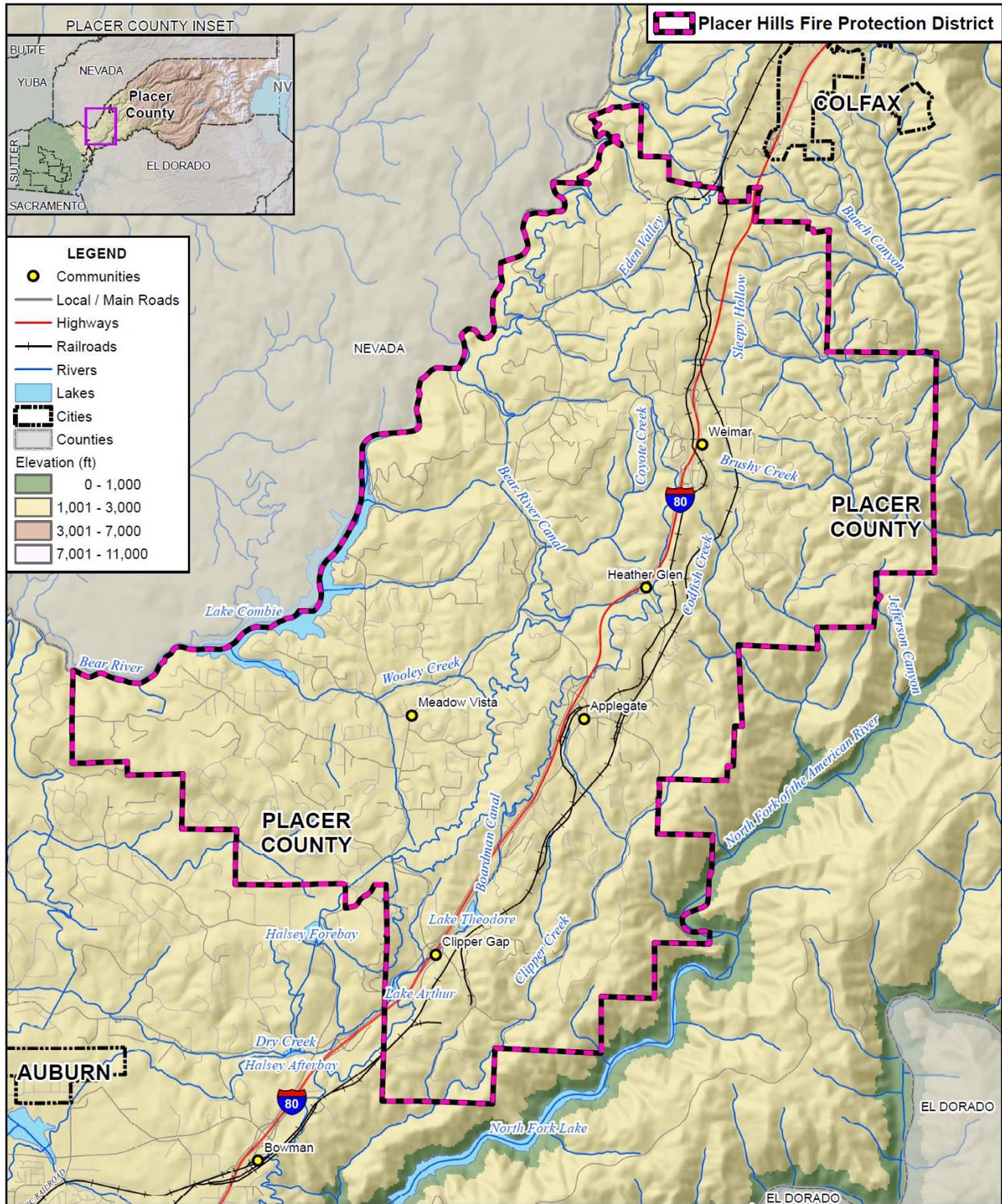
Table S-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	Mitigation related planning mechanisms were completed through coordination with Placer County CDRA

S.3 District Profile

The District profile for the Placer Hills FPD is detailed in the following sections. Figure S-1 displays a map and the location of the District within Placer County.

Figure S-1 Placer Hills FPD



FOSTER MORRISON CONSULTING

0 1.5 3 Miles

COUNTY OF Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

S.3.1. Overview and Background

The Placer Hills Fire Protection District (Placer Hills FPD) services a 34 square mile area that houses approximately 12,500 full time residents and a day population of about 15,000 people. The District services the communities of Applegate, Clipper Gap, Eden Valley, Meadow Vista, and Weimar.

In 1949, community members of the Meadow Vista came together through the Grange to create the Meadow Vista Fire Department. In 1988, the Meadow Vista Fire Protection District, Company No. 31 and the Ponderosa Fire Brigade annexed to become the Placer Hills Fire Protection District.

Placer County established Company No. 31 in 1979 at the Weimar Institute to assist in the County contract with the California Department of Forestry. In 1980, members of the Applegate and Weimar communities came together to develop Engine Company No. 31. The community built the fire station in Applegate in 1983 and the County provided an engine and a water-tender. John Velican provided an engine for the Ponderosa Fire Brigade.

With start-up monies budgeted by the Placer County Board of Supervisors, Placer Hills Fire Protection District built a new station at Weimar Crossroads and purchased a new mini-pumper quick attack in 1990. Also in the same year, the Fire Board hired a part-time Fire Marshal to establish a fire prevention program throughout the District. The Placer County Board of Supervisors adopted Ordinance 4225-B, County Code Chapter 7.50 creating the legal authority for fire districts to collect fees in order to mitigate the impacts of new development. The Placer Hills Fire Protection District started collecting the Fire Facilities Fees in late 1990 and has been able to purchase/lease state of the art firefighting engines and equipment.

To further enhance the fire protection of this District, the Fire Board passed a Fire Suppression Benefit Assessment in 1991, which provided daytime staffing during weekdays. Placer Hills Fire Protection District started providing non-transporting Advanced Life Support Services in October 1997. In September 2001 the District staffed one engine with a crew of two, 24 hours per day and an additional engine with 2 during work hours and fire season weekends. The community approved another Benefit Assessment of \$49 in June 2004. This enabled the District to staff an engine at both the Meadow Vista and Weimar fire stations 24/7. In 2019 the community approved an additional Benefit Assessment of \$185 to continue ALS and full staffing at both stations. The Fire District runs approximately 1,800 calls every year.

S.4 Hazard Identification

Placer Hills FPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table S-3).

Table S-3 Placer Hills FPD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Limited	Low	Medium
Climate Change	Limited	Likely	Critical	Medium	–
Dam Failure	Limited	Occasional	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance	Limited	Likely	Limited	Medium	Medium
Floods: Localized Stormwater	Extensive	Likely	Critical	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Critical	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Significant	Unlikely	Critical	Low	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Freeze and Snow	Limited	Unlikely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Limited	Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Limited	Low	Low
Tree Mortality	Limited	Likely	Limited	Medium	High
Wildfire	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

S.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

S.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section S.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table S-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

S.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the Placer Hills FPD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table S-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. Placer Hills FPD’s physical assets, valued at over \$12 million, consist of the buildings and infrastructure to support the District’s operations.

Table S-4 Placer Hills FPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Station 84	Essential	\$5,000,000	Wildfire
Station 85	Essential	\$2,000,000	Wildfire
Station 86	Essential	\$4,000,000	Wildfire
District Administrative Offices	Essential	\$1,000,000	Wildfire
Total		\$12,000,000	

Source: Placer Hills FPD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. Placer Hills FPD provides services to a number of resident types of which include: retired individuals, a majority of the population, senior and elderly persons, working families that commute to school and work, second family homes used periodically throughout the year, and recreational enthusiasts utilizing natural resources in the area.

It is important to note that there are several elderly, disabled, and low income people in the Placer Hills area. In the case of a wildfire evacuation, these people may not have transportation. Likewise, in the event of a power outage during the winter months, these special populations may not be able to get to a shelter for warmth.

Natural Resources

Placer Hills FPD has a variety of natural resources of value to the District. These natural resources parallels that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

Placer Hills FPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan. The District is in the planning stages of replacing the current Station 84, anticipating new construction in the next 4-5 years.

Development since 2016

Population growth since 2016 within District boundaries are covered in Section 4.3.1 of the Base Plan and in the individual annexes of the incorporated communities falling within the service area of the District.

No District facilities have been constructed since 2016. In 2019 the District purchased a commercial two story building for use as Administrative Offices, Board Meeting Room, and training classroom. Prior to that Administrative Offices were located within Station 84. This facility, like all District facilities, are located within a High Fire Severity Zone. No expansion of service areas is planned.

The Placer Hills Fire Protection District has a cooperative agreement with the Newcastle Fire Protection District for Administrative and Operation services. Of which include: Fire Chief, District Manager, Fire Marshal services, Battalion Chief response, and cross staffing of engine company personnel. Discussions are in process to evaluate the feasibility of consolidation between the two districts.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. The District is in the planning stages of creating an outdoor training facility for all risk hazard training. There are no plans for expansion of the District's service area. More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

S.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table S-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table S-5.

Table S-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water

supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Impacts that may affect the District due to drought are the increased risks of wildfire due to reduced fuel moistures and reduction of water sources for firefighting activities.

Assets at Risk

All District assets (from Table S-4) are at risk from this hazard.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

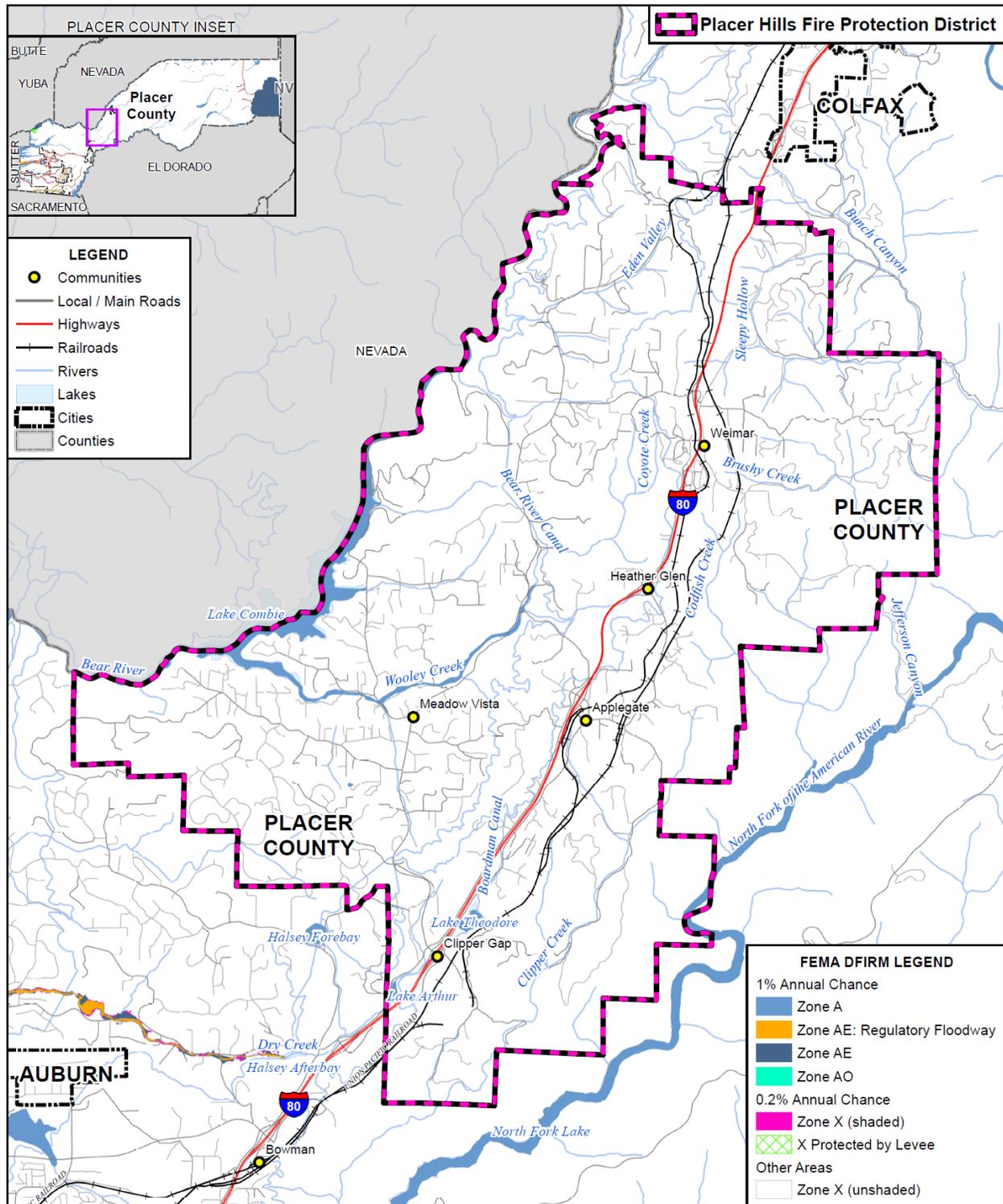
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the Placer Hills FPD have been subject to historical flooding.

Location and Extent

The Placer Hills FPD has areas located in the 1% annual chance floodplain. This is seen in Figure S-2.

Figure S-2 Placer Hills FPD – FEMA DFIRM Flood Zones



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COUNTY OF
Placer

Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table S-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table S-6 Placer Hills FPD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	Y
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	N
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	N
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	N
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	N
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	N
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	N
X	Areas outside of known floodplains.	Y

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table S-7. These events also likely affected the District to some degree.

Table S-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

No District assets (from Table S-4) are at risk from this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The Placer Hills FPD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The District tracks localized flooding areas. localized flood areas identified by the Placer Hills FPD are summarized in Table S-8.

Table S-8 Placer Hills FPD – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Placer Hills Rd at Crother Rd	X			X		X	
Placer Hills Rd along Woolley Creek	X			X		X	
Applegate Rd at railroad undercrossing	X			X			
Boole Rd at Hilltop Rd	X			X		X	
Combie Rd at lower parts	X			X			
Canyon Way at Live Oak	X			X		X	
Placer Hills Rd between Crother Rd and West Weimar Cross Rd					X		X

Source: Placer Hills FPD

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

Minor flooding occurs during heavy and prolonged periods of rain throughout the District. Such occurrences cause delays and or re-routing to emergency calls for service. Most all occurrences are confined to county roadways. Locations of the minor flooding that occurs is as follows:

Minor rock debris slides occur during heavy and prolonged periods of rain throughout the District. Such occurrences cause delays and or re-routing to emergency calls for service. Most all occurrences are confined to county roadways which are located along all portions of Placer Hills Rd and portions of Canyon Way.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

The District's concerns with localized flooding include increased response times to emergencies and the ability of citizen evacuation in flooded areas.

Assets at Risk

No District assets (from Table S-4) are at risk from this hazard.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought

can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on these types of power outages can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

The District has experienced increased wildfire danger during times of extreme heat and increased medical responses due to heat related illness.

During times of PSPS the District has been affected with loss of power that impacts communications such as internet and phone. Station 84, Station 86, and the Administrative Offices have back-up generators to continue continuity of services.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well, especially when combined with the potential for severe wind events. Health impacts, including loss of life, are often the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions and spread.

Extreme heat is a concern to the District. During extreme hot weather, the risk of wildfire increases. This can be further exacerbated during periods of drought. Also vulnerable to the effects of extreme hot weather is the elderly population located within District boundaries. The District contains a significant elderly population, with some residing in homes that have not been sufficiently updated to protect against extreme temperatures. The effects of extreme heat to the District include increased wildfire danger and potential heat related issues to personnel engaging in emergency response.

Assets at Risk

No District assets (from Table S-4) are at risk from this hazard.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and

disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table S-9.

Table S-9 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

The most eastern portion of the District that include the communities of Applegate, Weimar, and unincorporated Colfax experience snow and freezing. Typically this occurs 4-8 times a year requiring fire apparatus to utilize chains on response vehicles to navigate these conditions. This will usually result in

extended response times. An increase for calls of service due to broken water pipes does occur during these events.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed buildings can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Freeze and snow are a concern to the District. During periods of freeze and snow, pipes in both residential and commercial buildings freeze and crack, and transit becomes difficult with many roads in the area freezing over. The impact to the area road system is not just a concern to residents, but also to the emergency service crews who can become immobilized during emergency situations. Even the small snow events that occur half a dozen times every year in the Weimar area create significant traffic issues for cars and school buses. According to the Placer Hills FPD planning team, winter storms resulting in up to three feet of snow occurred in 1990 causing moderate property damage, and closing businesses, schools, and roads creating significant impacts to the area. During extreme winter events, response times to emergencies may be extended. Also vulnerable to the effects of freeze and snow is the elderly population located within District boundaries. The District contains a significant elderly population, with some residing in homes that have not been sufficiently updated to protect against extreme temperatures.

Impacts to the District include extended response times, increase in freeze related incidents of broken water pipes, increase in vehicle accidents, and medical emergencies related to freezing conditions.

Assets at Risk

No District assets (from Table S-4) are at risk from this hazard.

Tree Mortality

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the middle and eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”.”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

There have been several locations where tree mortality has been present in the District. Most areas have been relatively small in scale limited to 5-10 dead trees per acre on private properties. These areas have been mitigated by property owner actions to eliminate the dead trees.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015.

Past tree mortality in the District has been very limited, 1-2 trees on any given private parcel. Majority of tree mortality has occurred at higher elevations including the North Fork Shaded Fuel Break contingent to District boundary. This project is a Cal Fire project and tree mortality is addressed through the implementation.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose

on trees (i.e. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

The primary concerns the District has concerning tree mortality is the increased dead fuel loading for wildfire and falling dead trees into structures causing damage and or injury.

Assets at Risk

No District assets (from Table S-4) are at risk from this hazard.

Wildfire

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

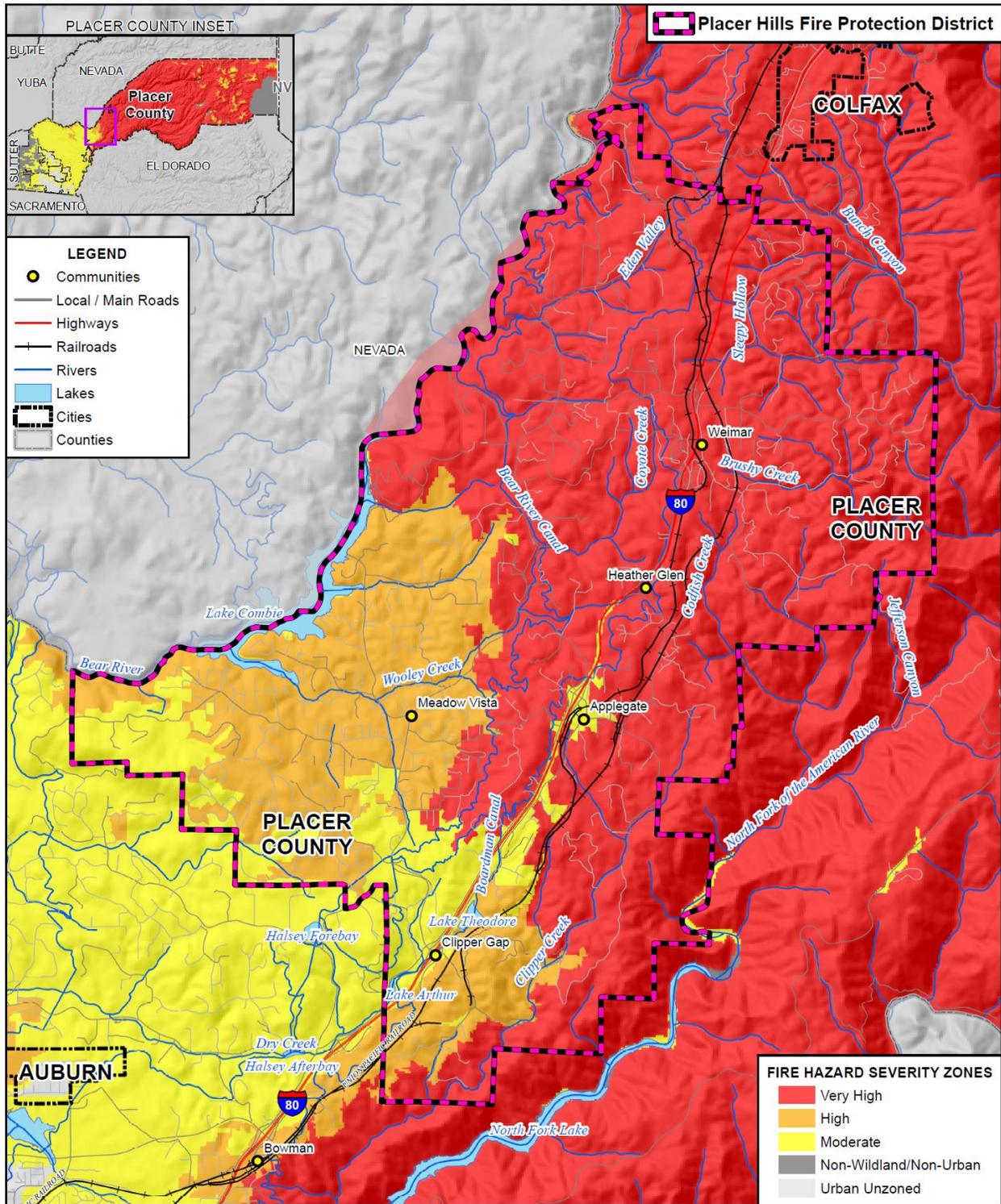
Wildland fire and the risk of a conflagration is an ongoing concern for the Placer Hills FPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the Placer Hills FPD were created. Figure S-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District range from Moderate to Very High.

The entire Placer Hills Fire District is within State Responsibility Area (SRA). Cal Fire is the primary agency for wildfire with assistance from the Placer Hills Fire District. Wildfire activity is captured and recorded by Cal Fire for the LHMP.

Figure S-3 Placer Hills FPD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table S-10.

Table S-10 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The Placer Hills Fire District responds to structure fires. There have been no significant sole structure fires within the District in the last 5 years.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat

of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Since all of the District is within a Fire Hazard Severity Zone as identified by Cal Fire and is a combination of Wildland Urban Intermix and Wildland Urban Interface, main concerns are for the safety of citizens and protection of structures from wildfire. Given the right conditions; weather, fuels, and topography, a wildfire can significantly impact and cause catastrophic damage to development within the District.

Assets at Risk

All District assets (from Table S-4) are at risk from this hazard.

S.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

S.6.1. Regulatory Mitigation Capabilities

Table S-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Placer Hills FPD.

Table S-11 Placer Hills FPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	
Capital Improvements Plan	Y	Mitigation measure to be incorporated into each specific project
Economic Development Plan	N	
Local Emergency Operations Plan	Y	Through coordination with Placer County
Continuity of Operations Plan	Y	Local District Operating Procedures, to follow Placer County Plan
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	Y	In coordination with the Placer Sierra Fire Safe Council

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: Enforced through Placer County CDRA
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score: ??(Placer County?)
Fire department ISO rating:	Y	Rating: 3/3Y
Site plan review requirements	Y	Enforced through District Standard Conditions for Development
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	(All these areas the District falls under Placer County)
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Continued cooperative planning and building review processes to ensure all agencies apply mitigation measures and conditions for development.		

Source: Placer Hills FPD

New Development: Project Guidelines

The District has and continues to adopt Ordinances to mitigate issues related to fire and life safety. These Ordinances include adoption of the most current California Fire Code, Placer County Hazardous Vegetation Ordinance with an MOU for enforcement/abatement services, Fee schedules for plan review, approval, and inspection to ensure compliance with Ordinances.

These guidelines contain fire prevention requirements for new development. Key elements include requirements for the following:

- Addresses and Access
- Water Supply, rural and municipal
- Fire suppression systems
- Vegetation Abatement and defensible space
- Fire Alarm Systems

- Hydrants and water storage for firefighting

S.6.2. Administrative/Technical Mitigation Capabilities

The Board is comprised of 5 members and is selected by registered voters within the District. The Board serves as the governing body for the District’s residents. The Board of Directors approves District Rules and Regulations and, through the Fire Chief, ensures adherence to District policies. The Placer Hills FPD provides services through three fire stations: Meadow Vista, Applegate, and Weimar.

Placer Hills FPD’s dispatch services are provided by the Placer County Sheriff’s Office 911 center in Auburn. The 911 center uses computer aided dispatching to ensure optimal resource monitoring and management utilizing the closest resource backed up by station cover assignments in a multi-tiered alarm structure. Table S-12 identifies the personnel responsible for activities related to mitigation and loss prevention in the District.

Table S-12 Placer Hills FPD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	In coordination with Placer County, Yes
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	Through Western Placer County Fire Chiefs Association, closest resources response agreement
Other	Y	Placer County Code Enforcement for abatement of hazardous vegetation
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	In coordination with Placer County
Floodplain Administrator	N	
Emergency Manager	Y	In coordination with Placer County
Community Planner	Y	In coordination with Placer County
Civil Engineer	Y	In coordination with Placer County
GIS Coordinator	Y	In coordination with Placer County
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	In coordination with Placer County
Hazard data and information	Y	In coordination with Placer County
Grant writing	N	
Hazus analysis	N	

Other
How can these capabilities be expanded and improved to reduce risk?
Continued cooperative planning and inspection processes to ensure all agencies apply mitigation measures and conditions to reduce risk.

Source: Placer Hills FPD

S.6.3. Fiscal Mitigation Capabilities

Table S-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table S-13 Placer Hills FPD’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	From Impact Fees and Special Assessments
Authority to levy taxes for specific purposes	Y	Voter approved only, to sustain funding for services
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Used for capital expenses
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Not Used
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	SAFER Grant for former Fire Marshal position
State funding programs	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
The District will continue to seek grant monies from all sources in order to better protect residents and structures in District territories.		

Source: Placer Hills FPD

S.6.4. Mitigation Education, Outreach, and Partnerships

Table S-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table S-14 Placer Hills FPD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	YN	Placer Sierra Fire Safe Council, Placer County Fire Alliance. Evaluate risk and identify projects to reduce wildfire risk.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Updated web site, social media- Facebook, Twitter. To get safety messages out to public.
Natural disaster or safety related school programs	Y	School programs
StormReady certification	N	
Firewise Communities certification	Y	Through Placer County Fire Alliance and FIREWISE Coordinator.
Public-private partnership initiatives addressing disaster-related issues	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Continued participation with allied agencies and organizations and collaborate with single messaging on specific issues.		

Source: Placer Hills FPD

The Placer Hills FPD has automatic aid agreements with bordering Districts and mutual aid agreements with other fire agencies throughout the area. The District relies heavily upon this aid from neighbors.

The District also works with other agencies on wildfire-related matters. Working with professional fire experts from the U.S. Forest Service and California Department of Forestry and Fire Protection helps ensure that the District’s work complements state and federal work and is up to standard for controlling wildfires.

S.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- In 2017/18 the District received a FEMA Fire Prevention Award for a Fire Marshal position. An individual was hired for this position and when funding ended (one year funding) the individual moved on to another agency. The Fire Marshal position was retained as a part-time position as it functions to this day.
- In 2019 the District was successful in passing of Measure A. A parcel tax for all properties within the District that brings in an approximate additional 1 million dollars. This funding allows the retention of two stations staffed 24/7 with paramedic capability, an internship program that provides a third FF on each engine company, ability to reserve funds for capital improvements, and as of this date and time, all full-time positions are filled.
- The District has developed Standards for new development and implemented a fee schedule for pre-development and inspection services.
- The District has adopted the Placer County Hazardous Abatement Ordinance and has a MOU with Placer County for Code Enforcement and Abatement processes. This Ordinance is used extensively for compliance of defensible space requirements within the District.

- An Administrative building was purchased in 2020 where District Administration functions, including meeting and training rooms.
- An agreement for services was implemented between the Newcastle Fire District and Placer Hills Fire District. Placer Hills provides administrative services; Fire Chief, Fire Marshal, District Manager, Battalion Chiefs, and allows for the sharing of firefighting personnel between the two agencies to ensure maximum staffing for each work shift. Discussion of consolidating the two agencies is ongoing.

The District is involved in a variety of mitigation activities including public education, fuels management projects, and other activities to reduce fuel loads and fire risk. These mitigation activities include:

- Public Education and Fire Safety
 - ✓ A variety of public outreach activities are conducted throughout the district on an ongoing basis.
 - ✓ The District has a program where they make address signs and provide them to the public at cost.
 - ✓ The District promotes the use of the County Chipper for local residents.
- Defensible Space
 - ✓ When staffing is available for program management, the District provides defensible space inspections for area residents upon request.
 - ✓ When staffing is available for program management complaint based inspections occur for vegetation management on private properties to be in compliance with the Hazardous Vegetation Ordinance.
- New Development
 - ✓ The District has a comprehensive review, approval, and inspection process for all new development within the Districts that address fire and life safety issues in addition to the Placer County development process.

S.7 Mitigation Strategy

S.7.1. Mitigation Goals and Objectives

The Placer Hills FPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

S.7.2. Mitigation Actions

The planning team for the Placer Hills FPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat

- Severe Weather: Freeze and Snow
- Tree Mortality
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Address signage for residential and commercial structures.

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water Shortage, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Freeze and Snow, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many structures throughout the fire district have either no addressing or limited addressing that is not consistent. Many structures were built at a time when there was no addressing standard in place. There is now a standard created by Placer County for consistent addressing in unincorporated areas of Placer County.

Project Description: Apply Placer County standard for addressing for all new construction throughout the fire district. Identify structures needing appropriate addressing and inform and educate property owners of a standard and consistent addressing means.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Addressing for new construction will be identified and implemented during the plan review and approval process as a condition to develop. Through inspection as well as emergency response to incidents where addressing is lacking, inform and educate property owners of the value of appropriate addressing.

Responsible Agency/ Department/Partners: Placer Hills Fire Protection District staff officers and engine company personnel.

Cost Estimate: No costs identified, use of district personnel to implement. Costs for address signage will be the responsibility of the property owner. Estimated at \$40-\$60 dependent upon where obtained.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents. Can assist in incidents requiring evacuation and in pre-planning communities for major incidents.

Potential Funding: Possible grant funding for large scale “addressing project”. The Placer Hills Firefighter Association creates address signs for citizens as a fund raising project.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 2. Defensible space inspection and implementation throughout the District.

Hazards Addressed: Wildfire, Climate Change, Drought and Water Shortage, and Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Most all of the District lies within Very High or High Fire Severity Zones as identified by Cal Fire. The application of defensible space and home hardening are ways to reduce the risk of wildfire destruction. Although homeowners/business owners are aware of such risks, through an inspection process property owners can be better informed of what action they can do to reduce such risks.

Project Description: Through an inspection process, educate, inform, and make recommendation for property owners on what actions to take to reduce the risk of destruction from wildfire. Identify vegetation to remove, reduce, and maintain to achieve defensible space. Identify potential areas of home hardening to better prepare for wildfire. Conduct inspections on private properties to identify specific needs of that property to achieve defensible space.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: All new construction will be conditioned to create and maintain defensible space through the plan review and approval process as a condition to build. Through an inspection program, identify areas to conduct property inspections. The basis of the inspection program will utilize Public Resource Code (PRC), Placer County Hazardous Vegetation Ordinance, and local fire district adopted ordinance.

Responsible Agency/ Department/Partners: Placer Hills Fire Protection District designated staff will implement and manage this inspection program.

Cost Estimate: Currently the District has one part-time funded Fire Marshal position to manage this program. Additional funding will increase success in implementation. Property owners are responsible for implementing clearance requirements.

Benefits (Losses Avoided): Reduction of property loss due to wildfire may be obtained through such a program.

Potential Funding: Possible grant funding for fulltime and or additional personnel for project management and inspection. Potential of charging fee for inspection.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 3. Private roadway and driveway vegetation clearances.

Hazards Addressed: Wildfire, Tree Mortality, Climate Change, Drought and Water Shortage, and Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Many private roadways and driveways throughout the fire district contain dense flammable vegetation along the shoulders of the roadway/driveway as well vertical clearances. This can impede fire resource response and somewhat limit access in the event of an emergency. During wildfire conditions this can pose significant risk to responders as well as civilians.

Project Description: Through inspection, identify those areas needing fuel reduction along private roadways and driveways. Optimal clearance is 10 feet from each shoulder and 15 vertical clearance. Inform property owners of the importance and their responsibility to create and maintain these accesses for emergency response and civilian evacuation. Implement the formal process of “Notice to Abate” as needed.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: All new constructed roads and driveways will be conditioned to create and maintain clearance through the plan review and approval process as a condition to develop. Through inspection as well as emergency response to incidents, personnel will identify areas needing appropriate clearance. Once identified, a process will be initiated based on the Placer County Hazardous Vegetation Ordinance and local fire district adopted ordinance.

Responsible Agency/ Department/Partners: Placer Hills Fire Protection District staff officers and engine company personnel.

Cost Estimate: Currently the District has one part-time funded Fire Marshal position to manage this program. Additional funding will increase success in implementation. Property owners are responsible for implementing clearance requirements.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents and potentially increased ability of civilian evacuation. Reduce vegetation to reduce fuel loading and the risk of wildfire.

Potential Funding: Possible grant funding for large scale roadside clearing projects for project management and fuel reduction implementation.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 4. *Participate and collaborate with the Placer Sierra Fire Safe Council (PSFSC) and contribute to the Community Wildfire Protection Plan (CWPP)*

Hazards Addressed: Wildfire, Climate Change, Drought and Water Shortage, and Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Placer Hills Fire Protection District is within the boundaries of the GAAFSC. Participation from Placer Hills Fire Protection District continues strong over the years. Two (2) members of the Placer Hills Fire Protection District have been appointed to the PSFSC. The Fire Safe Council's in Placer County contribute greatly to the CWPP. This is opportunity for local fire agencies to be involved in such a process.

Project Description: Continued participation and collaboration will occur on an on-going basis. Attending monthly meetings and participate in PSFSC events by command staff member(s).

Other Alternatives: No other alternatives have been identified that includes such collaboration

Existing Planning Mechanism(s) through which Action Will Be Implemented: Identify staff personnel to attend meetings and PSFSC events.

Responsible Agency/ Department/Partners: Placer Hills Fire Protection District command staff.

Cost Estimate: No costs are associated with this action.

Benefits (Losses Avoided): Keep current on projects and public outreach campaigns. Develop a collaborative approach to the wildfire risks and reduction methods. Participate in the CWPP process.

Potential Funding: Possible grant funding through the PSFSC to assist Placer Hills Fire Protection District with fuel reduction and related projects.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 5. *Heavy Rains, Localized Flooding, Flood, Freeze, and Snow Mitigation*

Hazards Addressed: Natural events that create flooding, localized flooding, freezing, and snow.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: From time to time, the District experiences localized heavy rains that create minor flooding on streets and roads used for emergency response. In addition, freezing may occur occasionally. This natural occurrence of rain, and freeze can have an impact on response to emergencies.

Project Description: Obtain the most up-to-date information regarding adverse weather, predicted weather events, and related weather that may impact District response to emergencies.

Other Alternatives: No other alternatives are identified at this time.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Coordinate with Placer OES on specific predicted weather events. Plan response accordingly to specific event: alternate routes for flooded areas and apparatus with appropriate chains for ice. Notify Placer County Roads through Placer Dispatch for problem areas that include flooding; need for storm drain clearing, sanding of roads for ice and snow, and road closures.

Responsible Agency/ Department/Partners: Newcastle Fire Protection District staff officers and engine company personnel.

Cost Estimate: No costs identified with this operational procedure.

Benefits (Losses Avoided): Prevent delay in emergency response to incidents and safety of responding personnel.

Potential Funding: None identified for this mitigation.

Timeline: Ongoing

Project Priority (H, M, L): Medium



Annex T San Juan Water District

T.1 Introduction

This Annex details the hazard mitigation planning elements specific to the San Juan Water District (SJWD or District), a new participating jurisdiction to the 2021 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to SJWD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

Note: SJWD participated in the original 2005 Placer County LHMP. A copy of that document could not be located by SJWD, Placer County, or Cal OES. Additionally, staff turnover in the past 16 years has reduced institutional memory of that 2005 Plan. It can be assumed that none of SJWD’s proposed mitigation actions were completed, SJWD’s mitigation priorities at that time are unknown, and that the 2005 Plan was not incorporated into any SJWD planning mechanisms. Development in the District since 2005 was described by SJWD as minimal, and a general description of more recent development in the District is included in Section T.5.2 of this Annex.

T.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table T-1. Additional details on plan participation and District representatives are included in Appendix A.

Table T-1 SJWD – Planning Team

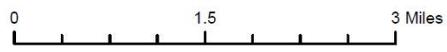
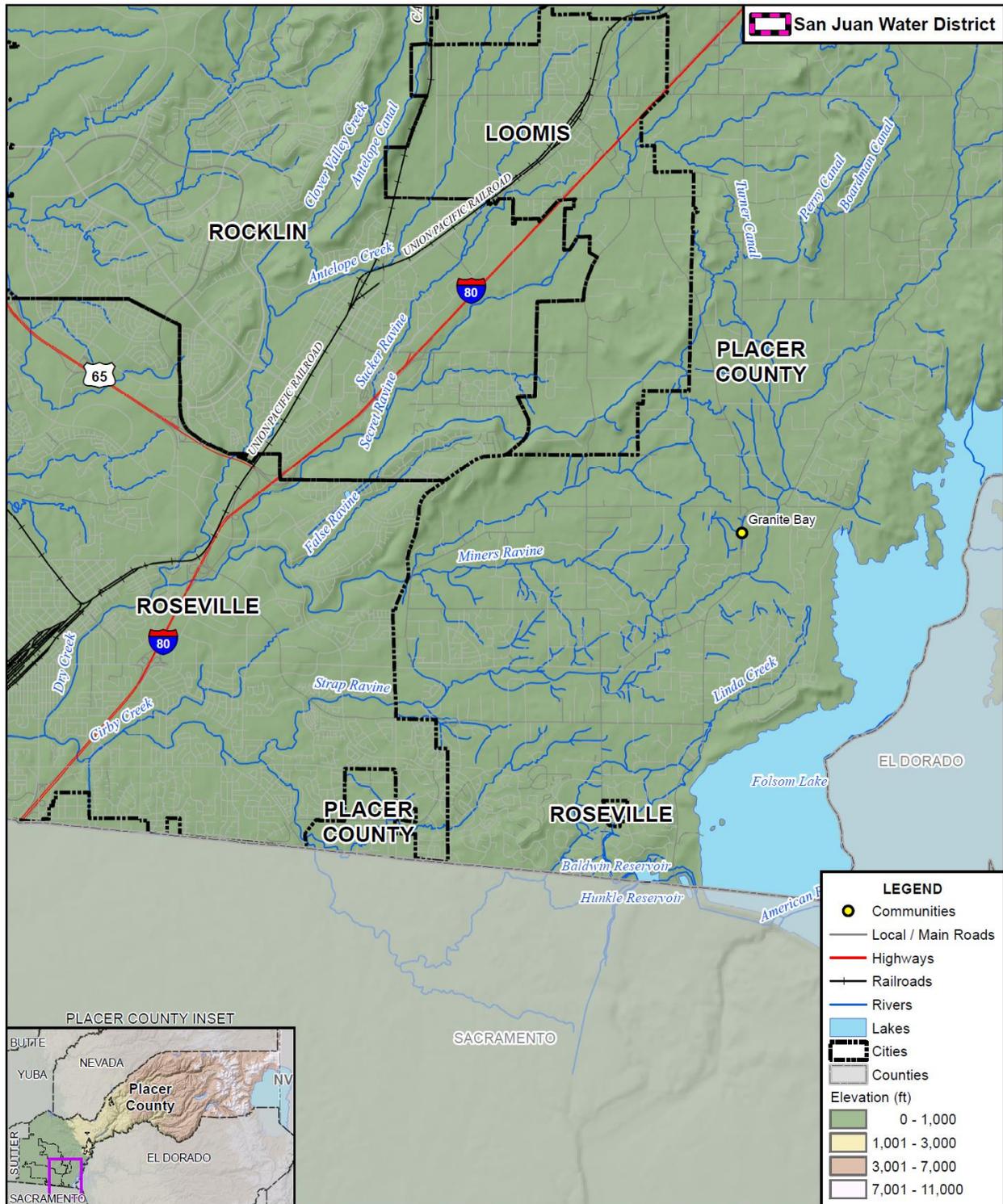
Name	Position/Title	How Participated
Scott Alcantara	Safety Regulatory Compliance Coordinator	Attended Meetings, coordinated participation, gathered information, edited and reviewed response
Tony Barela	Operations Manager	Research and review
Lisa Brown	Customer Service Manager	Research and review
Andrew Pierson	Engineering Manager	Research and review
Adam Larsen	Field Services Manager	Research and review

Name	Position/Title	How Participated
Greg Turner	Water Treatment Plant Superintendent	Research and review

T.3 District Profile

The District profile for the SJWD is detailed in the following sections. Figure T-1 displays a map and the location of the District within Placer County.

Figure T-1 SJWD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

T.3.1. Overview and Background

San Juan Water District is a community services district established by a vote of the citizens in 1954, formed under Section 61000 et seq., Title 6, Division 3 of the California Government Code Water Code, Section 3000. We provide reliable, high-quality water service to both retail and wholesale customers in eastern Sacramento and southern Placer counties. San Juan’s roots date back to the Gold Rush era with the formation in 1854 of the original entity, North Fork American River and Mining Company, later known as the North Fork Ditch Company.

SJWD provides drinking water supplies to approximately 160,000 residents in our retail and wholesale areas. The District provides treatment and delivery of more than 65,000 acre-feet of water per year through approximately 218 miles of pipeline to wholesale and retail customers. The retail division serves the northeast portion of Sacramento County, east Roseville and Granite Bay.

Wholesale customers include San Juan Water District, Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, a portion of the City of Folsom (north of the American River) and periodically to another 171,000 customers in Sacramento Suburban Water District.

T.4 Hazard Identification

SJWD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table T-2).

Table T-2 SJWD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Critical	Medium	–
Dam Failure	Limited	Unlikely	Critical	High	Medium
Drought & Water Shortage	Significant	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	High	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Critical	High	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Occasional	Limited	Medium	Low
Tree Mortality	Limited	Occasional	Limited	Low	High
Wildfire	Significant	Occasional	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

T.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

T.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section T.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table T-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

T.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the SJWD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table T-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. SJWD’s physical assets, valued at over \$130 million, consist of the buildings and infrastructure to support the District’s operations.

Table T-3 SJWD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Main Campus/Yard		\$10 Million	Earthquake/Flood
Water treatment plant		\$50 Million	Earthquake/Flood/Hazmat
Pumping stations		\$10 Million	Earthquake/Flood
Water distribution		\$50 Million	Earthquake/Subsidence
Water storage facilities		\$10 Million	Earthquake/Subsidence
Total		\$130 million	

Source: SJWD

Natural Resources

SJWD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan

Historic and Cultural Resources

SJWD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. SJWD provides drinking water supplies to approximately 160,000 residents in our retail and wholesale areas. The District provides treatment and delivery of more than 65,000 acre-feet of water per year through approximately 222 miles of pipeline to wholesale and retail customers. The retail division serves the northeast portion of Sacramento County, east Roseville and Granite Bay.

Wholesale customers include San Juan Water District, Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, a portion of the City of Folsom (north of the American River) and periodically to another 171,000 customers in Sacramento Suburban Water District.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

T.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table T-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence—Likely
Vulnerability—High

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing. The District is concerned that climate change can cause possible Harmful Algal Bloom (HAB) in its source water (Folsom Lake).

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack

- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

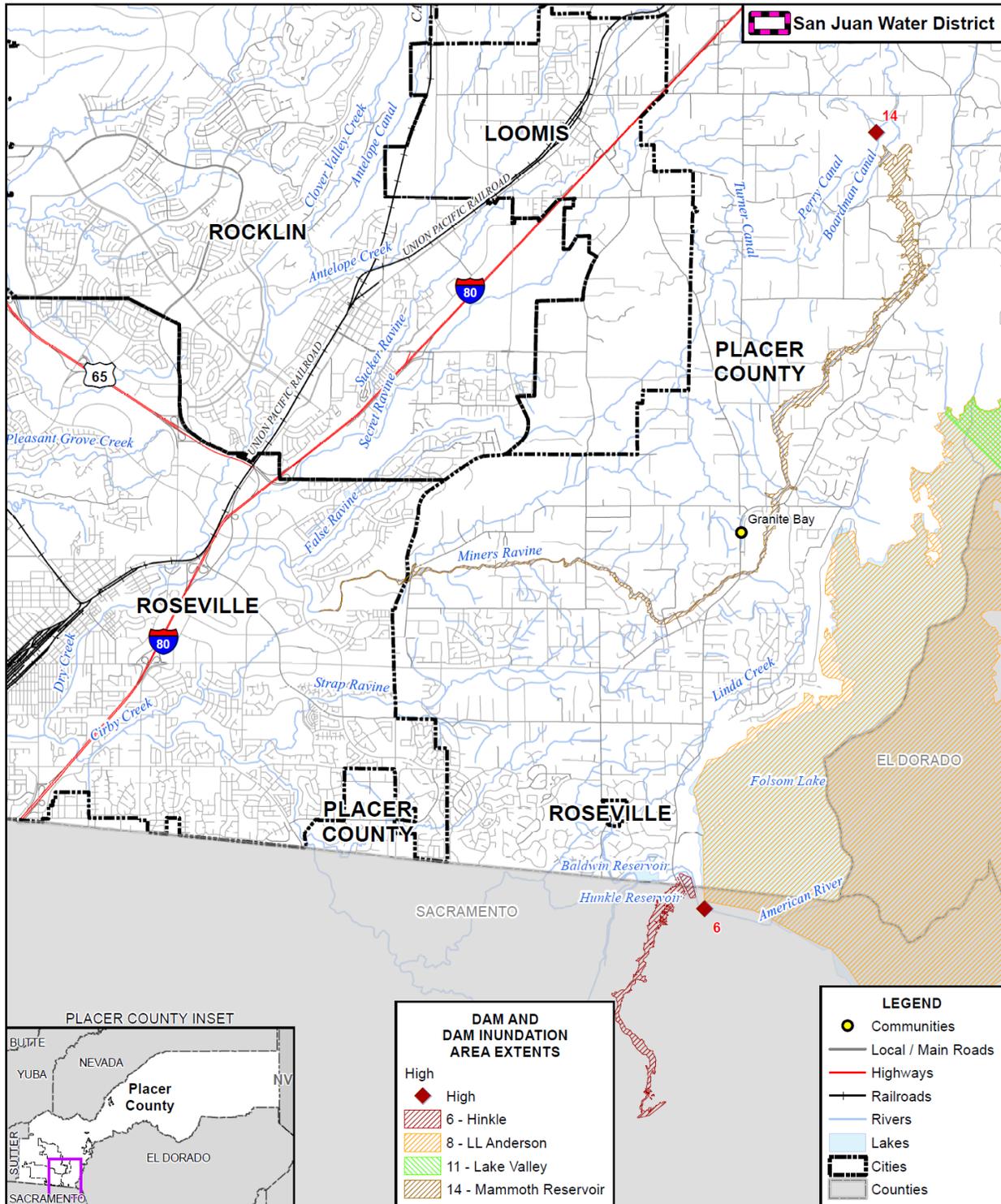
Location and Extent

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake. There is no scale with which to measure dam failure. However, Cal DWR Division of Safety of Dams (DOSD) assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in four categories that identify the potential hazard to life and property: Low, Significant, High, and Extremely High. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Dams inside the County that can affect the District can be seen on Figure T-2. No dams outside the County affect the District.

Figure T-2 SJWD – Dam Inundation Areas from Dams Inside the County



FOSTER MORRISON CONSULTING

0 1.5 3 Miles

COUNTY OF Placer

Data Source: DWR DSOD Data 2020, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Past Occurrences

There has been no federal or state disaster declarations for dam failure in the County. The District noted no other dam failure occurrences that have affected the District.

Vulnerability to and Impacts from Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Impacts to the District from a dam failure flood could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

The District is concerned with flooding and disruption of utility power impacts from a dam failure event.

Assets at Risk

The District noted the following facilities at risk:

- Main campus/Yard
- Water Treatment Plant
- 4 District pumping stations

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought

- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table T-4.

Table T-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

San Juan Water District is fortunate to have plentiful water storage under normal circumstances. The historic drought between 2012 and 2015 resulted in minor reduction in supplies; however, the drought resulted in more significant demand reductions forced by regulatory mandates. In general, summer 2015 water use has been cut by over 30% relative to 2013 levels. Economically the drought has impacted water sales reducing revenues for the District. Prolonged drought can affect capital improvement plans and operations over time.

Assets at Risk

No District assets from Table T-3 are directly at risk from this hazard.

Earthquake

Likelihood of Future Occurrence—Occasional
Vulnerability—High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate

anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismic shaking maps for the area show Placer County and the District fall within a low to moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. None of these types of buildings are owned by the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The SJWD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Earthquake could have a significant impact on underground drinking water and the fire hydrant supply lines. Additionally, the District has some bridge crossings that supply water throughout the system. These could be disturbed by earth movement. While there is significant diversification and redundancy within the system there is the possibility of some service disruption resulting from a severe earthquake in the area.

Assets at Risk

The District noted the following facilities at risk:

- Main Water Treatment Plant
- Pumping stations
- Water Distribution system
- Water Storage facilities

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

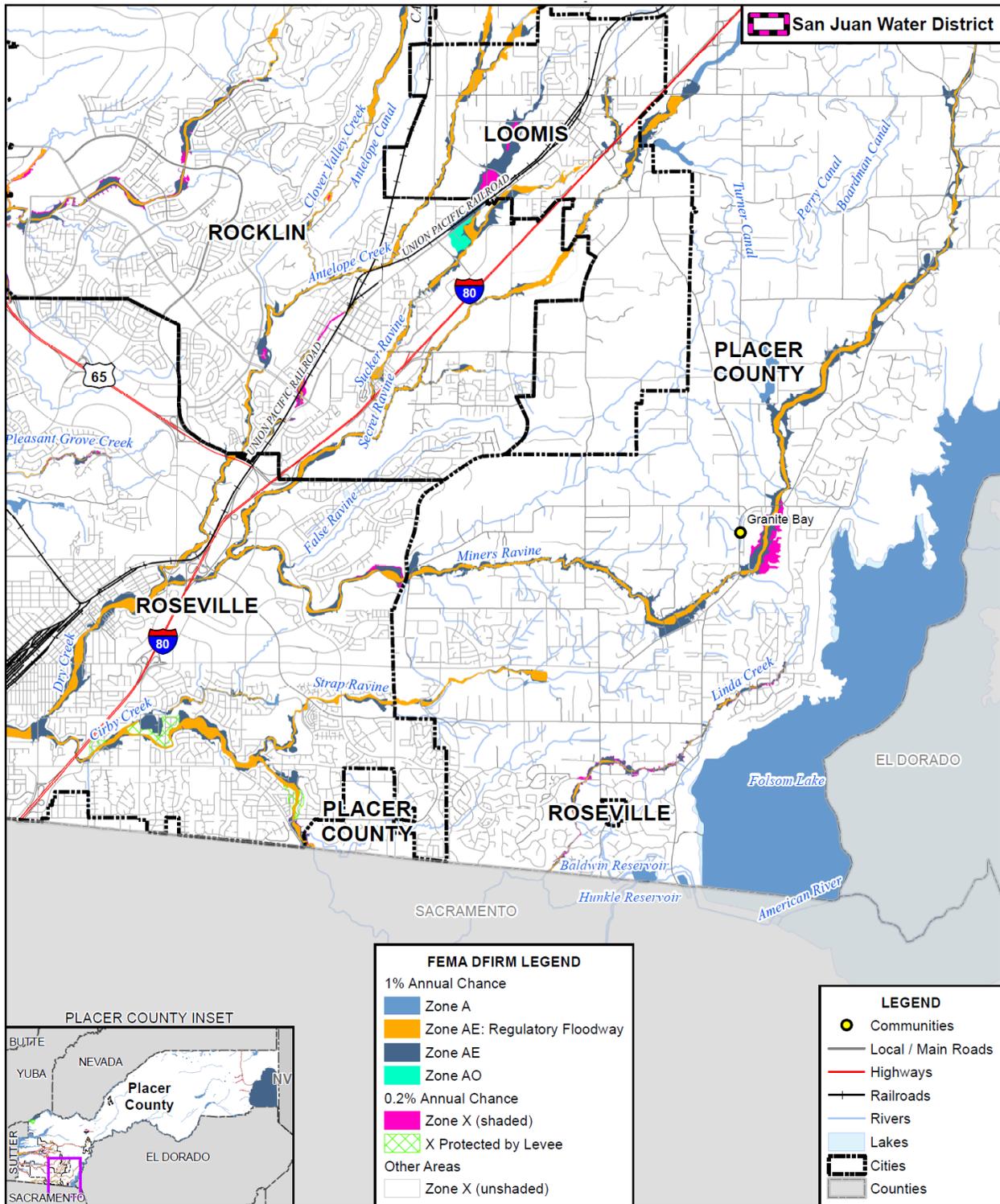
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the SJWD have been subject to historical flooding.

Location and Extent

The SJWD has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure T-3.

Figure T-3 SJWD – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table T-5 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table T-5 SJWD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	Areas subject to inundation by the 1% annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.	X
AE – Regulatory Floodway	Areas subject to inundation by the 1% annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply. Different from AE in that it adds the water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one foot.	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X	Areas outside of known floodplains.	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table T-6. These events also likely affected the District to some degree.

Table T-6 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Assets at Risk

The District noted the following facilities at risk:

- Water pumping stations
- Water Distribution system

Pandemic

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table T-7.

Table T-7 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

The San Juan Water District like other organizations was affected by the 2019/2020 Covid-19 pandemic in many ways. District personnel had to modify operations to protect employees and customers from possible exposure. These changes affected how maintenance and construction projects proceeded under the Governor's various executive orders.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or "self-quarantining," if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the District could increase exposure to pandemic, and increase the ability of each disease to be transmitted among the population of the District.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

The District has not been affected by the PG&E PSPS events. To date SMUD has not implemented any PSPS events on their distribution system.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts, including loss of life, are the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

Assets at Risk

No District assets (from Table T-3) are at risk from this hazard. District personnel who work outdoors can be affected.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table T-8.

Table T-8 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County.

Assets at Risk

The District noted the following facilities at risk:

- Water Treatment Plant

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months in the western side of the County and primarily in the fall and spring in the eastern side of the County.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

The District noted an event that occurred on May 14, 2015. The District’s water treatment plant at 9935 Auburn-Folsom Road was hit by lightning. Damages to various electrical systems for the pumps and other electric motors the District uses were reported. Fortunately, only minor impacts occurred, mostly due to available redundant systems the District maintains. \$4,700 in damages were reported.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating

significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Assets at Risk

The District noted the following facilities at risk:

- Water Treatment Plant
- Pumping stations
- Water Distribution system
- Water Storage facilities

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also cause PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring, primarily in the western part of the County.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District, but would more likely occur in Western Placer. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

Assets at Risk

The District noted the following facilities at risk:

- Water Treatment Plant
- Pumping stations

Wildfire

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

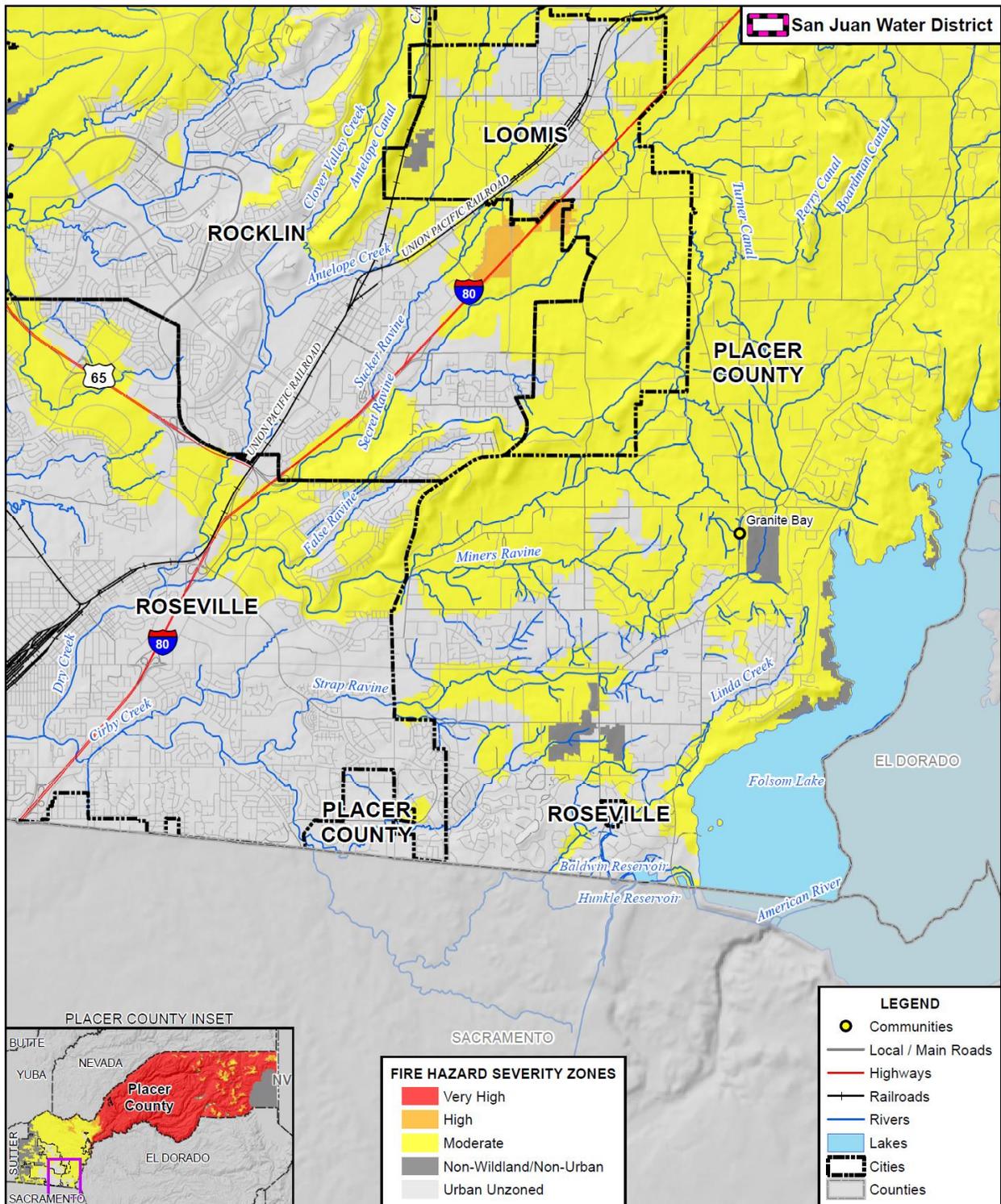
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the SJWD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the SJWD were created. Figure T-4 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from Urban Unzoned to Moderate.

Figure T-4 SJWD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table T-9.

Table T-9 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage

and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Assets at Risk

The District noted the following facilities at risk:

- Main Campus/Yard

T.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

T.6.1. Regulatory Mitigation Capabilities

Table T-10 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the SJWD.

Table T-10 SJWD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	See Placer County.
Capital Improvements Plan	Y	District specific plan
Economic Development Plan	Y	District specific plan
Local Emergency Operations Plan	N	See Placer County.
Continuity of Operations Plan	Y	District specific plan
Transportation Plan	N	See Placer County.
Stormwater Management Plan/Program	N	See Placer County.
Engineering Studies for Streams	N	See Placer County.
Community Wildfire Protection Plan	N	See Placer County.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	District specific Urban Water Management Plan
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year:

Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
Is the ordinance an effective measure for reducing hazard impacts?		
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	See Placer County
Subdivision ordinance	N	See Placer County
Floodplain ordinance	N	See Placer County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	See Placer County
Flood insurance rate maps	N	See Placer County
Elevation Certificates	N	See Placer County
Acquisition of land for open space and public recreation uses	N	See Placer County
Erosion or sediment control program	N	See Placer County
Other	N	See Placer County
How can these capabilities be expanded and improved to reduce risk?		
Regular planning and implementation of risk reduction measures are included into most if not all operations. The Agency has multiple cooperative partnerships that help enhance these capabilities. Additional grant funding could increase risk reduction, but limited staff hinders the Districts grant writing capabilities.		

Source: SJWD

T.6.2. Administrative/Technical Mitigation Capabilities

Table T-11 identifies the District department(s) responsible for activities related to mitigation and loss prevention in SJWD.

Table T-11 SJWD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	See Placer County
Mitigation Planning Committee	N	See Placer County
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	See Placer County
Mutual aid agreements	Y	SJWD has mutual aid agreements with other agencies
Other		
Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?		
Staff	Y/N FT/PT	
Chief Building Official	N	See Placer County
Floodplain Administrator	N	See Placer County

Emergency Manager	N	See Placer County
Community Planner	N	See Placer County
Civil Engineer	Y	Staff has some training on hazards and mitigation
GIS Coordinator	Y	Staff has some training on hazards and mitigation
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Access to Placer county system
Hazard data and information	N	See Placer County
Grant writing	N	See Placer County
Hazus analysis	N	See Placer County
Other		
How can these capabilities be expanded and improved to reduce risk?		
The Agency has a working relationship with the County for planning and emergency services. The District has developed its own safety department and is in the process of updating its Emergency Response Plan, and Vulnerability Assessment.		

Source: SJWD

T.6.3. Fiscal Mitigation Capabilities

Table T-12 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table T-12 SJWD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Fees are set based on cost of service
Impact fees for new development	Y	The District receives capacity fees used to expand the water system
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	Sources have not been used in the past.
State funding programs	Y	State Revolving Loan Funding
Insurance	Y	Used for replacement and mitigation of existing hazard conditions after loss.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
How can these capabilities be expanded and improved to reduce risk?		
If funding were available, additional planning division staffing would greatly improve SJWD's ability to increase vulnerability awareness and help plan for future mitigation programs. The District will seek FEMA, DWR, Cal OES, and other funding sources to increase mitigation capabilities.		

Source: SJWD

T.6.4. Mitigation Education, Outreach, and Partnerships

Table T-13 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table T-13 SJWD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	SJWD water conservation programs.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Ongoing communication and coordination throughout traditional and social media platforms. THE SJWD conservation program will be expanded if additional revenue becomes available.		

Source: SJWD

T.6.5. Other Mitigation Efforts

The District is involved in a variety of mitigation activities including public outreach and project activities. These mitigation activities include:

- Public Service Advertisements
- Water Conservation (public outreach) program
- Website Newsletters to the general public

- The District’s Water Conservation program includes residential programs and rebates for: high efficiency clothes washing machines, point of use hot water heater, weather based irrigation controllers, free mulch distribution, and water wise house calls.

T.7 Mitigation Strategy

T.7.1. Mitigation Goals and Objectives

The SJWD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

T.7.2. Mitigation Actions

The planning team for the SJWD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Updating the 2015 Urban Water Management Plan

Hazards Addressed: Climate Change, Drought and Water Storage Hazards, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Urban water suppliers having more than 3,000 service connections or supplying more than 3,000 acre-feet per year (AFY) for retail or wholesale uses are required to submit an UWMP every five years to the California Department of Water Resources (DWR). The Urban Water Management Planning Act (Act) requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures (DMMs), implementation strategy and schedule, and other relevant information and programs. An UWMP is required in order for a water supplier to be eligible for DWR administered state grants and loans and for drought assistance.

Project Description: The Act requires reporting agencies to describe its water supply reliability under single dry-year, multiple dry-year, and average year conditions, with projected information in five-year increments for a minimum of 20 years. One of the purposes of this UWMP is to ensure the efficient use of available water supplies, as required by the Act. The Act states that urban water suppliers should make every effort to assure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The UWMP describes the availability of water and discusses water use, reclamation, and water conservation activities. This UWMP concludes that the water supplies available to the District's retail and wholesale customer agencies are adequate over the next 25- year planning period

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Complete update of Urban Water Master Plan

Responsible Agency/ Department/Partners: SJWD

Cost Estimate: Various

Benefits (Losses Avoided): Reduced risk to drought and water shortage due to climate change.

Potential Funding: SJWD – DWR Grants

Timeline: Within 2021

Project Priority (H, M, L): Medium

Action 2. Dam Failure Mitigation

Hazards Addressed: Dam Failure – Hinkle Reservoir, Flood, Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: A dam failure can range from a small uncontrolled release to a catastrophic failure, caused by prolonged failure of the containment levee. The primary danger associated with dam failure is the flooding of those properties located within the inundation zone of the dam. Dam failure flooding varies by area depending on which dam fails and the nature and extent of the dam failure and associated flooding. The dam was built in 1980 and is the rock fill-earth core dam with 1300 ft. crest length.

Project Description: Replacement of reservoir hypalon liner and inspection and modifications to outlet structures

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Dam Failure EAP

Responsible Office: San Juan Water District and California Department of Water Resources Division of Safety of Dams

Priority (H, M, L): M

Cost Estimate: 18,425,000

Potential Funding: Various sources

Benefits (avoided Losses): Reduces risk of facility failure

Schedule: Complete by 2022

Action 3. Earthquake Mitigation

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Project Description: Earthquake damage to water treatment plant, distribution pump station both above and below ground water distribution mains.

Issue/Background: Various facilities have the potential to be damaged in an earthquake

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Strengthening of facilities when replacing or upgrading facilities when upgrades to existing facilities occurs.

Responsible Office: SJWD

Priority (H, M, L): L

Cost Estimate: Project dependent

Potential Funding: Capitol project funding and grants if available

Benefits (avoided Losses): More resilient facilities

Schedule: On-going

Action 4. Redundant/Backup Power System

Hazards Addressed: Climate Change, Extreme heat, freeze and winds

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The San Juan Water District administration building currently has no back up power source.

This recently became an issue due to the initiation of the Public Safety Power Shutoff (PSPS) events that have affected our area. Since the PSPS event can last a number of days they can disrupt the administration of our district. The increased likelihood of power outages caused by more frequent severe weather is also a factor that the District needs to consider

Project Description: This project would be to install a backup power source for the District's administration building. Two options would be explored, the first would be a solar array with battery storage or a diesel/natural gas emergency generator.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: San Juan Water District Engineering Department

Responsible Agency/ Department/Partners: San Juan Water District, Operation Department

Cost Estimate: \$750,000

Benefits (Losses Avoided): Increase administrative capabilities during PSPS events or other severe weather caused power outages

Potential Funding: FEMA grant Funding

Timeline: 24 months

Project Priority (H, M, L): High

Action 5. Water Main Bridge Crossing Replacement/Strengthening

Hazards Addressed: Wildfire, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The San Juan Water District has a number of water distribution mains that are attached to over crossings and bridges in our service area. Many of these mains are decades old and are undersized for the growth that has taken place since they were originally installed.

Project Description: This project would be to either strengthen the existing water main crossing or when possible, replace the existing main with a larger capacity line to increase water availability for increase fire hydrant flows and increase capacity for existing interties with other agencies.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: San Juan Water District Engineering Department

Responsible Agency/ Department/Partners: San Juan Water District, Water Distribution Department

Cost Estimate: \$500,000

Benefits (Losses Avoided): Increased water capacities and more resilient system

Potential Funding: FEMA grant Funding

Timeline: 48 months

Project Priority (H, M, L): High



Annex U Sierra Joint Community College District

U.1 Introduction

This Annex details the hazard mitigation planning elements specific to Sierra Joint Community College District (SJCCD or District), a new participating jurisdiction to the 2021 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to SJCCD, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

Note: SJCCD participated in the original 2005 Placer County LHMP. A copy of that document could not be located by SJCCD, Placer County, or Cal OES. Additionally, staff turnover in the past 16 years has reduced institutional memory of that 2005 Plan. It can be assumed that none of SJCCD’s proposed mitigation actions were completed, SJCCD’s mitigation priorities at that time are unknown, and that the 2005 Plan was not incorporated into any SJCCD planning mechanisms. Development in the District since 2005 was described by SJCCD as minimal, and a general description of more recent development in the District is included in Section U.5.2 of this Annex.

U.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table U-1. Additional details on plan participation and District representatives are included in Appendix A.

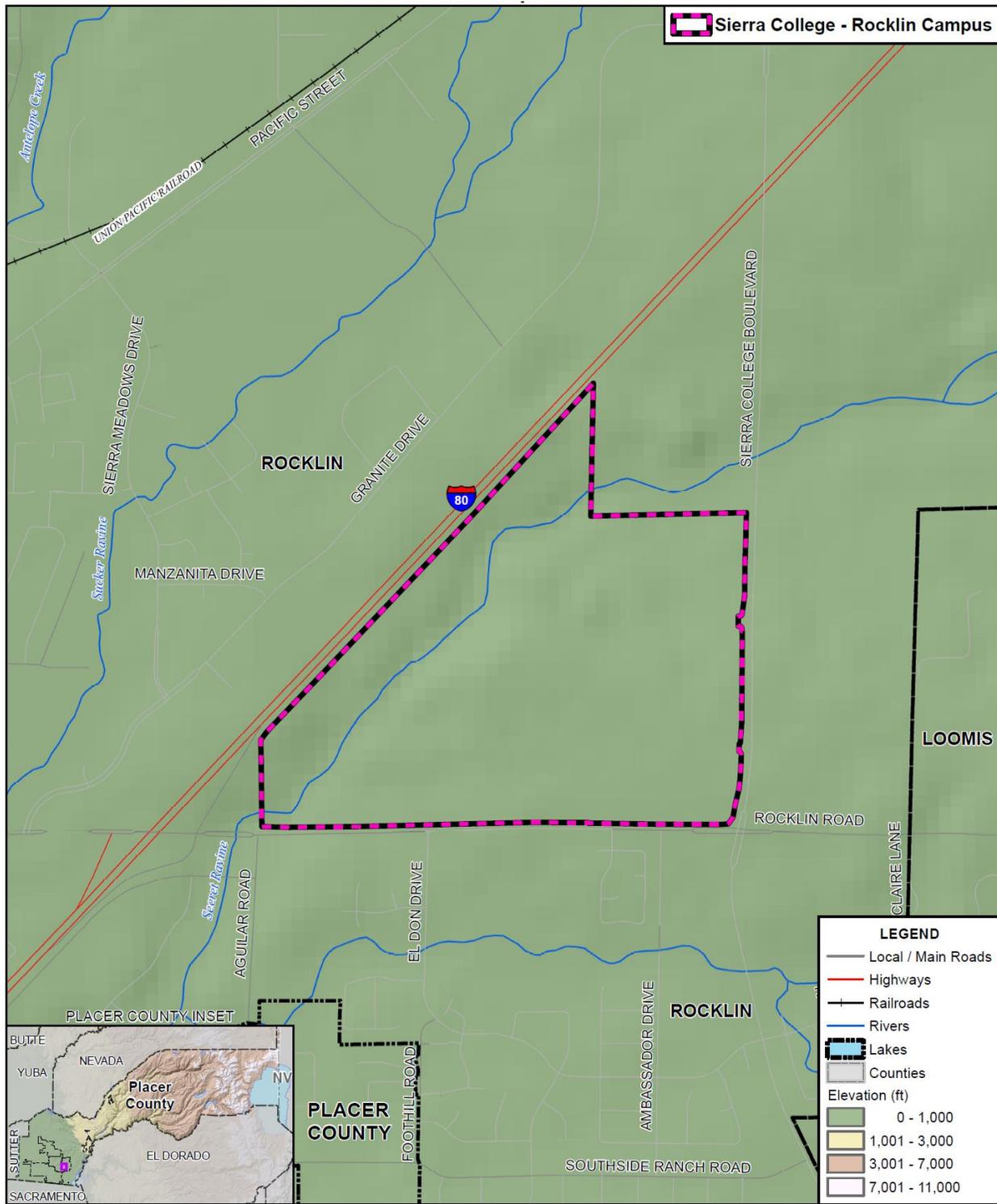
Table U-1 SJCCD – Planning Team

Name	Position/Title	How Participated
Erik Skinner	Vice President, Administrative Services	Coordination, planning, drafting
Linda Fisher	Director of Finance	Planning, drafting
Laura Doty	Director of Facilities	Planning, drafting
Judy Alquist	Director of Budget	Planning, drafting
Jamison Lopizich	Chief of Security	Planning, drafting
Stacey Carroll	Executive Assistant, Administrative Services	Coordination, planning, drafting

U.3 District Profile

The District profile for the SJCCD is detailed in the following sections. Figure U-1 displays a map and the location of the District within Placer County.

Figure U-1 SJCCD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

U.3.1. Overview and Background

Sierra College is a public community college in Rocklin, California. Sierra College is owned and operated by the Sierra Joint Community College District, a district that covers over 3,200 square miles, serves Placer, Nevada and parts of El Dorado and Sacramento counties.

The college was officially founded in 1936 and is fully accredited by the Western Association of Schools and Colleges. The main campus in Rocklin was chosen by 1960, out of 35 possible sites. The planned construction of Interstate 80 was a consideration in the decision making. In 1961, the new campus opened. In 1996, another campus in Nevada County opened, in between Grass Valley and Nevada City. During 2000–2005, outreach campuses in Roseville and near Truckee were opened. Today the SJCCD serves over 24,000 students.

SJCCD is governed by a board of seven trustees who are elected district-wide and a student trustee. The constituent groups within the district—trustees, faculty, students, management and classified staff—are committed to our mission of providing education and opportunity to area residents. The principle of participatory governance for assuring broad and deep participation in all decisions is a defining feature of the college and district. SJCCD is proud of our tradition of strong and stable leadership with only five individuals having held the post of president in the last 50 years and a board with long tenures of service.

U.4 Hazard Identification

SJCCD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table U-2).

Table U-2 SJCCD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Limited	Low	Medium
Drought & Water Shortage	Extensive	Unlikely	Negligible	Medium	High
Earthquake	Significant	Occasional	Limited	Low	Low
Floods: 1%/0.2% annual chance	Significant	Unlikely	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Likely	Negligible	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Critical	High	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Low	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Significant	Occasional	Negligible	Low	Low
Tree Mortality	Significant	Occasional	Limited	Low	High
Wildfire	Significant	Occasional	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

U.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

U.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 0, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table U-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

U.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the SJCCD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table U-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. SJCCD’s physical assets, valued at over \$481 million, consist of the buildings and infrastructure to support the District’s operations.

Table U-3 SJCCD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Rocklin Campus	Classrooms, Offices, Student Services, Dorm, Server Room	\$350 million	Earthquake, Flooding, Stormwater Flooding, Severe Weather, Tree Mortality and Wildfire
Nevada County Campus	Classrooms, Offices, Student Services, Public Safety Training Center, Server Room	\$100 million	Earthquake, Flooding, Stormwater Flooding, Severe Weather, Tree Mortality and Wildfire
Tahoe-Truckee Campus	Classrooms, Offices, Student Services, Server Room	\$25 million	Earthquake, Flooding, Stormwater Flooding, Severe Weather, Tree Mortality and Wildfire
Roseville Leased Space	Classroom and Office Contents, Server Room	\$6 million	Earthquake, Flooding, Stormwater Flooding

Source: SJCCD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. SJCCD provides services to over 24,000 students.

Natural Resources

SJCCD has a variety of natural resources of value to the District. These natural resources parallel that of the City of Rocklin. Information can be found in Section 4.3.1 of the Base Plan

Historic and Cultural Resources

SJCCD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of the City of Rocklin. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the City of Rocklin. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District is currently implementing a \$500 million construction program for the Rocklin Campus, funded primarily through the passage of the Measure E bond authorization. Part of this work includes a West Placer Transfer Center that will be built in conjunction with Sacramento State University's new center at Placer Ranch. More general information on growth and development in Placer County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

U.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table U-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Drought & Water Shortage

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table U-4.

Table U-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

The District experienced moderate loss of landscaping (plants, shrubs, turf, etc.) during the 2014 drought.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Identified vulnerabilities include moderate loss of landscaping (plants, shrubs, turf, etc.). To mitigate these risks and contribute to regional water conservation efforts, the District has developed a Landscape Master Plan for the Rocklin Campus that incorporates low-water, drought tolerant design.

Assets at Risk

There are no identified threats to assets listed in table U-3, damage would likely be limited to landscaping.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from

November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The SJCCD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

- **January 3-12, 2017** – Flooding from heavy rains occurred at the Rocklin, Roseville, Grass Valley, and Tahoe-Truckee campuses. Campuses were closed intermittently between January 3 & 12. Disaster No: FEMA DR-4301 Heavy rains and high winds causing damage to buildings and roofs, fallen trees, debris and localized flooding. Various intermittent campus closures due to severe weather, power outages and flying debris. Flooded elevator shaft, roof damage on several buildings, overwhelmed drains in pool complex, overwhelmed roof drains, water intrusion, fallen or damaged trees. These losses were not insured losses, since origin of most damage was flood water related.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

All District assets (from Table U-3) are at risk from this hazard. District personnel may be affected as they travel to and from work, as transportation routes may be affected.

Pandemic

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control (CDC) and Prevention has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the District, County, and surrounding region is at risk, as pandemic is a regional, national, and international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

There has been one state and federal disaster declaration due to pandemic, as shown in Table U-5.

Table U-5 Placer County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

The 20th century saw three outbreaks of pandemic flu.

- The 1918-1919 Influenza Pandemic (H1N1)
- The February 1957-1958 Influenza Pandemic (H2N2)
- The 1968 Influenza Pandemic (H3N2)

To date, the 21st century has seen two acknowledged pandemics.

- 2009 Swine Flu (H1N1)
- 2019/2020 COVID 19

In the District, the COVID-19 Pandemic resulted in a severe disruption to campus operations. It affected the Rocklin, Roseville, Grass Valley, and Tahoe-Truckee campuses. As of January 25, 2021, approximately 21 positive tests reported among on-site employees and students. Beginning in March 2020, roughly 95% of instruction converted to online delivery. Operations converted to a largely remote model. Continuing in this manner in spring of 2021 and into the foreseeable future. No community transmissions of the virus have occurred on site. No deaths have occurred among on-site employees and students.

Vulnerability to and Impacts from Pandemic

Pandemics have and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding the current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent the spread of a pandemic by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the District. Pandemic can have varying levels of impact to the citizens of the District and greater County, depending on the nature of the pandemic.

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food and essentials can be interrupted. Prisons may need to release prisoners to prevent significant outbreaks.

Assets at Risk

Pandemics do not affect District facilities, but can affect District personnel who operate District facilities.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought

can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

In recent years, PSPS events have impacted campus operations and forced closure of the campuses due to inability to operate building systems.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts, including loss of life, are the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

During periods of extreme heat, the District takes measures to ensure that facilities and grounds personnel employ safety procedures including hydration, rest breaks, and/or performing indoor duties. In the campus dormitory, each room is equipped with an air conditioning unit. The District plans to purchase and install a generator for the dormitory to ensure continued operation of air conditioners and other building systems in the event of power loss.

Assets at Risk

No District assets (from Table U-3) are at risk from this hazard.

Wildfire

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the SJCCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures,

low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the SJCCD were created. Figure U-2 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from Urban Unzoned to Moderate (though the District borders a High FHSZ).

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table U-6.

Table U-6 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

While no fires have directly threatened the District, wildfires have affected the District in recent years. Campuses have been closed for a total of approximately 8 days over past three years. Wildfires resulting from dry conditions and high winds. Resulted in limited hardship and disruption to campuses due to poor air quality. Campus closures.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic

delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District faces potential building loss, and need for campus evacuation and closure. Potential threats to the health and safety of students and employees. District performs annual fuel reduction in nature area with plans to expand these activities in the near future if additional funding can be secured.

Assets at Risk

All District assets (from Table U-3) are at risk from this hazard.

U.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

U.6.1. Regulatory Mitigation Capabilities

Table U-7 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the SJCCD.

Table U-7 SJCCD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y	Hazards addressed in campus EIR
Capital Improvements Plan	Y	Facilities Master Plan (all campuses except Roseville)
Economic Development Plan	N	
Local Emergency Operations Plan	Y	Emergency Operations Plan (Rocklin)/COVID-19 Safe Return to Campus Plan
Continuity of Operations Plan	Y	Embedded within EOP
Transportation Plan	Y	Dorm evacuation plan embedded within EOP
Stormwater Management Plan/Program	Y	Pending – in process in response to EIR
Engineering Studies for Streams	n/a	

Community Wildfire Protection Plan	n/a	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	n/a	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: CA Building Code/ADA Various years (1957-2021)
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Rocklin campus located in mixed-use zone. Wildfire mitigation required for vacant properties.
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District utilizes the planning processes named above to assess campus needs and develop appropriate responses.		

Source: SJCCD

U.6.2. Administrative/Technical Mitigation Capabilities

Table U-8 identifies the District department(s) responsible for activities related to mitigation and loss prevention in SJCCD.

Table U-8 SJCCD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	

Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Annual fuel reduction activities in the nature area adjacent to the Rocklin Campus (clearing dead wood, brush reduction through mowing and grazing)
Mutual aid agreements	N	
Other		
	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	
Floodplain Administrator	N	
Emergency Manager	Y	
Community Planner	N	
Civil Engineer	N	
GIS Coordinator	N	
Other	N	
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	
Hazard data and information	Y	
Grant writing	Y	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
District plans to expand fuel reduction activities.		

Source: SJCCD

U.6.3. Fiscal Mitigation Capabilities

Table U-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table U-9 SJCCD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Capital Project Fund, Bond Fund
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	N	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	N	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Implementation of construction upgrades will result in improved safety systems, including new detection and fire suppression.		

Source: SJCCD

U.6.4. Mitigation Education, Outreach, and Partnerships

Table U-10 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table U-10 SJCCD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	The District conducts ongoing campus safety training programs covering a variety of topics including building evacuation and first aid.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District continually reviews campus safety trainings to ensure effectiveness and relevance,		

Source: SJCCD

U.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Training of Incident Command Team
- Outfitting of Emergency Operation Centers
- Installation of AEDs
- Installation of First Aid Kits
- Installation of emergency generators

U.7 Mitigation Strategy

U.7.1. Mitigation Goals and Objectives

The SJCCD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

U.7.2. Mitigation Actions

The planning team for the SJCCD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought and Water Shortage
- Flood: Localized Stormwater Flooding
- Pandemic
- Severe Weather: Extreme Heat
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. *Campus safety: fire, earthquake, active shooter, power outage, health emergencies, and pandemics.*

Hazards Addressed: Drought and Water Shortage, Localized Flood, Pandemic, Extreme Heat, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: There is an ongoing need to provide campus safety trainings covering a variety of topics including building evacuation, active shooter, fire, first aid, and responding to pandemic-related threats. In addition, it is critical to outfit campuses with necessary emergency supplies.

Project Description: This project will mitigate hazards by training staff and students on potential hazards, and seeking ways to respond to those hazards in times of emergencies. There will be an educational component to this mitigation action.

Other Alternatives: Participate in trainings made available by external groups.

Existing Planning Mechanisms through which Action will be Implemented: Review by Safety and Emergency Preparedness Coordinator, input from campus stakeholders, input from community partners

Responsible Office: Safety and Emergency Preparedness Coordinator

Priority (H, M, L): High

Cost Estimate: unknown

Potential Funding: District funds, external grants as available

Benefits (avoided Losses): Avoid and/or mitigate losses to life and property.

Schedule: Ongoing

Action 2. Storm Water Flooding Mitigation

Hazards Addressed: Storm Water Flooding

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Intense rainstorms has the potential to cause flooding on campus.

Project Description: Design and implement storm water management solutions, including retention ponds and drainage systems.

Other Alternatives: Develop more limited and site-specific flood protection solutions such as raising door thresholds, installing ditches, etc.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Facilities Master Planning and Landscape Master Planning

Responsible Agency/ Department/Partners: Sierra College Facilities Department, in conjunction with architectural and construction consultants.

Cost Estimate: \$2 million to \$4 million, depending on number and complexity of storm water management solutions

Benefits (Losses Avoided): Avoid possible flooding damages.

Potential Funding: Bond funds

Timeline: 2021-2027

Project Priority (H, M, L): M

Action 3. Drought Tolerant Landscaping

Hazards Addressed: Drought

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Californian has increasingly experienced droughts.

Project Description: Redesign campus landscaping to reduce watering needs.

Other Alternatives: Continue with current landscaping.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Landscaping Master Planning process.

Responsible Agency/ Department/Partners: Sierra College Facilities in conjunction with landscaping architects, other consultants, and landscaping firms.

Cost Estimate: TBD

Benefits (Losses Avoided): Potential loss in campus vegetation in case of prolonged drought. Also broader negative impacts to the environment and agricultural operations.

Potential Funding: Bond funds and other District funds

Timeline: 2021 to 2027

Project Priority (H, M, L): Medium

Action 4. Fuel Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Sierra College’s Rocklin and Tahoe-Truckee campuses both abut forested nature areas. There is potential for wild fires in these areas as a result of lightning strikes or human behaviors such as car accidents and smoking.

Project Description: Expand efforts to clear brush and deadwood in nature areas.

Other Alternatives: Do not expand fuel reduction efforts.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Review of fuel reduction needs and contract for necessary fuel reduction services including cutting and hauling deadwood, brush removal, and mowing.

Responsible Agency/ Department/Partners: Sierra College Facilities in conjunction with environmental consultants.

Cost Estimate: TBD

Benefits (Losses Avoided): Loss of life and property damage

Potential Funding: District funds

Timeline: ongoing

Project Priority (H, M, L): M

Action 5. Emergency Power Generation

Hazards Addressed: Temporary Loss of Electric Power

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Electricity outages affecting the campus occur from time to time due to grid failures and public safety power shutoff events.

Project Description: Review need for back-up power and assess feasibility of installing emergency generators. The District has installed a number of generators of the years, but continues to assess changing needs and threats through ongoing planning.

Other Alternatives: Do not install additional emergency generators.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Ongoing campus safety planning processes

Responsible Agency/ Department/Partners: Sierra College Facilities

Cost Estimate: Variable

Benefits (Losses Avoided): Disruption to campus operations, inconvenience and hardship for dorm residents, loss of food supplies in cafeteria kitchen, and loss of vaccine supplies and other sensitive supplies.

Potential Funding: Bond funds and other District funds

Timeline: 2021-2027

Project Priority (H, M, L): M



Annex V South Placer Fire Protection District

V.1 Introduction

This Annex details the hazard mitigation planning elements specific to South Placer Fire Protection District (South Placer FPD), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. Note, this South Placer FPD absorbed the Loomis Fire Protection District also a participating jurisdiction to the 2016 LHMP Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to South Placer FPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

V.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table V-1. Additional details on plan participation and District representatives are included in Appendix A.

Table V-1 South Placer FPD – Planning Team

Name	Position/Title	How Participated
Jeff Ingolia	Division Chief	Attended meetings. Provided input on hazard identification and hazards affecting the District. Provided capability tables and mitigation actions. Provided maps and logos.
Karl Fowler	Chief	Provided input on hazard identification and hazards affecting the District.
Matt Feeley	Deputy Chief	Provided input on hazard identification and hazards affecting the District.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table V-2.

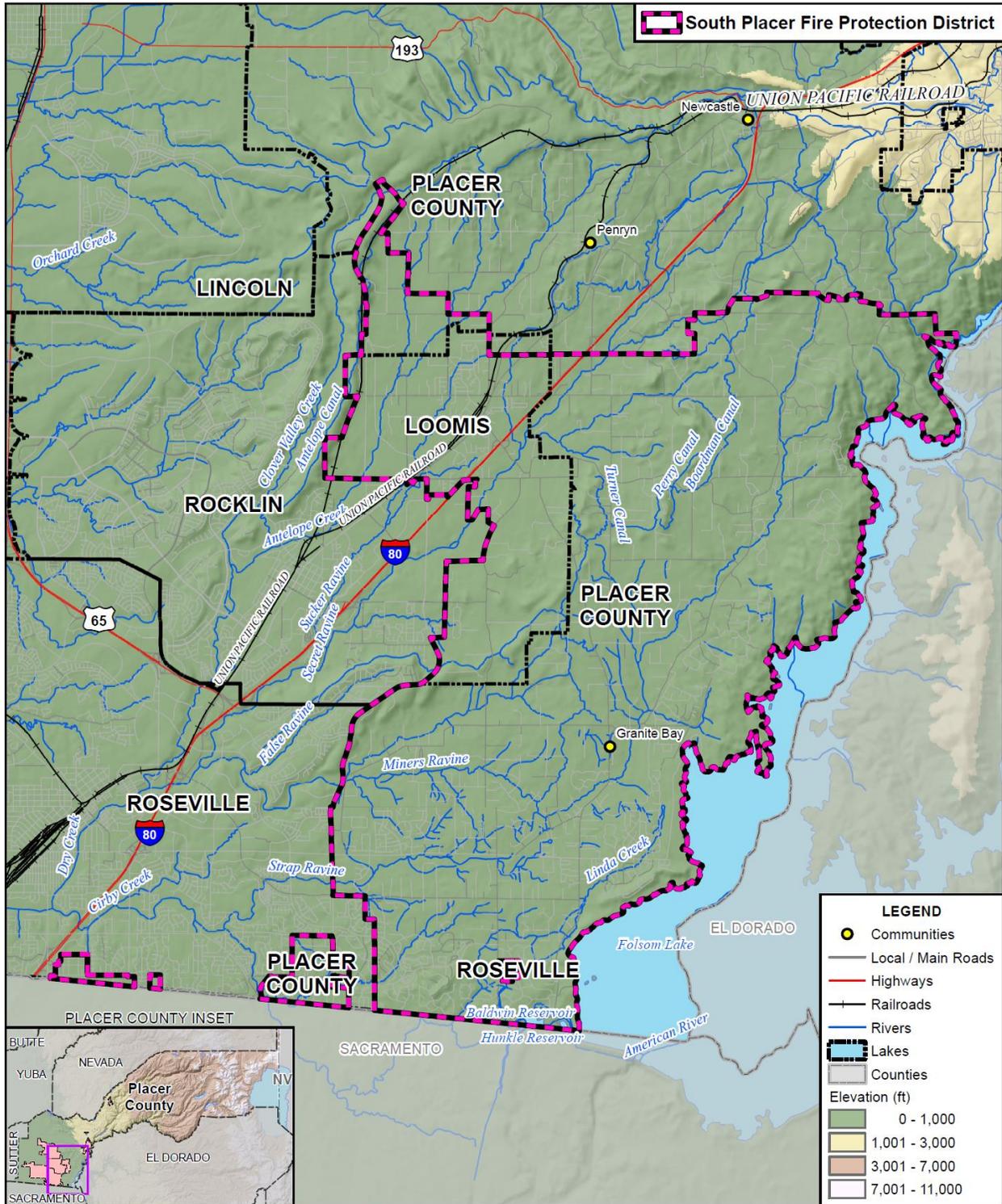
Table V-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No planning mechanisms related to the LHMP occurred since 2016.

V.3 District Profile

The District profile for the South Placer FPD is detailed in the following sections. Figure V-1 displays a map and the location of the District within Placer County.

Figure V-1 South Placer FPD



FOSTER MORRISON
CONSULTING

0 2 4 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

V.3.1. Overview and Background

South Placer FPD was formed on January 10, 1952. The principal act that governs the District is the Fire Protection District Law of 1987. This Act empowers fire districts to provide fire protection, rescue, emergency medical, hazardous material response, ambulance, and any other services relating to the protection of lives and property.

South Placer FPD is located entirely within Placer County and encompasses about 55 square miles. The District serves approximately 36 square miles of unincorporated Placer County (including the communities of Granite Bay and portions of Loomis, Penryn and Newcastle), and the Town of Loomis.

The District's boundary area consists of four non-contiguous parts. Three smaller areas are surrounded by the City of Roseville from three sides; in the south they are bordered by Sacramento County. The largest non-contiguous South Placer FPD portion to the east completely surrounds a small island of the City of Roseville and is bordered by the cities of Roseville and Rocklin in the west, Loomis, Penryn and Newcastle FPDs in the north, and Folsom Lake in the east.

V.4 Hazard Identification

South Placer FPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table V-3).

Table V-3 South Placer FPD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Significant	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Significant	Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Significant	Unlikely	Limited	Medium	Medium
Pandemic	Limited	Occasional	Critical	Low	Medium
Seiche	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Limited	Medium	Low
Tree Mortality	Significant	Likely	Limited	Low	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

V.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

V.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section V.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table V-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

V.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the South Placer FPD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table V-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. South Placer FPD’s physical assets, valued at over \$9.5 million, consist of the buildings and infrastructure to support the District’s operations.

Table V-4 South Placer FPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Station #15	Fire Facility	\$819,967.00	None
Station #16	Fire Facility	\$2,828,000.00	None
Administration (Portables)	Fire Facility	\$89,305.00	Levee Failure
Station #17	Fire Facility	\$2,361,700.00	Levee Failure
Station #17 Training Cargo Container	Fire Facility	\$2,862.00	Levee Failure
Shop	Fire Facility	\$305,259.00	Levee Failure
Station #19	Fire Facility	\$2,513,462.00	None
Station #20	Fire Facility	\$650,319.00	Wildfire
Total		\$9,570,874.00	

Source: South Placer FPD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. SPFPD provides services to home and property owners, the elderly housed in commercial and residentially based care facilities, students, livestock owners, travelers, commercial business owners including offices, restaurants, bars, assembly, and mercantile occupancies.

Natural Resources

South Placer FPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

South Placer FPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

There are approximately 29,973 residents within the District. The population density is 545 people per square mile. The District reported that it generally experienced moderate population growth over the last five years although in the last year South Placer FPD observed an increase in building starts and plan submittals. Population growth thus is trending toward significant. No formal population projections, however, have been done by the District. South Placer FPD estimates its future service needs through Placer County General Plan, Granite Bay Community Plan and Placer County Municipal Advisory Councils (MACs) planning meetings. The District also looks at the available lots for residential and commercial construction and plans for future construction.

The population of the District is anticipated to be 34,330 at full build-out of this rapidly developing area. The area is evenly divided between suburban and wildland areas, and mostly comprised of large-scale estates and ranch properties with many subdivisions, including wildland interface subdivisions and medium-scale retail shopping areas. The current average home is 6,710 square feet, with several homes over 18,000 square feet. Commercial building growth has been slower than residential growth.

South Placer FPD reports that growth has been concentrating in the southern area of the District. There are large parcels of land located near Station 16 (which is currently closed) that will be developed in the very near future. Approximately seven new subdivisions near Fire Stations 15,16 and 17, consisting of approximately 600 new homes will be developed and built within the next two to three years. Apart from the southern part of South Placer FPD, there are mainly lot splits and small parcels of land that will be developed on a regular basis until build out.

The Fire District anticipates accelerated population growth over the next 10 years. Service demand is expected to increase especially in the area of medical aids, with unknowns of weather conditions (drought, etc.) affecting the service demand. The continued use of the closest resource agreement and understaffing of local agencies may also impact the District's service demand.

Based on a review of the Granite Bay Community Plan and the Horseshoe Bar Community Plan, as well as through site survey of the properties in the District, District staff estimate that an additional 1800 residential units will be constructed in the District over the next 10 to 15 years. South Placer FPD also anticipates construction of an additional 980,000 square feet of commercial, office, and industrial building space during this time. In total, the District estimates that approximately 8.5 million square feet of building construction will occur in the District over the next 10 to 15 years. Fire Station 16 is currently unstaffed but is expected to house a full time Paramedic Unit this year (currently this resource resides at Station 17) and Engine Company in the next 2 years. Fire Station 18 is currently in the plan review stage for the construction of a new apparatus bay and station expansion and modernization which is anticipated to begin construction this year and be completed in 2022. There are currently no plans or proposals to increase the size of the Fire District.

Development since 2016

No District facilities have been constructed since 2016. Several Fire Stations within the District have been remodeled and updated within that time frame but there has been no new construction. As such, a change in vulnerability is unlikely.

Future Development

The District has no direct control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. As mentioned previously Fire Station 18 is currently in the plan review stage for a new apparatus bay and station expansion and modernization. Aside from this project there are no other construction activities planned for District facilities. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

V.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table V-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing. Dry conditions continue to increase the risk of a sever wildfire event within the District as vegetation dries out sooner, catches fire more easily and spreads more rapidly. Heat related injuries have also been on the rise as both residents and visitors to our community experience more heat related health issues in both residential and recreational areas within the District.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. Hotter temperatures, combined with recent drought conditions, exacerbates the potential for damaging wildfires.

Vulnerability to and Impacts from Climate Change

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California’s APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region’s economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the

majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

The District noted that there is a greater number of calls for heat related health issues as well as larger and more dangerous wildfires

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought

➤ D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table V-5.

Table V-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

Drought would most definitely affect the crop productions and pre-dry the lighter fuels creating more volatile wildfire conditions in the non-developed open areas of the District.

Assets at Risk

No District assets (from Table V-4) are at direct risk from this hazard.

Earthquake

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth’s outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth’s crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake’s magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan. Placer County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville’s 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in the Placer County Planning Area.

Although portions of western and eastern Placer County are located in a seismically active region, no known faults actually go through any of the cities or towns. However, the Bear Mountain and the Melones faults are situated approximately three to four miles west and east of the City of Auburn respectively. Earthquakes on these two faults would have the greatest potential for damaging buildings in Auburn, especially the unreinforced masonry structures in the older part of the city and homes built before 1960 without adequate anchorage of framing and foundations. Similar lower magnitude but nearby earthquakes are capable of producing comparable damages in other Placer County communities.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismic shaking maps for the area show Placer County and the District fall within a low to moderate shake risk.

Past Occurrences

There have been no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Placer County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. There are no URM or soft story buildings in the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The SPFPD is within the less hazardous Zone 3.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

Small bridges located within residential neighborhoods would be at risk from an earthquake. If a bridge were to become damaged it could prohibit or significantly delay our response to a call for service. Damage to individual gas and water lines in both residential and commercial structures during an earthquake could result in localized flooding or a fire if an ignition source is nearby. Lastly, earthquake damage to the Levee located along Auburn Folsom Rd. could result in local flooding and/or damage to the roadway which could prohibit travel north and south along the eastern edge of the District.

Assets at Risk

Station 17 could be at risk from Earthquake damage if the levee adjacent to Auburn Folsom Rd. failed. Flooding from a break could impact this Station with damage to our network, communications, and computer systems which are currently located within this structure. Fire Stations are built with increased structural support and reinforcement as mandated by Building and Fire Codes in California to begin with, so no identifiable retrofitting is required on any of our facilities.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence—Occasional

Vulnerability—Medium

Hazard Profile and Problem Description

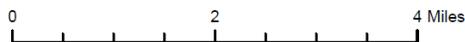
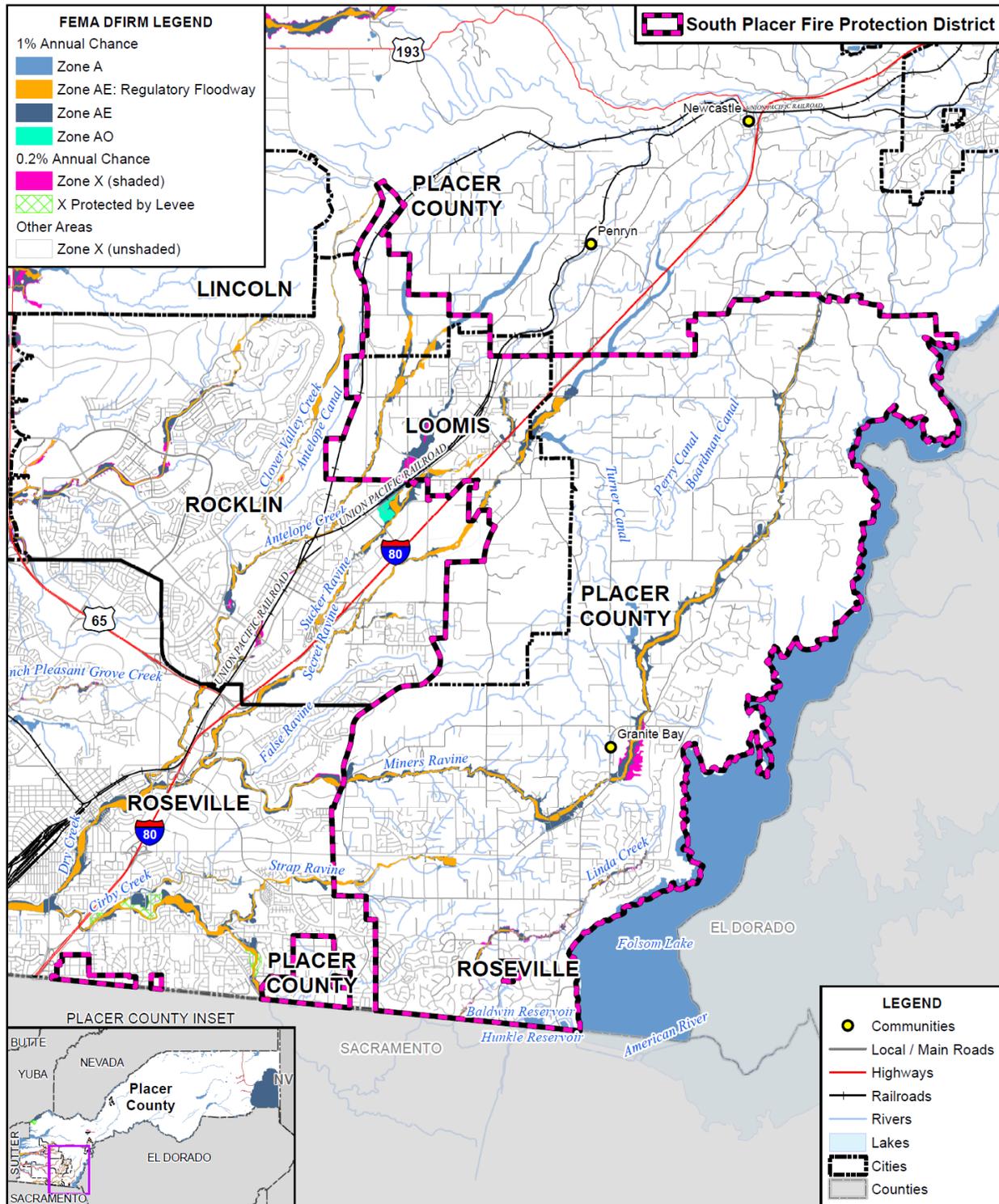
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Placer County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage.

As previously described in Section 4.3.12 of the Base Plan, the Placer County Planning Area and the South Placer FPD have been subject to historical flooding.

Location and Extent

The South Placer FPD has areas located in the 1% and 0.2% annual chance floodplain. This is seen in Figure V-2.

Figure V-2 South Placer FPD – FEMA DFIRM Flood Zones



Data Source: FEMA DFIRM 11/2/2018, Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Table V-6 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table V-6 South Placer FPD– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AO	1% annual chance flooding: sheet flow areas. BFEs derived from detailed hydraulic analyses are shown in this zone.	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X Protected by Levee	Areas protected by levees from 1% annual chance flood event. Levee protection places these areas in the 0.2% annual chance flood zone.	
X (unshaded)	No flood hazard	X

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Placer County from flooding is shown on Table V-7. These events also likely affected the District to some degree.

Table V-7 Placer County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017

Source: Cal OES, FEMA

Vulnerability to and Impacts from Flood

Floods have been a part of the District’s historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining

the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

The District is concerned with damage to commercial and residential properties from flooded creeks and ravines. This also may cause reduced crop production in the District.

Assets at Risk

No District assets (from Table V-4) are at direct risk from this hazard.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The South Placer FPD is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the

storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

The District tracks localized flooding areas. There are many localized flooding areas in the District. The localized flood areas identified by the South Placer FPD are summarized in Table V-8.

Table V-8 South Placer FPD – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Auburn Folsom	X						X
Joe Rodgers							X
Barton	X						
Itchy Acres	X						X
Cavitt Stallman	X						

Source: South Placer FPD

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

- Auburn Folsom Road is occasionally affected by overflowing streams and ravines as well as clogged storm drains which slowed travel and increased the likelihood of vehicle accidents. Some trees have fallen in this area and restricted travel but caused minimal damage to residences within this area.
- Joe Rodgers Rd was previously a problem area but improvements to the drainage in and around this area has made it less of a severe impact to the District. Some trees have fallen in this area and restricted travel but caused minimal damage to residences within this area.
- Barton Rd. is occasionally affected by overflowing streams and ravines as well as clogged storm drains which slowed travel and increased the likelihood of vehicle accidents.
- Itchy Acres is occasionally affected by overflowing streams and ravines as well as clogged storm drains which slowed travel and increased the likelihood of vehicle accidents. Some trees have fallen in this area and restricted travel but caused minimal damage to residences within this area.
- Cavitt Stallman Rd. is occasionally affected by overflowing streams and ravines as well as clogged storm drains which slowed travel and increased the likelihood of vehicle accidents.

Improvements have been made to drainage as well as the flow of streams and ravines within the District over the last few years and as a result we saw less adverse conditions from localized flooding during the heavy winter storms of 2017, 2019, and 2021. However, the District does still continue to experience a moderate number of downed trees which occasionally impede travel or under the most extreme conditions cause fires in vegetation or residential occupancies when they come in contact with overhead power lines.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams

overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

Primary concerns associated with stormwater flooding include life safety issues, and impacts to property and to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Assets at Risk

No District assets (from Table V-4) are at direct risk from this hazard.

Levee Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees. Levees in the District were shown on Figure V-2.

The South Placer Fire District is bordered by a large levee that parallels Auburn Folsom Rd between Eureka Rd. and Beals Point. This levee was created to contain and form this portion of Folsom Lake.

Past Occurrences

There have been no federal or state disaster declarations from levee failure. The District Planning Team noted no past occurrences of levee failures.

Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Levee failure risk in the District is the same as the flood vulnerability however Station 17 could experience significant issues if the levee along Auburn Folsom Rd. failed. Flooding could damage the Fire Station as well as the apparatus housed within this Station including a Fire Truck, Engine, Rescue Unit, and Brush Unit. In addition, Station 17 is the hub for our computer network and could affect outlying Fire Stations ability to access computer programs and/or phone lines that are utilized on a regular basis for departments activities such as staffing and run reports. Fire Inspection and Investigation records could be damaged or lost as well. If damage occurred to the mechanics shop it could affect the Districts ability to repair its fleet and it would have to outsource that service which could significantly delay repair times.

Assets at Risk

The areas at greatest risk from a levee failure would be Fire Station 17, the Administration Portables at Station 17 as well as the mechanics shop at this location

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been

overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power outages can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, including periods of high winds, high temperatures, and low humidity, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color

(green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2.

PSP events have negatively impacted and affected Fire Station 20 which experienced several power shutdowns in 2019. In 2020 the District installed an Emergency Backup Generator at this location and the effects are now nonexistent. Increased calls for service due to heat related health issues have increased slightly as does the District's emergency response occurrences to Folsom Lake as the number of visitors increases during extended periods of high daytime temperatures.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well, especially when combined with the potential for severe wind events. Health impacts, including loss of life, are often the primary concern with this hazard, though economic impacts can also be an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions.

High temperatures create volatile light flashy fuels, creating a severe fire hazard throughout the entire District, especially in the WUI. Reduced crop production would result as well.

Assets at Risk

All Fire Stations and Fire District Employees are at risk and can be negatively impacted by extreme heat in our area.

Severe Weather: Freeze and Snow

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down

trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and snow are regional issues, meaning the entire District is at risk to cold weather and freeze events. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, the WRCC reports that in a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F in western Placer County. Snowfall is measured in depths, and the WRCC reports that average snowfall on the western side of the County is 1.4 inches. Freeze and snow have a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snow event can last for hours or days, but is more unlikely in the western portion of the County. When it does snow, the snow often melts relatively quickly.

Past Occurrences

There has been no federal and one state disaster declarations in the County for freeze and snow, as shown on Table V-9.

Table V-9 Placer County – State and Federal Disaster Declarations from Freeze and Snow 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	1972	0	–

Source: Cal OES, FEMA

The District noted that cold and freeze is a regional phenomenon; events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.3.

The District has had minimal impacts due to cold and freeze events in our area. The most common experience is water pipes that burst and generate calls for service to assist home and business owners. There typically is no snow at our District’s elevation so it is not an issue in our area.

Vulnerability to and Impacts from Severe Weather: Freeze and Snow

The District experiences temperatures below 32 degrees during the winter months. Freeze can cause injury or loss of life to residents of the District. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. Freeze and snow can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. During extreme winter events, response times to emergencies may be extended.

The District has concerns with reduced crop production, in addition to infrastructure damage due to frozen pipes.

Assets at Risk

All Fire Stations within the District are at risk for broken pipes however the constant occupation of our buildings during the day and night significantly reduces that probability.

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter, and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Placer County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including

heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding. Though there have been no significant events in the District in the past five years, the impact of severe storms is felt by the need to upstaff our crews as well as a significant increase in call volume for weather related emergencies including but not limited to vehicle accidents, down trees, localized flooding, and damage to homes.

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services.

During periods of heavy rains and storms, power outages can occur. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

All District Fire Stations are susceptible to damage from severe storms. District apparatus can be impacted by physical damage to the unit while responding to and from an emergency, a catastrophic event at one of our Fire Stations due to the weather or blocked and/or flooded roadway. Impacts to the District are the costs incurred with damage to a Station or one of our Apparatus as well as delayed response times to an emergency if a unit or station is out of service.

Assets at Risk

All Fire Stations and Apparatus within the District are at risk from this hazard.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds are a primary factor in PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

In the District, high winds can cause issues for residents and District personnel. The HMPC provided past occurrences of wind events for the District. Downed power lines, caused by wind events, occurred 143 times between 1985 and 2015. 28 other severe weather events occurred inside District boundaries.

The District experienced a significant storm event on January 28th, 2021. This storm brought very high winds to the area and numerous trees fell causing a series of emergencies. Several trees fell against power lines causing small spot fires however one of these incidents did cause a power surge which subsequently caused a structure fire at a residence. In addition, one of our Fire Engines got stuck in soft ground as it attempted to maneuver around fallen trees across a driveway as it responded to an emergency. Once stuck,

the Engine blocked other Fire Engines and equipment and hose lines had to be hand carried to the home to address the emergency. No injuries or damage to our apparatus were reported but the blocked driveway did cause a significant delay in our response.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly, During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

All Fire Stations within the District are vulnerable to high wind damage which can cause falling trees into our buildings or across our driveways. All Fire Apparatus are vulnerable to high wind damage also in the form of falling trees while in quarters or when responding to an emergency. Damage to a Station or Apparatus can result in that unit being out of service which can delay emergency response times in that area as units from a neighboring Fire Station or jurisdiction would have to be utilized to respond to the emergency.

Assets at Risk

All Fire Stations and Apparatus are at risk from high winds in the form of fallen trees in, on or around our facilities and equipment.

Wildfire

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the South Placer FPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for

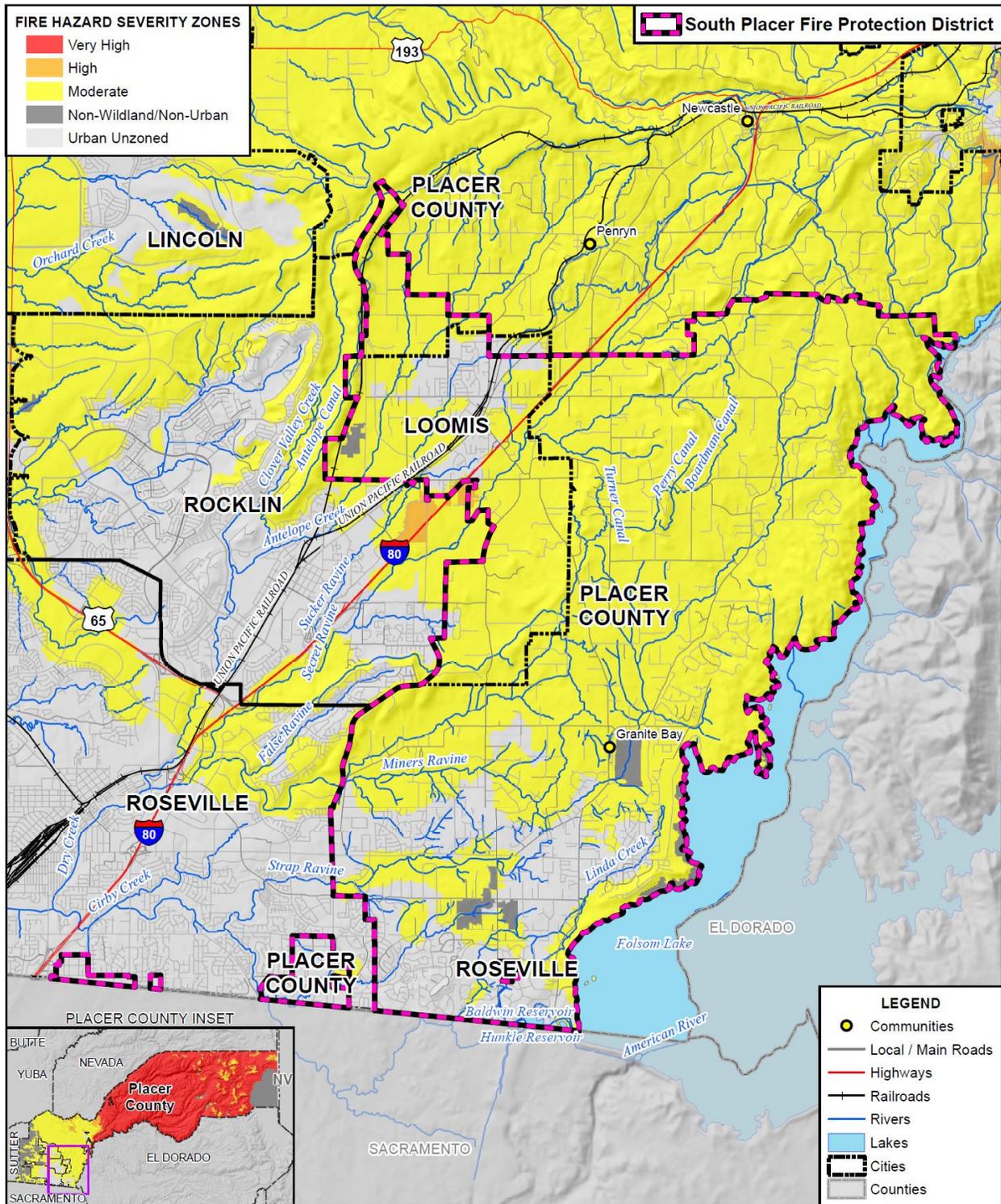
human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the South Placer FPD were created. Figure V-3 shows the CAL FIRE FHSZ in the District. As shown on the maps, the fire hazard severity zone within the District falls into the Moderate range.

The California Department of Forestry and Fire Protection (Cal Fire) provides services throughout the State. Generally, Cal Fire services are focused in wildland areas defined as state responsibility areas (SRA). Similarly, the United States Forest Service (USFS) also provides services in California, primarily within forests and grasslands. Areas where USFS services are focused are defined as federal responsibility areas (FRA). The territory of the District that lies within the Town of Loomis is designated as local responsibility area (LRA) and is not considered by Cal Fire to be a very high fire hazard severity zone. Unincorporated areas in the east and northwestern tip of the District are classified as SRA and considered to be moderate fire hazard severity zones. Cal Fire also provides technical support throughout the County in the form of specialized services such as fire suppression hand crews, dozers, and helicopter services when necessary.

Figure V-3 South Placer FPD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table V-10.

Table V-10 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The South Placer Fire Protection District provided past occurrences of fire that the District has responded to from 1985 to 2015. There were 1,485 fires that caused \$48,375,358 in total losses. Many of these fires were house, car, or building fires. However, 601 of these fires were in grass, brush, forest, or natural vegetation fires. Damages from these specific fires was unavailable.

There have been no significant fires of this type in our jurisdiction over the last 5 years. To date our largest fire has been approximately 5 acres... most are 1 acre or less.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District boundaries contain agricultural land. From time to time, fire threatens agricultural areas. According to data provided by the HMPC, there have been four incidents in the District where fire has threatened cultivated vegetation or trees. Damages from these fires was unavailable.

Assets at Risk

Station 20 is at direct risk from this hazard.

V.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

V.6.1. Regulatory Mitigation Capabilities

Table V-11 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the South Placer FPD.

Table V-11 South Placer FPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	Not Applicable to this Fire District
Capital Improvements Plan	Y	The District conducts capital improvement planning through multiple plans, including the apparatus replacement plan, capital facilities plan, long-term facility maintenance plan, and major equipment plan. The purpose of all capital improvements is the reduction of fire risk in the borders of the South Placer FPD.
Economic Development Plan	N	Not applicable to this Fire District

Local Emergency Operations Plan	N	Partnership with the Town of Loomis to address local hazards, identify projects and implement mitigation strategies. This plan is a guide, and any mitigation actions are identified at the time it is adopted.
Continuity of Operations Plan	N	Not applicable this Fire District
Transportation Plan	N	Not applicable this Fire District
Stormwater Management Plan/Program	N	Not applicable this Fire District
Engineering Studies for Streams	N	Not applicable this Fire District
Community Wildfire Protection Plan	Y	Currently done through Firewise Communities and Fire Safe Councils for individual neighborhoods within the District. These programs identify hazards and are used to create and implement mitigation measures.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	Not applicable this Fire District
Building Code, Permitting, and Inspections		
	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: 2019 CBC and 2013 CFC
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score: 1-3
Fire department ISO rating:	Y	Rating: 3/3Y
Site plan review requirements	Y	Board adopted standards.
Land Use Planning and Ordinances		
	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Reduces hazard impacts by regulating where homes can be built. The ordinance is adequately administered and enforced.
Subdivision ordinance	Y	Reduces hazard impacts by regulating subdivision access and water supplies ensuring our District needs are met so we can respond to and effectively mitigate an emergency.
Floodplain ordinance	N	Not applicable this Fire District
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	Not applicable this Fire District
Flood insurance rate maps	N	Not applicable this Fire District
Elevation Certificates	N	Not applicable this Fire District
Acquisition of land for open space and public recreation uses	N	Not applicable this Fire District
Erosion or sediment control program	N	Not applicable this Fire District
Other	N	Not applicable this Fire District
How can these capabilities be expanded and improved to reduce risk?		
Creation of a Natural Hazard specific section within our local ordinance could help our agency identify and reduce the possible negative impacts associated with homes being built in high-risk wildfire areas. This can assist the District by reducing the number of homes in these areas as well as improving our ability to respond effectively to an emergency within a specific natural hazard zone.		

Source: South Placer FPD

The District signed a MOU with Placer County for the Hazardous Vegetation Abatement Ordinance to help mitigate the hazardous vegetation within our District.

V.6.2. Administrative/Technical Mitigation Capabilities

Table V-12 identifies the District department(s) responsible for activities related to mitigation and loss prevention in South Placer FPD. The five-member board of directors governs the District. Board members are elected by the general population residing within the district boundaries and serve for staggered four-year terms.

Table V-12 South Placer FPD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Work with the Granite Bay MAC, Placer County and the Town of Loomis to regulate and promote safe community developments. Coordination is effective between all agencies involved.
Mitigation Planning Committee	N	Not applicable this Fire District
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	Not applicable this Fire District
Mutual aid agreements	Y	Assistance from allied agencies that border our District is extremely helpful and effective. Our ability to assist neighboring agencies when the need arises is also very effective.
Other	N	
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	Not applicable this Fire District
Floodplain Administrator	N	Not applicable this Fire District
Emergency Manager	N	Not applicable this Fire District
Community Planner	N	Not applicable this Fire District
Civil Engineer	N	Not applicable this Fire District
GIS Coordinator	N	Not applicable this Fire District
Other	N	
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	Not applicable this Fire District
Hazard data and information	N	Not applicable this Fire District
Grant writing	Y	Effective in the past but could be improved. All grants for the District are written and applied for by a private 3 rd party whom we pay to assist us with the application process.
Hazus analysis	N	Not applicable this Fire District
Other	N	

How can these capabilities be expanded and improved to reduce risk?

Since we are a Fire District most of the services listed above are adequately and effectively provided by the County. Our District has an excellent working relationship with the County and will continue to work hard to address concerns and work collaboratively on behalf of our citizens. Grant writing could be improved by our District by applying for more grants to obtain the funds to create, improve or enhance our ability to respond to emergencies within our protection area.

Source: South Placer FPD

The District reported that its actual response capability at an incident consisted of three engines, a truck, ambulance, a battalion chief, and all 14 personnel on duty at any given time. There is also an additional capability of Volunteer and or Intern Firefighters that respond off duty on a regular basis.

V.6.3. Fiscal Mitigation Capabilities

Table V-13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table V-13 South Placer FPD’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	Not applicable this Fire District
Authority to levy taxes for specific purposes	Y	Fire District have levied special fire taxes on their communities to help fund staffing, equipment or facility needs. This method has been considered but not implement within our Fire District yet.
Fees for water, sewer, gas, or electric services	N	Not applicable this Fire District
Impact fees for new development	Y	Zone of benefit assessments to commercial occupancies that can generate high call volumes. This has been used in the past and continues to be used within the District to generate revenue for the operations side of our Fire District.
Storm water utility fee	N	Not applicable this Fire District
Incur debt through general obligation bonds and/or special tax bonds	N	Not applicable this Fire District
Incur debt through private activities	N	Not applicable this Fire District
Community Development Block Grant	N	Not applicable this Fire District
Other federal funding programs	Y	This has been used in the form or grants and could be used again in the future to fund mitigation efforts or increase staffing to effectively deal with mitigation activities.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
State funding programs	Y	This has been used in the form of grants and could be used again in the future to fund mitigation efforts or increase staffing to effectively deal with mitigation activities
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Special Taxes, Zone of Influence fees, as well as Federal and Local grants are all tools to create funding for our Fire District which directly benefits acquisition of personnel, purchases of updated apparatus, and improvement to facilities all of which enhance our ability to respond to emergencies within our district in a safe, and competent manner while providing the highest level of service to those in need.		

Source: South Placer FPD

In FY 12-13, the District received \$8,084,253 in revenue, including 66 percent from property taxes, eight percent from special tax, 14 percent from ambulance service charges, two percent from mitigation fees, three percent from OES reimbursements, one percent from cellular tower lease, four percent from proceeds from capital lease, and one percent from other sources. Interest income and fees also constituted a small percentage of the District’s income (less than one percent).

The District is primarily funded by property tax, special tax and the District’s ability to generate revenue by providing ambulance service and contracting for other services. Reportedly, the District’s collection rate on ambulance services is about 42 percent.

Special tax was originally passed in 1980 and 1984 and is collected every year with no cost of living allowance at \$70 per residence or \$2 per acre of vacant land. The FY 21-22 tax role is anticipated at \$700,995.80 for 10,014 parcels. Special tax is collected by the County, which charges one percent of collected amount.

V.6.4. Mitigation Education, Outreach, and Partnerships

Table V-14 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table V-14 South Placer FPD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Fire Safe Councils and Fire Wise Communities work on emergency preparedness and mitigation within their specific communities

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Fire Prevention Trailer taken out to public events within the District. Fire Safety brochures are distributed to attendees.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	Y	Partnership with Firewise communities to help them obtain their certification and ongoing efforts within those communities to help in emergency preparedness and mitigation efforts.
Public-private partnership initiatives addressing disaster-related issues	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
The District does not have the revenue to employ a Public Education specialist, so it relies heavily on help from within the Community. Fire Safe Councils and Fire Wise Communities play a critical role in keeping communities safe and the District need to assist as many neighborhoods as possible in obtaining these certifications. The benefit to the District is immeasurable but immensely important as the best outcome from an emergency comes from the emergency never happening.		

Source: South Placer FPD

V.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

South Placer FPD is a signatory of the Western Placer County Cooperative Fire Services Response Agreement along with the 12 other fire protection agencies in western Placer County, including Alta Fire Protection District, Cal Fire/Placer County Fire Department, Foresthill Fire Protection District, Newcastle Fire Protection District, Penryn Fire Protection District, Placer Hills Fire Protection District, City of Auburn Fire Department, City of Colfax Fire Department, City of Lincoln Fire Department, City of Rocklin Fire Department, and City of Roseville Fire Department. According to the agreement, the agencies provide automatic aid to each other and make use of the closest resource dispatching fire, rescue, and medical emergency response without regard to jurisdiction or statutory responsibility.

The District provides services to other communities in California under the California State Mutual Aid Plan. South Placer FPD also supports the statewide mutual aid system by staffing a State of California Office Of Emergency Services Engine. The District is a part of the Placer County strike team deployment plan. District administrators have served as local area coordinators, strike team leaders, strike team assistants participated on State organized management teams and have sent emergency equipment to incidents all over the State of California and surrounding states.

South Placer FPD has automatic aid agreements with Sacramento Metropolitan Fire Protection District, City of Rocklin, City of Roseville and City of Folsom Fire Departments.

The District has a good working relationship with American Medical Response (AMR), which is one of the ambulance service providers in Placer County. South Placer FPD has automatic and mutual aid agreements with AMR to provide ambulance in some of the AMR service areas within eight minutes of South Placer FPD travel time, while AMR provides backup as needed. South Placer FPD is a party to two ambulance automatic aid agreements, AMR and Penryn FPD. The District also signed a medical services mutual aid agreement with AMR and Newcastle FPD, according to which the closest provider responds to a request for medical transportation within a specific area in Newcastle FPD.

The District is a member of the California Fire Chiefs Association, Western Placer County Fire Chiefs Association, California State Firefighters Association, Fire Districts Association of California, and Fire Agencies Self Insurance System (FASIS). South Placer FPD participates in the Placer County Closest Resource Agreement, Placer County Emergency Operations Plan, and Region Four Mass Casualty Incident (MCI) Plan.

V.7 Mitigation Strategy

V.7.1. Mitigation Goals and Objectives

The South Placer FPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

V.7.2. Mitigation Actions

The planning team for the South Placer FPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Levee Failure
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire

After review of possible mitigation actions, the following were dropped from priority for mitigation planning:

- Levee Failure
- Freeze and Snow

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Vegetation Management in Open Space Areas

Hazards Addressed: Climate Change, Drought and Water Shortage, Extreme Heat, High Winds and Tornadoes, Tree Mortality, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The topography, climate (including extreme heat, drought and water shortage, and high winds and tornadoes), and vegetation throughout the South Placer Fire District is conducive to the spread of wildfires. High Risk areas contain extensive grasslands and oak woodlands in rolling terrain. Some of this vegetation is invasive species, which choke out native flora. In times of drought, it is the invasive species that tend to proliferate. These invasive species can also serve as ladder fuels during periods of wildfire.

Project Description: Partner with our neighbors at Placer County Code Enforcement to enforce State Law regarding defensible space to reduce the rapid spread of wildfire. Vegetation will be removed to protect grasslands and oak woodlands. This vegetation competes with trees and green plants.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plan Review for new residences and subdivisions. Investigation of hazardous vegetation complaints. MOU w /Placer County for Hazardous Vegetation Abatement

Responsible Agency/Department/Partners: South Placer Fire District, Property Owners, Placer County Code Enforcement, CalFire

Cost Estimate: Unknown at this time.

Benefits (Losses Avoided): Reduce the risks associated with natural hazards in the area. Preservation of life and property.

Potential Funding: Grants

Timeline: Ongoing

Project Priority (H, M, L): High

Action 2. Shaded Fuel Break along west shore of Folsom Lake - Granite Bay

Hazards Addressed: Climate Change, Drought and Water Shortage, Earthquake, Flood Hazards, Levee Failure, Severe Weather Hazards, Tree Mortality, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The topography, climate, and vegetation throughout the South Placer Fire District is conducive to the spread of wildfires. High Risk areas contain extensive grasslands and oak woodlands in rolling terrain. This area has not been maintained for many years.

Project Description: Partner with our neighbors at CalFire, State Parks, and the Bureau of Reclamation to create a shaded fuel break along the lake and help protect the home that back up to this area.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Granite Bay Shaded Fuel Break Project, MOU w /Placer County for Hazardous Vegetation Abatement.

Responsible Agency/Department/Partners: South Placer Fire District, BOR, State Parks, CalFire

Cost Estimate: To be determined

Benefits (Losses Avoided): Reduce the risks associated with natural hazards in the area. Preservation of life and property.

Potential Funding: Grants

Timeline: Ongoing

Project Priority (H, M, L): High

Action 3. Backup Generator Installation for Fire Stations

Hazards Addressed: Climate Change, Drought and Water Shortage, Earthquake, Flooding (both 1%/0.2% and localized) Extreme Heat, Heavy Rains and Storms, High Winds and Tornadoes, Tree Mortality, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Natural disasters (those listed in the hazard addressed above) and PSPS can potentially affect the availability of electricity to South Placer Fire District Stations that do not have power backup capabilities. Communication (to and from) as well as critical networking infrastructure for the fire district can be affected by power outages. PSPS events occur during periods of hot dry weather. PSPS events also occur predominantly during high wind and drought conditions. It is during these times that the District is especially in need of backup power.

Project Description: Add Emergency Backup Generators to South Placer Fire District Stations 15,16 and 17.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Apply for grants to fund the addition of backup generators. Fundraising projects.

Responsible Agency/Department/Partners: South Placer Fire District, Placer County

Cost Estimate: \$50,000

Benefits (Losses Avoided): Ensures that communications and networking infrastructure is always available regardless of the status of the electric grid. Reduce the risks associated with natural hazards in the area. Preservation of life and property.

Potential Funding: Grants

Timeline: Ongoing

Project Priority (H, M, L): High



Annex W Tahoe City Public Utility District

W.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Tahoe City Public Utility District (TCPUD or District), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to TCPUD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

W.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table W-1. Additional details on plan participation and District representatives are included in Appendix A.

Table W-1 TCPUD – Planning Team

Name	Position/Title	How Participated
Tony Laliotis	Director of Utilities	Agency representative, meeting attendance, annex completion
Dan Lewis	Utilities Superintendent	Agency representative, meeting attendance, annex completion

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table W-2.

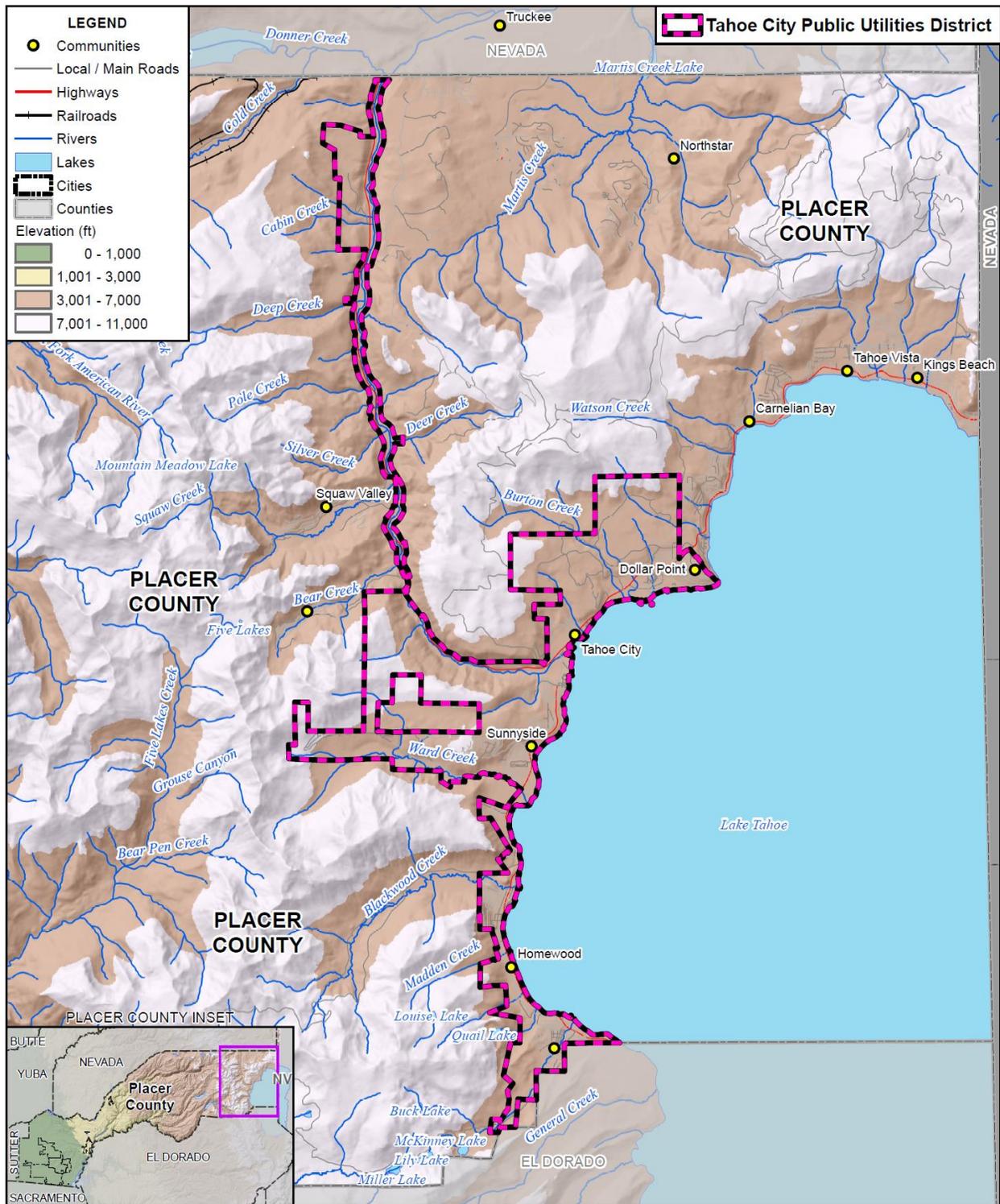
Table W-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No mitigation related planning mechanisms have been completed since 2016

W.3 District Profile

The District profile for the TCPUD is detailed in the following sections. Figure W-1 displays a map and the location of the District within Placer County.

Figure W-1 TCPUD



FOSTER MORRISON
CONSULTING

0 3 6 Miles

COUNTY OF
Placer

Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

W.3.1. Overview and Background

The Tahoe City Public Utility District was founded in 1938 to provide some of the governmental needs of the residents of Tahoe City. It is the oldest local government in the Tahoe Basin and was formed initially to provide public water service to the local community. Established under the State of California's Public Utility District Act, the founders of the District chose a form of government that could provide multiple types of services. The boundaries of the District extend from Emerald Bay to Dollar Hill, and along the Truckee River to the Nevada County line. The service area is very large, encompassing almost 22 square miles.

The TCPUD's provides sewer collection, parks facilities, and recreation services for the entire area of the District. Water service is provided in four separate systems and serves approximately half of the homes and businesses in the District. Water service is provided to approximately 4,000 customers; sewer services to 7,800 customers; and parks and recreation customers total over 500,000.

The Tahoe City area is characterized by mild summers and cool, wet winters, with an average high temperature in July of 82 and 42 in January. Annual precipitation in the watershed varies from an average of 65 inches in the west to approximately 40 inches per year in the east. The majority of precipitation occurs as snowfall during the winter months. A relatively small amount of precipitation occurs as rain during the spring and summer months.

W.4 Hazard Identification

TCPUD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table W-3).

Table W-3 TCPUD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Likely	Critical	Low	Medium
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Critical	Low	Medium
Drought & Water Shortage	Significant	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	Low	Low
Floods: 1%/0.2% annual chance	Significant	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Likely	Unlikely	Limited	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Likely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Limited	Unlikely	Limited	Low	Medium
Seiche	Significant	Unlikely	Critical	Medium	Medium
Severe Weather: Extreme Heat	Limited	Likely	Limited	Low	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Low	Medium
Severe Weather: Heavy Rains and Storms	Significant	Highly Likely	Critical	Low	Medium
Severe Weather: High Winds and Tornadoes	Significant	Highly Likely	Critical	High	Low
Tree Mortality	Significant	Highly Likely	Critical	High	High
Wildfire	Significant	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

W.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District’s hazards and assess the District’s vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

W.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section W.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table W-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

W.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District’s total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the TCPUD’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table W-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. TCPUD’s physical assets, valued at over \$62 million, consist of the buildings and infrastructure to support the District’s operations.

Table W-4 TCPUD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Fairway Community Center	Community Center	\$1,008,230	
Highland Community Center	Community Center	\$665,130	
Tahoe Community Center	Community Center	\$892,874	
Rideout Community Center	Community Center	Lease	
TCPUD Administration Building	Administration Building	\$2,234,370	
Parks & Rec. Corp. Yard	Corp. Yard	\$1,450,885	
Blackwood	Sewer Pump Station	\$1,500,000	Sewage Release
Coast Guard	Sewer Pump Station	\$1,500,000	Sewage Release
Harbor Master	Sewer Pump Station	\$1,500,000	Sewage Release
Madden	Sewer Pump Station	\$1,500,000	Sewage Release
McKinney	Sewer Pump Station	\$1,100,000	Sewage Release
Meeks Bay	Sewer Pump Station	\$1,100,000	Sewage Release
North Lane	Sewer Pump Station	\$1,100,000	Sewage Release
Rubicon	Sewer Pump Station	\$1,500,000	Sewage Release
Sunnyside	Sewer Pump Station	\$2,000,000	Sewage Release
Bay Vista	Sewer Pump Station	\$800,000	Sewage Release
Dollar 1	Sewer Pump Station	\$800,000	Sewage Release
Dollar 2	Sewer Pump Station	\$800,000	Sewage Release
Glenridge	Sewer Pump Station	\$800,000	Sewage Release
Highway 89	Sewer Pump Station	\$800,000	Sewage Release
Lonely Gulch	Sewer Pump Station	\$800,000	Sewage Release
Marina	Sewer Pump Station	\$800,000	Sewage Release
Park Terrace	Sewer Pump Station	\$800,000	Sewage Release
Rubicon Bch	Sewer Pump Station	\$800,000	Sewage Release

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Tahoma	Sewer Pump Station	\$800,000	Sewage Release
Waters Edge	Sewer Pump Station	\$800,000	Sewage Release
Commons Beach	Sewer Pump Station	\$800,000	Sewage Release
Sewer Gravity Line	4-inch Gravity Sewer Line	\$4,449,375	Sewage Release
Sewer Gravity Line	6-inch Gravity Sewer Line	\$24,310,589	Sewage Release
Sewer Gravity Line	6-inch Gravity Sewer Line	\$59,310,067	Sewage Release
Sewer Gravity Line	6-inch Gravity Sewer Line	\$4,864,635	Sewage Release
Sewer Gravity Line	6-inch Gravity Sewer Line	\$936,457	Sewage Release
Sewer Gravity Line	6-inch Gravity Sewer Line	\$401,712	Sewage Release
Sewer Gravity Line	8-inch Gravity Sewer Line	\$2,884,172	Sewage Release
Sewer Gravity Line	8-inch Gravity Sewer Line	\$9,933,772	Sewage Release
Sewer Gravity Line	8-inch Gravity Sewer Line	\$1,160,531	Sewage Release
Sewer Gravity Line	8-inch Gravity Sewer Line	\$631,840	Sewage Release
Sewer Gravity Line	10-inch Gravity Sewer Line	\$1,582,395	Sewage Release
Sewer Gravity Line	10-inch Gravity Sewer Line	\$2,467,070	Sewage Release
Sewer Gravity Line	10-inch Gravity Sewer Line	\$1,924,683	Sewage Release
Sewer Gravity Line	10-inch Gravity Sewer Line	\$350,152	Sewage Release
Sewer Gravity Line	10-inch Gravity Sewer Line	\$122,559	Sewage Release
Sewer Gravity Line	12-inch Gravity Sewer Line	\$676,368	Sewage Release
Sewer Gravity Line	12-inch Gravity Sewer Line	\$1,068,389	Sewage Release
Sewer Gravity Line	12-inch Gravity Sewer Line	\$865,517	Sewage Release
Sewer Gravity Line	15-inch Gravity Sewer Line	\$1,598,464	Sewage Release
Sewer Gravity Line	15-inch Gravity Sewer Line	\$1,045,749	Sewage Release
Sewer Gravity Line	15-inch Gravity Sewer Line	\$694,154	Sewage Release
Sewer Gravity Line	18-inch Gravity Sewer Line	\$449,963	Sewage Release
Sewer Gravity Line	18-inch Gravity Sewer Line	\$2,049,435	Sewage Release
Sewer Gravity Line	18-inch Gravity Sewer Line	\$236,863	Sewage Release
Sewer Gravity Line	21-inch Gravity Sewer Line	\$2,361,980	Sewage Release
Sewer Gravity Line	24-inch Gravity Sewer Line	\$1,643,125	Sewage Release
Sewer Gravity Line	24-inch Gravity Sewer Line	\$108,082	Sewage Release
Sewer Gravity Line	24-inch Gravity Sewer Line	\$191,108	Sewage Release
Sewer Gravity Line	27-inch Gravity Sewer Line	\$42,600	Sewage Release
Sewer Gravity Line	27-inch Gravity Sewer Line	\$825,612	Sewage Release
Sewer Gravity Line	27-inch Gravity Sewer Line	\$335,188	Sewage Release
Sewer Gravity Line	30-inch Gravity Sewer Line	\$179,035	Sewage Release
Sewer Gravity Line	30-inch Gravity Sewer Line	\$3,355,172	Sewage Release

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Sewer Gravity Line	30-inch Gravity Sewer Line	\$115,465	Sewage Release
Sewer Gravity Line	33-inch Gravity Sewer Line	\$577,395	Sewage Release
Sewer Gravity Line	33-inch Gravity Sewer Line	\$83,614	Sewage Release
Sewer Gravity Line	33-inch Gravity Sewer Line	\$1,963,259	Sewage Release
Sewer Gravity Line	36-inch Gravity Sewer Line	\$107,060	Sewage Release
Sewer Gravity Line	36-inch Gravity Sewer Line	\$1,747,666	Sewage Release
Sewer Gravity Line	36-inch Gravity Sewer Line	\$2,851,775	Sewage Release
Sewer Gravity Line	36-inch Gravity Sewer Line	\$332,640	Sewage Release
Sewer Gravity Line	36-inch Gravity Sewer Line	\$130,438	Sewage Release
Sewer Gravity Line	48-inch Gravity Sewer Line	\$78,466	Sewage Release
Sewer Force Main	4-inch Force Mains	\$749,400	Sewage Release
Sewer Force Main	6-inch Force Mains	\$857,925	Sewage Release
Sewer Force Main	8-inch Force Mains	\$1,484,297	Sewage Release
Sewer Force Main	10-inch Force Mains	\$479,236	Sewage Release
Sewer Force Main	12-inch Force Mains	\$3,970,050	Sewage Release
Sewer Force Main	18-inch Force Mains	\$531,244	Sewage Release
Sewer Force Main	20-inch Force Mains	\$72,281	Sewage Release
Sewer Laterals	4-inch Service Laterals	\$15,159,900	Sewage Release
Sewer Manholes	Sewer Manhole 5-Feet	\$4,230,000	Sewage Release
Sewer Manholes	Sewer Manhole 10-Feet	\$13,143,000	Sewage Release
Sewer Manholes	Sewer Manhole 15-Feet	\$3,757,500	Sewage Release
Sewer Manholes	Sewer Manhole 20-Feet	\$1,335,000	Sewage Release
Sewer Manholes	Sewer Manhole 25-Feet	\$259,000	Sewage Release
Dollar Point	Lake Intake	\$750,000	Drinking Water Outage, Sodium Hypochlorite Release
Grove Street	Lake Intake	\$1,000,000	Drinking Water Outage, Sodium Hypochlorite Release
Cedar Point	Lake Intake	\$750,000	Drinking Water Outage, Sodium Hypochlorite Release
McKinney	Lake Intake	\$750,000	Drinking Water Outage, Sodium Hypochlorite Release
Chambers Ldg	Lake Intake	\$750,000	Drinking Water Outage, Sodium Hypochlorite Release
Highlands I-III	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss
Rocky Ridge I-II	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss
Rubicon I-II	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss
Tavern I-II	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss
Granlibakken	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Upper Highlands	Booster Pump Station	\$625,000	Drinking Water Outage, Fire Flow Loss
Alpine Peaks	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Bunker	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Four Seasons	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Highlands	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Upper Highlands	Water Tank	\$1,000,000	Drinking Water Outage, Fire Flow Loss
Rocky Ridge	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Rubicon II	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Rubicon III	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Tahoe Hills	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Quail	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Timberland	Water Tank	\$700,000	Drinking Water Outage, Fire Flow Loss
Madden Creek	Water Tank	\$800,000	Drinking Water Outage, Fire Flow Loss
Tahoe Cedars	Water Tanks (2)	\$1,500,000	Drinking Water Outage, Fire Flow Loss
Bunker	Water Well	\$412,550	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Tahoe City IV	Water Well	\$1,500,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Tahoe City II	Water Well	\$1,500,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Tahoe City III	Water Well	\$1,500,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Highlands A	Water Well	\$1,295,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Highlands B	Water Well	\$1,295,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Crystal Way	Water Well	\$1,110,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Rubicon 1	Water Well	\$610,500	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Rubicon 2	Water Well	\$592,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Rubicon 3	Water Well	\$555,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Tahoe Tavern	Water Well	\$832,500	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Timberland	Water Well	\$800,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Silver Street Well	Water Well	\$800,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Elm Street Well	Water Well	\$1,000,000	Drinking Water Outage, Fire Flow Loss, Chlorine Release
Alpine Peaks	4-Inch Water Dist Line	\$425,000	Drinking Water Outage, Fire Flow Loss
Alpine Peaks	6-Inch Water Dist Line	\$1,725,000	Drinking Water Outage, Fire Flow Loss
Alpine Peaks	8-Inch Water Dist Line	\$1,382,813	Drinking Water Outage, Fire Flow Loss
Alpine Peaks	10-Inch Water Dist Line	\$1,068,281	Drinking Water Outage, Fire Flow Loss
Alpine Peaks	12-Inch Water Dist Line	\$472,500	Drinking Water Outage, Fire Flow Loss
Comstock	4-Inch Water Dist Line	\$900,000	Drinking Water Outage, Fire Flow Loss
Comstock	6-Inch Water Dist Line	\$2,125,000	Drinking Water Outage, Fire Flow Loss
Dollar Point	2.5-Inch Water Dist Line	\$80,000	Drinking Water Outage, Fire Flow Loss
Dollar Point	4-Inch Water Dist Line	\$997,500	Drinking Water Outage, Fire Flow Loss
Dollar Point	6-Inch Water Dist Line	\$5,900,000	Drinking Water Outage, Fire Flow Loss
Dollar Point	8-Inch Water Dist Line	\$996,094	Drinking Water Outage, Fire Flow Loss
Highlands	4-Inch Water Dist Line	\$205,500	Drinking Water Outage, Fire Flow Loss
Highlands	6-Inch Water Dist Line	\$3,905,000	Drinking Water Outage, Fire Flow Loss
Highlands	8-Inch Water Dist Line	\$31,875	Drinking Water Outage, Fire Flow Loss
Highlands	12-Inch Water Dist Line	\$2,346,750	Drinking Water Outage, Fire Flow Loss
Chambers-McK	2.5-Inch Water Dist Line	\$880,000	Drinking Water Outage, Fire Flow Loss
Chambers-McK	4-Inch Water Dist Line	\$4,057,500	Drinking Water Outage, Fire Flow Loss
Chambers-McK	6-Inch Water Dist Line	\$4,930,000	Drinking Water Outage, Fire Flow Loss
Chambers-McK	10-Inch Water Dist Line	\$201,234	Drinking Water Outage, Fire Flow Loss
Chambers-McK	12-Inch Water Dist Line	\$551,250	Drinking Water Outage, Fire Flow Loss
Dollar Condos 1&2	2.5-inch Water Dist Line	\$87,500	Drinking Water Outage, Fire Flow Loss
Dollar Condos 1&2	4-inch Water Dist Line	\$62,500	Drinking Water Outage, Fire Flow Loss
Dollar Condos 1&2	6-inch Water Dist Line	\$87,500	Drinking Water Outage, Fire Flow Loss
Dollar Condos 1&2	12-inch Water Dist Line	\$223,125	Drinking Water Outage, Fire Flow Loss
Granlibakken	4-inch Water Dist Line	\$25,000	Drinking Water Outage, Fire Flow Loss
Granlibakken	6-Inch Water Dist Line	\$125,000	Drinking Water Outage, Fire Flow Loss
Granlibakken	8-Inch Water Dist Line	\$766,406	Drinking Water Outage, Fire Flow Loss
Granlibakken	10-Inch Water Dist Line	\$549,047	Drinking Water Outage, Fire Flow Loss
Granlibakken	12-Inch Water Dist Line	\$454,125	Drinking Water Outage, Fire Flow Loss
Highway 28	12-Inch Water Dist Line	\$3,252,375	Drinking Water Outage, Fire Flow Loss
Highway 89	6-Inch Water Dist Line	\$337,500	Drinking Water Outage, Fire Flow Loss
Highway 89	10-Inch Water Dist Line	\$491,906	Drinking Water Outage, Fire Flow Loss
Highway 89	12-Inch Water Dist Line	\$1,123,500	Drinking Water Outage, Fire Flow Loss
Meeks Bay Vista	2.5-inch Water Dist Line	\$31,250	Drinking Water Outage, Fire Flow Loss
Meeks Bay Vista	6-Inch Water Dist Line	\$1,606,250	Drinking Water Outage, Fire Flow Loss

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Panorama	4-inch Water Dist Line	\$260,000	Drinking Water Outage, Fire Flow Loss
Panorama	6-inch Water Dist Line	\$1,947,500	Drinking Water Outage, Fire Flow Loss
Panorama	8-inch Water Dist Line	\$4,688	Drinking Water Outage, Fire Flow Loss
Panorama	12-Inch Water Dist Line	\$826,875	Drinking Water Outage, Fire Flow Loss
Rubicon	2.5-inch Water Dist Line	\$785,000	Drinking Water Outage, Fire Flow Loss
Rubicon	4-inch Water Dist Line	\$362,500	Drinking Water Outage, Fire Flow Loss
Rubicon	6-inch Water Dist Line	\$9,353,750	Drinking Water Outage, Fire Flow Loss
Rubicon	8-inch Water Dist Line	\$278,906	Drinking Water Outage, Fire Flow Loss
Star Harbor & Pomi	2.5-inch Water Dist Line	\$287,500	Drinking Water Outage, Fire Flow Loss
Star Harbor & Pomi	6-Inch Water Dist Line	\$100,000	Drinking Water Outage, Fire Flow Loss
Star Harbor & Pomi	8-Inch Water Dist Line	\$51,563	Drinking Water Outage, Fire Flow Loss
Star Harbor & Pomi	10-Inch Water Dist Line	\$211,172	Drinking Water Outage, Fire Flow Loss
Lake Forest Glen	2.5-inch Water Dist Line	\$500,000	Drinking Water Outage, Fire Flow Loss
Lake Forest Glen	4-inch Water Dist Line	\$112,500	Drinking Water Outage, Fire Flow Loss
Lake Forest Glen	6-inch Water Dist Line	\$575,000	Drinking Water Outage, Fire Flow Loss
Lake Forest Glen	8-inch Water Dist Line	\$539,063	Drinking Water Outage, Fire Flow Loss
N. Shore Condos	8-Inch Water Dist Line	\$445,313	Drinking Water Outage, Fire Flow Loss
N. Shore Condos	10-Inch Water Dist Line	\$397,500	Drinking Water Outage, Fire Flow Loss
N. Shore Condos	12-Inch Water Dist Line	\$157,500	Drinking Water Outage, Fire Flow Loss
Rocky Ridge Condos	2.5-inch Water Dist Line	\$470,000	Drinking Water Outage, Fire Flow Loss
Rocky Ridge Condos	6-inch Water Dist Line	\$147,500	Drinking Water Outage, Fire Flow Loss
Rocky Ridge Condos	8-inch Water Dist Line	\$414,844	Drinking Water Outage, Fire Flow Loss
Rocky Ridge Condos	10-Inch Water Dist Line	\$1,055,859	Drinking Water Outage, Fire Flow Loss
St. Francis Condos	2.5-inch Water Dist Line	\$167,500	Drinking Water Outage, Fire Flow Loss
St. Francis Condos	4-inch Water Dist Line	\$112,500	Drinking Water Outage, Fire Flow Loss
St. Francis Condos	8-inch Water Dist Line	\$539,063	Drinking Water Outage, Fire Flow Loss
St. Francis Condos	12-Inch Water Dist Line	\$341,250	Drinking Water Outage, Fire Flow Loss
Tahoe City	2.5-inch Water Dist Line	\$395,000	Drinking Water Outage, Fire Flow Loss
Tahoe City	4-inch Water Dist Line	\$350,000	Drinking Water Outage, Fire Flow Loss
Tahoe City	6-inch Water Dist Line	\$3,372,500	Drinking Water Outage, Fire Flow Loss
Tahoe City	8-inch Water Dist Line	\$977,344	Drinking Water Outage, Fire Flow Loss
Tahoe City	10-Inch Water Dist Line	\$186,328	Drinking Water Outage, Fire Flow Loss
Tahoe City	12-Inch Water Dist Line	\$1,034,250	Drinking Water Outage, Fire Flow Loss
Tahoe Hills	2.5-inch Water Dist Line	\$275,000	Drinking Water Outage, Fire Flow Loss
Tahoe Hills	4-inch Water Dist Line	\$674,000	Drinking Water Outage, Fire Flow Loss
Tahoe Hills	6-inch Water Dist Line	\$5,430,000	Drinking Water Outage, Fire Flow Loss

Name of Asset	Type	Replacement Value	Which Hazards Pose Risk
Tahoe Tavern Heights	2.5-inch Water Dist Line	\$900,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Heights	4-inch Water Dist Line	\$545,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Heights	6-inch Water Dist Line	\$2,887,500	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Heights	8-inch Water Dist Line	\$1,858,594	Drinking Water Outage, Fire Flow Loss
Tavern Shores Condo	2.5-inch Water Dist Line	\$200,000	Drinking Water Outage, Fire Flow Loss
Tavern Shores Condo	4-inch Water Dist Line	\$30,000	Drinking Water Outage, Fire Flow Loss
Tavern Shores Condo	6-inch Water Dist Line	\$412,500	Drinking Water Outage, Fire Flow Loss
Villa's Condos	2.5-inch Water Dist Line	\$75,000	Drinking Water Outage, Fire Flow Loss
Villa's Condos	6-inch Water Dist Line	\$95,000	Drinking Water Outage, Fire Flow Loss
Villa's Condos	8-inch Water Dist Line	\$747,656	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Condos	2.5-inch Water Dist Line	\$375,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Condos	4-inch Water Dist Line	\$50,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Condos	6-inch Water Dist Line	\$650,000	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Condos	8-inch Water Dist Line	\$421,875	Drinking Water Outage, Fire Flow Loss
Tahoe Tavern Condos	10-Inch Water Dist Line	\$37,266	Drinking Water Outage, Fire Flow Loss
Tamarack MW	6-inch Water Dist Line	\$147,500	Drinking Water Outage, Fire Flow Loss
Tamarack MW	8-inch Water Dist Line	\$1,155,469	Drinking Water Outage, Fire Flow Loss
T-T Forest Track	2.5-inch Water Dist Line	\$200,000	Drinking Water Outage, Fire Flow Loss
T T Forest Track	6-inch Water Dist Line	\$225,000	Drinking Water Outage, Fire Flow Loss
T T Forest Track	8-inch Water Dist Line	\$585,938	Drinking Water Outage, Fire Flow Loss
Tahoe Cedars Water System	8-12 inch Water Dist Line	\$25,500,000	Drinking Water Outage, Fire Flow Loss
Madden Creek Water System	8-12 inch Water Dist Line	\$7,800,000	Drinking Water Outage, Fire Flow Loss
Timberland Water System	8-inch Water Dist Line	\$2,400,000	Drinking Water Outage, Fire Flow Loss
Total		\$62,209,892	

Source: TCPUD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. TCPUD provides services to approximately 15,000 full time residents. Seasonal populations can increase to over 50,000 residents at times during peak summer months such as July.

Natural Resources

TCPUD has a variety of natural resources of value to the District. These natural resources parallel that of the Tahoe Area of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

TCPUD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of the Tahoe Area of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

Due to specific development restrictions within the Lake Tahoe Basin, typical growth within the District boundaries is less than one half percent (0.5%) annually.

Development since 2016

No District facilities have been constructed since 2016. As such, a change in vulnerability is unlikely.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Tahoe Area of Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

W.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table W-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.

- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a complex issue involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the District, is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme drought
- D4 – Exceptional drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages and for longer periods. Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District and the County are shown in Section 4.3.10 of the Base Plan.

Past Occurrences

There has been one state and one federal disaster declaration due to drought since 1950. This can be seen in Table W-5.

Table W-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977

Source: Cal OES, FEMA

Since drought is a regional phenomenon, past occurrences of drought for the District are the same as those for the County and includes 5 multi-year droughts over an 85-year period. Details on past drought occurrences can be found in Section 4.3.10 of the Base Plan.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

The most significant qualitative impacts associated with drought in the Placer County Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. With a reduction in water, water supply issues based on water rights becomes more evident. Climate change may create additional impacts to drought and water shortage in the County and the District.

During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section below, as well as in Section 4.3.2 of the Base Plan.

The impact of a drought on the District is primarily one of water supply. All water provided by the TCPUD comes from deep groundwater wells located in various locations in the Lake Tahoe Basin. Continued drought can severely compromise the water supply within the district. Most recently, after multiple years of below-average rainfall and very low snow-melt run off, Governor Brown in signed emergency regulations into place in 2015 requiring all of California to reduce water use by 25%. TCPUD has adopted Ordinance 284, Water Conservation and Drought Response Standards since the last LHMP and has been actively working with customers to meet the State mandates.

Assets at Risk

All groundwater wells within the District.

Severe Weather: High Winds and Tornadoes

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds can also cause PSPS events.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, are another severe weather hazard that can affect areas of the Placer County Planning Area, primarily during the rainy season in the late fall, winter, and early spring, primarily in the western part of the County.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes, while rare, can occur at any location in the County and District, but would more likely occur in Western Placer. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for winds and tornadoes. The District noted that since high winds is a regional phenomenon, events that affected the upper elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.5.

Vulnerability to and Impacts from Severe Weather: Wind and Tornado

High winds are common occurrences in the District throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. High winds can impact critical facilities and infrastructure and can lead to power outages. Wind can also drive wildfire flames, spreading wildfires quickly. During periods of high winds and dry vegetation, wildfire risk increases. High winds that occur during periods of extreme heat can cause PSPS events to be declared in the County. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan.

Impacts from high winds in the District will vary. Future losses from straight line winds include:

- Downed trees
- Power line impacts and economic losses from power outages
- Increased PSPS events
- Occasional building damage, primarily to roofs

The District noted that it is the wildfires driven by the winds that will be of greatest impact to the District.

Assets at Risk

All District assets are at direct risk from high winds. Tornadoes are much less likely in the District.

Future Development

Any new development in the District will be built to current standards, which take high winds into account. Tornadoes are unlikely to affect future District facilities.

Tree Mortality

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

One of the many vulnerabilities of drought in Placer County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and

exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

Location and Extent

Onset of tree mortality events can be relatively fast; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Duration of tree mortality is lengthy, as once the tree dies, it remains in place until removed by human activity, wildfire, or breakdown of the wood by nature. Many areas in Placer County have seen increases in tree mortality. The County has mapped these areas, and that map was shown in Section 4.3.18 of the Base Plan. Using a color legend, the map provided by CAL FIRE shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 to 40 dead trees per acre
- Orange depicting 5 to 15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

In the past decade, mortality has increased in the eastern portion of Placer County. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Placer County areas were designated during this event and the majority of Placer County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality, along with numerous Tier 1 High hazard “hot spots”. A map of these areas was shown in in Section 4.3.18 of the Base Plan.

Past Occurrences

There have been no state or federal disasters in the County related directly to tree mortality, though it has most likely contributed to the intensity of past wildfires in the County. Those events are shown in the Past Occurrences section of Wildfire below. In 2015, then-Governor Edmund G. Brown Jr. proclaimed a state of emergency due to the extreme hazard of the dead and dying trees. Following the proclamation, 10 counties were determined to be most affected, which included Placer County. Placer County proclaimed a local emergency due to tree mortality conditions on Dec. 8, 2015. No events of past tree mortality have affected the District. Though the District noted it was unclear if the Washoe Fire in 2007 was worsened by tree mortality.

Vulnerability to and Impacts from Tree Mortality

Placer County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (i.e. soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead

trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure.

Primary impacts include facility damage due to falling trees and increased fuels for wildfire proliferation.

Assets at Risk

All water and sewer assets are vulnerable to tree mortality due to physical damage or by wildfire.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

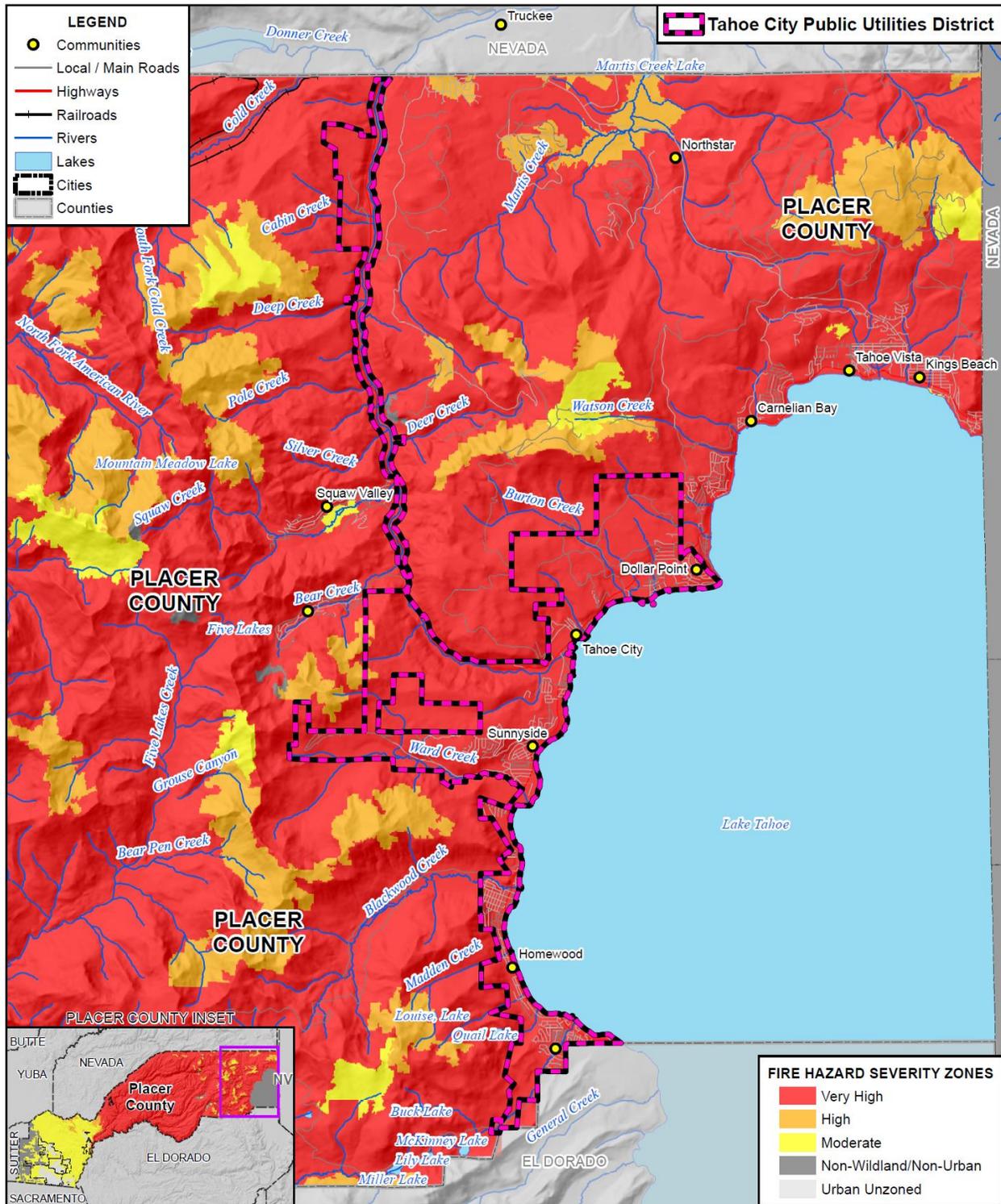
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the TCPUD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the TCPUD were created. Figure W-2 shows the CAL FIRE FHSZ in the District. As shown on the maps, FHSZs within the District range from High to Very High.

Figure W-2 TCPUD – Fire Hazard Severity Zones



FOSTER MORRISON
CONSULTING

0 3 6 Miles

COUNTY OF
Placer

Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table W-6.

Table W-6 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The District was affected by the Washoe Fire. This fire occurred in the wildland urban interface area of Tahoe Park and Tahoe Woods Subdivision, along the West shore of Lake Tahoe. The fire was caused by a failure of some propane equipment. Although no lives were lost, the fire destroyed 5 residential structures and encompassed 19 acres. Power and gas utilities were incurred damages. There were also losses to timber assets, loss of watershed protection, and loss of the aesthetic value of a scenic corridor. This event caused major disruptions to west shore and Tahoe City traffic and business on a busy summer weekend. Highway 89, West Lake was closed for a period of time.

Lastly, impacts from smoke and air quality issues have become a regular occurrence due to the marked increase in wildfire activity in Northern and Central California. Poor air quality has resulted in disruption of District maintenance activities due the work force being sent home or sequestered inside due to local air quality warnings by the local AQMD.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on

watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Further, many of the communities in the District are limited to one route access and egress in the event of a major wildfire. Historically, these routes are closed during major events, stranding many people, including visitors, away from their families and homes. So far there has been no loss of life attributed to the limited evacuation routes, but it is likely only a matter of time before people are cut off and trapped by a major fire event.

Lastly, impacts from smoke and air quality issues have become a regular occurrence due to the marked increase in wildfire activity in Northern and Central California. Poor air quality has resulted in disruption of District maintenance activities due the work force being sent home or sequestered inside due to local air quality warnings by the local AQMD.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's energy companies (including PG&E and Liberty Utilities), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Assets at Risk

All above ground structures and those requiring electricity to operate are at risk to wildfire and PSPS, including all sewer and water pumping facilities, administrative office facilities, and equipment storage facilities.

W.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

W.6.1. Regulatory Mitigation Capabilities

Table W-7 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the TCPUD.

Table W-7 TCPUD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	
Capital Improvements Plan	Y	Plan includes projects that address hazards, and are included in mitigation strategies.
Economic Development Plan	N	
Local Emergency Operations Plan	Y 2013	TCPUD Emergency Response Plan, Jan. 2018. Plan typically addresses response to an emergency and not mitigation.
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Sewer System Management Plan, May 2019 Urban Water Management Plan, July 2016
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	N	

		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Most projects that serve as mitigation strategies are captured within Capital Improvement Plan. The District will seek to actively pursue these measures in the future. When the CIP is updated, hazards and their mitigation will be reviewed and incorporated, as necessary.		

Source: TCPUD

Tahoe City Public Utilities District Emergency Response Plan, 2018

The TCPUD Emergency Response Plan serves as a guide for the District’s response to emergencies/disasters within District boundaries, and to coordinate and assist with disaster response in neighboring jurisdictions.

Tahoe City Public Utilities District Sewer System Management Plan, 2014

The TCPUD Sewer System Management Plan serves as a guide for Districts response to emergencies/disasters within District boundaries as it relates to its sewer collection system.

Codes and Ordinances

Avalanche

Placer County’s avalanche management program defines Potential Avalanche Hazard Areas (PAHAs) where the minimum probability of avalanche occurrence is 1 in 100 per year or where avalanche damage has already occurred. According to the Placer County Avalanche Ordinance the following information must be disclosed in PAHAs:

- Identification that a structure is within a PAHA
- A warning that avalanche control work is conducted in the area and avalanche warnings will be provided as feasible
- Identification of sources that provide weather information and general information on avalanches

In addition, the county limits construction as necessary in PAHAs and will not issue a building permit for construction in a PAHA without certifying that the structure will be safe under the anticipated snow loads and conditions of an avalanche.

Tahoe City Public Utilities District Ordinances and Permits

TCPUD has enacted several ordinances:

- Water Ordinance 263
- Sewer Ordinance 255

In addition, the District has water and sewer permit requirements specific to:

- New Construction
- Tear Down-Rebuilds and Remodels

W.6.2. Administrative/Technical Mitigation Capabilities

Table W-8 identifies the District department(s) responsible for activities related to mitigation and loss prevention in TCPUD.

Table W-8 TCPUD’s Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	TCPUD maintains and implements a preventative maintenance program on all of its facilities. TCPUD maintains a staff, fleet and equipment capable of implementing this maintenance program.
Mutual aid agreements	Y	TCPUD actively participates in a local mutual aid agreement with other agencies
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	Y FT	Utilities/Risk Coordinator is trained on hazards and mitigation.
Community Planner	N	
Civil Engineer	Y FT	Engineering/Senior Civil Engineer is trained on hazards and mitigation.
GIS Coordinator	Y FT	Information Systems and Technology Administrator is trained on hazards and mitigation.

Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Fire and Security alarm. Telemetry for the sewer and water stations. Cell phone and radio communications.
Hazard data and information	N	
Grant writing	Y	Grants and Community Information Administrator
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued development of communication and network infrastructure in the area.		

Source: TCPUD

W.6.3. Fiscal Mitigation Capabilities

Table W-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table W-9 TCPUD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Replacing or upgrading infrastructure
Authority to levy taxes for specific purposes	Y	Replacing or upgrading infrastructure
Fees for water, sewer, gas, or electric services	Y	Ongoing operation and maintenance
Impact fees for new development	Y	Replacing or upgrading infrastructure
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Replacing or upgrading infrastructure
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	Both the Lake Tahoe Restoration Act and USFS Omnibus Funding have been used for Fuels Thinning and Water System Improvements to enhance fire protection capabilities. Future funding may be available pending approval of a new Lake Tahoe Restoration Act.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
State funding programs	Y	Funding sources from Propositions 50 and 84 and the State Revolving Fund have been used for water and sewer system improvements improving fire protection capacity of the water system and sewer storage and pumping capacity of the sewer system. Future funding may be available in future Propositions as well as State Revolving Funds (SRF) pending approval of submitted projects.
Other		
How can these capabilities be expanded and improved to reduce risk?		
Any additional funding for infrastructure, specifically water for fire suppression, from federal, state or local sources would be beneficial.		

Source: TCPUD

W.6.4. Mitigation Education, Outreach, and Partnerships

Table W-10 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table W-10 TCPUD’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Truckee River Basin Working Group, Red Cross, Truckee River Watershed Council
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	TCPUD water conservation programs. See http://conservation.tcpud.org/
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	Work with Red Cross on storage of their emergency response equipment for local use.
Other		
N/A		
How can these capabilities be expanded and improved to reduce risk?		
Continued partnerships with pertinent stakeholders to bring ideas and projects forward, and support each other’s organization by providing collaborative expertise when needed.		

Source: TCPUD

W.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- Staff educated in the Safety Program
- Website and Quarterly Newsletters to the general public
- Upgrading generators at all pump stations
- Retro fit stations (fire proofing, flood proofing, etc.)
- Fuel Reduction around facilities
- Staff training

Water System, Fire Protection Improvements

Also in the aftermath of the Angora fire in 2007, TCPUD has completed a full analysis of its water systems and is prioritizing the capital improvements necessary to increase fire protection capabilities. Since a significant amount of the District's sub-regional water systems are more than 40 years old and were acquired at various times from developers or other companies, extensive infrastructure work is necessary to meet current standards. TCPUD has successfully worked with the local fire departments, state and federal legislators, and officials to help secure the millions of funding needed to implement recommended improvements. Since 2008, the District has received over \$6,000,000 in funding from various sources for water system improvements.

2007 Phase 1 – Highlands Fuel Reduction

Fuel reduction, mastication and track chipping on 25 acres of District owned open space. This property is bounded by North Tahoe High School and single family homes. The fire potential was considered high. This work was completed in 2010.

2008 Blackwood Pump Station Storm Damage

1996 Blackwood Creek overflow flood damage to the Blackwood sewer pump station. F.E.M.A. repair assistance received in the amount of \$46,645.00. The T.C.P.U.D. funded a complete retrofit of the pump station at an additional cost of \$108,000.00. This retrofit protects the pump station from future flooding and the potential for a large sewage spill into Lake Tahoe. The project was completed in 2008.

2009 Fuel Reduction Program – Chambers Foothills and Quail Lake

Chambers Foothills and Quail Lake Fuel Reduction program, mechanical & hand treatment on 70 acres. Project funded by Nevada and California Fire Safe Council and T.C.P.U.D. participation funding. Grant funding not to exceed \$175,000. District participation will be \$56,000. The property is bounded by single family homes and commercial business property.

Seismic Stability Study and Retrofit

The District owns eleven (11) water storage tanks. The seismic stability of these tanks was last analyzed in a report prepared by Nolte Associates dated January 2006 and September 2010. Of the 11 analyzed tanks:

- One (1) was built in 2005 and is seismically stable and requires no retrofits (Upper Highlands).
- One (1) is seismically unstable and requires a major foundation and shell retrofit or requires a change in its operational water level (Lower Highlands).
- One (1) is seismically unstable and due to its age and material requires a complete replacement (Bunker), replaced in 2019
- Eight (8) are seismically stable with minor improvements recommended.

Tahoe Cedars Water System Interconnection and Distribution Project

In January 2018, TCPUD acquired and began operating the Tahoe Cedars Water System (formerly Mid Sierra Utilities). Since the acquisition, TCPUD Board of Directors has dedicated significant time towards understanding how to invest in and improve the water supply and fire suppression capabilities of the Tahoe Cedars System.

TCPUD identified a high priority need for backup water supply and additional water storage for the Tahoe Cedars System. The system has been in operation for over 50 years and relied that whole time on one groundwater source with no appreciable backup supply. To correct this, the District developed a project to interconnect the Tahoe Cedars System to the TCPUD’s McKinney-Quail Water System. The Project provides the needed backup water supply and emergency water storage, in addition to replacement of critical water system components to enhance fire protection and improve water delivery and pressure. The Project was completed in 2018 at a cost of \$1.92 million.

Madden Creek Water System Interconnection and Distribution Project

In January 2018, TCPUD acquired and began operating the Madden Creek Water System (formerly Mid Sierra Utilities). Since the acquisition, TCPUD Board of Directors has dedicated significant time towards understanding how to invest in and improve the water supply and fire suppression capabilities of the Madden System.

TCPUD identified a high priority need for backup water supply and additional water storage for the Madden System. To accomplish this, the District developed this project to interconnect the Madden System to the TCPUD’s McKinney-Quail Water System. The Project will provide the needed backup water supply and emergency water storage, in addition to replacement of critical water system components to enhance fire protection and improve water delivery and pressure.

Due to the size and complexity of the Project, it has been broken into a two-phased construction schedule; the first phase includes the McKinney-Quail interconnection and associated high pressure transmission line replacement, and the second phase includes water distribution, servicing, and fire protection improvements. Phase 1 construction was completed in 2019 at a cost of \$970,000. Phase 2 is scheduled to be completed in Summer of 2021 at a cost of \$2.3 million.

The project benefits the public by enhancing water supply and reliability as well as improving fire protection within the water system service area.

Tahoe Cedars and Madden Creek Systems Master Plans

In January 2018, TCPUD acquired and began operating the Tahoe Cedars and Madden Creek Water Systems (formerly Mid Sierra Utilities). Since the acquisition, TCPUD Board of Directors has dedicated significant time towards understanding how to invest in and improve the water supply and fire suppression capabilities of these systems and has already provided critical interconnectivity for these systems as discussed above.

However, the majority water distribution systems within these two water service areas are failing and lacks critical basic fire protection needs such as fire hydrants and adequate flow, pressure and storage to support basic fire suppression activities. The District hired Carollo Engineers in 2020 to prepare a comprehensive waters system master plans for both systems. The final plans are due to be completed in 2021 and provide the framework for essentially full system replacements for both service areas. The estimated cost to complete the master plans is approximately \$215,000. Initial system replacement estimates for both systems combines is approximately \$50 million dollars.

Timberland Interconnection and Distribution Improvements

In January 2018, TCPUD acquired the former Timberland Water Company and began providing water service to Timberland's former customers on January 2, 2018. Following the acquisition, the TCPUD Board of Directors has dedicated significant time in understanding how to invest in and improve the water supply and fire suppression capabilities of the system.

Phase I of the Project was completed in 2019. This phase included installation of approximately 4,440 linear feet of 8-inch water main, 487 linear feet of 4-inch water main, 80 service reconnections and meters, 10 new fire hydrants, and 6 refurbished fire hydrants to replace the varying 2-inch to 6-inch existing system infrastructure.

Phase II completed the Project in 2020 by constructing the remaining new waterlines, service laterals, valves and fire hydrants on roads north of Sugar Pine Road on Cedar Lane, Rustic Lane, and Shady Lane, as well as Timberland Lane and Hwy 89.

The project benefits public health through enhancement of water supply and reliability as well as improving fire protection within the water system service area. Total cost for Phase 1 and II was \$3.6 million.

West Lake Tahoe Regional Water Treatment Plant

The Tahoe City Public Utility District (TCPUD) is undertaking the construction of a permanent, year round drinking water treatment plant to replace the temporary seasonal treatment plant located at Chambers Landing. The new water treatment plant will provide a reliable, drought-resistant, and safe drinking water source to the TCPUD's McKinney-Quail Water Service area and, potentially, other water systems in the West Lake Tahoe region.

In October of 2015, the TCPUD Board of Directors completed the California Environmental Quality Act (CEQA) review process for the project, adopting a Mitigated Negative Declaration and Mitigation

Monitoring & Reporting Program and approving the project. The Project is out to public bid as of February 26, 2021 and scheduled to be awarded and begin construction in mid-2021.

Backup Generator Installations

The TCPUD currently operates a total of 32 permanent generator sites within our service territory to power critical water and sewer pumping facilities. In addition, the TCPUD owns and operates a fleet of 5 portable generators that can be towed anywhere in the District. Since 2016, the TCPUD has installed or acquired 9 new fixed generator sites.

These generators supply emergency power supply to critical facilities during power outages caused by a multitude of hazards including weather related power outage events, PSPS outage events, and possible power disruption due to wildfire.

W.7 Mitigation Strategy

W.7.1. Mitigation Goals and Objectives

The TCPUD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

W.7.2. Mitigation Actions

The planning team for the TCPUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought & Water Shortage
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

Though initially considered a priority hazard, due to the difficulty in the District in having direct mitigation actions for high winds, it was dropped as a hazard for mitigation planning purposes. The hazards addressed below still include high wind, as its effects are mitigated by these actions.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each

jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. West Shore Storage Augmentation Project

Hazards Addressed: Wildfire, Tree Mortality, High Winds, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The west shore of Lake Tahoe is comprised of 10 separate public water systems each with its own infrastructure such as water sources, storage tanks, water mains and services. The systems all vary in their ability to provide sufficient fire flow rates and volume due to differing hydraulic grade lines (elevation of the tanks) and varying capacities of storage tanks. Most systems fall short of meeting basic fire code requirements for fire flow rates and volumes to provide adequate duration of flow.

Project Description: This project proposes to construct two new storage tanks to interconnect with two existing storage tanks to create a network of storage facilities at the same elevations which will interconnect 6 of those 10 systems. In addition, once interconnected, all systems will have access to approximately 1 million gallons per day of treated surface water from Lake Tahoe from the West Lake Tahoe Regional Water Treatment Plant which begins construction in 2021.

Other Alternatives:

- Build six new tanks and build surface water treatment plants for each system.
- No Project - Continue to operate fractured water systems with significant fire flow storage and flow deficiencies

Existing Planning Mechanism(s) through which Action Will Be Implemented: Master plan will be completed for this project in 2021

Responsible Agency/ Department/Partners: Tahoe City Public Utility District

Cost Estimate: \$5.0 million

Benefits (Losses Avoided): Ability to prevent structure fires from entering the WUI, structure protection from wildfires entering the WUI, drought resistant source capacity.

Potential Funding: Placer County Water Agency, SRF, Rate Revenue, Ad Valorem Property Tax

Timeline: 2021-2024

Project Priority (H, M, L): High

Action 2. Tahoe Cedars Water System Interconnection and Distribution Project

Hazards Addressed: Wildfire, Tree Mortality, High Winds, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Tahoe Cedars Water system was originally built in the 1950's and to support the Tahoma subdivision. The system is largely comprised of smaller 4 inch diameter water mains and is approximately 75% deficient in the necessary number of fire hydrants required to meet modern fire codes.

Project Description: This project proposes to rebuild approximately 80,000 lineal feet of water main, install approximately 100 fire hydrants and approximately 1,180 water services and meters. Approximately 15,000 feet of pipeline is located in Placer County.

Other Alternatives: No Project - Continue to operate a system that cannot support modern fire suppression measures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Master plan completed for this project in 2021

Responsible Agency/ Department/Partners: Tahoe City Public Utility District

Cost Estimate: \$45 million (Approximately \$5 million in Placer County)

Benefits (Losses Avoided): Ability to prevent structure fires from entering the WUI, structure protection from wildfires entering the WUI, reduce water use by replacing leaking infrastructure and by installation of water meters.

Potential Funding: Placer County Water Agency, SRF, Rate Revenue, Ad Valorem Property Tax

Timeline: 2021-2030

Project Priority (H, M, L): High

Action 3. Madden Creek Water System Interconnection and Distribution Project

Hazards Addressed: Wildfire, Tree Mortality, High Winds, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Madden Creek Water system was originally built in the 1930s and 1940s to support the small summer home community of Homewood. As time went on the water system began to serve both year round residences and commercial businesses. The system is largely comprised of smaller 2 inch diameter water mains and is approximately 75% deficient in the necessary number of fire hydrants required to meet modern fire codes.

Project Description: This project proposes to rebuild approximately 24,000 lineal feet of water main, 40 fire hydrants and approximately 150 water services and meters.

Other Alternatives: No Project - Continue to a system that cannot support modern fire suppression measures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Master plan completed for this project in 2021

Responsible Agency/ Department/Partners: Tahoe City Public Utility District

Cost Estimate: \$3.8 million

Benefits (Losses Avoided): Ability to prevent structure fires from entering the WUI, structure protection from wildfires entering the WUI, reduce water use by replacing leaking infrastructure and by installation of water meters.

Potential Funding: Placer County Water Agency, SRF, Rate Revenue, Ad Valorem Property Tax

Timeline: 2021-2025

Project Priority (H, M, L): High

Action 4. West Lake Tahoe Regional Water Treatment Plant

Hazards Addressed: Wildfire, Tree Mortality, High Winds, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The west shore of Lake Tahoe is comprised of 10 separate public water systems each with its own infrastructure such as water sources, storage tanks, water mains and services. The primary source of water in these systems is groundwater. Groundwater in this area of the Tahoe basin is subject to widely variable water quality as well as limited availability during prolonged drought periods. The use of Lake Tahoe as a dedicated source of drinking water will provide a drought tolerant source of water with predictable quality and the necessary firm capacity to provide water supply during wildfire events.

Project Description: This project proposes to construct a new water treatment plant capable of providing up to 1 million gallons a day of drinking water to the Placer County communities of Tahoma north to the Timberland Subdivision. The plant will be designed to be expandable to 1.5 million gallons per day in the future.

Other Alternatives:

- Replace individual wells with individual surface water plants.
- No Project - Continue to operate fractured water systems with individual wells subject to water quality and supply issues

Existing Planning Mechanism(s) through which Action Will Be Implemented: Preliminary Design Report completed in 2014.

Responsible Agency/ Department/Partners: Tahoe City Public Utility District

Cost Estimate: \$15 million

Benefits (Losses Avoided): Drought resistant source capacity, ability to prevent structure fires from entering the WUI, structure protection from wildfires entering the WUI, drought resistant source capacity.

Potential Funding: Placer County Water Agency, SRF, Rate Revenue, Ad Valorem Property Tax

Timeline: 2021-2024

Project Priority (H, M, L): High



Annex X Truckee Fire Protection District

X.1 Introduction

This Annex details the hazard mitigation planning elements specific to Truckee Fire Protection District (Truckee FPD), a previously participating jurisdiction to the 2016 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to Truckee FPD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

X.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table X-1. Additional details on plan participation and District representatives are included in Appendix A.

Table X-1 Truckee FPD – Planning Team

Name	Position/Title	How Participated
Bill Seline	Fire Chief	Attended meetings, provided hazard identification table. Provided information on vulnerability of the District to hazards of concern.
Rod Brock	Div. Chief	Review of local hazards, priorities and possible mitigation
Jeff Dowling	Forester	CWPP, Maps, projects concerning wildfire mitigations and fuel reduction
Kevin McKechnie	Fire Marshal	Review of local hazards, priorities and possible mitigation

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table X-2.

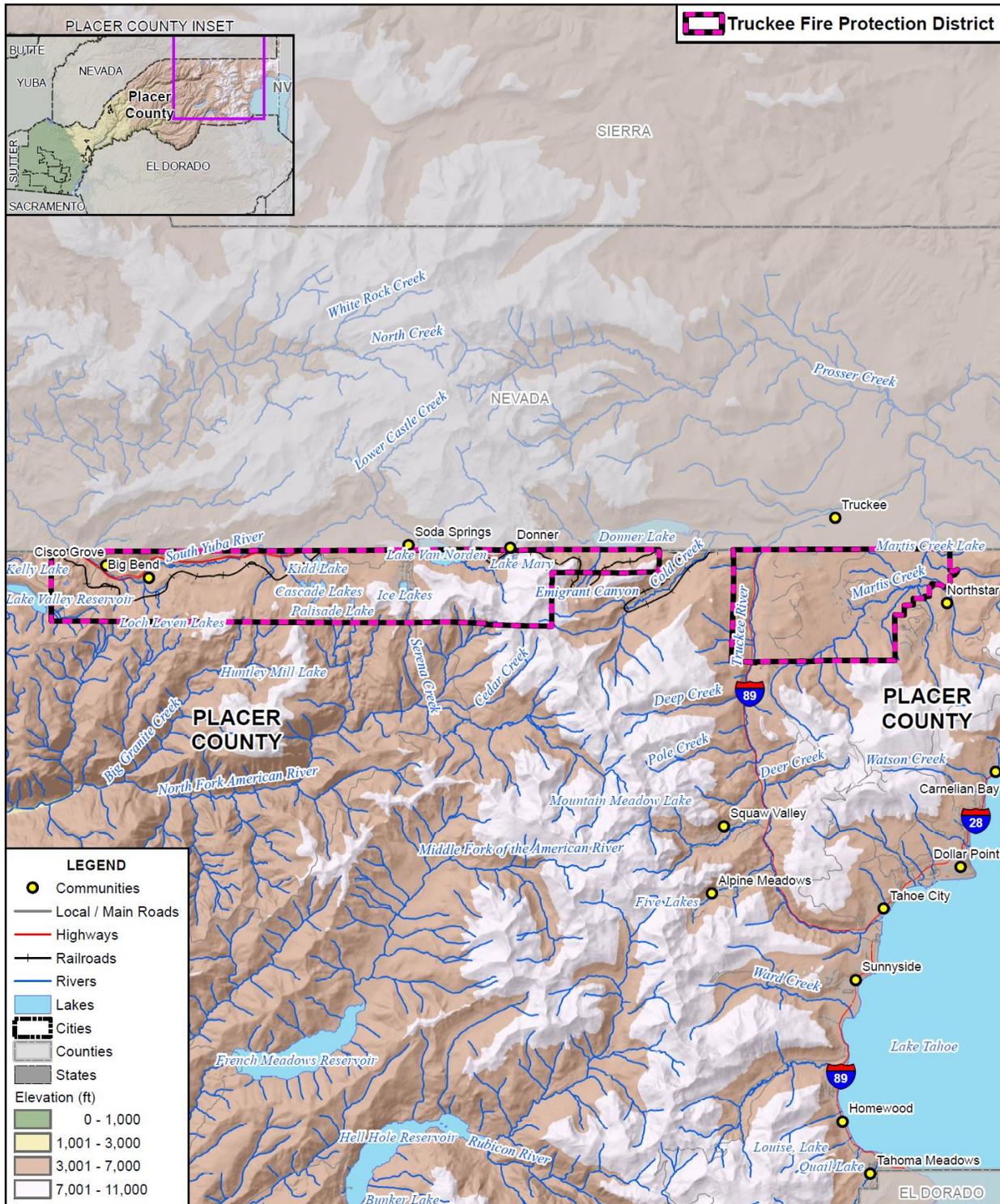
Table X-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	No mitigation planning mechanisms have been completed since 2016

X.3 District Profile

The District profile for the Truckee FPD is detailed in the following sections. Figure X-1 displays a map and the location of the District within Placer County.

Figure X-1 Truckee FPD



Data Source: Placer County GIS, Cal-Atlas, NVBLM; Map Date: 2021.

X.3.1. Overview and Background

Truckee FPD is officially responsible for 125 square miles and is one of the oldest fire districts in the Truckee Tahoe area of Northern California. A public agency, supported by public funds, the District operates under Fire District Law established in 1987 and is an independent Special District.

The District's business is the protection of life and property through the provision of fire rescue and emergency medical services. This District offers a high level of service to our mountain community and outlying areas and is made up of 49 full time and 9 part time and/or volunteer members.

X.4 Hazard Identification

Truckee FPD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table X-3).

Table X-3 Truckee FPD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Extensive	Occasional	Limited	Low	Medium
Avalanche	Limited	Occasional	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Occasional	Limited	Low	High
Earthquake	Extensive	Unlikely	Critical	Low	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Occasional	Negligible	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Pandemic	Extensive	Likely	Critical	Low	Medium
Seiche	Limited	Unlikely	Catastrophic	Low	Medium
Severe Weather: Extreme Heat	Extensive	Unlikely	Limited	Low	High
Severe Weather: Freeze and Snow	Extensive	Highly likely	Limited	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Negligible	Low	Low
Tree Mortality	Limited	Likely	Negligible	Low	High
Wildfire	Extensive	Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

X.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

X.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section X.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table X-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

X.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the Truckee FPD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table X-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. Truckee FPD’s physical assets, valued at over \$48 million, consist of the buildings and infrastructure to support the District’s operations.

Table X-4 Truckee FPD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Fire station 91	Administrative station	\$10 million	Wildfire, earthquake
Fire Station 92	Ambulance and Engine	\$10 million	Wildfire, earthquake
Fire Station 95	Ambulance and Engine	\$8 million	Wildfire, earthquake
Fire Station 96	Ambulance and Engine	\$10 million	Wildfire, earthquake
Fire Station 97	Ambulance and Engine	\$10 million	Wildfire, earthquake

Source: Truckee FPD

Populations Served

Also potentially at risk should the District be affected by natural hazard events are the populations served by the District. TFPD provides services to over 20,000 residents and thousands more visitors to the lakes, forests, campgrounds and ski areas. Additionally, services are provided to the users of the transcontinental railroad, Interstate 80, five area lakes and Truckee Tahoe Airport.

Natural Resources

Truckee FPD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

Truckee FPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Current development is at its highest level in 15 years in the Truckee area including over 500 large single family residences that have been or being built in the Martis Camp and Coldstream subdivisions, multiple other multi-family units with 50-100 units each, many in-fill commercial and single family residences throughout the area. Other longer range developments are planned in the Donner Summit area and the area east of the Glenshire. All of the new and proposed developments are within the wildland urban interface.

Development since 2016

No District facilities have been constructed since 2016.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallel that of the Tahoe Area of the Placer County Planning Area. The District Service area remains the same, however, construction of a new planned fire station (Station 90) is being considered, pending design and financing approval by the Board, with a goal to be completed by 2023. The station will be located near downtown Truckee and will serve that area and areas north of town. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

X.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table X-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Wildfire

Likelihood of Future Occurrence–Likely

Vulnerability–Extremely High

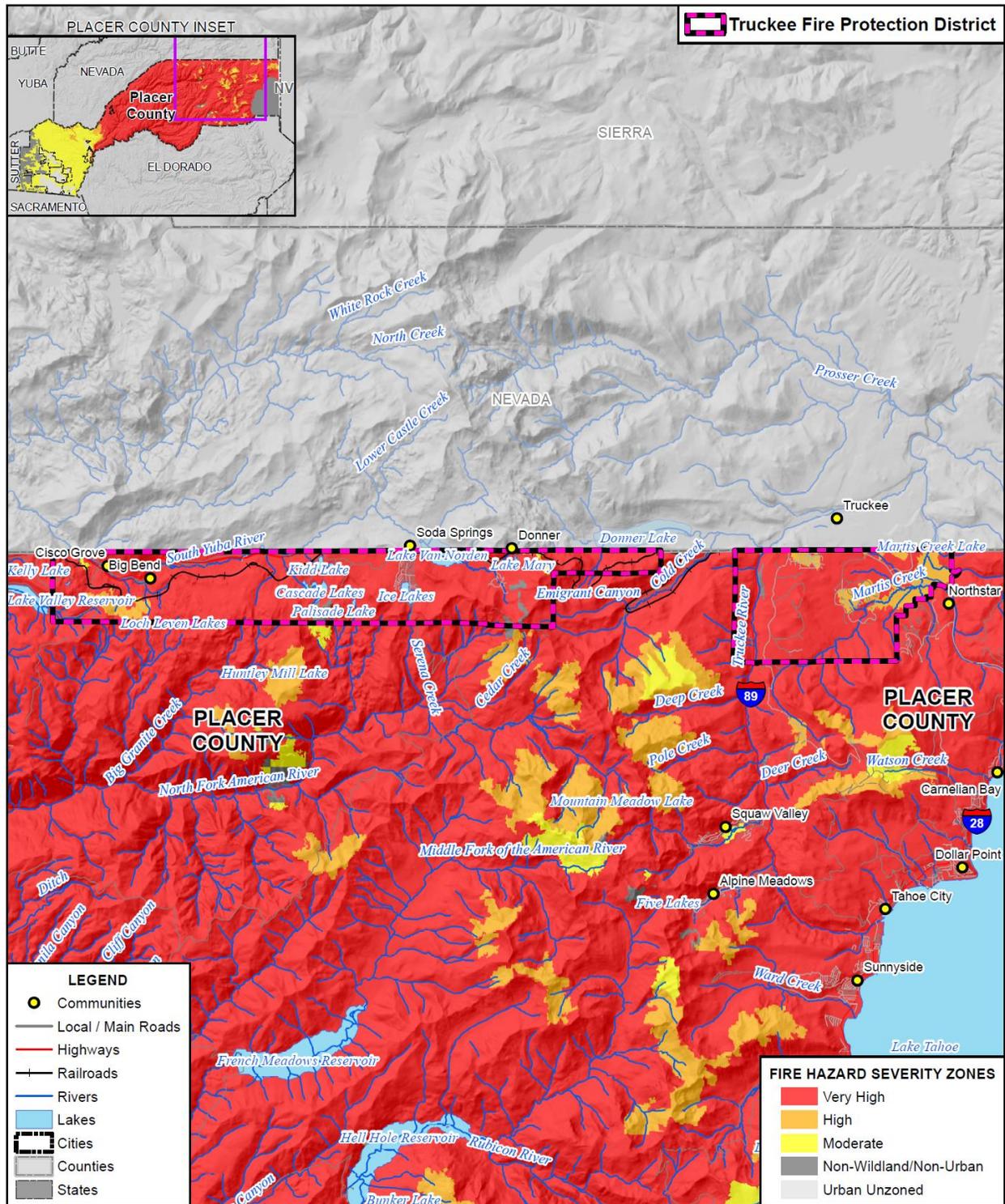
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the Truckee FPD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the Truckee FPD were created. Figure X-2 shows the CAL FIRE FHSZ in the District. As shown on the maps, fire hazard severity zones within the District range from Moderate to Very High.

Figure X-2 Truckee FPD – Fire Hazard Severity Zones



Data Source: Cal-Fire (Draft 09/2007 - c31fhszl06_1, Adopted 11/2007 - fhszs06_3_31, Recommended 12/2008 - c31fhszl06_3), Placer County GIS, Cal-Atlas, NV/BLM; Map Date: 2021.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table X-5.

Table X-5 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

Only small, few acre fires occur at most in our Placer areas. Last fire was the King 2014 and the American 2013 that were within 10 miles of our Placer area (Serene Lakes). All of the residential and commercial structures in the Truckee area are in the wildland urban interface and are at risk from a catastrophic fire event.

Every season smoke from large fire affects the Truckee area often for months at a time. The District responded to 20-30 smaller wildland fires each season, any one of which could become a destructive fire in the right conditions. Last season (2020) the area also had a record number of red flag days almost double the average at 15. The District participates in the Statewide mutual aid system and responded to 5 major fires in the state and had resources deployed for months in 2020.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year around fire season, the dry vegetation and hot and sometimes windy weather results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading

water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2 of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District sees a large number of visitors here for leisure and recreations often not aware of the severe hazard conditions. This coupled with outdoor activities like fireworks, campfires and BBQ's the Truckee area is venerable to a large wildfire.

Assets at Risk

All of the District assets are in the WUI and are at risk of being damaged or destroyed in a wildland fire.

X.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation education, outreach, and partnerships.

X.6.1. Regulatory Mitigation Capabilities

Table X-6 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Truckee FPD.

Table X-6 Truckee FPD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	N	
Capital Improvements Plan	N	New facilitates built to the newest safety standards
Economic Development Plan	N	

Local Emergency Operations Plan	Y	Town of Truckee Plan, no mitigation
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	In progress	Complete in 2016
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: Town of Truckee, Placer Co, Nevada Co. It is adequately enforced
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	WUI
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Wildfire and WUI management of property
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continuing to encourage a robust local building and fire code helps reduce damage from many types of events		

Source: Truckee FPD

As indicated above, the District has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these are described in more detail below.

Truckee Fire Evacuation Plan

Truckee Fire Protection District is a bi-county District that also encompasses the incorporated Town of Truckee. Truckee Fire follows the Placer, Nevada counties as well as the Town of Truckee evacuation plans. Each year the agencies meet to coordinate and exercise on the plan.

Fire Hydrant Snow Plan

The winter months bring a special concern to the citizens of Truckee, Donner Summit, and the Truckee Fire District. Winter storms often hide fire hydrants under a mountain of snow, making them impossible to find quickly. In the event of a fire, firefighters have to locate and clear hydrants of snow before they are able to connect hose and establish a water supply to aid in fighting fire. District crews stop at hydrants to clear them of snow. In most locations within the Fire District, hydrants are located 500 feet from one another. Because of the great number of hydrants located within the Fire District, it is virtually impossible to clear every hydrant of snow after each storm. The Fire District has adopted a strategic plan of which hydrants are to be cleared of snow after a snowstorm, depending on life-hazards and proximity to other hydrants which are maintained.

CWPP

Truckee Fire recently received a CAL FIRE grant to hire a consultant to develop a CWPP for the Truckee Fire Protection District. The process was started in the summer of 2015 and is expected to be completed by summer of 2016. Many local stakeholders are involved in the process including the USFS, CAL FIRE, various homeowner associations, State Parks, Town of Truckee, both counties, to name a few. The plan outlines and prioritizes the wildfire risk in the fire district and outlines various projects that will help mitigate the hazard.

The plan was completed, and work outlined in the plan commenced over the last 5 years. The District was awarded over 3 million dollars in grants to do various fuel reduction projects. Currently the District is considering a wildfire measure to raise a sustainable revenue source to do significant fuels reduction work. Prior to beginning work the CWPP will be updated in 2022 to identify a 5-10 year list of fuel reduction projects and wildfire mitigation work.

X.6.2. Administrative/Technical Mitigation Capabilities

Table X-7 identifies the District department(s) responsible for activities related to mitigation and loss prevention in FPD.

Table X-7 Truckee FPD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	In-house forest and WUI experts that inspect residential and commercial properties
Mutual aid agreements	N	
Other	N	

Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	Town of Truckee and County has these offices and coordinates well with TFPD
Floodplain Administrator	N	Town
Emergency Manager	Y	Town and Fire Department
Community Planner	Y	Town
Civil Engineer	Y	Town
GIS Coordinator	N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Town of Truckee and both Counties have abilities to communicate with the public. The Fire District can communicate via Nixle
Hazard data and information	Y	Town
Grant writing	Y	TFPD
Hazus analysis	Y	Town
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continuing to encourage a robust local building and fire code helps reduce damage from many types of events.		

Source: Truckee FPD

X.6.3. Fiscal Mitigation Capabilities

Table X-8 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table X-8 Truckee FPD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	Y	With 2/3 vote.
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Mitigation fees have supported fire station improvement and additional apparatus
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
A local source of revenue from a parcel tax would allow the District to do on-going significant fuel reduction work in the WUI		

Source: Truckee FPD

X.6.4. Mitigation Education, Outreach, and Partnerships

Table X-9 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table X-9 Truckee FPD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	The District started a CERT team with over 100 members over the last 5 years.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Various community educational programs including community events and annual school fire safe program
Natural disaster or safety related school programs	Y	School fire safety
StormReady certification	N	
Firewise Communities certification	N	The District has facilitated the creation of over 20 Firewise Communities in the last 5 years
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The CERT program has recently developed a 2 hour Personal Emergency Preparedness program (PEP) that they are delivering to many HOAs and community groups to share the best practices of emergency preparedness		

Source: Truckee FPD

X.7 Mitigation Strategy

X.7.1. Mitigation Goals and Objectives

The Truckee FPD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

X.7.2. Mitigation Actions

The planning team for the Truckee FPD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

➤ Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. 2022 CWPP

Hazards Addressed: Multi-Hazard (Climate Change, Dam Failure, Earthquake, Floods 1%/0.2% annual chance, Pandemic, Seiche, Severe Weather: Freeze and Snow, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Truckee Fire Protection District is a bi-county fire district with residents, visitors, vacant parcels, commercial and residential structures that are in the WUI and at risk of wildfire.

Project Description: Although much work has been completed in the last 5 years there are many more acres on the larger vacant properties needs fuel reduction work. Additionally, residents need support with creating defensible space with things like green waste pickup, chipping, tree removal, support of elderly

and low income. Evacuation routes need vegetation maintenance and evacuation systems like planning and notification need to be advanced with emerging technology.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District will hire a consultant to implement the CWPP process involving stakeholders and the general community.

Responsible Agency/ Department/Partners: Truckee Fire

Cost Estimate: CWPP 30k. CWPP work identified will be up to 15 million in projects

Benefits (Losses Avoided): Wildfire prevention

Potential Funding: Grants and a local Wildfire Prevention Parcel Tax Measure (August 2021)

Timeline: CWPP in 2022, projects over next 5 years

Project Priority (H, M, L): H

Annex Y Placer County Air Pollution Control District

Y.1 Introduction

This Annex details the hazard mitigation planning elements specific to Placer County Air Pollution Control District (PCPCAPCD or District), a new participating jurisdiction to the 2021 Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to PCAPCD, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

Y.2 Planning Process

As described above, the District followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table Y-1. Additional details on plan participation and District representatives are included in Appendix A.

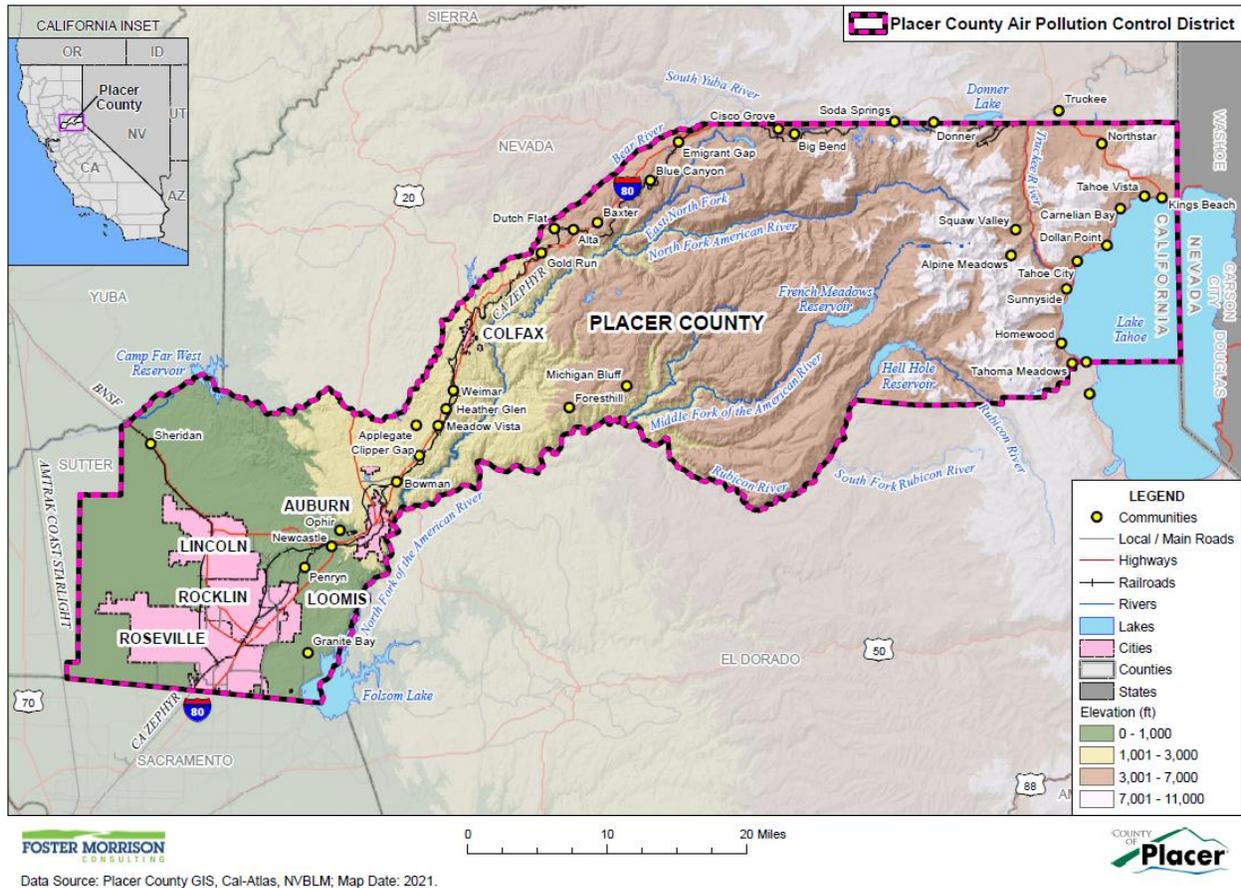
Table Y-1 PCAPCD – Planning Team

Name	Position/Title	How Participated
Adam Baughman	Deputy APCO	Attended LHMP meetings, researched and identified hazards & impacts, prepared feasible mitigation measures worksheets.
Ann Hobbs	Associate Planner	Attended LHMP meetings as needed, reviewed and commented on mitigation measure worksheets.
Molly Johnson	Air Quality Specialist II	Developed mitigation measures, reviewed & commented on LHMP.
Yushuo Chang	Senior Air Quality Planner	Developed mitigation measures, reviewed & commented on LHMP.

Y.3 District Profile

The District profile for the PCAPCD is detailed in the following sections. Figure Y-1 displays a map and the location of the District within Placer County.

Figure Y-1 PCAPCD



Y.3.1. Overview and Background

The District is charged with the enforcement of local air pollution control rules adopted by its Board of Directors, as well as state and federal air quality requirements. The District permits the control of air pollution by businesses, regulates open burning, responds to odor and dust complaints, and encourages the reduction of emissions in areas that are not regulated directly.

There are five air monitoring stations in the County to measure air quality on a 24-hour basis. The District is responsible for preparing, adopting, and implementing air quality plans that seek to achieve and maintain state and federal air quality standards. The District provides incentives to local businesses and agencies to reduce air pollution in our communities. The District participates in and promotes efforts to reduce the impacts of wildfire. The District develops an annual emission inventory of all sources within Placer County. The District reports this information to CARB for inclusion in their statewide database.

The District is governed by a Board of Directors (Board) composed of three County Board of Supervisors and one elected official from each of the six County incorporated municipalities: Auburn, Colfax, Lincoln, Loomis, Rocklin, Roseville. The District’s Board appoints the Director/Air Pollution Control Officer (APCO).

The District currently employs 15 full-time and 4 extra-help employees, and is organized into four operating sections: Administrative Services, Planning & Monitoring, Compliance & Enforcement, and Permitting & Engineering.

The District's current annual budget is approximately \$9.3 million, of which \$2.9 million is included as clean air incentive funding to assist local businesses in obtaining cleaner equipment. Most of the District's operational funding comes from a surcharge imposed by the Department of Motor Vehicles, along with emission and equipment fees assessed on permitted facilities. The District's activities are programmed into five separate funds depending on the revenue source. Each fund has its own revenue and expenditure accounts. The District's philosophy of budgeting revenues conservatively and expenditures adequately has allowed the District to meet its current fiscal needs and provide funding for beginning the upcoming fiscal year.

Y.4 Hazard Identification

PCAPCD identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table Y-2).

Table Y-2 PCAPCD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agriculture Pests and Diseases	Significant	Highly Likely	Critical	Low	Medium
Avalanche	Limited	Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Critical	Low	Medium
Drought & Water Shortage	Extensive	Likely	Critical	Low	High
Earthquake	Significant	Occasional	Critical	Low	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	Low	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Low	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Low	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	Low	Low
Tree Mortality	Extensive	Likely	Limited	Low	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid				
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				
	Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

Y.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Placer County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Placer County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

Y.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section Y.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table Y-2) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Placer County Planning Area.

Y.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the PCAPCD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

This definition is further refined by separating out three classes of critical facilities:

Class 1 facilities include those facilities that contribute to command, control, communications and computer capabilities associated with managing an incident from initial response through recovery.

Class 2 facilities include those facilities that house Emergency Services capabilities.

Class 3 facilities are those facilities that enable key utilities and can be used as evacuation centers/shelters/mass prophylaxis sites, etc.

Additional information on the three classes of critical facilities is described further in Section 4.3.1 of the Base Plan.

Table Y-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. PCAPCD’s physical assets, valued at over \$2.6 million, consist of the buildings and infrastructure to support the District’s operations.

Table Y-3 PCAPCD Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
PCAPCD Offices, 110 Maple St., Auburn, CA 95603	Office Building	\$2,078,298	Wildfire
Air Quality Monitoring Equipment – Stationary	Remote Air Quality Monitoring sites	\$347,830	Wildfire/Snowstorm etc. for Tahoe
Air Quality Monitoring Equipment – Mobile	Air Quality Monitoring Equipment housed in towable District Trailer	\$17,134	Wildfire
District Vehicles (various)	Fleet Vehicles	\$150,000	Wildfire
Weather Monitoring Equipment-Stationary	Remote Weather Monitoring Stations	\$39,946	Wildfire/ Avalanche / Snowstorm, Wind Event
Total		\$2,633,208	

Source: PCAPCD

Natural Resources

PCAPCD has a variety of natural resources of value to the District. These natural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

PCAPCD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Placer County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Populations Served

Potentially at risk, should the District be affected by natural hazard events, are the populations served by the District. The PCAPCD provides services to the whole of Placer County.

Growth and Development Trends

General growth in the District parallels that of the Placer County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District has no control over future development in areas the District services. Future development in these areas parallels that of the Placer County Planning Area. More general information on growth and development in Placer County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Placer County Vulnerability and Assets at Risk of the Base Plan.

Y.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table Y-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the District, Placer County, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members did, however, note that in Placer County, the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. A protracted, hotter, drier and windier summer season, combined with the cumulative impact of drought conditions, high amounts of excessive vegetation, referred to in fire terms as fuel and tree mortality exacerbates the potential for damaging wildfires. California's Fourth Climate Change Assessment by UC Davis (2018) indicated the impacts of climate change on the Sacramento Region will result in extreme heatwaves, drier landscapes, less snow, variable precipitation, more intense droughts, and increased risk of wildfire. These impacts will lead to a decrease in air quality via higher levels of ground-level ozone and particulate matter (PM), leading to air quality impacts on public health

Vulnerability to and Impacts from Climate Change

The 2014 California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change. California's APG: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Placer County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. This information can be used to guide climate adaptation planning in the District and Placer County Planning Area.

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Placer County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

As noted above, many of these impacts will result in increased ground-level ozone and particulate matter (PM), leading to injurious effects on public health. PCAPCD will require increased resources to develop programs and strategies to effectively address this increased air pollution to continue to move toward attainment of state and federal ambient air quality standards. In the case of increased wildfire, there would be an expectation of increased wildfire smoke. This would result in the need to provide clean air shelter and other clean air equipment, including the District's office.

Assets at Risk

The District noted that its facilities will most likely not be at risk from climate change. However, with increased wildfire albeit smoke, the District's main office would need to be kept free from smoke in order for staff to work safely inside.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risk to the built environment from extreme heat. While extreme heat on its own does not usually affect structure, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat and high winds can cause power outages and PSPS events, causing issues to buildings in the District.

Extreme Heat and Power Shortage/Power Failure

The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan.

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan.

Since the District Office is located in the urban downtown of the City of Auburn, power to the building has remained relatively stable during the PSPS events. However, most District employees live outside the city in more rural areas more frequently subject to PSPS. Likewise, the District's air quality monitoring equipment and purple air sensors are located in areas that could be subject to PSPS.

Location and Extent

Heat is a regional phenomenon and affects the whole of the District. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

There has been no federal or state disaster declarations in the County for heat. The District Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2. Additionally, California's Fourth Climate Change Assessment prepared by UC Davis (2018) expects Sacramento maximum temperatures to be 10 degrees F higher by the end of this century, leading to increasingly poor air quality and increased fire danger. The average number of days exceeding 104 degrees F annually is expected to increase from 4 to 40 by 2100. This will lead to an increase in ground level ozone and a decrease in public health.

Vulnerability to and Impacts from Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen. Also, power outages and PSPS events may occur during these times as well. Health impacts, including loss of life, are the primary concern with this hazard, though economic impacts are also an issue.

Days of extreme heat have been known to result in medical emergencies, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also further dry out vegetation, making it more vulnerable to completely burning if a wildfire occurred.

The District noted the following impacts:

- Causes an increase in ozone and ozone exceedances which leads to an increase in public health issues. The western portion of Placer County is in nonattainment area for both the federal and state ambient air quality standards for ozone. While air quality has improved, as it gets hotter more often, it will become increasingly difficult to achieve the standards (greater heat = more ozone due to more reaction with ozone precursor pollutants).
- Causes an increase in wildfire frequency and severity, leads to increase in particulate matter in the air from smoke, increase in public health issues, asthma, etc. While close to meeting the air quality standards, the County is technically in non-attainment of federal and state PM standards as well.
- With respect to wildfire smoke, the Sacramento area air districts have asked the US EPA a number of times, as needed, to make an Exceptional Event finding for the Sacramento Region and to exclude data in the last few years from attainment emissions. Without these Exceptions, the County will most likely not be able to meet the PM standard by the EPA's deadline which could result in repercussions for the area.

Assets at Risk

While none of the District's assets are directly impacted by extreme heat, District resources to address the increased air pollution will be impacted. As ambient and average temperatures rise in the Sacramento Region, it will be increasingly difficult to address the impact on air quality and continue to move the County toward attainment of state and federal air quality standards.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–High

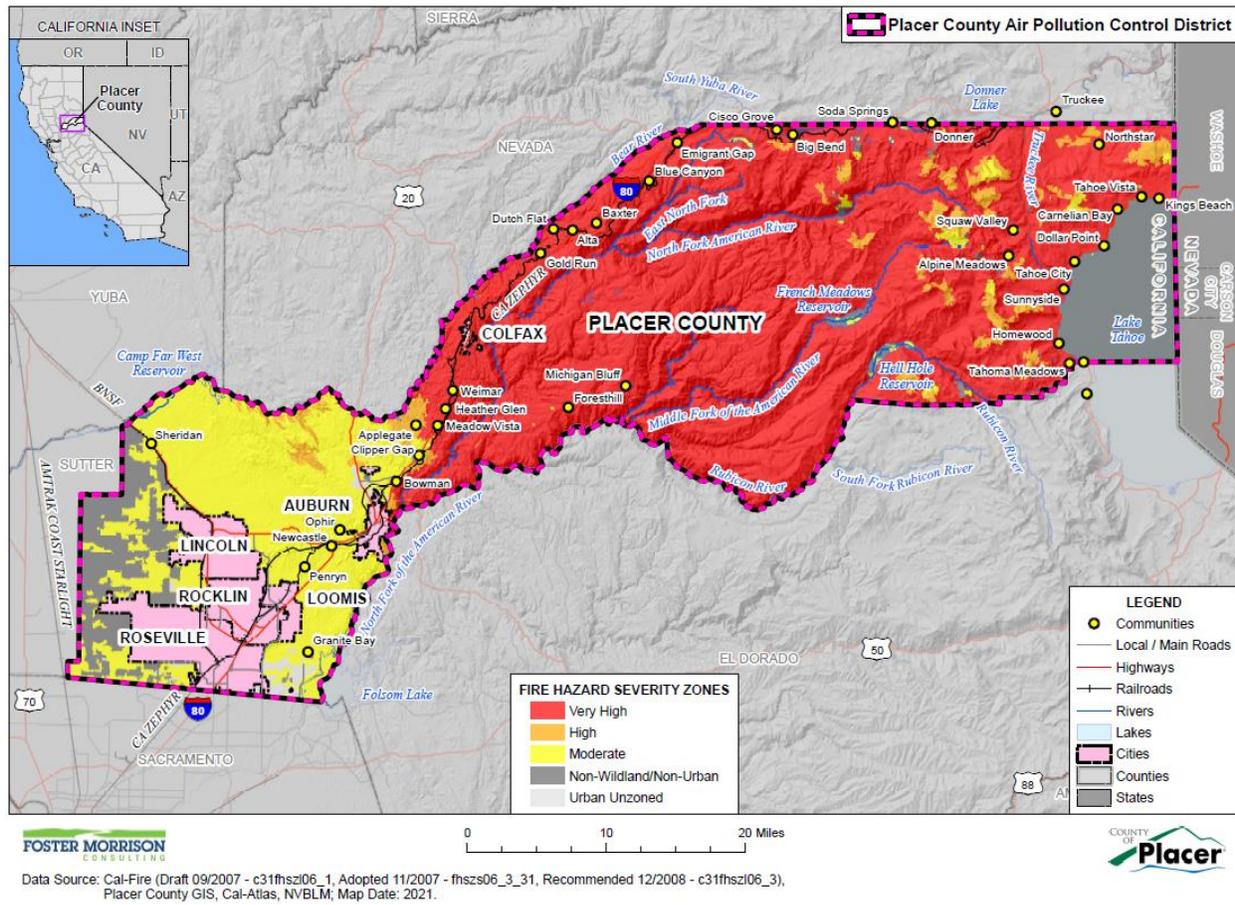
Hazard Profile and Problem Description

Wildland fire and the risk of a conflagration is an ongoing concern for the PCAPCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel (vegetation), accumulation of excess vegetation, and high winds. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.19 of the Base Plan, wildfire maps for the PCAPCD were created. Figure Y-2 shows the CAL FIRE Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Urban/Unzoned to Very High.

Figure Y-2 PCAPCD – Fire Hazard Severity Zones



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

There has been five state and six federal disaster declarations for Placer County from fire. These can be seen in Table Y-4.

Table Y-4 Placer County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)

Source: Cal OES, FEMA

The District noted the following past events:

- The Trailhead Fire (2016) was across the of Middle Fore of the American River in El Dorado County, but certainly impacted Placer as there was a huge concern it would travel into Todd Valley and the Foresthill area. Although it did not spread into those areas, the smoke significantly impacted the Foresthill area. The highest hourly average PM2.5 concentration was 268 ug/m³. This would be in hazardous level if this value or higher continued for a 24-hour period.
- From an air quality perspective, Placer County has been impacted by the Detwiler (2017), Ferguson (2018), Carr Fire (2018), Mendocino Complex Fire (2018), Camp Fire (2018), Loyaltan Fire (2020), SCU Lightning Complex Fire (2020), August Complex Fire (2020), LNU Lightning Fire (2020), and North Complex Fire and countless other wildfires that were smaller in acreage. The smoke from these wildfires impacted Placer County residents significantly, resulting in three (3) days in 2017, 25 days in 2018, and 35 days in 2020 that exceeded the PM2.5 daily average standards, respectively.
- Ten joint Air Quality and Public Health Advisories were issued in 2018 and five were issued in 2020, spanning multiple consecutive days. The District briefed its Board with information items in February 2019 and October 2020 with charts showing the air quality impacts. The District also had one advisory for 2016, two advisories for 2017, and one advisory in 2019.

Vulnerability to and Impacts from Wildfire

Risk and vulnerability to the Placer County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, combined with a large built environment and population, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including lightning strikes, periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and potentially catastrophic fires. During the nearly year-round fire season, the dry vegetation and heat, and sometimes windy weather with an ignition source can result in an increase in fire. Any fire, once ignited, has the potential to quickly become large, and out-of-control. As development continues throughout the County and the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

Potential impacts from wildfire include loss of life and injury; damage to structures and other improvements, natural and cultural resources, croplands, and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through the loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from large fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in the loss of function of buildings and infrastructure. Economic impacts of the loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate PSPSs which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. More information on power shortage and failure can be found in the Severe Weather: Extreme Heat Section above, as well as in Section 4.3.2

of the Base Plan. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The District noted the following impacts:

- With respect to wildfire smoke, in the last few years, the Sacramento area Air Districts have requested the U.S. EPA several times to determine an Exceptional Event finding for the Sacramento Region to exclude data from attainment emissions. Without these Exceptions, the County will most likely not be able to meet the PM standard by the U.S. EPA's deadline which could result in repercussions for the area.

Assets at Risk

The District assets most at risk due to increased wildfires would be the remote air quality monitoring stations and weather stations (RAWS), and to a lesser extent, the District's office in the City of Auburn.

Y.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

Y.6.1. Regulatory Mitigation Capabilities

Table Y-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PCAPCD.

Table Y-5 PCAPCD Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan		The District develops strategies and rules designed to decrease air pollutant emissions and improve air quality thereby moving the region toward attainment of state and federal ambient air quality standards. The proposed mitigation measures are consistent with the District's air quality improvement planning.
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program		
Engineering Studies for Streams		

Community Wildfire Protection Plan		
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		The District worked with other Sacramento local air districts to develop the Sacramento Wildfire Exceptional Event Mitigation Plan in 2018. The plan is developed to minimize the public exposure to PM2.5 generated from wildfire events.
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code		Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:		Rating:
Site plan review requirements		
		Is the ordinance an effective measure for reducing hazard impacts?
Land Use Planning and Ordinances	Y/N	Is the ordinance adequately administered and enforced?
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (stormwater, steep slope, wildfire)		
Flood insurance rate maps		
Elevation Certificates		
Acquisition of land for open space and public recreation uses		
Erosion or sediment control program		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional resources and funding for District operations and the proposed mitigation measures will help address impacts to public health due to Climate Change, Extreme Heat, and Wildfire (Smoke) impacts. Increased public education and outreach will better inform the public of potential health impacts due to these three hazards. More local, low-cost air sensors (ex. Purple Air) will allow the public to make informed decisions about daily activities during wildfire smoke events. Air purifying equipment at local Clean Air Centers during wildfire smoke events will provide a healthier environment especially for the low income community.		

Source: PCAPCD

Y.6.2. Administrative/Technical Mitigation Capabilities

Table Y-6 identifies the District department(s) responsible for activities related to mitigation and loss prevention in PCAPCD.

Table Y-6 PCAPCD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission		
Mitigation Planning Committee		

Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	The District periodically must clear the area around monitors and weather stations of vegetation. This is sometimes done in coordination with CAL FIRE and/or USFS.
Mutual aid agreements		
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	N	
Community Planner	N	
Civil Engineer	N	
GIS Coordinator	N	
Other	Y	Deputy APCO, Associate Planner, Air Quality Specialist II, and Senior Air Quality Planner are trained in mitigation.
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	
Hazard data and information	N	
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District will collaborate with the County/OES to utilize warning systems to inform the public if areas reach very unhealthy/hazardous and how to find a Clean Air Center.		

Source: PCAPCD

Y.6.3. Fiscal Mitigation Capabilities

Table Y-7 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table Y-7 PCAPCD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	N	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	N	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District can identify and pursue State funding programs for Clean Air Centers.		

Source: PCAPCD

Y.6.4. Mitigation Education, Outreach, and Partnerships

Table Y-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table Y-8 PCAPCD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		The District has produced various wildfire smoke safety outreach materials, such as the outdoor smoke activity table for school day decision making developed with the County's Office of Education.
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Develop and distribute wildfire smoke related materials to the public. Support wildfire smoke impact response, such as press releases, public education events, webpage based information, social media posts and brochures/flyers/pamphlets. This comment seems like it is a county comment and not for our annex specifically if we are talking our infrastructure.		

Source: PCAPCD

Y.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

Climate Change: This issue area is not a distinct and separate hazard but rather exacerbates the two hazards below.

Extreme Heat: The District participates in the regional “Spare the Air” program, which is a service alerting the public during time of unhealthy air quality both during the summer (ozone) and winter (particulate matter). The District also performs its own public education and outreach concerning the hazards of unhealthy air quality and ways to minimize air pollutant emissions around open burning, and other combustion activities. The District has a robust grants and incentives program to reduce air pollutant emissions by replacing dirty pieces of equipment and vehicles with cleaner equipment/vehicles, offering incentives to changeout high-polluting wood stoves with cleaner heating devices, installing zero emission fueling infrastructure, and incentivizing the purchase of electric passenger vehicles.

Wildfire (smoke): The District has previously purchased and installed low-cost Purple Air sensors for particulate matter and placed them strategically throughout the County in areas not covered our five regulatory air quality monitoring sites. These sensors give the public a real-time method of assessing air quality related to wildfire smoke. Additionally, the District has purchased temporary EBAM monitors which are technology more closely related to our regulatory monitors that can be deployed during wildfire smoke events for a higher level of accuracy.

The District has funded wood chipping programs through our Clean Air Grants (CAG) that provide a no or low-cost service to County residents to dispose of woody debris and create defensible space around structures. Several fire engines have been funded by the CAG as well. The District has also supported biomass to energy projects which remove woody fuel from the forests and convert it to electricity primarily through combustion to heat water, creating steam and turning steam generators.

Finally, the local air districts in the Sacramento region collaborated to prepare the “Wildfire Mitigation Plan for the Sacramento Federal Nonattainment Area for PM 2.5” in 2018. This plan was developed to minimize public exposure to the impacts of PM2.5 during wildfire events. The plan outlines the procedures the air districts should take to protect public health due to increases in PM concentrations from wildfires.

Y.7 Mitigation Strategy

Y.7.1. Mitigation Goals and Objectives

The PCAPCD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

Y.7.2. Mitigation Actions

The planning team for the PCAPCD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and

administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Severe Weather: Extreme Heat
- Wildfire (smoke)

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Air Quality Public Education & Outreach

Hazards Addressed: Wildfire Smoke Air Quality Impacts / Extreme Heat / Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: General public knowledge about air quality, its effects on health, and ways to improve it, is low. Wildfire smoke events continue to be frequent, especially in areas that are not fully fire resilient such as northern California's mountainous counties like Placer County. Additionally, extreme heat events brought on by climate change greatly increase local ozone concentrations, leading to public health impacts. It is critical for the public to understand how wildfire smoke and extreme heat impact their health, how to identify poor air quality, and steps they can take to minimize their exposure.

Project Description: Develop and distribute wildfire smoke, extreme heat, and climate change related materials to the public. Support wildfire smoke impact response, and extreme heat events, such as press releases, public education events, webpage-based information, social media posts and brochures/flyers/pamphlets/fact sheets.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Placer County Air Pollution Control District (PCAPCD) staff have the experience and knowledge to provide public education and outreach on wildfire smoke impacts and extreme heat event impacts. PCAPCD staff can provide labor for this project.

Responsible Agency/ Department/Partners: Placer County Air Pollution Control District

Cost Estimate: \$100,000

Benefits (Losses Avoided): Increased Public Education and Outreach before and during wildfire incidents and extreme heat events to provide health-based information to the public so they can take steps to protect their health.

Potential Funding: Local, state, and federal grant sources.

Timeline: Immediate

Project Priority (H, M, L): High

Action 2. Local Air Quality Sensors to provide instantaneous public information on local PM concentrations due to wildfire smoke.

Hazards Addressed: Wildfire Smoke Air Quality Impacts / Extreme Heat / Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During the increasing number of acres burned during wildfire events along with the ensuing wildfire smoke (especially in times of extreme heat), the local air quality is greatly impacted with many hours to days with health based air quality standards exceeded. While there is a county-wide network (five total) of sophisticated PM air quality monitors, these are primarily used to monitor regulatory compliance with state and federal Ambient Air Quality Standards (AAQS), take measurements averaged over long periods of time, and do not provide instant “real-time” data for which to make quicker decisions affecting public health. Air quality sensors have become increasingly helpful to provide excellent indicators on widespread smoke and fairly accurate data that is vital for making immediate decisions concerning outdoor activities especially when wildfire smoke levels fluctuate greatly within just a few minutes to hours. The existing PM monitoring network for regulatory purposes cannot provide this localized, neighborhood timely information.

Project Description: This project would purchase and deploy throughout the county low-cost, local air quality sensors that instantaneously measure PM levels. Typically, this information is instantaneously uploaded to a website where anyone can view current and recent past readings of PM concentration. Various thresholds of concentrations are indicated allowing the viewer to determine if it is safe for them to spend time outdoors. Many groups, such as schools and outdoor sports leagues, use this information to determine the level and intensity of outdoor activities right before commencing.

Other Alternatives: Relying on existing regulatory PM air quality monitors, of which there are only 5 in the county, and which do not publicly provide real-time local PM concentrations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Placer County Air Pollution Control District (PCAPCD) has experience deploying and installing these types of sensors and would provide personnel to install these units.

Responsible Agency/ Department/Partners: Placer County Air Pollution Control District, in partnership with Placer County and Health and Human Services.

Cost Estimate: Approximately \$250-300 per sensor

Benefits (Losses Avoided): These sensors provide the public no-cost, instantaneous PM concentrations in the vicinity of the sensor via a publicly accessible website in order to help make informed, real-time decisions about their level of outdoor activity to protect the public health.

Potential Funding: \$50,000 to provide 165-200 PM air quality sensors will be sought from state, local, and federal sources.

Timeline: Immediate to be prepared for the next wildfire smoke event

Project Priority (H, M, L): High

Action 3. Wildfire Smoke Impact Response – Clean Air Centers for Vulnerable Populations

Hazards Addressed: Wildfire Smoke Air Quality Impacts / Extreme Heat / Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During the increasing number of acres burned during wildfire events and the ensuing wildfire smoke, local air quality is greatly impacted, with air quality concentrations qualified with the U.S. EPA’s air quality index (AQI) reaching high levels in the very unhealthy and hazardous levels. These high levels of smoke increase health effects for everyone especially for those with more serious health effects in vulnerable populations including children, elderly, and those with health conditions. Placer County residents were exposed to 40+ days of heavy smoke in 2020.

Project Description: Establish Clean Air Centers to help those most affected by wildfire smoke impacts. The Centers will provide enhanced air filtration at facilities in communities with vulnerable populations in Auburn, Kings Beach, Lincoln, Rocklin and Roseville, recognizing that unhealthy air disproportionately impacts children and elderly populations, people with pre-existing health problems, and low-income communities. The Clean Air Centers will be equipped with portable, high performance ultra-fine particulate matter (PM2.5) air filtration units. Portable units will provide the Placer County Air Pollution Control District (PCAPCD) and regional emergency management authorities and disaster response agencies the flexibility to address smoke impacts anywhere in the county. Covered costs would include staffing at both portable sites and permanent ones (Roseville High School and Placer High School).

Other Alternatives: Increased impacts on the healthcare system to treat those seriously impacted by smoke inhalation. Purchase of high quality ultra-fine-particulate matter air filters for individual residences.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCAPCD staff have the experience and knowledge to coordinate the purchase and installation of enhanced air filtration systems. In addition, PCAPCD is equipped to provide localized air quality data, advisories and alerts including

health-based information on wildfire smoke and its impacts so the public can take appropriate action to protect their health. PCAPCD staff can provide labor for this project.

Responsible Agency/ Department/Partners: PCAPCD in collaboration with Placer County Health and Human Services and partnering facilities (schools, community, sports, veteran and senior centers, fairgrounds, and libraries).

Cost Estimate: \$100,000 (7 portable units and replacement filters)

Benefits (Losses Avoided): Decreased health impacts and serious health impacts to vulnerable populations

Potential Funding: Local, state, and federal funding sources will be sought.

Timeline: Immediate to be prepared for the next wildfire smoke event

Project Priority (H, M, L): High



Appendix A Planning Process

A.1 Placer County Step 1: Organize to Prepare a Plan

(a). *Involvement of Community Land Use and Comprehensive Planning*

In addition to attending meetings, providing draft text for inclusion in the plan, reviewing plan documents, and coordinating input from other departments and stakeholders, Placer County planners also provided information on development since the last plan, mapping and details on future development areas, input on current mitigation capabilities, coordination with other planning mechanisms, and input on capabilities including in-progress modifications to various County plans, ordinances, and associated documents specific to Placer County’s floodplain management program.

Placer County Planners

- Angel Green, Senior Planner, Planning Services Division, Placer County Community Development Resource Agency

Other planners to the process included Jeanine Foster and Chris Morrison, professional planners with Foster Morrison, the consultant for this LHMP Update, as well as other planners and staff from the incorporated communities and other participating jurisdictions involved in future land use development decisions for the Placer County Planning Area.

(b). *Staff of County Departments on HMPC with Expertise on CRS Step 7 Activities*

In order to promote the integration of CRS into this planning process, the representatives from the County were selected based on their areas of expertise relative to the CRS mitigation categories as detailed in Table A-1.

Table A-1 Placer County Staff Capability with Six Mitigation Categories

Jurisdiction/Departments	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Placer County							
Emergency Services, Rod Rodriguez, Emergency Services Coordinator	X	X	X	X	X	X	X
Community Development Resource Agency, Planning Services Division, Angel Green, Senior Planner	X	X	X		X	X	X

Jurisdiction/Departments	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Department of Public Works/Stormwater and Floodplain Programs, Mary Keller, PE, CFM	X	X	X		X	X	X

(c) Placer County Resolution formally recognizing and establishing the planning process/planning committee

Placer County put together a formal resolution early in the planning process for the establishment of a planning committee. This resolution can be seen below.

**Before the Board of Supervisors
County of Placer, State of California**

Resolution No.: 2021-028

In the matter of: A resolution establishing a Hazard Mitigation Planning Committee and Hazard Mitigation Planning Subcommittee for the update of the Placer County Local Hazard Mitigation Plan

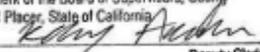
The following Resolution was duly passed by the Board of Supervisors of the County of Placer at a regular meeting held on February 16, 2021, by the following vote:

Ayes: GORE, WEYGANDT, HOLMES, JONES, GUSTAFSON

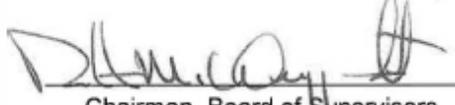
Noes: NONE

Absent: NONE

THE FOREGOING INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE
ATTEST

MEGAN WOOD
Clerk of the Board of Supervisors, County of Placer, State of California

Deputy Clerk

Signed and approved by me after its passage.


Chairman, Board of Supervisors

Attest:


Clerk of said Board

WHEREAS, Placer County is required to do hazard mitigation planning pursuant to the Robert T Stafford Disaster Mitigation Act of 2000 (DMA 2000) and for continued eligibility for certain sources of Federal Emergency Management Agency (FEMA) mitigation funding programs; and

WHEREAS, Placer County participates in The National Flood Insurance Program's (NFIP) Community Rating System (CRS); and

WHEREAS, the CRS Program also requires the County to adopt a Local Hazard Mitigation Plan (LHMP) with a Floodplain Management Plan component; and

WHEREAS, FEMA encourages combining the LHMP and CRS planning efforts into a single, coordinated plan; and

WHEREAS, to combine both program's efforts and meet the requirements of the LHMP and CRS Activity 510, it is necessary to establish a Hazard Mitigation Planning Committee (HMPC) and Hazard Mitigation Planning Subcommittee (HMP Subcommittee); and

WHEREAS, collectively, the HMPC and HMP Subcommittee will meet to fulfill the obligations of FEMA's DMA 2000 and the CRS Program Floodplain Management planning requirements through

organizing preparation of the LHMP update, involving the public, coordinating with other agencies, assessing the hazards, assessing problems, setting goals, reviewing possible activities, and assisting in the drafting of a mitigation action plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF SUPERVISORS OF THE COUNTY OF PLACER, that the Board takes the following actions:

1. Establish a Hazard Mitigation Planning Committee (HMPC) and authorize the County Executive Officer, or designee, to appoint County staff members to the HMPC; and
2. Approve the following criteria for representation on the HMPC:

HMPC Representation

a. County Departments

- i. Agricultural Commissioner
- ii. Assessor's Office
- iii. Community Development Resource Agency
- iv. Facilities Services
- v. Fire Service
- vi. Health and Human Services
- vii. Office of Emergency Services
- viii. Public Works
- ix. Risk Management
- x. Sheriff's Office

b. Incorporated communities

- xi. City of Auburn
- xii. City of Colfax
- xiii. City of Lincoln
- xiv. City of Rocklin
- xv. Town of Loomis

c. Other participating organizations to include special districts and others seeking FEMA approval of their respective annex in the LHMP.

d. Other private citizens, members of the public, and stakeholders including local, regional, state, and federal agencies and partners identified by the Placer County Office of Emergency Services.

3. Establish a Hazard Mitigation Planning Subcommittee comprised of three (3) members of the public appointed by the County Executive Officer, or designee, and the three (3) County staff members of the HMPC from the Community Development Resource Agency, the Department of Public Works, and the Office of Emergency Services.
4. This resolution shall take effect immediately.

Lists of Hazard Mitigation Planning Committee Invitees

Last Name	First Name	Agency	Title	Email
Boulais	Brad	PC - Facilities	Deputy Director	BBoulais@placer.ca.gov
Bourgault	West	PC - HHS-EH	Environmental Health Manager	wbourgau@placer.ca.gov
Brewer	Brad	PC - DPW-Flood Control District	Manager	BBrewer@placer.ca.gov
Conkle	Katherine	PC - DPW-Flood Control District	Engineer - Junior	kconkle@placer.ca.gov
Fisher	Andy	PC - DPW-Parks	Parks Administrator	afisher@placer.ca.gov
Gray-Garcia	Chris	PC - CEO-PIO	Deputy Director	CMGray@placer.ca.gov
Grim	Mary	USFS - American River District	District Ranger	mary.grim@usda.gov
Herrera	Stephanie	PC - CEO-PIO	Public Information Assistant	SHerrera@placer.ca.gov
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Hudson	Jim	CAL FIRE / PCF	Deputy Unit Chief	Jim.Hudson@fire.ca.gov
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Mackwood	Brian	CAL FIRE / PCF	Assistant Chief - West Div	brian.mackwood@fire.ca.gov
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Bell	Kevin	PC - DPW	Deputy Director	KBell@placer.ca.gov
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Last Name	First Name	Agency	Title	Email
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Hazard Mitigation Planning Committee Participant List

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Mueller	Joe	Alpine Springs Water District	General Manager	joe@alpinesprings.org

Kickoff Meeting

Kickoff Meeting Invite to Planning Team, Stakeholders, and Public

From:

Sent: Tuesday, October 6, 2020 3:48 PM

To: Young Rodriguez; (Elsa.Hucks@fire.ca.gov); (Shawn.Watkins@rocklin.ca.us); (mhiggins@penrynfire.org); amy.feagans@colfax-ca.gov; AndersBL@sutterhealth.org; Andy Fisher; Angel Green; Ann Hobbs; Brad Boulais; Brad Brewer; Brad Donohue (PWDirector@loomis.ca.gov); Brandon Sanders (BLSY@pge.com); Brett Storey; Brian Walker (WalkerBrian@roseville.ca.us); brian.eagan@fire.ca.gov; Brian.Estes@fire.ca.gov; Chip Close (close@nidwater.com); Chris Brown; Chris Gray-Garcia; Chris Morrison (chris.morrison@fostermorrison.com); Christina Hanson; Christopher Schmidt; Crystal Jacobsen; Darryl Mitani; Dave Atkinson; Dave Spencer (dspencer@auburn.ca.gov); David LeBlanc (dleblanc@usbr.gov); David Mohlenbrok (David.Mohlenbrok@rocklin.ca.us); Davis, Mike; dhughes@tahoetransportation.org; Doug Lee (Doug.Lee@lincolnca.gov); Ed Snider; 'Eric Sweet'; 'Eric Walder'; Erik Angle (AngleE@sutterhealth.org); Erik White; Es Skinner2@sierracollege.edu; Felix Berbena (felix.berbena@pge.com); Fowler, Karl; George Alves (galves.pcs@earthlink.net); George Booth (boothge@saccounty.net); glofrano@placerhillsfire.org (glofrano@placerhillsfire.org); Greg Jones (jonesg@nidwater.com); Holly Powers; Ian Gow (igow@placerhillsfire.org); JAnderberg@placercoc.k12.ca.us; Jarrett Thiessen; Jason Rizzi (JRizzi@roseville.ca.us); Jeanine Foster (Jeanine.foster@fostermorrison.com); Jennifer Byous; jhutchings@usbr.gov; Jim Hudson (Jim.Hudson@fire.ca.gov); Jim Kotey; jingolia@southplacerrcd.org; Joshua Huntsinger; Julie Martin (j2martin@blm.gov); Kate Espinola (kate@placerrcd.org); Ken Grehm; Kevin Bell; Kevin Taber; Knox, Jesse -FS; Leonard Kiolbasa (Leonard.Kiolbasa@libertyutilities.com); Luana Dowling (dowlingluana@gmail.com); Mary George; Mary Keller; Michael Romero; Michael Woodbridge (mjwoodbridge@fs.fed.us); Michelle Mead - NOAA Federal (michelle.mead@noaa.gov); Mike Howard (mike.howard@parks.ca.gov); Mooshian, Mark; Neil Cochran - Foresthill PUD (neilc38@outlook.com); Nikki Streegan; Patrick Dillon (Patrick.Dillon@libertyutilities.com); PCWA Risk Management (Peter Cheney) (pcheney@pcwa.net); rangelocci@loomis.ca.gov; Reginald.williams@rocklin.ca.us; Rick Bartee (RBartee@roseville.ca.us); Rick Forstall (Rick.Forstall@rocklin.ca.us); Rick Holmes (Richard.Holmes@rocklin.ca.us); robert.f.griffith@kp.org; Ryan.Hanson@wildlife.ca.gov; Sarah Jones (sarah@placerrcd.org); Scott Alcantara (salcantara@sjwd.org); Scott.Liske@parks.ca.gov; Shawna Pratt; Shayne Wright (SCWright@placer.ca.gov); Stephanie Herrera; Steve Newsom; Steve Pedretti; Tami Martin (tami.martin@redcross.org); Ted Rel; Terry Butrym; Timothy Wegner; tlim@fs.fed.us; Tony Barela (tbarela@sjwd.org); Vicki Sacksteder; Wendy Williams; Wes Heathcock (wes.heathcock@colfax-ca.gov); West Bourgault (WBOurgau@placer.ca.gov); (billseline@truckeeffire.org); Allen Riley (ariley@svpsd.org); Brad Johnson (bjohnson@ntpud.org); Brandon Burks (bburks@svpsd.org); Dennis Walsh; dlewis@tcpud.org; Emily Setzer; Erin Casey; hornvedt@ntfire.net; jflannery@fs.fed.us; jgibeaut@northstarfire31.com; jgroom@fs.fed.us; John Collins; jparker@ttsa.net; Kevin McKechnie (kevinmckechnie@truckeeffire.org); lgriffin@ttsa.net; mbutton@ttusd.org; 'McNamara, Steve' (mcnamara@ntfire.net); Michael Schwartz (schwartz@ntfire.net); michaelholley@tdpud.org; Peter Kraatz; rgreen@ttusd.org; Sean Bailey (SBailey@northstarcsd.org); Suzi Gibbons (sgibbons@ntpud.org); Tony Laliotis

Cc: Bekki Riggan; Sarah Poindexter; Brandon Burks; Sean Rabe; Brenna Howell; Adam Baughman; Allen Riley; Mishler, Andrew K -FS; Crawford, Brian B -FS; Paul.Cummings@co.nevada.ca.us; Jenn Tamo; Rebecca Leys; Cindi Dunsmoor; Mike Davis; Mark D'Ambrogio; Sadie Caldas; Robin Mahoney

Subject: Placer County Local Hazard Mitigation Plan Update Project - Hazard Mitigation Planning Committee Kickoff Meeting Invite

When: Wednesday, October 28, 2020 1:30 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Zoom Platform -

<https://us02web.zoom.us/j/81109100563?pwd=K1lmSzdzcDd4YjZtc2NxNUdvWnJ3dz09>; Meeting ID: 811 0910 0563; Passcode: 479633; Or call in: +1 669 900 6833 US (San Jose)

Greetings,

Placer County is kicking off efforts to develop a Local Hazard Mitigation Plan (LHMP) Update to the 2016 LHMP. The purpose of the LHMP Update process is to help reduce the impacts of hazards to the citizens, property, and critical infrastructure in the County. The Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved LHMP in place in order to be eligible for certain pre- and post-disaster mitigation funding utilized to protect communities from future disaster-related losses. Another benefit of this LHMP Update is to enhance the floodplain management programs of the county and cities which can help reduce the costs of flood insurance to residents of Placer County through their participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).

You are receiving this notice because we would like to invite you to take part in this plan update as a member of the Hazard Mitigation Planning Committee (HMPC). In addition to plan participation by Placer County Departments, Cities/Town, fire districts, special districts, and state and federal agencies, the public and other interested stakeholders are encouraged to attend and participate. For additional info on the make-up of HMPC and participating allied agencies and stakeholders, please see attachment.

Agency and community participation and coordination is a requirement of an approved Plan, as is the inclusion of any hazard data, information, and mitigation projects your organization may want to see included in the Plan. Thus, your participation in this process is important and encouraged. Your input will be critical to the success of this project. Participation includes:

- Attending and participating in the HMPC meetings (5 anticipated over the next 9 months)
- Providing available data/information requested of the HMPC
- Reviewing and providing comments on the plan drafts

Placer County Office of Emergency Services (OES) is taking the lead on coordinating the LHMP updating project working with hired consultant, Foster Morrison Consulting (FMC). A project kickoff meeting will be held at the following location and date/time:

Planning Committee Meeting: Virtual Meeting – Zoom Platform

October 28, 2020 (Wednesday)

1:30 – 4:00 pm

<https://us02web.zoom.us/j/81109100563?pwd=K1lmSzdzcDd4YjZtc2NxNUdvWnJ3dz09>

Meeting ID: 811 0910 0563

Passcode: 479633

Or call in: +1 669 900 6833 US (San Jose)

The kickoff meeting will explain the process and how you can be involved. A public stakeholder meeting will also be held the evening of the same day of the kickoff meeting via Zoom from 6:00 – 7:30 pm. We encourage the public to participate as part of the HMPC to help inform this LHMP Update.

For more information on this project, please visit: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>

Please RSVP and plan on attending or delegating attendance to this important meeting. If you are not the point of contact for your organization or would like to include others from your staff to receive future invites or updates, please let me know. For additional information or if you have questions, please contact Young (Rod) Rodriguez at yrodrigu@placer.ca.gov or by calling at (530) 886-5316.

Young (Rod) Rodriguez

Emergency Services Coordinator

Placer County Office of Emergency Services

(530) 886-5316

Email – yrodrigu@placer.ca.gov

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Kickoff Meeting Agenda

PLACER COUNTY LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE HMPC (KICKOFF) MEETING #1 October 28, 2020

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The National Flood Insurance Program (NFIP) Community Rating System (CRS)
4. The Role of the Hazard Mitigation Planning Committee (HMPC)
5. Planning for Public Input
6. Coordinating with other Agencies
7. Hazard Identification
8. Schedule
9. Data Needs
10. Questions and Answers

Kickoff Meeting Sign-in Sheets

Name/Title	Department/Agency/ Affiliation
Jeff Ingolia	South Placer Fire District
Eric Sweet	Sierra Pacific Industries
Darryl Mitani	Placer County Agriculture Department
Andrew Mishler	USFS Tahoe NF – American River
Neil Cochran	Foresthill Public Utility District
Mary George	Placer County Library
Scott Alcantara	San Juan Water District
Erik Angle	Sutter Roseville Medical Center
Brandon Burks	Olympic Valley Public Services District
Rod Rodriguez	Placer County OES
Brenna Howell	Howell Consulting with Foster Morrison
Holly Powers	Placer County OES
Shawna Pratt	Placer County OES
Ted Rel	Placer County Parks and Rec Division
Bob Costa	Citizen Participan
Jim Kotey	Placer County Risk Management
Eric Horntvedt	North Tahoe Fire Protection District
Terry Butrym	Placer County Risk Management
Bill Seline	Truckee Fire
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Adam Baughman	Placer County APCD
Dennis Hughes	Placer County Facilities Management
Brett Storey	Placer County CDRA
Peter Kraatz	Placer County Public Works Department
Angel Green	Senior Planner, Placer County Community Development Resource Agency
Greg Jones	Nevada Irrigation District
Chris Gray-Garcia	Placer County Deputy Director of Communications and Public Affairs
Mary Keller	Placer County Flood
Brian Crawford	USFS Tahoe NF
Ed Snider	Placer County and Alta Fire Protection District
Allen Riley	Olympic Valley Fire Department
Roland Neufeld	City of Lincoln
Sarah Jones	Placer RCD, Executive Director
Erin Holland	North Tahoe Fire Public Information Officer
Brad Brewer	Placer County Flood Control and Water Conservation District, District Mgr.

Name/Title	Department/Agency/ Affiliation
Josh Huntsinger	Placer County Agriculture Department
Lee Kiolbasa	Liberty Utilities
Ann Hobbs	Placer County Air Pollution Control District
Justin Nartker	City of Rocklin
Sean Bailey	Northstar Fire Department
Nikki Streegan	Placer County Planning Services
Crystal Jacobsen	Placer County Tahoe CDRA
Suzi Gibbons	North Tahoe Public Utility District
Jenn Tamo	Nevada County Office of Emergency Services
Steve Pedretti	Director of Placer CDRA
Georges Alves	Placer RCD
Jim Hudson	Placer County Fire Department/Cal Fire
Chris Brown	Placer County CDRA
James Anderberg	Placer County Office of Education, Chief Operations Officer, Admin Svcs
Sadie Caldas	Placer County Environmental Engineering, Env. Resource Specialist
Robin Mahoney	Placer County Environmental Engineering
Reggie Williams	City of Rocklin, Fire Chief
Danielle Hughes	Tahoe Transportation District, Capital Program Manager
Emily Setzer	CDRA Tahoe, Sr. Management Analyst
Wendy Williams	Placer County Director of Communications
Sarah Poindexter	Placer County Executive Office, Management Analyst II
Jamie Sartain	City of Rocklin, Environmental Services Technician
Mark D'Amrogi	Placer Hills Fire District
Mark D'Amrogi	Newcastle Fire District
Mark D'Amrogi	Placer Sierra Fire Safe Council
Daniel Dottai	Public Representative
Luana Dowling	Placer Firewise Community Coordinator
Jerry Martinez	Fire Management Officer BLM
Shane Wright	Placer County
Dave Spencer	City of Auburn Fire Department
Erik Skinner	VP Administrative Services, Sierra College
Sean Rabe	Town of Loomis, Town Manager
Mike Garabedian	Public
Peter Cheney	Placer County Water Agency
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

Risk Assessment Meeting

Risk Assessment Meeting Invite to Planning Team, Stakeholders, and Public

From: Young Rodriguez <YRodrigu@placer.ca.gov>

Sent: Wednesday, January 20, 2021 4:20 PM

To: Young Rodriguez; (Elsa.Hucks@fire.ca.gov); (Shawn.Watkins@rocklin.ca.us); Adam Baughman; amy.feagans@colfax-ca.gov; AndersBL@sutterhealth.org; andrew.mishler@usda.gov; Andy Fisher; Angel Green; Ann Hobbs; austind@nidwater.com; bmancebo@penrynfire.org; Brad Boulais; Brad Brewer; Brad Donohue (PWDirector@loomis.ca.gov); Brandon Sanders (BLSY@pge.com); Brenna Howell (brenna@brennahowell.com); Brett Storey; Brian Walker (WalkerBrian@roseville.ca.us); brian.crawford@usda.gov; brian.eagan@fire.ca.gov; Brian.Estes@fire.ca.gov; Chip Close (close@nidwater.com); Chris Brown; Chris Gray-Garcia; Chris Morrison; Christina Hanson; Christopher Schmidt; Connie Schmidt; Crystal Jacobsen; dambrogi@placerrcd.org; Darryl Mitani; Dave Atkinson; Dave Spencer (dspencer@auburn.ca.gov); Dave Whitt (dwhitt@foresthill.org); David LeBlanc (dleblanc@usbr.gov); David Mohlenbrok (David.Mohlenbrok@rocklin.ca.us); Dennis Hughes; dhughes@tahoetransportation.org; Doug Lee (Doug.Lee@lincolnca.gov); Ed Snider; 'Eric Sweet'; 'Eric Walder'; Erik Angle (AngleE@sutterhealth.org); Erik White; Eskinner2@sierracollege.edu; Felix Berbena (felix.berbena@pge.com); Fowler, Karl; George Alves (galves.pcs@earthlink.net); glofrano@placerrcd.org (glofrano@placerrcd.org); Greg Jones (jonesg@nidwater.com); Holly Powers; hwakelee@gmail.com; Ian Gow (igow@placerrcd.org); Jamie Sartain (jamie.sartain@rocklin.ca.us); Jared Matcham (jmatcham@foresthillfire.org); Jarrett Thiessen; Jason Gibeaut (jgibeaut@northstarcad.org); Jason Rizzi (JRizzi@roseville.ca.us); Jeanine Foster; Jeff Botto (jbotto@northstarcad.org); Jennifer Byous; jhutchings@usbr.gov; Jim Hudson (Jim.Hudson@fire.ca.gov); Jim Kotey; jingolia@southplacerrcd.org; john@alpinesprings.org; Joshua Huntsinger; Julie Martin (j2martin@blm.gov); Justin Nartker (Justin.Nartker@Rocklin.ca.us); Kate Espinola (kate@placerrcd.org); Ken Grehm; Kevin Bell; Kevin Taber; Knox, Jesse -FS; Luana Dowling (dowlingluana@gmail.com); Mary George; Mary Keller; Michael Ridley (mridley@foresthillfire.org); Michael Romero; Michael Woodbridge (mjwoodbridge@fs.fed.us); Michelle Mead - NOAA Federal (michelle.mead@noaa.gov); Mike Howard (mike.howard@parks.ca.gov); Mike Lewis; Mooshian, Mark; Neil Cochran -Foresthill PUD (neilc38@outlook.com); Nikki Streegan; Patrick Dillon (Patrick.Dillon@libertyutilities.com); PCWA Risk Management (Peter Cheney) (pcheney@pcwa.net); rangelocci@loomis.ca.gov; Ray Leftwich (Ray.Leftwich@lincolnca.gov); rcosta1@sbcglobal.net; Rebecca Leys; Reginald.williams@rocklin.ca.us; Rick Bartee (RBartee@roseville.ca.us); Rick Forstall (Rick.Forstall@rocklin.ca.us); Rick Holmes (Richard.Holmes@rocklin.ca.us); robert.f.griffith@kp.org; Robin Mahoney; Roland.Neufeld@lincolnca.gov; Ryan.Hanson@wildlife.ca.gov; Sadie Caldas; Sarah Jones (sarah@placerrcd.org); Sarah Murdock (Sarah.Murdock@CalOES.ca.gov); sbarclay@tcpud.org; Scott Alcantara (salcantara@sjwd.org); Scott.Liske@parks.ca.gov; Shawanna Pratt; srabe@loomis.ca.gov; Stephanie Herrera; Steve Newsom; Steve Pedretti; Tami Martin (tami.martin@redcross.org); Ted Rel; Terry Butrym; Timothy Wegner; tlim@fs.fed.us; Tony Barela (tbarela@sjwd.org); Wendy Williams; Wes Heathcock (wes.heathcock@colfax-ca.gov); West Bourgault; Williams, Phillip; (billseline@truckeeffire.org); Allen Riley (ariley@olympicvalleyfire.org); Brad Johnson (bjohnson@ntcpud.org); Brandon Burks (bburks@svpsd.org); Darrell Steinhauer; dlewis@tcpud.org; Emily Setzer; Erin Casey; Holland, Erin; horntvedt@ntfire.net; jflannery@fs.fed.us; jgibeaut@northstarfire31.com; jgroom@fs.fed.us; jparker@ttsa.net; Kevin McKechnie (kevinmckechnie@truckeeffire.org); lgriffin@ttsa.net; mbutton@ttusd.org; 'McNamara, Steve' (mcmamara@ntfire.net); Michael Schwartz (schwartz@ntfire.net); michaelholley@tdcpud.org; Peter Kraatz; rgreen@ttusd.org; Sean Bailey (SBailey@northstarcad.org); Suzi Gibbons (sgibbons@ntcpud.org); Todd A. Rivera; Tony Lalotis

Cc: Bekki Riggan; Sarah Poindexter; Paul Cummings (Paul.Cummings@co.nevada.ca.us); Jenn Tamo (Jenn.Tamo@co.nevada.ca.us); Cindi Dunsmoor (CDunsmoor@buttecounty.net); George Booth (boothge@saccounty.net)

Subject: Placer County Local Hazard Mitigation Plan Update - Risk Assessment Meeting

When: Wednesday, February 3, 2021 1:30 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Zoom Platform -

<https://us02web.zoom.us/j/83106184231?pwd=RXRzdWhpKzFUOEpiSk5GeUVNbkh3UT09>; Or call in: +1 669.900.6833 (San Jose), Meeting ID: 831 0618 4231, Passcode: 216515

Placer County Hazard Mitigation Planning Committee:

You are invited to the HMPC Risk Assessment Meeting, our second planning committee meeting for the development of Placer County's Local Hazard Mitigation Plan (LHMP) Update. Many of you attended the planning committee kickoff meeting on October 28, 2020 which initiated the hazard mitigation planning effort, with support from Foster Morrison Consulting. Over the past couple of months, the Foster Morrison team has been working to collect data to develop Chapter 4 of our LHMP, the Risk Assessment Chapter, and for development of the Jurisdictional Annexes to the LHMP.

This Risk Assessment Meeting will be held via Zoom on Wednesday, February 3 from 1:30 – 4:00 pm. During this meeting, we will be reviewing the risk assessment data developed to date and will be looking for your feedback in refining and adding to this in-process Risk Assessment Chapter. We will also be discussing jurisdictional participation and data still needed to inform the risk assessment for the Placer County LHMP Update. Current information on the LHMP Update and dates and times of future meetings are located at

<https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>

Join Zoom Meeting

<https://us02web.zoom.us/j/83106184231?pwd=RXRzdWhpKzFUOEpiSk5GeUVNbkh3UT09>

Meeting ID: 831 0618 4231

Passcode: 216515

One tap mobile

+16699006833,,83106184231#,,,,*216515# US (San Jose)

Your ongoing participation is critical to the success of this project. Please let me know if you have any questions.

Thank you,

Young (Rod) Rodriguez

Emergency Services Coordinator

Placer County Office of Emergency Services

(530) 886-5316

Email – yrodrigu@placer.ca.gov

www.placer.ca.gov



Risk Assessment Meeting Agenda

Placer County Local Hazard Mitigation Plan (LHMP) Update Risk Assessment Meeting: February 3, 2021

1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment
4. Open Discussion and Input on the Risk Assessment (Handout)
5. Review of Data Needs
6. Next Steps

Risk Assessment Meeting Sign in Sheets

Name/Title	Department/Agency/ Affiliation
Jeff Ingolia	South Placer Fire District
Scott Alcantara	San Juan Water District
Brandon Burks	Olympic Valley Public Services District
Rod Rodriguez	Placer County OES
Brenna Howell	Howell Consulting with Foster Morrison
Holly Powers	Placer County OES
Shawanna Pratt	Placer County OES
Eric Horntvedt	North Tahoe Fire Protection District
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Adam Baughman	Placer County APCD
Brett Storey	Placer County CDRA
Angel Green	Senior Planner, Placer County Community Development Resource Agency
Chris Gray-Garcia	Placer County Deputy Director of Communications and Public Affairs
Mary Keller	Placer County Flood
Brian Crawford	USFS Tahoe NF
Ed Snider	Placer County and Alta Fire Protection District
Allen Riley	Olympic Valley Fire Department
Roland Neufeld	City of Lincoln
Jarrett Thiessen	Placer County – IT Director
Phillip Williams	Placer County Office of Education – Deputy Superintendent
Erin Holland	North Tahoe Fire Public Information Officer
Josh Huntsinger	Placer County Agriculture Department
Suzi Gibbons	North Tahoe Public Utility District
Jed Matcham	Assistant Chief/Fire Marshall, Foresthill Fire Department
Dannette Austin	Nevada Irrigation District, austind@nidwater.org
Karen Enghusen	City of Rocklin kmtenghusen@hotmail.com
Dan Lewis	Tahoe City PUD, dlewis@tcpud.org
Pat Dillon	Liberty Utility
Heath Wakelee	Public, American Red Cross, Friends of Auburn Ravine, hwakelee@gmail.com
Matt Shawver	PCOE, mshawver@placercoe.org
Tami Martin	American Red Cross, tami.martin@redcross.org
Tolan Dworak	City of Lincoln Fire, tolan.dworak@lincolnca.gov
Jason Gibeaut	Northstar Fire Department, jgibeaut@northstarcsd.org
Steve Newsom	Placer County Director of Facilities Management
Dennis Hughes	Placer County Facilities Management

Name/Title	Department/Agency/ Affiliation
Bob Costa	Citizen Participant, rcosta1@sbcglobal.net
Bonnie Anderson	Sutter Auburn Faith Hospital Emergency Preparedness Coordinator, andersbl@sutterhealth.org
Shawn Watkins	Rocklin Fire, shawn.watkins@rocklin.ca.us
Felix Berbena, Jr.	PG&E, Sr. Public Safety Specialist, felix.berbena@pge.com
Mike Rufenacht	Assistant Chief
Brian Mackwood	Assistant Chief
Karen Enghusen	City of Rocklin
Chip Close	NID
Steve Pedretti	Director of Placer CDRA
Georges Alves	Placer RCD
Chris Brown	Placer County CDRA
Sadie Caldas	Placer County Environmental Engineering, Env. Resource Specialist
Reggie Williams	City of Rocklin, Fire Chief
Elsa Hucks	Cal Fire
Jamie Sartain	City of Rocklin, Environmental Services Technician
Mark D'Amrogi	Placer Hills Fire District
Mark D'Amrogi	Placer Sierra Fire Safe Council
Mark D'Amrogi	Newcastle Fire District
Luana Dowling	Placer Firewise Community Coordinator
Dave Spencer	City of Auburn Fire Department
Erik Skinner	VP Administrative Services, Sierra College
Sean Rabe	Town of Loomis, Town Manager
Peter Cheney	Placer County Water Agency
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

Mitigation Strategy Meetings

Mitigation Strategy Meetings Invite to Planning Team, Stakeholders, and Public

From: Young Rodriguez <YRodrigu@placer.ca.gov>

Sent: Wednesday, February 10, 2021 4:37 PM

To: Young Rodriguez; (Elsa.Hucks@fire.ca.gov); (Shawn.Watkins@rocklin.ca.us); Adam Baughman; amy.feagans@colfax-ca.gov; AndersBL@sutterhealth.org; andrew.mishler@usda.gov; Andy Fisher; Angel Green; Ann Hobbs; austind@nidwater.com; bmancebo@penrynfire.org; Brad Boulais; Brad Brewer; Brad Donohue (PWDirector@loomis.ca.gov); Brandon Sanders (BLSY@pge.com); Brenna Howell (brenna@brennahowell.com); Brett Storey; Brian Walker (WalkerBrian@roseville.ca.us); brian.crawford@usda.gov; brian.eagan@fire.ca.gov; Brian.Estes@fire.ca.gov; Chip Close (close@nidwater.com); Chris Brown; Chris Gray-Garcia; Chris Morrison; Christina Hanson; Christopher Schmidt; Connie Schmidt; Crystal Jacobsen; dambrogi@placerhillsfire.org; Darryl Mitani; Dave Atkinson; Dave Spencer (dspencer@auburn.ca.gov); Dave Whitt (dwhitt@foresthill.org); David LeBlanc (dleblanc@usbr.gov); David Mohlenbrok (David.Mohlenbrok@rocklin.ca.us); Dennis Hughes; dhughes@tahoetransportation.org; Doug Lee (Doug.Lee@lincolnca.gov); Ed Snider; Emmanuel Ursu (planning@colfax-ca.gov); 'Eric Sweet'; 'Eric Walder'; Erik Angle (AngleE@sutterhealth.org); Erik White; Eskinner2@sierracollege.edu; Felix Berbena (felix.berbena@pge.com); Fowler, Karl; George Alves (galves.pcs@earthlink.net); glofrano@placerhillsfire.org (glofrano@placerhillsfire.org); Greg Jones (jonesg@nidwater.com); Holly Powers; hwakelee@gmail.com; Ian Gow (igow@placerhillsfire.org); Jamie Sartain (jamie.sartain@rocklin.ca.us); Jared Matcham (jmatcham@foresthillfire.org); Jarrett Thiessen; Jason Gibeaut (jgibeaut@northstarcsd.org); Jason Rizzi (JRizzi@roseville.ca.us); Jeanine Foster; Jeff Botto (jbotto@northstarcsd.org); Jennifer Byous; jhutchings@usbr.gov; Jim Hudson (Jim.Hudson@fire.ca.gov); Jim Kotey; jingolia@southplacerville.org; john@alpinesprings.org; Joshua Huntsinger; Julie Martin (j2martin@blm.gov); Justin Nartker (Justin.Nartker@Rocklin.ca.us); Kate Espinola (kate@placerrcd.org); Ken Grehm; Kevin Bell; Matt Lewis; Knox, Jesse -FS; Luana Dowling (dowlingluana@gmail.com); Mary George; Mary Keller; Michael Ridley (mridley@foresthillfire.org); Michael Romero; Michael Woodbridge (mjwoodbridge@fs.fed.us); Michelle Mead - NOAA Federal (michelle.mead@noaa.gov); Mike Howard (mike.howard@parks.ca.gov); Mike Lewis; Mooshian, Mark; Neil Cochran-Foresthill PUD (neilc38@outlook.com); Nikki Streegan; Patrick Dillon (Patrick.Dillon@libertyutilities.com); PCWA Risk Management (Peter Cheney) (pcheney@pcwa.net); rangelocci@loomis.ca.gov; Ray Leftwich (Ray.Leftwich@lincolnca.gov); rcosta1@sbcglobal.net; Rebecca Leys; Reginald.williams@rocklin.ca.us; Rick Bartee (RBartee@roseville.ca.us); Rick Forstall (Rick.Forstall@rocklin.ca.us); Rick Holmes (Richard.Holmes@rocklin.ca.us); robert.f.griffith@kp.org; Robin Mahoney; Roland.Neufeld@lincolnca.gov; Ryan.Hanson@wildlife.ca.gov; Sadie Caldas; Sarah Jones (sarah@placerrcd.org); Sarah Murdock (Sarah.Murdock@CalOES.ca.gov); sbarclay@tcpud.org; Scott Alcantara (salcantara@sjwd.org); Scott.Liske@parks.ca.gov; Shawna Pratt; snyder@jps.net; srabe@loomis.ca.gov; Stephanie Herrera; Steve Newsom; Steve Pedretti; Tami Martin (tami.martin@redcross.org); Ted Rel; Terry Butrym; Timothy Wegner; tlim@fs.fed.us; Tony Barela (tbarela@sjwd.org); Wendy Williams; Wes Heathcock (wes.heathcock@colfax-ca.gov); West Bourgault; Williams, Phillip; (billseline@truckeeffire.org); Allen Riley (ariley@olympicvalleyfire.org); Brad Johnson (bjohnson@ntpud.org); Brandon Burks (bburks@svpsd.org); Darrell Steinhauer; dlewis@tcpud.org; Emily Setzer; Erin Casey; Holland, Erin; horntvedt@ntfire.net; jflannery@fs.fed.us; jgibeaut@northstarfire31.com; jgroom@fs.fed.us; joe@alpinesprings.org; jparker@ttsa.net; Kevin McKechnie (kevinmckechnie@truckeeffire.org); lgriffin@ttsa.net; mbutton@ttusd.org; 'McNamara, Steve' (mcnamara@ntfire.net); Michael Schwartz (schwartz@ntfire.net); michaelholley@tdpud.org; Peter Kraatz; rgreen@ttusd.org; Sean Bailey (SBailey@northstarcsd.org); Suzi Gibbons (sgibbons@ntpud.org); Todd A. Rivera; Tony Lalotis; Brad Cavallo; Jim Haufler; michaelgarabedian@earthlink.net; ShusterSL@cdmsmith.com; Steve Hubbard

Subject: Placer County LHMP Update: Mitigation Strategy Goal Meeting - Save the Date, 2/24/2021

When: Wednesday, February 24, 2021 2:00 PM-3:30 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Zoom Meeting Link:

<https://us02web.zoom.us/j/81578188040?pwd=RE9rRnVKMFhKYXRHNGJCeTFpdnRxUT09>, Or call-in +1 669 900 6833, Meeting ID: 815 7818 8040, Passcode: 958595

Good afternoon,

First, thank you to those who attended last week's LHMP Risk Assessment Meeting and for all the great hazard input! Keep it coming – Remember we need hazard information specific to Placer County and each Participating Jurisdiction including hazard problem areas, past hazard occurrences since 2016, including impacts and damages and any unique vulnerability issues and impacts. Review the attached “Placer Risk Assessment Summary v020321” highlights for areas where additional information is needed.

Second, you are invited to the Mitigation Strategy Meetings (HMPC #3 & #4) for the 2021 Placer County LHMP Update. **[These are the two most important meetings for this LHMP Update.](#)**

Wednesday, February 24 (2:00 pm - 3:30 pm) - Mitigation Strategy Goal Meeting –

During this first meeting, we will be providing an overview of the LHMP Update Project and defining Next Steps. We will also be updating LHMP goals and objectives from the 2016 LHMP.

Zoom Meeting

Link: <https://us02web.zoom.us/j/81578188040?pwd=RE9rRnVKMFhKYXRHNGJCeTFpdnRxUT09>

Meeting ID: 815 7818 8040

Passcode: 958595

One tap mobile

+16699006833,81578188040#, *958595# US (San Jose)

Tuesday, March 2 (2:00 pm – 4:30 pm) - Mitigation Strategy Actions/Projects Meeting –

During this second meeting, we will be working to identify and evaluate potential mitigation actions and projects for reducing Placer County's and all Participating Jurisdiction's risk and vulnerability to priority hazards and disasters.

****Please make sure everyone that has mitigation projects to include in the LHMP Update for all identified priority hazards attends – All Participating Jurisdictions and their key staff, with knowledge or input on mitigation actions and projects, need to be present****

***Attached is the “Goals and Actions from the 2016 LHMP” for reference – this is what we are updating and adding to!

Zoom Meeting

Link: <https://us02web.zoom.us/j/81003262326?pwd=RDE3cUx0aY5b0V1bTQyS09UK1RYQT09>

Meeting ID: 810 0326 2326

Passcode: 922171

One tap mobile

+16699006833, 81003262326, *922171# US (San Jose)

Information for both meetings and attachments will also be posted on the County website at <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>

County and agency participation and coordination is a requirement of an approved LHMP, as is the inclusion of any hazard data, information, and mitigation projects your department or agency may want to see included in the plan. Your continued participation and input is critical to the success of this project.

Attachments:

- **FEMA Mitigation Ideas:** This reference document will provide mitigation projects ideas. Highly encourage all participants to review. What fits for Placer County?
- **Goals and Actions from the 2016 LHMP:** Will be reviewed during the meeting March 2nd
- **Placer Mitigation Action Worksheet:** This will need to be completed for each mitigation project/action to be included in the Plan Update, whether they are new or are being carried forward from the 2016 project list.
- **Placer Risk Assessment Summary v020321:** for reference and additional hazard risk information

Please let me know if you have questions. Thank you.

Young (Rod) Rodriguez

Emergency Services Coordinator

Placer County Office of Emergency Services

(530) 886-5316

Email – yrodrigu@placer.ca.gov

www.placer.ca.gov



Mitigation Strategy Meeting Agenda

Placer County Local Hazard Mitigation Plan (LHMP) Update Mitigation Strategy Meetings February 24th and March 2nd, 2021

HMPC Meeting #2:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Priority Hazards Review
4. Develop Plan Goals and Objectives
5. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #3:

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Review of Voting Process for Prioritization of Mitigation Projects
5. Questions

Mitigation Strategy Meeting Sign in Sheets – February 24th

Name/Title	Department/Agency/Affiliation
Jeff Ingolia	South Placer Fire District
Scott Alcantara	San Juan Water District
Brandon Burks	Olympic Valley Public Services District
Rod Rodriguez	Placer County OES
Brenna Howell	Howell Consulting with Foster Morrison
Holly Powers	Placer County OES
Shawna Pratt	Placer County OES
Eric Horntvedt	North Tahoe Fire Protection District
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Adam Baughman	Placer County APCD
Brett Storey	Placer County CDRA
Angel Green	Senior Planner, Placer County Community Development Resource Agency
Mary Keller	Placer County Flood
Brian Crawford	USFS Tahoe NF
Ed Snider	Placer County and Alta Fire Protection District
Allen Riley	Olympic Valley Fire Department
Erin Holland	North Tahoe Fire Public Information Officer
Suzi Gibbons	North Tahoe Public Utility District
Dannette Austin	Nevada Irrigation District, austind@nidwater.org
Matt Shawver	PCOE, mshawver@placercoe.org
Dennis Hughes	Placer County Facilities Management
Bob Costa	Citizen Participant, rcosta1@sbcglobal.net
Shawn Watkins	Rocklin Fire, shawn.watkins@rocklin.ca.us
Georges Alves	Placer RCD
Elsa Hucks	Cal Fire
Jamie Sartain	City of Rocklin, Environmental Services Technician
Mark D'Amrogi	Placer Hills Fire District
Mark D'Amrogi	Newcastle Fire District
Luana Dowling	Placer Firewise Community Coordinator
Dave Spencer	City of Auburn Fire Department
Erik Skinner	VP Administrative Services, Sierra College
Sean Rabe	Town of Loomis, Town Manager
Peter Cheney	Placer County Water Agency
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

Name/Title	Department/Agency/Affiliation
Doug Lee	City of Lincoln Police and Fire
Emily Setzer	Placer County Community Development Resource Agency
Philip Williams	PCOE pwilliams@placercoe.k12.ca.us
Michael Ridley	Foresthill FPD
Brad Brewer	Placer County Flood Control and Water Conservation District
Jason Rizzi	Roseville Fire Department
Erik Angle	Sutter Roseville Med Center anglee@sutterhealth.org
Connie Schmidt	Placer County Sheriff
Brian Walker	City of Roseville Floodplain Mgr Sr. Engineer
John Hutchings	Bureau of Reclamation jhutchings@usbr.gov
Matt Lewis	Placer County Department of Public Works Roads
Emanuel Ursu	City of Colfax Planning planning@colfax-ca.gov
Robin Mahoney	Placer County Department of Public Works, Env Eng. Division rmahoney@placer.ca.gov
Sarah Jones	Placer County RCD
Daniel Dottai	Public Representative Daniel.dottai@king-engineering-inc.com
Bill Seline	Truckee FPD
Tami Martin	American Red Cross
Lee Kiolbasa	Liberty Utilities, Leonard.kiolbasa@libertyutilities.com

Mitigation Strategy Meeting Sign in Sheets – March 2nd

Name/Title	Department/Agency/Affiliation
Jeff Ingolia	South Placer Fire District
Scott Alcantara	San Juan Water District
Brandon Burks	Olympic Valley Public Services District
Rod Rodriguez	Placer County OES
Brenna Howell	Howell Consulting with Foster Morrison
Holly Powers	Placer County OES
Eric Hornvedt	North Tahoe Fire Protection District
Sadie Caldas	Placer County Environmental Utilities
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Adam Baughman	Placer County APCD
Angel Green	Senior Planner, Placer County Community Development Resource Agency
Mary Keller	Placer County Flood
Brian Crawford	USFS Tahoe NF
Ed Snider	Placer County and Alta Fire Protection District

Name/Title	Department/Agency/Affiliation
Erin Holland	North Tahoe Fire Public Information Officer
Suzi Gibbons	North Tahoe Public Utility District
Dannette Austin	Nevada Irrigation District, austind@nidwater.org
Matt Shawver	PCOE, mshawver@placercoe.org
Dennis Hughes	Placer County Facilities Management
Bob Costa	Citizen Participant, rcosta1@sbcglobal.net
Shawn Watkins	Rocklin Fire, shawn.watkins@rocklin.ca.us
Georges Alves	Placer RCD
Jamie Sartain	City of Rocklin, Environmental Services Technician
Mark D'Amrogi	Placer Hills Fire District
Mark D'Amrogi	Newcastle Fire District
Erik Skinner	VP Administrative Services, Sierra College
Sean Rabe	Town of Loomis, Town Manager
Peter Cheney	Placer County Water Agency
Roland Neufeld	City of Lincoln
Jeff Botto	Northstar Fire
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting
Michael Ridley	Foresthill FPD
Brad Brewer	Placer County Flood Control and Water Conservation District
Connie Schmidt	Placer County Sheriff
Matt Lewis	Placer County Department of Public Works Roads
Robin Mahoney	Placer County Department of Public Works, Env Eng. Division rmahoney@placer.ca.gov
Tony Laliotis	Tahoe City PUD
Daniel Dottai	Public Representative Daniel.dottai@king-engineering-inc.com
Bill Seline	Truckee FPD
Lee Kiolbasa	Liberty Utilities, Leonard.kiolbasa@libertyutilities.com
Justin Narkin	City of Rocklin
Peter Kraatz	Placer County Public Works, Assistant Director
Hank White	Foresthill PUD, gm@foresthillpud.com
Jed Matcham	Foresthill Fire Protection District, jmatcham@foresthillfire.org
Joe Mueller	Alpine Springs Water District4f
Ted Rel	Placer County Parks
Terry Butrym	Placer County Risk Management
John Rogers	City of Auburn

Final HMPC Meeting

Final Team Meeting Invite to Planning Team, Stakeholders, and Public

From: Young Rodriguez <YRodrigu@placer.ca.gov>

Sent: Tuesday, May 25, 2021 5:47 PM

To: Young Rodriguez; (Elsa.Hucks@fire.ca.gov); (Shawn.Watkins@rocklin.ca.us); Adam Baughman; amy.feagans@colfax-ca.gov; AndersBL@sutterhealth.org; Andy Fisher; Angel Green; Ann Hobbs; austind@nidwater.com; bmancebo@penrynfire.ca.gov; Brad Boulais; Brad Brewer; Brad Donohue (PWDirector@loomis.ca.gov); Brandon Sanders (BLSY@pge.com); Brenna Howell (brenna@brennahowell.com); Brian Walker (WalkerBrian@roseville.ca.us); brian.crawford@usda.gov; Brian Eagan (brian.eagan@fire.ca.gov); Brian.Estes@fire.ca.gov; Chip Close (close@nidwater.com); Chris Brown; Chris Gray-Garcia; Chris Morrison; Christopher Schmidt; Connie Schmidt; Crystal Jacobsen; dambrogi@placerhillsfire.org; Darryl Mitani; Dave Atkinson; Dave Spencer (dspencer@auburn.ca.gov); Dave Whitt (dwhitt@foresthilfire.org); David LeBlanc (dleblanc@usbr.gov); David Mohlenbrok (David.Mohlenbrok@rocklin.ca.us); Dennis Hughes; dhughes@tahoetransportation.org; Ed Snider; Emmanuel Ursu (planning@colfax-ca.gov); 'Eric Sweet'; Erik Angle (AngleE@sutterhealth.org); Erik White; Eskinner2@sierracollege.edu; Felix Berbena (felix.berbena@pge.com); Fowler, Karl; george@placerrcd.org; glofrano@placerhillsfire.org (glofrano@placerhillsfire.org); gm@foresthilpud.com; Greg Jones (jonesg@nidwater.com); Ian Gow (igow@placerhillsfire.org); Jamie Sartain (jamie.sartain@rocklin.ca.us); Jared Matcham (jmatcham@foresthilfire.org); Jarrett Thiessen; Jason Gibeaut (jgibeaut@northstarcsd.org); Jason Rizzi (JRizzi@roseville.ca.us); Jeanine Foster (Jeanine.foster@fostermorrison.com); Jeff Botto (jbotto@northstarcsd.org); Jennifer Byous; jhutchings@usbr.gov; Jim Hudson (Jim.Hudson@fire.ca.gov); Jim Kotey; jingolia@southplacerefire.org; john@alpinesprings.org; Joshua Huntsinger; jrogers@auburn.ca.gov; Julie Martin (j2martin@blm.gov); Justin Nartker (Justin.Nartker@Rocklin.ca.us); Kate Espinola (kate@placerrcd.org); Ken Grehm; Kevin Bell; Knox, Jesse -FS; Luana Dowling (dowlingluana@gmail.com); Mary George; Mary Keller; Matt Randall; Matt Lewis; Michael Ridley (mridley@foresthilfire.org); Michael Romero; Shanisha.reese@usda.gov; Michelle Mead - NOAA Federal (michelle.mead@noaa.gov); Mike Howard (mike.howard@parks.ca.gov); Mike Lewis; Neil Cochran - Foresthill PUD (neilc38@outlook.com); Nikki Streegan; Patrick Dillon (Patrick.Dillon@libertyutilities.com); PCWA Risk Management (Peter Cheney) (pcheney@pcwa.net); rangelocci@loomis.ca.gov; rcosta1@sbcglobal.net; Rebecca Leys; Reginald.williams@rocklin.ca.us; Rick Bartee (RBartee@roseville.ca.us); Rick Holmes (Richard.Holmes@rocklin.ca.us); Robin Mahoney; Roland.Neufeld@lincolnca.gov; ryan.hanson@wildlife.ca.gov; Sadie Caldas; Sarah Jones (sarah@placerrcd.org); Sarah Murdock (Sarah.Murdock@CalOES.ca.gov); sbarclay@tcpud.org; Scott Alcantara (salcantara@sjwd.org); Scott.Liske@parks.ca.gov; Shawna Pratt; snyder@jps.net; srabe@loomis.ca.gov; Stephanie Herrera; Steve Newsom; Steve Pedretti; Tami Martin (tami.martin@redcross.org); Dan Fonner; Ted Rel; Terry Butrym; Timothy Wegner; tlim@fs.fed.us; Tony Barela (tbarela@sjwd.org); Wendy Williams; Wes Heathcock (wes.heathcock@colfax-ca.gov); West Bourgault; Williams, Phillip; (billseline@truckeeffire.org); Brad Johnson (bjohnson@ntpud.org); Brandon Burks (bburks@svpsd.org); Darrell Steinhauer; dlewis@tcpud.org; Emily Setzer; Erin Casey; Holland, Erin; Eric Hornvedt (hornvedt@ntfire.net); jflannery@fs.fed.us; jgibeaut@northstarfire31.com; jgroom@fs.fed.us; joe@alpinesprings.org; jparker@ttsa.net; Kevin McKechnie (kevinmckechnie@truckeeffire.org); lgriffin@ttsa.net; Mark Button; Leighton@ntfire.net; michaelholley@tdpud.org; Peter Kraatz; rgreen@ttusd.org; Sean Bailey (SBailey@northstarcsd.org); Suzi Gibbons (sgibbons@ntpud.org); Todd A. Rivera; Tony Laliotis; Brad Cavallo; Daniel.Dottai@King-Engineering-Inc.com; Jim Haufler; michaelgarabedian@earthlink.net; ShusterSL@cdmsmith.com; Steve Hubbard; Bekki Riggan; Sarah Poindexter

Cc: Berbena Jr., Felix; Jessica Gallagher; Katrina Hoop; Mackwood, Brian@CALFIRE

Subject: Placer County LHMP Update: Final Planning Committee Meeting

When: Thursday, June 10, 2021 9:00 AM-11:00 AM (UTC-08:00) Pacific Time (US & Canada).

Where: Zoom Meeting Link:

<https://us02web.zoom.us/j/85379203728?pwd=aTdvek85cmNvQmt3cyt6ZG10cmI2UT09>; Or Call-in: +1 669 900 6833, Meeting ID: 853 7920 3728, Passcode: 109274

Good afternoon,

Information for the Final Planning Committee Meeting from Foster Morrison Consultant.

June 10: HMPC Meeting

Jeanine Foster is inviting you to a scheduled Zoom meeting.

Topic: Placer County LHMP Update: Final Planning Committee Meeting

Time: Jun 10, 2021 9:00 - 11:00 AM Pacific Time (US and Canada)

Join Zoom Meeting

<https://us02web.zoom.us/j/85379203728?pwd=aTdvek85cmNvQmt3cyt6ZG10cmI2UT09>

Meeting ID: 853 7920 3728

Passcode: 109274

One tap mobile

+1 669 900 6833 US (San Jose)

If you have any questions, please contact myself or Jeanine.foster@fostermorrison.com or 303.717.7171.

Young (Rod) Rodriguez

Emergency Services Coordinator

Placer County Office of Emergency Services

(530) 886-5316

Email – yrodrigu@placer.ca.gov

www.placer.ca.gov



Final HMPC Meeting Agenda

AGENDA **Placer County Local Hazard Mitigation Plan (LHMP) Update** **Final Meeting** **June 10, 2021**

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Summary of Changes in Placer County Planning Area Vulnerabilities/ Mitigation Priorities
5. Final Input: Data/Projects
6. Next Steps

Final Team Meeting Sign in Sheet

Name/Title	Department/Agency/ Affiliation
Jeff Ingolia	South Placer Fire District
Scott Alcantara	San Juan Water District
Phillip Williams	Placer County Office of Education
Josh Huntsinger	Placer County Agriculture Department
Brandon Burks	Olympic Valley Public Services District
Rod Rodriquez	Placer County OES
Dan Fonner	Placer County Parks and Open Space
Eric Horntvedt	North Tahoe Fire Protection District
Sadie Caldas	Placer County Environmental Utilities
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Adam Baughman	Placer County APCD
Angel Green	Senior Planner, Placer County Community Development Resource Agency
Mary Keller	Placer County Flood
Ed Snider	Placer County and Alta Fire Protection District
Suzi Gibbons	North Tahoe Public Utility District
Matt Shawver	PCOE, mshawver@placercoe.org
Bob Costa	Citizen Participant, rcosta1@sbcglobal.net
Georges Alves	Placer RCD
Jamie Sartain	City of Rocklin, Environmental Services Technician
Mark D'Amrogi	Placer Hills Fire District
Mark D'Amrogi	Newcastle Fire District
Erik Skinner	VP Administrative Services, Sierra College
Sean Rabe	Town of Loomis, Town Manager
Peter Cheney	Placer County Water Agency
Roland Neufeld	City of Lincoln
Jeff Botto	Northstar Fire
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting
Brad Brewer	Placer County Flood Control and Water Conservation District
Felix Berbena	PG&E
Emmanuel Ursu	City of Colfax
Reggie Williams	City of Rocklin
Tony Laliotis	Tahoe City PUD
Daniel Dottai	Public Representative
Bill Seline	Truckee FPD

Name/Title	Department/Agency/ Affiliation
Peter Kraatz	Placer County Public Works, Assistant Director
Hank White	Foresthill PUD
Jed Matcham	Foresthill Fire Protection District
Tami Martin	American Red Cross
Ted Rel	Placer County Parks and Open Space
Peter Cheney	Placer County Water Agency
Terry Butrym	Placer County Risk Management
John Rogers	City of Auburn
Matt Randall	Placer County Department of Public Works, Road Maintenance Division
Steve Garcia	Cal Fire

A.2 Placer County Step 2: Involve the Public

Multiple efforts were made to engage the public during the creation of this plan, including direct outreach efforts such as phone calls, emails, direct mailings, and face-to-face meetings, in addition to the broader outreach efforts such as e-newsletters, website postings, newspaper advertisements and articles, and leveraging other community events to communicate and invite participation in the LHMP Update project. A key element of public participation is including members of the public and other public-type stakeholders (at 50% participation) on the Hazard Mitigation Planning Committee.

a) List of Hazard Mitigation Planning Committee (HMPC) Members

The HMPC, comprising key county, city, special district, and other government and stakeholder representatives and the public, developed the plan with leadership from the County OES and facilitation by Foster Morrison. The non-local government members of the Steering Committee (citizens and other outside stakeholders) represent more than 50% representation of the committee.

This list of HMPC members is shown in Section A.1.c of this Appendix.

b) and c) Public Meetings

In addition to advertisement and newspaper article for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders with an interest in the Placer County Planning Area. The majority of these people reside in Placer County or in surrounding communities. The formal public meetings for this project are summarized in the following table.

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Early Public Meeting	1) Intro to DMA, CRS and mitigation planning 2) 2021 LHMP Update Process	October 28, 2020	Zoom Meeting
Final Public Meeting	1) Presentation of Draft LHMP and solicitation of public and stakeholder comments	June 9, 2021	Zoom Meeting

Article Advertising Early Public Meeting

The screenshot shows a news article on the Roseville Today website. The article title is "PLACER COUNTY SEEKS COMMUNITY FEEDBACK FOR LOCAL HAZARD MITIGATION PLAN UPDATE". The sub-headline is "LONG-TERM STRATEGY TO REDUCE DISASTER LOSSES". The article is dated October 13, 2020, and is written by Staff. The article text discusses Placer County's efforts to update its local hazard mitigation plan, mentioning a partnership with cities and special districts to assess risks from floods, drought, wildfires, and severe weather. It also notes that a FEMA-approved plan allows for pre- and post-disaster mitigation grant funding, which can lead to lower flood insurance premiums. The website interface includes a navigation menu, social media sharing options, and a sidebar with "Upcoming Events" and "Around California" sections.

Business, Travel & Entertainment
Roseville Today
Since 2003

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Premier Website
19 Years Online

Business / Travel / Entertainment
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HOME LOCAL NEWS YELLOW PAGES ADVERTISE TRAVEL COLUMNS EVENTS MUSIC

Home > News > Auburn > Placer County seeks community feedback for Local Hazard Mitigation Plan update

NEWS AUBURN LOCAL NEWS ROSEVILLE NEWS

PLACER COUNTY SEEKS COMMUNITY FEEDBACK FOR LOCAL HAZARD MITIGATION PLAN UPDATE

Staff · October 13, 2020

Share

LONG-TERM STRATEGY TO REDUCE DISASTER LOSSES

COUNTY OF Placer

AUBURN, Calif – Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

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Upcoming Events

May 18	Roseville Swim School Registration
May 22	Journey Revisited Drive In Concert
Jun 11	Is EV Right for You?
Jun 24	Placer County Fair 2021

View Calendar

Around California

CALIFORNIA DISTRICT ATTORNEYS RAISE ALARM OVER EARLY RELEASE OF VIOLENT CRIMINALS

Placer County Website Inviting Public to Early Public Meeting

	Public counter services limited Click here to learn more	Stay up to date on the coronavirus in Placer County Click here to learn more
--	--	--

- Joint air quality advisory
- Hidden Falls town hall meeting
- County seeks input on internet service levels
- Outdoor urgency ordinance extended
- Supervisors approve second round of grants
- Halloween during COVID-19
- Help Placer County update their hazards plan

Placer County is seeking community feedback for their 2021 local hazard mitigation plan update

Published Oct. 8, 2020

Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

Placer County is seeking members of the public to participate on the hazard mitigation planning committee for this plan update. Background experience on the issue is not required. Placer County is requesting attendance and participation from the community at the upcoming planning committee and public meetings to kick off the project.

Planning committee virtual meeting
 Wednesday, Oct. 28
 1:30 – 4 p.m.
<https://us02web.zoom.us/j/81109100563?pwd=K1ImSzdzcDd4YjZlc2NkNUdvWmJ3dz09>
 Meeting ID: 811 0910 0563
 Passcode: 479633
 Or call in: +1 669 900 6833

Public information virtual meeting
 Wednesday, Oct. 28
 6– 7:30 p.m.
<https://us02web.zoom.us/j/86599073886?pwd=MXJlWmN6d1hqdm10MEhTbDNZbnQ2UT09>
 Meeting ID: 865 9907 3886
 Passcode: 165810
 Or call in: +1 669 900 6833

Interested residents can find more information by visiting the LHMP webpage at <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or by contacting Rod Rodriguez at yrodriq@placer.ca.gov.

Placer County eNewsletter Govdelivery - October 8, 2020

More help for businesses, nonprofits impacted by COVID-19

Placer County <PlacerCounty@public.govdelivery.com>
 To: Stephanie Herrera
Retention Policy: Entire Mailbox 3 Year (3 years)

Reply Reply All Forward
 Thu 10/8/2020 6:32 PM



The Placer County Board of Supervisors this week approved the opening of a second round of Placer Shares grant applications to distribute \$250,000 to small businesses. Additionally, \$150,000 will be distributed to eligible county nonprofits that have already applied for a Placer Shares grant, but were not funded during the first round. [Learn more](#)

Let's work together to reduce natural hazard risks in Placer County



We're asking for your feedback to help update our local hazard mitigation plan. The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. Join us (virtually) for our first community meetings Oct. 28. [Learn more](#)

Early Public Meeting Press Release



Placer County 2021 Local Hazard Mitigation Plan Update

HELP YOUR COMMUNITY BE HAZARD-READY!

Placer County with its cities and numerous special districts will be updating their 2016 Local Hazard Mitigation Plan (LHMP) looking at the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the County. While hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses. A FEMA-approved Hazard Mitigation Plan allows agencies to apply for pre- and post-disaster mitigation grant funding. In addition, this LHMP Update provides for lower costs of flood insurance premiums to residents of Placer County through the National Flood Insurance Program's (NFIP) Community Rating System (CRS).

You are invited. Placer County is seeking members of the public to participate on our Hazard Mitigation Planning Committee (HMPC) for this LHMP Update. No background or expertise is required. We encourage attendance and participation from the general public at our upcoming Planning Committee and Public Meetings to kick off the project; please select the time and location that works best for you:

Planning Committee Virtual Meeting
October 28, 2020 (Wednesday)
1:30 - 4:00 pm

Public Information Virtual Meeting
October 28, 2020 (Wednesday)
6:00 – 7:30 pm

For more information and to obtain the Zoom link for the meetings, please visit our LHMP webpage at <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or contact Rod Rodriguez at yrodrigu@placer.ca.gov.

###

Early Public Meeting Article

The screenshot shows a news article on the Roseville Today website. The article is titled "PLACER COUNTY SEEKS COMMUNITY FEEDBACK FOR LOCAL HAZARD MITIGATION PLAN UPDATE" and is dated October 13, 2020. The article features a sub-headline "LONG-TERM STRATEGY TO REDUCE DISASTER LOSSES" and a Placer County logo. The main text discusses the county's plan to seek community feedback to update its local hazard mitigation plan, which assesses risks from floods, drought, wildfires, and severe weather. It also mentions that a FEMA-approved plan allows for pre- and post-disaster mitigation grant funding. The article includes social media sharing options and a "View Calendar" link. On the right side, there is a section for "Upcoming Events" listing several events from May to June 2021, and a section for "Around California" with a link to a story about California district attorneys raising an alarm over the early release of violent criminals.

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Home > News > Auburn > Placer County seeks community feedback for Local Hazard Mitigation Plan update

NEWS AUBURN LOCAL NEWS ROSEVILLE NEWS

PLACER COUNTY SEEKS COMMUNITY FEEDBACK FOR LOCAL HAZARD MITIGATION PLAN UPDATE

Staff · October 13, 2020

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LONG-TERM STRATEGY TO REDUCE DISASTER LOSSES

COUNTY OF Placer

AUBURN, Calif – Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

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Upcoming Events

May 18	Roseville Swim School Registration
May 22	Journey Revisited Drive In Concert
Jun 11	Is EV Right for You?
Jun 24	Placer County Fair 2021

View Calendar

Around California

CALIFORNIA DISTRICT ATTORNEYS RAISE ALARM OVER EARLY RELEASE OF VIOLENT CRIMINALS

Early Public Meeting Agenda

**PLACER COUNTY
LOCAL HAZARD MITIGATION PLAN (LHMP)
PUBLIC MEETING #1
OCTOBER 28, 2020**

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. Hazard Identification and Profiles
4. Schedule
5. Questions and Answers

Early Public Meeting –Sign-in Sheets

SIGN-IN SHEET
Placer County
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Kickoff Meeting #1
October 28, 2020

Name/Title	Department/Agency/ Affiliation
Rod Rodriguez	Placer County OES
Holly Powers	Placer County OES
David Atkinson	Placer County, Department of Public Works, Environmental Utilities
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

Article Advertising Final Public Meeting

Business, Travel & Entertainment
Roseville Today
Community Supported

19th Year Online
Premier Website

Business / Travel / Entertainment
Roseville

Wednesday, June 30, 2021

HOME LOCAL NEWS SUMMER '21 YELLOW PAGES TRAVEL COLUMNS EVENTS MUSIC

Home » News » Auburn » Public Review Live for proposed Placer County local hazard mitigation draft plan

NEWS AUBURN LINCOLN CA NEWS ROCKLIN NEWS ROSEVILLE NEWS

PUBLIC REVIEW LIVE FOR PROPOSED PLACER COUNTY LOCAL HAZARD MITIGATION DRAFT PLAN

Staff June 2, 2021

Share

2021 LOCAL HAZARD DRAFT MITIGATION PLAN UPDATE



Roseville, CA- Placer County's local hazard mitigation draft plan is now live on its website and the county is seeking community feedback to the plan update.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

FEMA-APPROVED HAZARD MITIGATION

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-

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Upcoming Events

Jul 4	Roseville 4th of July Fireworks
Jul 16	The Great Out There
Jul 28	Steely Dead at "Foothill Fillmore" in Auburn
Aug 7	Petaluma Music Festival 2021
Aug 28	Kathryn Hall Harvest Celebration; Celebrating The Year We Missed!
Sep 3	BottleRock Napa Valley

View Calendar

Around California

Invitation to Comment on LHMP during Public Review Period

Placer County Government ✓
 Published by CoSchedule App 🌐 · May 27 · 🌐

Our draft Local Hazard Mitigation Plan is now LIVE for your review! The plan is a partnership with cities and special districts to assess the risk of floods, drought, wildfires, severe weather and other natural hazards of concern to the county. Check out the draft plan and you can give your input at our next update meeting on June 9!

📄 Review the draft plan: <https://www.placer.ca.gov/.../Placer-County-LHMP-Update.....> See More



4,704 People Reached 87 Engagements ↑ +1.1x Average Distribution Score [Boost Again](#)

Boosted on May 27 Completed
 By Stephanie Herrera

People Reached	787	Post Engagements	76
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Last chance to give YOUR feedback on emergency plans!



This is the final week to give feedback on emergency planning efforts in Placer County! Our Local Hazard Mitigation Plan is now live for your review and will be receiving feedback at community meetings June 9 and June 10. Also, this is the last week to take our Community Wildfire Preparedness Plan survey. Together we can make sure our county is emergency prepared! [View the LHMP plan](#) and [take the CWPP survey today](#)



Help Reduce Disaster Losses in Your Community! **We need your participation in the** **Placer County Local Hazard Mitigation Plan Update**

Placer County is partnering with their incorporated communities and several special districts to develop a Local Hazard Mitigation Plan (LHMP) Update to their 2016 plan. The purpose of this LHMP Update is to assess community risk and vulnerability to identified hazards, implement actions to reduce future losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000.

What is Hazard Mitigation?

Hazard mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Natural Hazard Mitigation Important?

Most people who live or work in Placer County have been affected by natural hazards in one way or another. Placer County and its residents are vulnerable to a variety of hazards including floods, drought, wildfire, earthquake, and a variety of other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. Obviously, torrential rains and floods cannot always be prevented from occurring. Planning for natural hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through natural hazard mitigation.

Hazard Mitigation Plan and Plan Update Process

Utilizing a FEMA grant, Placer County is developing an update to their 2016 LHMP. This LHMP Update is being developed by a Hazard Mitigation Planning Committee comprised of representatives from the County, Cities, neighboring jurisdictions, federal, state, and local agency stakeholders, and the public.

The plan will address an updated list of hazards, will assess the likely impacts of these hazards to the people and assets of the Placer County Planning Area, and will also establish updated goals and prioritize projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.



Another benefit of mitigation planning is that it can also help lessen the cost of flood insurance to the residents of Placer County through FEMA’s National Flood Insurance Program’s (NFIP) Community Rating System.

National Flood Insurance Program’s Community Rating System

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions in meeting the goals of the CRS Program. The reduction in flood insurance premium rates is provided according to a community’s CRS classification. Placer County is currently a CRS Class 5, which provides for a 25 percent discount on flood insurance to those located within the special flood hazard area (SFHA) and a 10 percent discount to those located in non-SFHA areas.

Opportunities for Input

Members of the community have a very important role in this process.

Draft LHMP Documents

A draft of the LHMP Update is available for review and comment by the public and all interested stakeholders on the County website at: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> and hard copies placed in the following locations: **INSERT**.

All comments on the Public Review Draft should be submitted to jeanine.foster@fostermorrison.com.

Final Meetings

Public Meeting

Wednesday June 9, 2021
6:00-7:30 pm (Zoom Meeting)

Final Committee Meeting

Thursday June 10, 2021
9:00-11:00 am (Zoom Meeting)

All interested stakeholders and members of the public are encouraged to attend our planning team and public meetings.

For more information on this project and Zoom information for the upcoming meetings go to: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or contact the following individuals:

Rod Rodriguez	Jeanine Foster
Placer County Office of Emergency Services	Foster Morrison Consulting Ltd.
Phone: (530) 886-5316	Phone: (303) 717-7171
YRodrigu@placer.ca.gov	jeanine.foster@fostermorrison.com

Final Public Meeting Press Release



Press Release

Placer County Invites Comments on their 2021 Local Hazard Mitigation Plan Update!

HELP YOUR COMMUNITY BE HAZARD-READY!

Placer County, CA: Placer County is partnering with its five incorporated communities and several special districts to develop an update their 2016 Local Hazard Mitigation Plan (LHMP). Floods, drought, wildfires, and severe weather are just a few of the hazards of concern to the Placer County Planning Area. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, communities with a FEMA-approved LHMP are eligible to apply for both pre- and post-disaster mitigation grant funding and for lower costs of flood insurance to residents through the National Flood Insurance Program's (NFIP) Community Rating System (CRS).

The process began in November 2020 with an initial planning and public meeting and the establishment of a Hazard Mitigation Planning Committee (HMPC) comprised of representatives from the County, incorporated communities, special districts, other key stakeholders, and the public. The 2021 LHMP Update is scheduled to be finalized and submitted to Cal OES and FEMA in June 2021.

Public Review Draft

The Public Review Draft of the 2021 LHMP Update is available online (pdf format) at: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>. It is also available (in printed copy) at the following Placer County locations:

- Placer County Public Library Main Branch
- ???

Public and Planning Committee Meetings

We encourage attendance and participation from the general public at our upcoming public and planning committee meetings on the Draft LHMP. Please select the time and location that works best for you:

Public Meeting

Wednesday June 9, 2021
6:00-7:30 pm (Zoom Meeting)

Final Committee Meeting

Thursday June 10, 2021
9:00-11:00 am (Zoom Meeting)

Call in information for the Zoom meetings is provided at: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan>.

Comments on the Public Review Draft (due by June 18, 2021)

There are a couple of options for providing input and comments on the Public Review Draft:

- Email comments to Jeanine.foster@fostermorrison.com or yrodriagu@placer.ca.gov
- Drop off written comments or send by mail to: **Placer County OES, Attn. Young Rodriguez, 2968 Richardson Drive, Auburn CA 95603**

For more information contact Rod Rodriguez at yrodriagu@placer.ca.gov.

Final Public Meeting – Public Agenda

AGENDA Placer County Local Hazard Mitigation Plan (LHMP) Update Final Public Meeting June 9, 2021

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Summary of Changes in Placer County Planning Area Vulnerabilities/ Mitigation Priorities
5. Public: Data/Projects
6. Next Steps

Final Public Meeting Sign in Sheets

Name/Title	Department/Agency/Affiliation
Rod Rodriguez	Placer County OES
Dave Atkinson	Placer County OES
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

(d) Other Public Outreach Efforts

Effort	Description
Press Release October 8, 2020	A press release was developed and sent out by Placer County to inform the community of the upcoming LHMP kickoff meetings, and how they could get involved in the LHMP Update process.
Placer County eNewsletter Govdelivery October 8, 2020	Placer County sent out information on the LHMP Update process via their internal GovDelivery Newsletter to inform the community of the upcoming LHMP kickoff meetings, and how they could get involved in the LHMP Update process.
Article in Roseville Today Newspaper October 13, 2020	An article was published in Roseville Today Newspaper to make citizens in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Nextdoor Posting October 13, 2020	Information was posted on Nextdoor to make residents in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Article in Gold Country Newspaper (Auburn Journal) October 27, 2020	An article was published in Gold Country Newspaper to make citizens in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Public Outreach Flyer	An LHMP Update Public Outreach Flyer was developed as an outreach tool to inform the community of the LHMP Update process and how they can be involved.

Effort	Description
Facebook Event outreach February 3, 2021	Placer County posted information on their Facebook Page, informing the public of the LHMP Update and inviting them to the Risk Assessment meeting of the Hazard Mitigation Planning Committee Meeting.
Placer County LHMP Update Website	Information on the Plan update process and location of documents, and HMPC and public meeting information were posted on the County website. Links to the County website were placed on websites from the other incorporated communities.
Survey	A public survey was posted on the County's website inviting the public to comment on how prepared both the County and individuals are for a possible natural disaster, including flood events
Public Outreach at Placer County Public Library, Auburn location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Auburn location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Granite Bay location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Granite Bay location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Rocklin location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Rocklin location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Tahoe City location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Tahoe City location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach at Placer County Public Library, Kings Beach location	The County prepared a table in the reference section with the draft plan at the Placer County Public Library, Kings Beach location. Invitations were placed on the County website, and as part of the advertisement for public meetings to let the public know that the documents were there for review and input.
Public Outreach Flyer	An LHMP Update Public Outreach Flyer was developed as an outreach tool to inform the community of the LHMP Update Public Review Draft and how they can provide comments to the document prior to submittal to Cal OES and FEMA.
Twitter Posting on 5/27/2021	The public was invited to comment on the Public Review Draft of the LHMP Update.
Gold County Media Article 5/28/2021	Information on the LHMP was discussed in an article on Gold County Media. When the LHMP was discussed with the Board of Supervisors, a discussion on wildfire mitigation took place.
Placer County Newsletter 6/3/2021	Information on the Plan update process and location of documents, and final HMPC and public meeting locations were included in the Placer County e-newsletter informing interested parties on how to provide input to the draft plan prior to submittal to Cal OES/FEMA. This reaches over 30,000 subscribers.
Article in Local Newspaper: Roseville Today 6/2/2021	An article was published before the final public meetings, to make citizens in the County aware of the hazard mitigation update process and invite comment on the draft plan/attendance at public meetings prior to submittal to Cal OES/FEMA

Press Release - October 8, 2020

	Public counter services limited Click here to learn more	Stay up to date on the coronavirus in Placer County Click here to learn more
<ul style="list-style-type: none"> Joint air quality advisory Hidden Falls town hall meeting County seeks input on internet service levels Outdoor urgency ordinance extended Supervisors approve second round of grants Halloween during COVID-19 Help Placer County update their hazards plan 	<h2 style="color: #0070c0;">Placer County is seeking community feedback for their 2021 local hazard mitigation plan update</h2> <p><i>Published Oct. 8, 2020</i></p> <p>Placer County is seeking community feedback to update its local hazard mitigation plan.</p> <p>The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.</p> <p>A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.</p> <p>Placer County is seeking members of the public to participate on the hazard mitigation planning committee for this plan update. Background experience on the issue is not required. Placer County is requesting attendance and participation from the community at the upcoming planning committee and public meetings to kick off the project.</p> <p>Planning committee virtual meeting Wednesday, Oct. 28 1:30 – 4 p.m. https://us02web.zoom.us/j/81109100563?pwd=K1mSzdzcDd4YjZlc2NxNUdvWmJ3dz09 Meeting ID: 811 0910 0563 Passcode: 479633 Or call in: +1 669 900 6833</p> <p>Public information virtual meeting Wednesday, Oct. 28 6– 7:30 p.m. https://us02web.zoom.us/j/86599073886?pwd=MXJlWmN6d1hqdm10MEhTbDNZbnQ2UT09 Meeting ID: 865 9907 3886 Passcode: 165810 Or call in: +1 669 900 6833</p> <p>Interested residents can find more information by visiting the LHMP webpage at https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan or by contacting Rod Rodriguez at yrodriq@placer.ca.gov.</p>	

Placer County eNewsletter Govdelivery - October 8, 2020

More help for businesses, nonprofits impacted by COVID-19

Placer County <PlacerCounty@public.govdelivery.com>
 To: Stephanie Herrera
Retention Policy: Entire Mailbox 3 Year (3 years)

Reply
 Reply All
 Forward

Thu 10/8/2020 6:32 PM

Expires 10/8/2023

The Placer County Board of Supervisors this week approved the opening of a second round of Placer Shares grant applications to distribute \$250,000 to small businesses. Additionally, \$150,000 will be distributed to eligible county nonprofits that have already applied for a Placer Shares grant, but were not funded during the first round. [Learn more](#)

Let's work together to reduce natural hazard risks in Placer County

We're asking for your feedback to help update our local hazard mitigation plan. The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. Join us (virtually) for our first community meetings Oct. 28. [Learn more](#)

Article in Roseville Today Newspaper - October 13, 2020

Business, Travel & Entertainment
Roseville Today
Since 2007

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Business / Travel / Entertainment
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HOME LOCAL NEWS YELLOW PAGES ADVERTISE TRAVEL COLUMNS EVENTS MUSIC

Home > News > Auburn > Placer County seeks community feedback for Local Hazard Mitigation Plan update

NEWS AUBURN LOCAL NEWS ROSEVILLE NEWS

PLACER COUNTY SEEKS COMMUNITY FEEDBACK FOR LOCAL HAZARD MITIGATION PLAN UPDATE

Staff · October 13, 2020

Share

LONG-TERM STRATEGY TO REDUCE DISASTER LOSSES

AUBURN, Calif – Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

Upcoming Events

May 18	Roseville Swim School Registration
May 22	Journey Revisited Drive In Concert
Jun 11	Is EV Right for You?
Jun 24	Placer County Fair 2021

View Calendar

Around California

CALIFORNIA DISTRICT ATTORNEYS RAISE ALARM OVER EARLY RELEASE OF VIOLENT CRIMINALS

Nextdoor Posting - October 13, 2020

nextdoor Search Nextdoor

Placer County
Placer County Public Information Stephanie Herrera • 17 hr ago

Placer County is seeking community feedback for their 2021 local hazard mitigation plan update. Hello!

Placer County is seeking community feedback to update its local hazard mitigation plan.

The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval.

A FEMA-approved hazard mitigation plan allows agencies to apply for pre- and post-disaster mitigation grant funding. It can also increase community ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

Placer County is seeking members of the public to participate on the hazard mitigation planning committee for this plan update. Background experience on the issue is not required. Placer County is requesting attendance and participation from the community at the upcoming planning committee and public meetings to kick off the project.

Planning committee virtual meeting
Wednesday, Oct. 28
1:30 – 4 p.m.
<https://us02web.zoom.us/j/81109100563?pwd=K1lMszdzcDd4YjZtc2NxNUdvWmJ3dz09>
Meeting ID: 811 0910 0563
Passcode: 479633
Or call in: +1 669 900 6833

Public information virtual meeting
Wednesday, Oct. 28
6 – 7:30 p.m.
<https://us02web.zoom.us/j/86599073886?pwd=MXJlWnN6d1hqdmI0MEhTbDNZbnQ2UT09>
Meeting ID: 865 9907 3886
Passcode: 165810
Or call in: +1 669 900 6833

Interested residents can find more information by visiting the LHMP webpage at <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or by contacting Rod Rodriguez at yrodruigu@placer.ca.gov.

Posted to **Subscribers of Placer County in 1 area**

Like Comment 7 · 1793 Impressions

Add a comment...

Placer County
135,569 members Invite
48% of 187,699 households
371 neighborhoods

Details Edit

Placer County
175 Fulweiler Ave
Auburn, CA 95603
Get directions

(530) 886-4646
PIOStaff@placer.ca.gov

nextdoor Search Nextdoor

ratings used for the National Flood Insurance Program, which can result in lower flood insurance premiums through the program.

Placer County is seeking members of the public to participate on the hazard mitigation planning committee for this plan update. Background experience on the issue is not required. Placer County is requesting attendance and participation from the community at the upcoming planning committee and public meetings to kick off the project.

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PIOStaff@placer.ca.gov
placer.ca.gov/

Article in Gold Country Newspaper (Auburn Journal) - October 27, 2020

Gold Country Media

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Placer County seeks public feedback for local hazard mitigation plan update

 Stacey Adams Oct 27, 2020 5:00 AM

Placer County is inviting the public to provide feedback on the update of the 2016 local hazard mitigation plan.

According to the Federal Emergency Management Agency (FEMA) website, a mitigation plan minimizes the impact of disasters and is the key to breaking the cycle of disaster damage, reconstruction and repeated damage.

The county works with several allied local, state and federal agencies, such as Cal Fire, Caltrans, Parks and Recreation, CHP and the Bureau of Reclamation, to assess natural hazards that are of concern to the county and each agency, including wildfires, floods and severe weather. Throughout the process, a risk and vulnerability assessment will be completed and information from participating agencies will be reviewed and updated, according to Rod Rodriguez, Placer County emergency services coordinator.

The plan develops the foundation for a strategy to reduce disaster loss and makes FEMA resources available once a plan is approved. According to a county news release, a FEMA-approved plan allows agencies to apply for disaster mitigation funding, and can increase community ratings used for the National Flood Insurance Program, which can lower flood insurance premiums through the program.

The county will host two virtual meetings Wednesday, Oct. 28, for the project update:

Planning committee meeting

1:30 p.m.-4 p.m.

Access via phone: +1 669-900-6833

Access via Zoom: <https://us02web.zoom.us/j/81109100563?pwd=K1lmSzZxODd4YzZlcnIubktNUdWfnJ3dz09>

School vandalism, vacation rental scam, more

Placer County Sheriff's crime log: Counterfeit bills, fentanyl possession arrest, more

Capital Connector project underway to connect Folsom to Elk Grove



Brook's bomb sends Rocklin off with a bang



Lincoln News Messenger
Four teens injured in Lincoln backyard fire





Help Reduce Disaster Losses in Your Community! We need your participation in the Placer County Local Hazard Mitigation Plan Update

Placer County is partnering with their incorporated communities and several special districts to develop a Local Hazard Mitigation Plan (LHMP) Update to their 2016 plan. The purpose of this LHMP Update is to assess community risk and vulnerability to identified hazards, implement actions to reduce future losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000.

What is Hazard Mitigation?

Hazard mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Natural Hazard Mitigation Important?

Most people who live or work in Placer County have been affected by natural hazards in one way or another. Placer County and its residents are vulnerable to a variety of hazards including floods, drought, wildfire, earthquake, and a variety of other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. Obviously, torrential rains and floods cannot always be prevented from occurring. Planning for natural hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through natural hazard mitigation.

Hazard Mitigation Plan and Plan Update Process

Utilizing a FEMA grant, Placer County is developing an update to their 2016 LHMP. This LHMP Update is being developed by a Hazard Mitigation Planning Committee comprised of representatives from the County, Cities, neighboring jurisdictions, federal, state, and local agency stakeholders, and the public.

The plan will address an updated list of hazards, will assess the likely impacts of these hazards to the people and assets of the Placer County Planning Area, and will also establish updated goals and prioritize projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.



Another benefit of mitigation planning is that it can also help lessen the cost of flood insurance to the residents of Placer County through FEMA’s National Flood Insurance Program’s (NFIP) Community Rating System.

National Flood Insurance Program’s Community Rating System

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions in meeting the goals of the CRS Program. The reduction in flood insurance premium rates is provided according to a community’s CRS classification. Placer County is currently a CRS Class 5, which provides for a 25 percent discount on flood insurance to those located within the special flood hazard area (SFHA) and a 10 percent discount to those located in non-SFHA areas.

Opportunities for Input

Members of the community have a very important role in this process. Several planning team meetings will be held over the next eight months. A draft of the LHMP Update will be available Spring 2021 for review and comment by the public and all interested stakeholders on the County website and in select public libraries. Public meetings on the Draft Plan and final planning team meetings will also occur in early Summer 2021. All interested stakeholders and members of the public are encouraged to attend our planning team and public meetings.

For more information on this project and Zoom information for the upcoming meetings go to: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or contact the following individuals:

Rod Rodriguez	Jeanine Foster
Placer County Office of Emergency Services	Foster Morrison Consulting Ltd.
Phone: (530) 886-5316	Phone: (303) 717-7171
YRodrign@placer.ca.gov	jeanine.foster@fostermorrison.com

Facebook Event outreach - February 3, 2021

Placer County Local Hazard Mitigation Plan -- Community Meeting
Online Event

WED, FEB 3 · 1:30 PM

Event Performance Last 7 Days: Jan 26 - Feb 2

People Reached 4,451 +4,451 last 7 days	Responses 51 +51 last 7 days	Track ticket sales Add Ticket Link
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Placer County LHMP Update Website

COVID-19 RESPONSE Public counter services limited [Click here to learn more](#) Stay up to date on the coronavirus and vaccine information in Placer County [Click here to learn more](#)

Press **F11** to exit full screen

Home » Government » Departments A - D » County Executive Office » Ready Placer » About Us » About OES » Local Hazard Mitigation Plan

LOCAL HAZARD MITIGATION PLAN

FEMA defines **Hazard Mitigation** as any action taken to reduce or eliminate the long-term risk to human life and property from identified hazards of concern.

Placer County is partnering with its Cities, Towns, fire districts, and several special districts to update the 2016 Local Hazard Mitigation Plan (LHMP). Wildfire, flood, severe weather, drought, and earthquake are just a few of the hazards to Placer County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction.

Communities with a FEMA-approved LHMP are eligible for FEMA pre- and post-disaster grant funding and are better positioned to respond and recover when disasters occur. Through the LHMP development process, Placer County can also assist in lowering the costs of flood insurance premiums to county residents through participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).

Nationwide, taxpayers annually pay billions of dollars helping communities, organizations, businesses and individuals recover from disaster. Some disasters are predictable and, in many cases, damage can be reduced or eliminated through hazard mitigation planning. The Federal Emergency Management Agency (FEMA) has targeted natural disaster loss reduction as one of its primary goals. Under the Disaster Mitigation Act of 2000, local jurisdictions are required to have a FEMA-approved Local Hazard Mitigation Plan (LHMP) to better position resources in advance of a disaster and to maintain eligibility for certain disaster assistance and hazard mitigation funding programs.

Placer County 2021 Local Hazard Mitigation Plan Update

Placer County is kicking off the LHMP Update process with meetings in October 2020. The plan will address an updated list of hazards, will assess the likely impacts of these hazards to the people and assets of the Placer County planning area, and will also establish updated goals and prioritize projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.

Opportunities for Input

Members of the community have a very important role in this process. A draft of the 2021 LHMP Update will be available on this website in Spring 2021 for review and comment by the public and all interested stakeholders.

Planning Committee and public meetings will also be held as part of the plan development process. In addition to plan participation by Placer County departments, cities, towns, fire districts, special districts, state and federal agencies, the public, and other interested stakeholders are encouraged to attend and participate in either Planning Committee or public meetings. Information on specific meeting times and locations are detailed below.

You may also provide your input by participating in [this survey](#).

Select Language

Survey

An integral element in hazard mitigation planning is broad public participation. Information provided by residents fosters a better understanding of local hazard concerns and can spawn innovative ideas to reduce impacts of future hazard events. A public opinion survey was accomplished to gather information from Placer County Planning Area residents concerning local hazards. The survey was located on the County's LHMP website and survey participation was promoted through public meetings, program websites, press

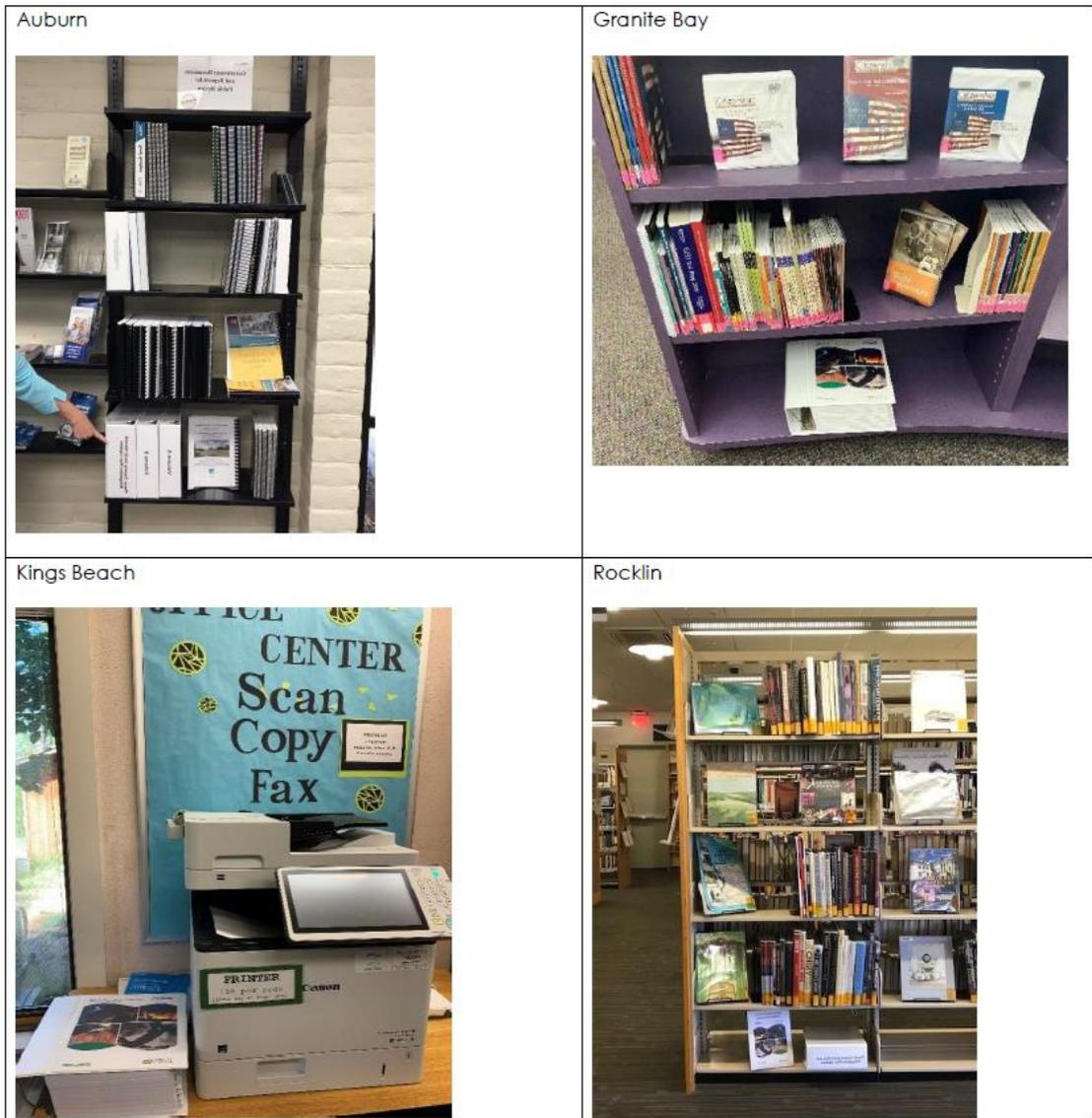
releases, social media, and other public outreach events as previously described. Following is a summary of survey results.

- 231 individuals took the survey.
- 122 out of the 231 people who responded were extremely concerned about the possibility of the community being affected by a disaster.
- Wildfire, drought, and climate change were hazards of greatest concern.
- 3 out of 231 respondents noted that their house was in a floodplain, 61 out of 231 did not know if their home was in a floodplain.
- 201 of the 231 respondents do not have flood insurance, while 13 of them do.
- 78 out of 231 stated that communities are not doing enough to inform the public about hazards affecting the County, while 65 of the 231 stated the community was doing a good job. 85 did not know or had no opinion.
- Of the 231 respondents, 25 felt unprepared, 157 felt somewhat prepared, and 44 felt well prepared for a natural disaster.
- Email, direct mailings, social media, and the County website were the best choices to reach the public regarding disaster information and making homes more disaster resistant.

Public Outreach at Placer County Public Library – Auburn, Granite Bay, Kings Beach, and Rocklin locations



Local Hazard Mitigation Plan Binder Location at Placer County Libraries



Placer County Library Administration ▪ 145 Fulweiler Avenue, Ste. 150 ▪ Auburn, CA 95603
530-886-4550 office ▪ 530-886-4555 fax



Public Outreach at Placer County Public Library, Tahoe City location





Help Reduce Disaster Losses in Your Community! **We need your participation in the** **Placer County Local Hazard Mitigation Plan Update**

Placer County is partnering with their incorporated communities and several special districts to develop a Local Hazard Mitigation Plan (LHMP) Update to their 2016 plan. The purpose of this LHMP Update is to assess community risk and vulnerability to identified hazards, implement actions to reduce future losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000.

What is Hazard Mitigation?

Hazard mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Natural Hazard Mitigation Important?

Most people who live or work in Placer County have been affected by natural hazards in one way or another. Placer County and its residents are vulnerable to a variety of hazards including floods, drought, wildfire, earthquake, and a variety of other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. Obviously, torrential rains and floods cannot always be prevented from occurring. Planning for natural hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through natural hazard mitigation.

Hazard Mitigation Plan and Plan Update Process

Utilizing a FEMA grant, Placer County is developing an update to their 2016 LHMP. This LHMP Update is being developed by a Hazard Mitigation Planning Committee comprised of representatives from the County, Cities, neighboring jurisdictions, federal, state, and local agency stakeholders, and the public.

The plan will address an updated list of hazards, will assess the likely impacts of these hazards to the people and assets of the Placer County Planning Area, and will also establish updated goals and prioritize projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.



Another benefit of mitigation planning is that it can also help lessen the cost of flood insurance to the residents of Placer County through FEMA’s National Flood Insurance Program’s (NFIP) Community Rating System.

National Flood Insurance Program’s Community Rating System

The NFIP’s Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions in meeting the goals of the CRS Program. The reduction in flood insurance premium rates is provided according to a community’s CRS classification. Placer County is currently a CRS Class 5, which provides for a 25 percent discount on flood insurance to those located within the special flood hazard area (SFHA) and a 10 percent discount to those located in non-SFHA areas.

Opportunities for Input

Members of the community have a very important role in this process.

Draft LHMP Documents

A draft of the LHMP Update is available for review and comment by the public and all interested stakeholders on the County website at: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> and hard copies placed in the following locations: **INSERT**.

All comments on the Public Review Draft should be submitted to jeanine.foster@fostermorrison.com.

Final Meetings

Public Meeting

Wednesday June 9, 2021
6:00-7:30 pm (Zoom Meeting)

Final Committee Meeting

Thursday June 10, 2021
9:00-11:00 am (Zoom Meeting)

All interested stakeholders and members of the public are encouraged to attend our planning team and public meetings.

For more information on this project and Zoom information for the upcoming meetings go to: <https://www.placer.ca.gov/1381/Local-Hazard-Mitigation-Plan> or contact the following individuals:

Rod Rodriguez	Jeanine Foster
Placer County Office of Emergency Services	Foster Morrison Consulting Ltd.
Phone: (530) 886-5316	Phone: (303) 717-7171
YRodrigu@placer.ca.gov	jeanine.foster@fostermorrison.com

Twitter Posting on 5/27/2021

 **Placer County Government**  ...
 Published by CoSchedule App  · May 27 · 

Our draft Local Hazard Mitigation Plan is now LIVE for your review! The plan is a partnership with cities and special districts to assess the risk of floods, drought, wildfires, severe weather and other natural hazards of concern to the county. Check out the draft plan and you can give your input at our next update meeting on June 9!

 Review the draft plan: <https://www.placer.ca.gov/.../Placer-County-LHMP-Update.....> See More



4,704 People Reached 87 Engagements  +1.1x Average Distribution Score [Boost Again](#)

Boosted on May 27 Completed
 By Stephanie Herrera

People Reached	787	Post Engagements	76
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Placer County reviews wildfire preparedness, mitigation; inmate crews 'decimated'

Chief: Inmate program has been 'decimated' across state



Stacey Adams May 28, 2021 12:00 PM

The Placer County Board of Supervisors received a presentation Tuesday of the county's efforts regarding wildfire preparedness and mitigation.

"Last year was a record year," said Brian Estes, CAL FIRE/Placer County Fire Department Chief. "In fact, it was the most disastrous fire season recorded in California history."

Estes said 4.2 million acres were burned in state responsibility area and national forest system land, 10,488 structures were burned or destroyed and 33 deaths were directly related to fires. There were 341 wildland fires in Placer County.

"CAL FIRE has a mission of keeping 95 percent of our fires at 10 acres or less," Estes said, noting a success rate of 95.8 percent within the county, as 14 fires grew beyond 10 acres for 1,459 total acres.

For the 2021 fire season, Estes said there are no late spring rains predicted and potential for monsoonal flow with lightning into the summer months. Estes noted burning conditions (soil moisture, fuel moisture) are three months ahead of normal.

In preparation, burning was suspended May 24. Estes said stateside staffing will peak June 11 with 411 state-funded personnel, and the county is always at full preparedness level. Across the counties, there will be 22 frontline engines, five reserve engines, five Type I hand crews, four dozer units and the aircraft will come online at Grass Valley Air Attack Base on or around June 1.

"Probably the biggest thing that we should all be concerned about is that our inmate firefighting hand crew program has literally been decimated across the state," Estes said.

According to Estes, the peak capacity of inmate hand crews is normally 160 crews with 15-17 per crew. This year, there are 80 hand crews with two local crews of 13-14 out of Nevada County.

variance for Auburn riding arena cover

Selling a home contingent on finding another

Former Mayor Kirby to be remembered at community BBQ July 10



News
Truck hauling 71 cows overturns in Newcastle



News
Placer County Sheriff's crime log: Smashed lawn decorations, stolen pool tools, more



Last chance to give YOUR feedback on emergency plans!



This is the final week to give feedback on emergency planning efforts in Placer County! Our Local Hazard Mitigation Plan is now live for your review and will be receiving feedback at community meetings June 9 and June 10. Also, this is the last week to take our Community Wildfire Preparedness Plan survey. Together we can make sure our county is emergency prepared! [View the LHMP plan](#) and [take the CWPP survey today](#)

Article in Local Newspaper: Roseville Today 6/2/2021

The screenshot shows a news article on the Roseville Today website. The article title is "PUBLIC REVIEW LIVE FOR PROPOSED PLACER COUNTY LOCAL HAZARD MITIGATION DRAFT PLAN". The sub-headline is "2021 LOCAL HAZARD DRAFT MITIGATION PLAN UPDATE". The article text states: "Roseville, CA- Placer County's local hazard mitigation draft plan is now live on its website and the county is seeking community feedback to the plan update. The plan, a partnership with cities and special districts, assesses the risk of floods, drought, wildfires, severe weather, and other natural hazards of concern to the county. While hazards are not always preventable, a hazard mitigation plan establishes the foundation for a long-term community strategy to reduce disaster losses, while also making Federal Emergency Management Agency resources available upon plan approval." The article is dated June 2, 2021. The website header includes "Roseville Today" and "19 Placer County's Premier Website 19th Year Online". The navigation menu includes HOME, LOCAL NEWS, SUMMER '21, YELLOW PAGES, TRAVEL, COLUMNS, EVENTS, MUSIC. The sidebar on the right lists "Upcoming Events" such as "Roseville 4th of July Fireworks" and "The Great Out There".

Public Comments Received and How Addressed

Comment Date	Person Commenting	Method Received			Comments	How addressed?
		Email	Phone	Written		
2/4/2021	Heath Wakee	X			<p>Hi Jeanine & Chris, Thank you for the good meeting today. I'm a rookie at this and I have comments but some (all) of my comments may not be relevant. If you feel that there is merit in including the mentioned risks and you need clarification, please let me know and I'll do the research.</p> <ol style="list-style-type: none"> 1. You mentioned the potential need for temporary heat and cooling shelters. What about the need for shelters when either the Hayward or San Andreas fault explode in the Bay area? We may have an influx of a million people looking for food and shelter. 2. There are many automobile bridges along Auburn Ravine including a railroad bridge. Debris can block the flow and undermine their foundations. 3. The Gold Hill Dam along Auburn Ravine is a threat to downstream dams and property. It should be evaluated to ensure that it would be able to withstand all hazards. 4. The levi along Auburn Ravine in Lincoln has failed in the past and the most recent storm resulted in some levi erosion. A larger storm would likely have breached the levi. <p>Best Regards, Stay Safe & Well, Heath Wakelee</p>	<p>Hi Heath, We are glad you could make the meeting. Good input below on problem areas and issues. I will share and discuss with the Placer County flood folks to get their input on the Auburn Ravine area, but seems like it should be included as a problem area in the plan and possible mitigation strategies identified. With respect to the Auburn Ravine area, do you all have information on specific events that resulted in road or bridge closures, flooding etc. and the impacts and damages \$\$ caused by those events. It would be good to be able to document past losses in these areas. Your concern on the big earthquake in other areas causing mass evacuations and sheltering needs is real, but really beyond the scope of this LHMP. The State of California is also required to do a state level hazard mitigation plan and that falls more under their efforts. Keep in mind that identifying problem areas and including a mitigation action in the plan does not insure it will get addressed as all projects are subject to funding, and most funding will be pursued, depending on other priorities, and if there are champions at the local government level. But identifying the issue and including it in the plan is a good start. I hope you and your group will continue to participate in this process. Feel free to reach out with any questions or additional information and we will be back in touch. Thanks, Jeanine Foster</p>

A.3 Placer County Step 3: Coordinate

This planning step credits coordinating with other agencies and key stakeholders and incorporating other plans and other agencies' efforts into the floodplain management plan or LHMP. Other agencies and organizations were contacted to determine if they have studies, plans and information pertinent to the floodplain management plan, to determine if their programs or initiatives may affect the community's program, inviting them to participate in the planning process, and otherwise asking them to support the community's efforts in this LHMP Update. Coordination efforts with these other agencies are documented in Table A-2 below.

Table A-2 List of Agencies and Key Stakeholders Coordinated with Through the 2021 LHMP Update Process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
CA DWR/Michael Gill	8/17/2020		X			Obtained NFIP Community Information System Data let him know the LHMP Update process was starting and inviting his input
California Dept of Conservation	11/6/2020	Website request	X	X		Williamson Act data
California Dept of Conservation	11/13/2020		X	X		Williamson Act data and other important farmland
Placer County Office of Realtors/Dean Anderson	12/1/2020		X			Sent Public Outreach Flyer to be distributed to 4200 realtors letting them know of the LHMP Update and how they can get involved.
CA DWR/Sami Nall	11/10/2020		X			Obtained input on DSOD dam data to support the LHMP process and inviting input to the process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
National Weather Service/ Michelle Mead	12/7/2020		X			Checked in with NWS to determine any new data sources for weather to support the LHMP update
Contractors Association of Tahoe Truckee/ Pat Davidson	12/18/2020		X			Sent Public Outreach Flyer to be distributed to 390 contractor companies letting them know of the LHMP Update and how they can get involved.
Placer County Firewise Community Coordinator	1/18/2021	X	X	X		Contacted Luanna to engage her assistance in the LHMP Update process and to help outreach to others.
Placer Fire Safe Alliance Outreach/Bob Crawford, USFS	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Carol Rutenbergs, USDA	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
Placer Fire Safe Alliance Outreach/Elias Grant, Placer Land and Trust Organization	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Eric Sweet, Sierra Pacific Industries	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Gary Kirk, Sebastian Corp	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/George Morris III, Cal Fire	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Cynthia Hayes, PG&E	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
Placer Fire Safe Alliance Outreach/Jeff Wood, Bender Insurance Company	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Jennifer Johnson, USDA	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Jerry Martinez, BLM	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/John Hutchings, US Bureau of Reclamation	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/John Mohoff, Cal Fire	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
Placer Fire Safe Alliance Outreach/John Hotchkiss, Cal Fire	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Julie Martin, BLM	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Jesse Knox, USFS	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Adam Leyba, USFS	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Lynn Tomachoff, Cal Fire	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process

Agency Name/ Contact	Date	Mechanism	Contacted via Mail/email	Contacted via Phone	Contacted via Meeting	Topics Discussed
Placer Fire Safe Alliance Outreach/Mary Beth Farley, Union Pacific Railroad	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Matthew Moore, Auburn Rancheria	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer Fire Safe Alliance Outreach/Michael Woodbridge, USDA	1/20/2021	Placer County Fire Safe Alliance Group Outreach from Luanna Dowling, Placer County Firewise Community Coordinator	X		X	Sent Public Outreach Flyer to inform the group members of the LHMP and inviting them to participate in the process
Placer County Firewise	1/28/2021	Fire Safe Alliance Outreach	X	X		Firewise meetings
Cal Fire/Steve Garcia	6/9&10/2021	Email/meeting	X		X	Invited Steve to the final HMPC Meeting to provide input on fire issues.

CA DWR/Michael Gill

From: Gill, Michael@DWR <Michael.Gill@water.ca.gov>
Sent: Wednesday, October 28, 2020 2:06 PM
To: Jeanine Foster <jeanine.foster@fostermorrison.com>
Subject: RE: NFIP community data request

Hi Jeanine,

I have attached the CIS information of the nine communities that were requested below. If you need anything else please let me know.

Thank You,

Michael Gill
*Engineer, Water Resources
Community Assistance Section
Office of Floodplain Management
Division of Flood Management
CA Dept. of Water Resources
Office: 916-574-1471
Mobile: 916-261-2582*

California Dept of Conservation

Good Morning,

Your request for Williamson Act data was forwarded to me.

Due to the lack of city and county reported enrollment data, the Department of Conservation does not host Williamson Act enrollment maps and/or data. For the most current and up to date information on the status of Williamson Act contracted parcels the Department suggests that interested parties contact the city or county in which the property resides. As you know the Williamson Act allows local landowners to enter into contracts with cities and/or counties, and as such, the participating city/county must retain a copy of each contract and therefore should have a record of each contracted parcel within its jurisdiction.

Sincerely,



Farl Grundy

Associate Environmental Planner
Division of Land Resource Protection
Williamson Act / CEQA

California Department of Conservation

801 K Street, MS 14-15, Sacramento, CA 95814

T: (916) 324-7347

E: Farl.Grundy@conservation.ca.gov



California Dept of Conservation

From: Kisko, Kerri@DOC <Kerri.S.Kisko@conservation.ca.gov>
Sent: Friday, November 13, 2020 5:45 PM
To: Chris Morrison <chris.morrison@fostermorrison.com>
Subject: RE: Release of documents

Chris,

I have finished updating all the documents for Placer (2016), Sacramento (2018), Sutter (2018), and Yuba (2018). I have not had time to update the links on the website yet, but I didn't want you to have to wait until next week.

I have attached the documents that meet the Accessibility Standards for publishing. These include: Prime & Statewide Soils Lists (Sacramento_gSSURGO.pdf, Sutter_gSSURGO.pdf, and Yuba_gSSURGO.pdf); Land Use Summary Tables (SAC_1988_2018.xlsx, SUT_1988_2018.xlsx, and YUB_1988_2018.xlsx); and Alternate Conversion Tables (Alternate_Sacramento_County_2016-2018_Land_Use_Conversion.pdf, Alternate_Sutter_County_2016-2018_Land_Use_Conversion.pdf, and Alternate_Yuba_County_2016-2018_land_Use_Conversion.pdf).

Several of our documents are not currently ADA compliant for the web due to time constraints and/or complexity. These documents are available through our File Request System. I have included the links to these documents below:

Placer County 2016:

(Placer 2014-2016 Conversion Table) placon16.xls:

<https://filerequest.conservation.ca.gov/RequestFile/2817629>

(Placer Prime & Statewide Soils List) Placer_gSSURGO.pdf:

<https://filerequest.conservation.ca.gov/RequestFile/2817748>

(Placer Land Use Summary Table) PLA_1984_2016.xls:

<https://filerequest.conservation.ca.gov/RequestFile/2817823>

(Placer 2016 PDF Map) Pla16.pdf:

<https://filerequest.conservation.ca.gov/RequestFile/2816267>

Placer County Important Farmland Metadata.docx:

<https://filerequest.conservation.ca.gov/RequestFile/2816268>

Sacramento County 2018:

(Sacramento 2016-2018 Conversion Table) saccon18.xlsx:

<https://filerequest.conservation.ca.gov/RequestFile/2817662>

(Sacramento 2018 PDF Map) sac18.pdf:

<https://filerequest.conservation.ca.gov/RequestFile/2816273>

Sacramento County Important Farmland Metadata.docx:

<https://filerequest.conservation.ca.gov/RequestFile/2816274>

Sutter County 2018:

(Sutter 2016-2018 Conversion Table) sutcon18.xlsx:

<https://filerequest.conservation.ca.gov/RequestFile/2817671>

(Sutter 2018 PDF Map) sut18.pdf:

<https://filerequest.conservation.ca.gov/RequestFile/2816308>

Sutter County Important Farmland Metadata.docx:

<https://filerequest.conservation.ca.gov/RequestFile/2816309>

Placer County Office of Realtors/Dean Anderson

Phone Conversation Log

Project: Placer LHMP		Date: 12/1/20
Contact Name	Dean Anderson	
Contact Organization	Placer County Office of Realtors	
Contact Phone #	dean@pcaor.com	
Subject	Placer County LHMP Update	

Items Discussed
Sent Public Outreach Flyer discussing LHMP to Dean. Dean forwarded to his group of approximately 4200 professionals. Wanted them to be aware of the LHMP Update process and that we would like their input and participation.

Follow-up		
By	Name: Mary Keller	Organization: Placer County Floodplain Manager

CA DWR/Sami Nall

Email Log

Project: Placer County 2021 LHMP Update		Date: 11/10/20
Contact Name	Sami Nall, Sr. Engineer	
Contact Organization	CA DWR, Office of Floodplain Management	
Contact Email	Sami.Nall@water.ca.gov	
Subject	DSOD Dam Data: Hazard Classifications and Inundation Data	

Items Discussed
Reached out to Sami Nall at CA DWR to find out what source should be the most current for determining Hazard Classifications and inundation data for dams, as different sources reported different data even within the CA DWR DSOD. Sami indicated that both an annual document and the DSOD viewer should be current, but that the viewer should take precedent.

Follow-up		
By	Name:	Organization
	Jeanine Foster	Foster Morrison

From: Nall, Sami@DWR <Sami.Nall@water.ca.gov>
Sent: Tuesday, November 10, 2020 8:53 AM
To: Jeanine Foster <jeanine.foster@fostermorrison.com>
Subject: RE: California DWR, DSOD data

Hi Jeanine, Let me ask DSOD about this as I would think the viewer would be more current. However there is an updated document (dated 2019) at this link: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/2019-Dams-Within-Jurisdiction-of-the-State-of-California-Alphabetically-by-County_a_y20.pdf.

I believe DSOD publishes an updated list every year. However, it may be taking longer to publish it because of accessibility rules. I'll also check to see if an updated list will be published in 2020.

Thanks,
Sami

Sami Nall, P. E.

Senior Engineer, Office of Floodplain Management
[Department of Water Resources](#)
3464 El Camino Avenue, Suite 200
Sacramento, CA 95821
Office: 916.574.1432
Email: Sami.Nall@water.ca.gov

From: Michelle Mead - NOAA Federal <michelle.mead@noaa.gov>
Sent: Monday, December 7, 2020 11:39 AM
To: Jeanine Foster <jeanine.foster@fostermorrison.com>
Subject: Re: California Weather Data

Good morning Jeanine~

XMACIS: <https://xmacis.rcc-acis.org/> is a site that has a lot of climate information you may also find useful. It's not the most user friendly, but does give you access to all historical climatological data. The Marysville AP data on this site is up to date. I added the max temps for Marysville over the past 20 years as an example.

I have been getting these hazard mitigation emails, but have not been able to attend.

Sincerely,
Michelle



Michelle Mead
Meteorologist in Charge (MIC)
National Weather Service
WFO Sacramento
3310 El Camino Ave. Suite 228 95821-6373
Office: (916) 979-3041 x222
Cell: (406) 370-8882

Placer Fire Safe Alliance Outreach/Bob Crawford, USFS

From: Luana Dowling <dowlingluana@gmail.com>

Sent: Wednesday, January 20, 2021 12:03 PM

To: Alex harvey <harveyalex74@yahoo.com>; Allison Erny <allison@placerrcd.org>; Angel Green <AGreen@placer.ca.gov>; Angel Hertslet <angel.hertslet@TNC.ORG>; Ann Hobbs <AHobbs@placer.ca.gov>; Anton <vettemanace62@gmail.com>; Bekki Riggan <BRiggan@placer.ca.gov>; Beryl Smith <beryls@pacbell.net>; Beverly Roberts <BRoberts@placer.ca.gov>; Bill Steward <billsteward@truckeefire.org>; bill.george@mail.house.gov; Bob Bena <rbena@sbcglobal.net>; Bob Snyder <snyder@jps.net>; Brett Storey <BStorey@placer.ca.gov>; Brian Crawford <bbcrawford@fs.fed.us>; carol.rutenbergs <carol.rutenbergs@ca.usda.gov>; Chris Dallas <Chris.Dallas@sierranevada.ca.gov>; Chris Paulus <CDFBAT2313@gmail.com>; Christine.Rydell@sen.ca.gov; Crystal Jacobsen <CJacobse@placer.ca.gov>; Daniel Berlant <dberlant@auburn.ca.gov>; Dave Spencer <dspencer@auburn.ca.gov>; Diane Scanlon <dianescanlon@mac.com>; Don Adams <windrimm@yahoo.com>; Dyer, Elizabeth <elizabethdyer@usbr.gov>; Eldridge, Mary@CALFIRE <mary.eldridge@fire.ca.gov>; elias.grant@Placerlandtrust.org; Elsa Hucks <Elsa.Hucks@fire.ca.gov>; Eric Horntvedt <horntvedt@ntfire.net>; Eric Sweet <esweet@spi-ind.com>; Frank J. Udvarhelyi <udvarhelyi@live.com>; fschafer@nltfpd.net; Gary Kirk <gkirk@sebastiancorp.net>; George Alves <galves.pcs@earthlink.net>; George.morrisIII@fire.ca.gov; Haynes, Cynthia <CLH3@pge.com>; Holland, Erin <holland@ntfire.net>; Holly Powers <HPowers@placer.ca.gov>; Jane LaBoa <nccsaf@mcn.org>; Jeanine Foster <jeanine.foster@fostermorrison.com>; Jeff Mikles <jlmikles@gmail.com>; Jeffrey Wood <jwood@wgbender.com>; Jennifer Leighty <Leightylady@gmail.com>; Jenny Johnson <jennifer.johnson@ca.usda.gov>; Jerry Martinez <jerry_martinez@blm.gov>; John Hutchings <jhutchings@usbr.gov>; John Mohoff <John.Mohoff@fire.ca.gov>; john.hotchkiss@fire.ca.gov; Judy McKeig <JMckeig@placer.ca.gov>; Julie Martin <j2martin@blm.gov>; Karen Calvert <kcalvert389@gmail.com>; karina silvas-Bellanca <karina.bellanca@gmail.com>; Kathie Remaley <windrose45@hotmail.com>; Kathryn Baxter <keblkb@gmail.com>; Kathy's laptop <istahap@jps.net>; Katie Espnola <Katie@placercountyrcd.org>; Katrina Hoop <khoop@southplacerefire.org>; Kelly Reynolds <ksreynolds9@att.net>; Kevin Hanley <hanleykh@jps.net>; Knox, Jesse -FS <jknox02@fs.fed.us>; laurainebacon@gmail.com; Leyba, Adam -FS <aleyba@fs.fed.us>; Luana Dowling <dowlingluana@gmail.com>; Lynne Tolmachoff <lynne.tolmachoff@fire.ca.gov>; Maddison Easley <Maddison@placercountyrcd.org>; Mark D'Ambrogio <markc1200@outlook.com>; Mark Von Thaden <mark@weredancing.com>; MaryBeth Farley <mfarley@up.com>; Matthew Moore <mmoore@auburnrancheria.com>; Michael Brown <mbrown@nltfpd.net>; Michael Garabedian <michaelgarabedian@earthlink.net>; Michael Woodbridge <Michael.woodbridge@usda.gov>; Sarah Jones <sarah@placerrcd.org>; Terri Shawn Batsel Henry <hbatsel@gmail.com>

Subject: Placer County Local Hazard Mitigation Plan Public Participation

Hi All,

Placer County is looking for interest to participate in the Hazard Mitigation Planning Committee meetings and provide inputs/feedback on the process and the draft Local Hazard Mitigation Plan when completed. Interest public members can contact Young (Rod) Rodriguez or Jeanine Foster listed at the bottom of the flyer if there is any questions. Thank you.

Cheers,

Luana R Dowling

Placer Firewise Communities Coordinator

dowlingluana@gmail.com

Placer Fire Safe Alliance Outreach/Carol Rutenbergs, USDA

See email image above.

Placer Fire Safe Alliance Outreach/Elias Grant, Placer Land and Trust Organization

See email image above.

Placer Fire Safe Alliance Outreach/Eric Sweet, Sierra Pacific Industries

See email image above.

Placer Fire Safe Alliance Outreach/Gary Kirk, Sebastian Corp

See email image above.

Placer Fire Safe Alliance Outreach/George Morris III, Cal Fire

See email image above.

Placer Fire Safe Alliance Outreach/Cynthia Hayes, PG&E

See email image above.

Placer Fire Safe Alliance Outreach/Jeff Wood, Bender Insurance Company

See email image above.

Placer Fire Safe Alliance Outreach/Jennifer Johnson, USDA

See email image above.

Placer Fire Safe Alliance Outreach/Jerry Martinez, BLM

See email image above.

Placer Fire Safe Alliance Outreach/John Hutchings, US Bureau of Reclamation

See email image above.

Placer Fire Safe Alliance Outreach/John Mohoff, Cal Fire

See email image above.

Placer Fire Safe Alliance Outreach/John Hotchkiss, Cal Fire

See email image above.

Placer Fire Safe Alliance Outreach/Julie Martin, BLM

See email image above.

Placer Fire Safe Alliance Outreach/Jesse Knox, USFS

See email image above.

Placer Fire Safe Alliance Outreach/Adam Leyba, USFS

See email image above.

Placer Fire Safe Alliance Outreach/Lynn Tomachoff, Cal Fire

See email image above.

Placer Fire Safe Alliance Outreach/Mary Beth Farley, Union Pacific Railroad

See email image above.

Placer Fire Safe Alliance Outreach/Matthew Moore, Auburn Rancheria

See email image above.

Placer Fire Safe Alliance Outreach/Michael Woodbridge, USDA

See email image above.

Cal Fire/Steve Garcia

Project: Placer County 2021 LHMP Update	Date: June 9 &10
Meeting Purpose: Final HMPC Meeting	

Attendees: See June 10 Meeting Sign-in for all attendees – contact is for Steve Garcia		
Name	Agency	Contact Phone
Steve Garcia	Cal Fire	

Items Discussed
Steve Garcia was invited to attend the final HMPC meeting to provide input on fire issues and possible mitigation measures throughout the County from the Cal Fire perspective.

Follow-up		
Integrate information into LHMP Update		
By	Name	Organization
	Jeanine Foster	Foster Morrison

A.4 Meeting Handouts

Below are the handouts for each meeting held during the planning process for this Plan Update.

A.4.1. Kickoff Meeting Handouts

Placer County Hazard Identification and Profiles –2021

Disaster Declarations and National Weather Service Research

Placer County – Disaster Declarations 1950-2020

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2020	Covid-19	Pandemic	Pandemic	DR-4482	3/4/2020	1/20/2020
2020	Covid-19	Pandemic	Pandemic	EM-3428	3/4/2020	1/20/2020
2017	California Severe Winter Storms, Flooding, And Mudslides	Flood	Storms	DR-4305	2/10/2017	3/16/2017
2014	King Fire	Wildfire	Wildfire	FM-5081	–	9/17/2014
2014	Applegate Fire	Wildfire	Wildfire	FM-5082	–	10/8/2014
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2010	Galleria Incident	Wildfire	Wildfire	GP 2010-12	10/22/2010	–
2009	49er Fire	Wildfire	Wildfire	FM-2832	–	8/31/2009
2008	Gladding Fire	Wildfire	Wildfire	FM-2786	–	9/1/2008
2008	2008 January Storms	Flood	Storms	GP 2008-01	1/5/2008	–
2006	2006 June Storms	Flood	Storms	DR-1646	–	6/5/2006
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	–	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	–	9/13/2005
2004	Stevens Fire	Wildfire	Wildfire	FM-2541	–	8/8/2004
2002	Sierra Fire	Wildfire	Wildfire	FM-2463	–	9/19/2002
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	1/4/1997

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1995	1995 Late Winter Storms	Flood	Storms	DR-1046	Proclaimed	1/10/1995
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1987	1987 Wildland Fires	Wildfire	Wildfire	GP	9/3/1987 9/10/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1983	Winter Storms	Flood	Flood	DR-677	12/8/82-3/21/83	2/9/1983
1980	1980 April Storms	Flood	Storms	80-01 – 80-25	4/1/1980	–
1977	1977 Drought	Drought	Drought	EM-3023	–	1/20/1977
1973	Southern Pacific Railroad Fires and Explosions (Roseville)	Fire	Explosion	–	4/30/1973	–
1973	1973 Floods and Storms	Flood	Storms	–	2/28/1973	–
1972	1972 Freeze	Freeze	Freeze	–	4/17/1972 5/22/1972 5/31/1972	–
1969	1969 Storms	Flood	Storms	DR-253	1/23/69-3/12/69	1/26/1969
1965	1965 Fires	Wildfire	Wildfire	–	9/18/1965	–
1964	1964 Late Winter Storms	Flood	Storms	DR-183	–	12/24/1964
1963	1963 Floods	Flood	Storms	–	2/14/1964	–
1962	1962 Floods and Rains	Flood	Storms	–	10/17/1962 10/25/1962 10/30/1962 11/4/1962	10/24/1962
1961	1961 Widespread Fires	Wildfire	Wildfire	–	9/18/1961	–
1958	1958 April Storms and Floods	Flood	Storms	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Source: FEMA, Cal OES

Placer County Disaster Declaration Summary Table by Hazard Type 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1977
Economic	1	2001	0	
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1973, 1980, 1983, 1986, 1995 (twice), 1997, 2008, 2017	13	1955, 1958, 1962, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 2006 (twice), 2017
Freeze	1	1972	0	–
Hurricane	0	–	1	2005
Pandemic	1	2020	1	2020
Fire	5	1961, 1965, 1973, 1987, 2010	6	2002, 2004, 2008, 2009, 2014 (twice)
Totals	25	–	22	–

Source: FEMA, Cal OES

Disasters since 2016 Plan

- 2017 Flood (state and federal)
- 2020 Pandemic (2 state and 2 federal)

NCDC Severe Weather Events for Placer County 1950-7/31/2020*

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Avalanche	15	6	12	\$0	\$0	0	0
Blizzard	4	0	0	\$30,000	\$0	0	1
Cold/Wind Chill	19	1	0	\$0	\$0	2	8
Debris Flows	6	0	0	\$8,000	\$0	0	0
Dense Fog	11	6	38	\$2,120,000	\$0	0	1
Dense Smoke	1	0	0	\$0	\$0	0	0
Drought	44	0	0	\$0	\$0	0	0
Excessive Heat	5	6	1	\$0	\$0	0	2
Extreme Cold/Wind Chill	1	0	0	\$0	\$0	0	0
Flash Flood	6	0	0	\$150,000	\$0	0	0
Flood	33	2	1	\$12,370,000	\$7,800,000	0	0
Frost/Freeze	9	0	0	\$200,000	\$5,000,000	0	0
Funnel Cloud	2	0	0	\$0	\$0	0	0
Hail	9	0	0	\$1,000	\$0	0	0

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Deaths (indirect)	Injuries (indirect)
Heat	27	0	3	\$0	\$0	1	1
Heavy Rain	59	2	0	\$10,000	\$0	0	0
Heavy Snow	633	2	6	\$1,675,000	\$0	1	3
High Surf	1	0	0	\$0	\$0	0	0
High Wind	150	0	1	\$12,371,000	\$48,000	0	0
Landslide	1	0	0	\$0	\$0	0	0
Strong Wind	34	1	2	\$2,599,600	\$0	0	0
Thunderstorm Wind	4	0	0	\$20,000	\$0	0	0
Tornado	5	0	0	\$252,530	\$0	0	0
Waterspout	1	0	0	\$0	\$0	0	0
Wildfire	22	3	22	\$500,525,000	\$0	21	0
Winter Storm	154	2	3	\$265,000	\$0	1	1
Winter Weather	93	4	0	\$10,000	\$0	0	2
Total	1,349	35	89	\$532,607,130	\$12,848,000	26	19

Source: NCDC

*Note: Losses reflect totals for all impacted areas

**Due to the regional nature of reporting certain hazard events, these hazards are included in the NCDC database for Placer County

Placer County Hazards Comparison Summary

2016 Placer County Plan	Placer County General Plan Safety Element	2018 State of California Plan Applicable Hazards	Proposed 2021 Hazards
Agricultural Hazards	–	Agriculture Pests and Diseases	<i>(Incorporated into other hazards)</i>
Avalanche	Avalanche Hazards	Avalanche	Avalanche
–	–	Climate Change	Climate Change
Dam Failure	Flood Hazards	Dam Failure	Dam Failure
Drought and Water Shortage	–	Droughts and Water Shortage	Drought and Water Shortage
Earthquake	Seismic and Geological Hazards	Earthquake	Earthquake
Flood: 100/500 year	Flood Hazards	Flood	Flood: 1%/0.2% annual chance
Flood: Localized Stormwater Flooding	Flood Hazards	Flood	Flood: Localized Stormwater Flooding
Hazardous Materials Transport	Hazardous Materials	Hazardous Materials Release/Oil Spills	<i>(Not a natural hazard/ covered in other planning mechanisms)</i>
Landslides and Debris Flows	Seismic and Geological Hazards	Landslide	Landslides, Mudslides, and Debris Flows
Levee Failure	Flood Hazards	Levee Failure	Levee Failure
–	–	Epidemic/Pandemic/Vector Borne Disease Hazards	Pandemic
Seiche	–	–	Seiche
Severe Weather: Extreme Heat	–	Extreme Heat	Severe Weather: Extreme Heat
Severe Weather: Freeze and Snow	–	Freeze	Severe Weather: Freeze and Snow
Severe Weather: Fog (2016-Low)	–	–	<i>(Incorporated into other hazards)</i>
Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind)	–	Severe Weather and Storms	Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning)
Severe Weather: Tornadoes	–	–	Severe Weather: High Winds and Tornadoes
Soil Bank Erosion (2016-Low)	–	–	<i>(Incorporated into other hazards)</i>
Subsidence (2016-Low)	Seismic and Geological Hazards	–	<i>(Incorporated into other hazards)</i>
Wildfire	Fire Hazards	Wildfire	Wildfire

Placer County Hazard Identification 2021

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence		
Avalanche					Medium		
Climate Change					–		
Dam Failure					Medium		
Drought & Water Shortage					High		
Earthquake					Low		
Floods: 1%/0.2% annual chance					Medium		
Floods: Localized Stormwater					Medium		
Landslides, Mudslides, and Debris Flows					Medium		
Levee Failure					Medium		
Pandemic					Medium		
Seiche					Medium		
Severe Weather: Extreme Heat					High		
Severe Weather: Freeze and Snow					Medium		
Severe Weather: Heavy Rains and Storms (Hail, Lightning)					Medium		
Severe Weather: High Winds and Tornadoes					Low		
Wildfire					High		
<table border="0"> <tr> <td style="vertical-align: top;"> <p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> </td> <td style="vertical-align: top;"> <p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> </td> </tr> </table>						<p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p>	<p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p>
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HISTORIC HAZARD EVENTS WORKSHEET

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	
	Please return worksheets by mail, email, or fax to:
Prepared by:	Jeanine Foster, Foster Morrison
Phone:	10298 Boulder Ridge Dr
Email:	Peyton, CO 80831
Date:	fax: (720) 893-0863
	email: jeanine.foster@fostermorrison.com

A.4.2. Risk Assessment Meeting Handouts

Hazard Identification & Profiles: Placer County

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Significant	Highly Likely	Critical	Medium	Medium
Avalanche	Limited	Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Critical	High	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Seiche	Limited	Unlikely	Limited	High	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	High	Low
Tree Mortality	Extensive	Likely	Limited	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact				

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely:** Near 100% chance of occurrence in next year, or happens every year.
- **Likely:** Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional:** Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely:** Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low:** The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low:** Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium:** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High:** Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High:** Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences:** Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences:** Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures:** This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Placer County Planning Area

Agricultural Hazards

- Most agricultural disasters in Placer County are associated with severe weather events, including heavy rains, floods, heat, and drought; insects and noxious weeds are also a concern.
- All but one USDA declarations (24 total) from 2002-2020 were associated with severe weather events; one associated with fire. Since 2012, 20 out of 23 USDA declarations were associated with drought.
- **WHAT ARE THE BIGGEST AG ISSUES RELATED TO NATURAL HAZARDS?**
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Avalanche

- High and moderate avalanche zones are located near the Placer-Nevada County line, south of Donner Lake and Lake Van Norden, east of Tahoe City, near Twin Peaks and McKinney Bay, and in areas near Squaw Valley, Alpine Meadows, and Sugar Bowl.
- Since 2009, there have been 286 avalanche fatalities in the US. There were 20 avalanche fatalities in Placer County between 1982 and 2020. Of these, 2 fatalities occurred in two incidents since the 2016 LHMP.
- **ANY ADDITIONAL ISSUES/CONCERNS SINCE THE 2016 LHMP?**
- Likelihood of Future Occurrence: Likely
- Vulnerability: Low
- Non-Priority Hazard?

Climate Change

- The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- **THE PLACER COUNTY SUSTAINABILITY PLAN HAS LOTS OF GREAT CLIMATE CHANGE INFO. DOES ANYONE HAVE ANY CLIMATE CHANGE CONCERNS/ISSUES TO NOTE?**
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam Failure

- According to data provided by Placer County, CA DWR, and Cal OES, there are 47 dams in the County. Of these, there are 3 extremely high hazard dams, 11 high hazard dams, 9 significant hazard dams, and 12 low hazard dams in Placer County that falls under the jurisdiction of the DSOD (jurisdictional dams

described above). 12 dams in Placer County lie outside the jurisdiction of the DSOD and do not have a hazard classification.

- In addition, there are 2 extremely high (Camp Far West/Rollins) and 4 High Hazard dams (Combie, Magnolia, Mark Edson, Lake Angela) located outside the County with inundation areas in unincorporated Placer.
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.
- Most inundation areas from extremely high and high dams intersect the unincorporated County; 3 dams (inside the County) also intersect Auburn – Lake Valley, LL Anderson, Sugar Pine.
- 4 Dam incidents affecting Placer County: 1964 Hell Hole Dam failure, 1986 Auburn Coffey Dam Failure. August 2004 Ralston Dam Release Gate Break, 2009 Cottonwood dam incident, Oroville Spillway Incidence 2018 (Butte County), OTHERS?
- WHAT ARE THE COUNTY’S BIGGEST CONCERN FROM DAMS? MOST NOTABLE DAMS OF CONCERN?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: High to Extremely High?
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Placer County Planning Area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack at 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they’ve been in 22 years. But then back down again in early 2018, only to be back up again in late 2018/2019. 2019/2020 was experiencing a fair amount of rain early on, and now again as we go in to 2021.
- 1 state (2014) disaster declarations and 1 federal declaration (1977) for Placer County since 1950. 26 USDA disaster declarations for drought 2012 – 2020. There have been 44 NCDRC drought events in Placer County.
- WHAT ARE THE BIGGEST ISSUES/IMPACTS AND CONCERNS IN THE COUNTY FROM DROUGHT AND WATER SHORTAGE?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: High
- Priority Hazard

Earthquake

- Placer County lies between two seismically active regions in the western United States. Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles to the west of the County. Extreme eastern Placer County borders the Basin and Range province that entails most of Nevada and western Utah. This area is riddled with active faults that are responsible for and form the boundary between each basin or valley and the neighboring mountain range.
- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. Placer County falls within an area of mostly low to moderate seismic risk.

- USGS identified 51, 5.0 or greater earthquakes have occurred within 90 miles of Western Placer, and 66, 5.0 or greater earthquakes have occurred within 90 miles of Eastern Placer.
- ANY SPECIFIC PAST OR FELT OCCURRENCES FROM NEARBY EVENTS? PAST DAMAGES? WHAT ABOUT THE EARTHQUAKES ON THE EASTERN SIDE OF THE COUNTY?
- DO COMMUNITIES HAVE A URM OR OTHER INVENTORY OF VULNERABLE SEISMIC BUILDINGS?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: High – Extremely High?
- Priority Hazard?

Flood Hazards

1%/0.5%/0.2% Annual Chance

- Historically, portions of Placer County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that surround/traverse the County.
- 16 state and 13 federal declarations from 1950-present were for heavy rains and flooding. 39 NCDC Flood Events, and an additional 59 events related to severe rain and storms.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- NEED SUMMARY OF IMPACTS FROM THE 2017/2018 FLOOD EVENT (THAT RESULTED IN EOC ACTIVATION AND A DISASTER DECLARATION). NEED INFORMATION ON ANY OTHER EVENTS SINCE THE 2016 PLAN. HOW ABOUT 2019 AND LAST WEEK?
- Likelihood of Future Occurrence: 1%-Occasional; 0.5% and 0.2%-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- CAN THE EACH PARTICIPATING JURISDICTION PROVIDE UPDATED DETAILS ON PROBLEM AREAS? PAST OCCURRENCES?
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON SIGNIFICANT FLOOD EVENTS/ISSUES/AREAS.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- The NCDC contains no records of landslides in the County. There have been no disaster declarations associated with landslides in Placer County.
- Notable landslides of record include the landslides in the Tahoe area along the Truckee River, Squaw Creek, and Bear Creek rivers associated with the 1997 Flood event.
- Recent landslide areas of concern (from 2016 LHMP) include the following: Old Foresthill Road, Ophir Road (two sites) – (1) near Stonehouse Road and (2) near Wise Road, Yankee Jim/s Road. OTHERS?

- Other landslide incidents of varying degrees of magnitude tend to occur in places throughout the County several times in a given year, but in most cases do not cause significant damage or public safety risk.
- ANY CURRENT LOCATIONS/PAST EVENTS TO NOTE?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Low
- Non-Priority Hazard

Levee Failure

- Several levees within Placer County and its incorporated communities (Roseville/Lincoln) have been determined to provide protection from the flood that has a 1-percent-chance of being equaled or exceeded in any given year.
- There are several existing levee systems at the downstream end of Auburn Ravine (mainly past the confluence with Orchard Creek) that are not certified by FEMA as providing protection against a 1% annual chance flood.
- No past occurrences of levee failure. ANY PAST OCCURRENCES/ISSUES/CONCERNS?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Low
- Non-Priority Hazard

Pandemic

- The 20th Century had 3 Pandemics (WHO): 1918-1919 Influenza Pandemic (H1N1), 1957-1958 Influenza Pandemic (H2N2), and the 1968 Influenza Pandemic (H3N2). The 21st Century had 2 Pandemics (WHO): 2009 Swine Flu (H1N1) and 2020 Covid-19.
- One 2020 state and federal declaration for Covid-19; the NCDC does not track pandemics.
- The Placer County EOC was activated for COVID-19 in March – April (Level 1), May (Level 2), and June (Level 3).
- As of early February 2021, there had been over 18,000 cases of Covid-19 in the County and around 200 deaths.
- CAN WE GET A BRIEF SUMMARY OF PLACER COUNTY COVID-19 IMPACTS/ RESPONSE EFFORTS/PRIMARY ISSUES/CONCERNS? WHAT ABOUT THE 2009 SWINE FLU?
- Likelihood of Future Occurrence: Likely
- Vulnerability: High
- Priority Hazard

Seiche

- Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The three faults directly underneath the lake are considered capable of generating magnitude 7.0 or larger earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point, and the casinos in South Lake Tahoe.
- There have been no occurrences of major seiche activity at Lake Tahoe in recent years. University of Nevada geologists have found deposits that extend for 10 miles along the McKinney Bay shore from

Sunnyside through Tahoma. These deposits indicate a tsunami or seiche with 30-foot-high waves occurred approximately 7,000 years ago.

- ANYTHING TO UPDATE FOR SEICHE?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High
- Non-Priority Hazard?

Severe Weather

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 113°F in July 1972 in western Placer. In a typical year, maximum temperatures exceed 90°F on 67.7 days in western Placer.
- In eastern Placer, the highest recorded daily extreme was 94°F in July 1933. In a typical year, maximum temperatures exceed 90°F on 0.4 days in eastern Placer.
- No state or federal disaster declarations. 5 USDA declarations since 2012. 32 extreme heat events (NCDC) since 1950.
- Climate change likely to affect this hazard in the future.
- EOC activations include an Extreme Heat and Potential Rolling Blackout in August 2020; numerous PSPS events: 2018 (2), 2019 (7), 2020 (5).
- IS THERE A SUMMARY OF PSPS EVENTS, AREAS AFFECTED, DURATION, ETC. TO NOTE?
- PLEASE PROVIDE DETAILS ON OTHER EXTREME HEAT EVENTS/MAJOR CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Freeze and Snow

- Annual occurrences of winter weather
- The lowest recorded daily extreme was 16°F in 1972 in western Placer. In a typical year, minimum temperatures fall below 32°F on 22.6 days with 0 days falling below 0°F. Average snowfall on the western side of the County is 1.4 inches
- The lowest recorded daily extreme was -16°F in 1972 in eastern Placer. In a typical year, minimum temperatures fall below 32°F on 209 days with 0.4 days falling below 0°F. Average snowfall on the eastern side of the County is 190.7 inches.
- 913 severe winter weather and freeze events (NCDC) from 1993-2014
- 1 freeze and severe weather state Disaster Declaration, 1972
- HMPC TO REVIEW RISK ASSESSMENT TO PROVIDE DETAILS ON MAJOR FREEZE AND SNOW EVENTS IN THE COUNTY. WHAT ABOUT BIG SNOW EVENTS IN THE EASTERN SIDE OF THE COUNTY SINCE 2016? HOW ABOUT THIS LAST WEEK?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy Rains and Storms (Hail, Lightning, Wind)

- Significant County history: annual occurrences; Severe storms/heavy rains are the primary cause of most major flooding.
- Average annual precipitation in western Placer County is 34.39 inches per year. The highest recorded annual precipitation is 64.87 inches in 1983; the highest recorded precipitation for a 24-hour period is 5.41 inches on October 13, 1962. The lowest recorded annual precipitation was 11.76 inches in 1976.
- Average annual precipitation in eastern Placer County is 31.46 inches per year. The highest recorded annual precipitation is 66.41 inches in 1996; the highest recorded precipitation for a 24-hour period is 7.0 inches on November 4, 1903. The lowest recorded annual precipitation was 9.34 inches in 1976.
- There have been 16 federal and 13 state declarations since 1950 for flooding, including heavy rains and storms. Since 2012, there have been 9 USDA declarations related to heavy rains.
- The NCDC data recorded 68 events for Placer County since 1950.
- CAN THE HMPC PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS, INCLUDING HAIL, LIGHTNING, AND WIND IN THE COUNTY SINCE 2013. PA SHEETS? OTHER?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Tree Mortality

- Tree Mortality has been a significant issue in Placer County since the 2012-2016 tree mortality event in the central and southern Sierra Nevada counties.
- No state or federal disaster declarations for Tree Mortality since 1950. A state of emergency was declared in 2015. NCDC does not track tree mortality issues.
- CAN THE COUNTY PROVIDE US WITH DATA AND PROBLEM AREAS, KEY ISSUES/CONCERNS RELATED TO TREE MORTALITY? INCLUDE BOTH PAST EVENTS, AREAS AFFECTED, AND MITIGATION UNDERTAKEN SINCE 2016.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Placer County Planning Area.
- Any ignition has the potential to become an out of control wildfire.
- Numerous named fires causing a variety of damages.
- 5 state and 6 federal disaster declarations for Wildfire since 1950.
- Cal Fire database lists numerous notable fires; 22 NCDC wildfire events since 1993.
- Significant wildfires since the 2016 LHMP include those where EOC was activated: Trail Head Fire (2016), North Fire, Sliger Fire, and Camp Fire (2018), Fork Fire (2020). NEED SPECIFIC IMPACTS TO COUNTY AND JURISDICTIONS FROM THESE FIRES.
- OTHER SIGNIFICANT HISTORIC WILDFIRES AND PAST DAMAGES/ IMPACTS/ ISSUES SINCE 2016? INCLUDE THOSE BOTH OCCURRING INSIDE AND OUTSIDE THE COUNTY WHERE THE COUNTY WAS AFFECTED? 2020 NORTH COMPLEX FIRE?
- INCLUDE INFORMATION ON IMPACTS AND DAMAGES, AIR QUALITY AND SMOKE ISSUES? EVACUATION OR MUTUAL AID SUPPORT? OTHER?

- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Data Needs

Review of Key Items to Date

- Hazard-specific data
 - ✓ Hazard ID tables
 - ✓ Historic Hazard Worksheets or list of past hazard occurrences and impacts to each jurisdiction
 - Old participating jurisdictions – need past occurrences/hazard history since 2016
 - New participating jurisdictions –significant hazard occurrences - back 50 years or so
- Risk Assessment Worksheets (County)
- Data on future development areas (County/Cities)

Other Data Items

General

- Logos for each participating jurisdiction
- Historic Hazard Data and Key areas affected by Jurisdiction (items identified in today's meeting)
- PA Summaries
- Photos, Photos, Photos
- Review of Updated Chapter 4 Risk Assessment and Jurisdictional Annexes

A.4.3. Mitigation Strategy Meeting Handouts

Handouts specific to the Risk Assessment Meeting can be found in Appendix C.

A.4.4. Final HMPC Meeting Handouts

The Final Meeting handout is contained in Section 2.2 of the Base Plan.

A.4.5. Initial Public Meeting Handouts

Placer County LHMP Update: 2021 Hazards

- Avalanche
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: (1%/0.2% year)
- Flood: Localized/Stormwater
- Landslide, Mudslide, and Debris Flows
- Levee Failure
- Pandemic
- Seiche
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms (Hail, Lightning)
- Severe Weather: High Winds and Tornadoes
- Wildfire

Placer County Historic Hazard Worksheet (Past Occurrences)

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	
	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 10298 Boulder Ridge Dr. Peyton, CO 80831 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.4.6. Final Public Meeting Handouts

The Final Meeting handout is contained in Section 2.2 of the Base Plan.



Appendix B References

2016 Placer County LHMP

2018 California State Hazard Mitigation Plan

2018 State of California Hazard Mitigation Plan

ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.

Bureau of Land Management

CA DWR Best Available Maps

Cal Adapt – Extended Drought Scenarios

CAL FIRE GIS datasets

Cal OES

Cal-Adapt

Cal-Adapt – Annual Average of Acres Burned

Cal-Adapt – Number of Extreme Heat Days by Year

Cal-Adapt – Precipitation: Decadal Averages Map

CalAtlas

California Adaptation Planning Guide

California Climate Adaptation Strategy (CAS) – 2014

California Department of Finance

California Department of Fish and Game

California Department of Parks and Recreation Office of Historic Preservation

California Department of Water Resources

California Department of Water Resources (CA DWR) Division of Safety of Dams

California Department of Water Resources Best Available Maps

California Department of Water Resources Division of Safety of Dams

California Division of Mines and Geology

California Geological Survey

California Natural Diversity Database

California Office of Emergency Services – Dam Inundation Data

California Office of Emergency Services (CAL OES)

California’s Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.

Climate Change and Health Profile Report – Placer County

County staff

Existing plans and studies

FEMA

FEMA Disaster Declaration Database

FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

FEMA’s HAZUS-MH 4.2 GIS-based inventory data

Hazus MH 4.2

HMPC input

Integrated Regional Water Management Plan

IPCC Fifth Assessment Synthesis Report (2014)

Kenward, Alyson PhD, Adams-Smith, Dennis, and Raja, Urooj. Wildfires and Air Pollution – The Hidden Health Hazards of Climate Change. Climate Central. 2013.

Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. Climatic Change. 138: 655. doi:10.1007/s10584-016-1762-6. 2016.

Multi-Hazard Identification and Risk Assessment, FEMA 1997

National Drought Mitigation Center

National Drought Mitigation Center – Drought Impact Reporter

National Institute of Building Science Multi-Hazard Mitigation Council

National Integrated Drought Information System

National Levee Database

National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database

National Oceanic and Atmospheric Administration’s National Climatic Data Center

National Weather Service

Natural Resource and Conservation Service

NOAA Storm Prediction Center

Pacific Gas and Electric Company

Personal interviews with planning team members and staff from the County

Placer County General Plan (2013)

Placer County General Plan Background Report

Placer County Housing Element (2013)

Placer County Housing Element Background Report (2013)

Placer County Resource Conservation District Long Range Strategic Plan (2011)

Placer County Sustainability Plan (2020)

Proceedings of the National Academy of Sciences

Public Health Alliance of Southern California

Public Policy Institute of California

Science Magazine

State of California Department of Conservation

Statewide GIS datasets from other agencies such as Cal OES, FEMA, USGS, CGS, Cal Atlas, and others

U.S. Census Bureau 2010 Household Population Estimates

U.S. Fish and Wildlife Service

U.S. Fish and Wildlife Service's National Wetlands Inventory maps

U.S. Forest Service GIS datasets

U.S. Geological Survey

U.S. Occupational Safety and Health Administration

United States Geological Survey Open File Report 2015-3009

University of California

US Army Corps of Engineers

US Census Bureau

US Department of Agriculture

US Farm Service Agency

US Fish and Wildlife Service

USDA Forest Service Region 5

USGS Bulletin 1847

USGS National Earthquake Information Center

USGS Publication 2014-3120

Vaisala National Lightning Detection Network

Western Regional Climate Center

World Health Organization

Written descriptions of inventory and risks provided by Placer County



Mitigation Strategy

C.1 Mitigation Strategy Handout

Placer County
Local Hazard Mitigation Plan Update
HMPC Meetings #3 & 4 - Mitigation Strategy Meetings
February 24 & March 2, 2021

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AGENDA

Placer County
Local Hazard Mitigation Plan (LHMP) Update
HMPC Meetings #3 & #4 - Mitigation Strategy Meetings
February 24 & March 2, 2021

HMPC Meeting #3: (1.5 hours)

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Priority Hazards Review
4. Develop Plan Goals and Objectives
5. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4: (2 to 2.5 hours)

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Review of Voting Process for Prioritization of Mitigation Actions/Projects
5. Questions

**Mitigation Strategy Meetings
February 24 & March 2, 2021
Day 1**

Status of the 2021 Placer County LHMP Update Project/Next Steps

LHMP Update Project Schedule/Key Dates

2021 LHMP Update Meetings

- **February 24** (Wednesday) HMPC Meeting #3 (Mitigation Strategy: Goals Development) (2:00-3:30 pm)
- **March 2** (Tuesday) HMPC Meeting #4 (Mitigation Strategy: Actions and Projects) (2:00-4:30 pm)
- **June 9** (Wednesday) Public Meeting #2 (6:00-7:30 pm)
- **June 10** (Thursday) HMPC Meeting #5 (2:00-4:00 pm)

Mitigation Strategy Meetings - Follow up

- **March 5** (Friday) Mitigation Strategy Actions and Projects processed and voting site launched
- **March 12** (Friday) Voting ends
- **March 19** (Friday) Foster Morrison to send Mitigation Action prioritization follow up to HMPC
- **April 9** (Friday) Planning Team Mitigation Action (Project) Worksheets due to Foster Morrison

LHMP Document Drafts

- **March 1 – 5** (M-F) Foster Morrison to send out draft Jurisdictional Annexes for input
- **April 9** (Friday) Jurisdictions to return updated Annexes to Foster Morrison
- **April 16** (Friday) HMPC (First) Draft LHMP to County
- **May 7** (Friday) HMPC comments due on Draft Plan
- **May 19** (Wednesday) Comments incorporated into Public Review (Second) Draft to County
- **May 26** (Wednesday) County to place Public Review Draft on County website
- **June 18** (Friday) all final Planning Team and Public input to Foster Morrison
- **June 30** (Wednesday) Public and HMPC comments incorporated and LHMP submittal to Cal OES – June 2021

Participating Jurisdictions

- County
- All 5 incorporated communities (have hazard data returned from all but 2 incorporated communities)
- 19 District Annexes – (have hazard data returned for all but 1 District)
- **25 Total Participating Jurisdictions**

Placer County Hazard Identification & Profiles

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Significant	Highly Likely	Critical	Medium	Medium
Avalanche	Limited	Likely	Limited	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Critical	High	Medium
Drought & Water Shortage	Extensive	Likely	Critical	High	High
Earthquake	Significant	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Limited	Occasional	Critical	High	Medium
Floods: Localized Stormwater	Limited	Occasional/Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flows	Limited	Occasional	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Pandemic	Extensive	Likely	Catastrophic	Medium	Medium
Seiche	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Freeze and Snow	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	High	Low
Tree Mortality	Extensive	Likely	Limited	High	High
Wildfire	Extensive	Highly Likely	Critical	High	High
Geographic Extent		Magnitude/Severity			
Limited: Less than 10% of planning area		Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths			
Significant: 10-50% of planning area		Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability			
Extensive: 50-100% of planning area		Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability			
Likelihood of Future Occurrences		Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid			
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.		Significance			
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.		Low: minimal potential impact			
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.		Medium: moderate potential impact			
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		High: widespread potential impact			
		Climate Change Influence			
		Low: minimal potential impact			
		Medium: moderate potential impact			
		High: widespread potential impact			

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely:** Near 100% chance of occurrence in next year, or happens every year.
- **Likely:** Between 10 and 90% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional:** Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely:** Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low:** The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low:** Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium:** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High:** Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High:** Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences:** Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences:** Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures:** This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Placer County Priority Hazards

- Agricultural Hazards
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Flood: 1%/0.2% annual chance
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Snow
- Severe Weather: Heavy Rains and Storms (hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

Non-Priority Hazards:

- Levee Failure
- Seiche

Jurisdiction: _____

Priority Hazards???

- Agricultural Hazards
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Flood: 1%/0.2% annual chance
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
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- Severe Weather: Heavy Rains and Storms (hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Tree Mortality
- Wildfire

Data Needs

Review of Key Items to Date

- Hazard-specific data
 - ✓ Hazard ID tables
 - ✓ Historic Hazard Worksheets or list of past hazard occurrences and impacts to each jurisdiction
 - Old participating jurisdictions – need past occurrences/hazard history since 2016
 - New participating jurisdictions –significant hazard occurrences - back 50 years or so
 - PA Summaries from 2017 Disaster Declarations for affected communities
- Risk Assessment Worksheet (County)
 - ✓ Data on future development areas (County/Cities)
- Status updates to 2016 Mitigation Actions/Projects

Other Data Items

- Logos for each participating jurisdiction
- Photos, Photos, Photos
- Updated Goals Statements **by March 5th**
- New/Carry over Mitigation Action Worksheets due **by April 9th**
- Jurisdictions to return updated Annexes to Foster Morrison **by April 9th**

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

6. Mitigation Goals
7. Mitigation Actions
8. Mitigation Action (Implementation) Plan

Mitigation Goals

Up to now, the HMPC has been involved in collecting and providing data for the Placer County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of the Placer County Planning Area to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals will lead to incorporating these improvements into the Mitigation Strategy portion of the LHMP. Our planning goals should provide direction for what loss reduction activities can be undertaken to make the Planning Area and Participating Jurisdictions more disaster resistant.

Mitigation Goals are general guidelines that represent the community's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation, cost, schedule, and means are not considered. ***Goals are public policy statements that:***

- **Represent basic desires of the jurisdiction;**
 - **Encompass all aspects of planning area, public and private;**
 - **Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;**
 - **Are future-oriented, in that they are achievable in the future; and**
 - **Are time-independent, in that they are not scheduled events.**
-
- ❖ *While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.*
 - ❖ *Goals statements will form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.*
 - ❖ *The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.*
 - ❖ *Consider other planning area goals from other regional/county/city programs, plans and priorities.*

Types/Sources of other area mitigation plans/ programs include:

- General Plans
- Stormwater Program and Plans
- Flood/Watershed Management Plans and Studies
- Drought Plans, Urban/Integrated Regional Water Management Plan
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Adaptation Plans
- Other?

2018 State Plan/2016 Placer County LHMP Goals

Goals from the 2018 California State Hazard Mitigation Plan

1. Significantly reduce life loss and injuries.
2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities.
3. Protect the environment.
4. Promote community resilience through integration of hazard mitigation with public policy and standard business practices.

Placer County 2016 LHMP Update (This is what we are updating)

Goal 1: Minimize risk and vulnerability of Placer County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards (through well-planned communities)
- Minimize impacts to natural and cultural resources
- Minimize impacts from climate change
- Minimize impacts to watersheds/Promote watershed health
- Prevent and reduce wildland fire risk and related losses
- Prevent and reduce flood risk and related damages, with a focus on repetitive loss structures and infrastructure

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

- Provide protection for critical infrastructure from the wildland fires, floods, and severe storms/weather (e.g., repeaters, cell towers, water tanks, utilities)
- Improve infrastructure/system reliability for critical lifeline utilities, including stormwater systems, roadways (evacuation routes, emergency services and supplies); rail lines, and pipelines.
- Minimize risk of loss of life and injury to At-risk Populations

Goal 3: Improve public awareness, education, and preparedness for all hazards.

- Enhance public outreach, education, and preparedness program to include all hazards of concern (e.g. fire restrictions, water conservation measures, hazardous vegetation, air and water quality issues)
- Increase public knowledge of the risk and vulnerability to identified hazards and their recommended responses to disaster events to reduce losses
- Educate general public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities to include defensible space, hazardous vegetation abatement projects, and forest management projects and practices to reduce flood risk on private property
- Utilize multiple public outreach avenues such as schools, new technologies, and social media
- Coordination with other regional jurisdictions to facilitate (consistent/coordinated) public information function prior to, during and after an event (e.g., facebook, twitter, everbridge, web, tv, radio)

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event.

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities such as fuels reduction and other multi-jurisdictional wildland fire projects
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels/provide for enhanced service levels
- Increase first responders awareness of vulnerable populations and other priority needs during a hazard event;(use of technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.

- Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP's Community Rating System (CRS) where feasible.

Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

General Recommendation for Categories of Goals

- Reduce Losses/Protection of Life, Property, Public Health, and the Environment from all Hazards
- Reduce Losses/Protection of Critical Facilities and Infrastructure from all Hazards
- Public Education
- Increase County Capabilities to all Hazards
- Any Hazard-specific goals

Goals Development

The purpose of goal's development is to reach a consensus on updated goals for the Placer County 2021 LHMP Updates. Provided above are example goals for this LHMP and goals from the previous 2016 Placer County LHMP. *You may reword those above or develop your own updated goals.*

Each person should provide either via chat (on this zoom call) or email to Jeanine.foster@fostermorrison.com: Two (2) goals they would like to see included for this 2021 Placer County LHMP Update. (Please submit by Friday, March 5th)

When collated, we will combine and rework them into 4-6 goals for this LHMP Update and send them out to the HMPC for further review and refinement.

**Mitigation Strategy Meetings
February 24 & March 2, 2021
Day 2**

Mitigation Strategy Action Development: Ground Rules

Rule 1: All Participating Jurisdictions **MUST** have a Mitigation Action/Project to address each of their Priority Hazards (those rated as a high or medium significance in their respective Hazard Identification table).

Rule 2: Every Mitigation Action/Project **MUST** be supported by Risk Assessment Data contained within Chap 4 of the Base Plan and/or within each Participating Jurisdictions' Annexes. Note: this might necessitate backfilling the hazard risk assessment data.

Rule 3: The Mitigation Actions/Projects for this 2021 LHMP Update should reflect each Participating Jurisdictions' WISH LIST for mitigation, regardless of funding source.

Rule 4: Any Mitigation Action/Project that might be considered for FEMA mitigation grant funding over the next 5-years covered by this LHMP **MUST** be included in this 2021 LHMP Update.

Rule 5: While the updated Mitigation Strategy should include all potential Mitigation Actions/Projects for each Participating Jurisdiction (regardless of funding source), keep in mind that no one is obligated to implement **ANY** of the identified Mitigation Actions/Projects – all are always subject to funding and changing priorities.

Rule 6: Each Mitigation Action/Project to be included in this LHMP Update **MUST** have a Mitigation Action Worksheet completed by each Participating Jurisdictions. This applies to Mitigation Actions/Projects being carried forward from the 2016 LHMP.

Rule 7: Participating Jurisdictions **CAN** include Mitigation Actions/Projects that might not get identified during this Mitigation Action/Project Prioritization process – the key is to complete a Mitigation Action Worksheet for any project to be included in the updated LHMP prior to submittal to Cal OES/FEMA.

REMEMBER: Having a FEMA approved LHMP for your Jurisdiction is a prerequisite for being eligible to apply for FEMA pre and post mitigation funding.

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the goals and accomplish risk reduction in the community.

Categories of Mitigation Measures

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
 - ✓ Subdivision regulations
 - ✓ Building Codes
 - Fire-Wise Construction
 - ✓ Floodplain development regulations
 - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
 - ✓ NOAA Weather Radio
 - ✓ Sirens
 - ✓ “Reverse 911” (Emergency Notification System)
- Emergency Response
 - ✓ Evacuation & Sheltering
 - ✓ Communications
 - ✓ Backup power supply/generators
 - ✓ Emergency Planning
 - Activating the EOC (emergency management)
 - Closing streets or bridges (police or public works)
 - Shutting off power to threatened areas (utility company)
 - Holding/releasing children at school (school district)
 - Ordering an evacuation (mayor)
 - Opening emergency shelters (Red Cross)
 - Monitoring water levels (engineering)
 - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection
- Post-Disaster Mitigation
- Building Inspections
 - ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
 - ✓ Floods
 - Wet/Dry floodproofing (barriers, shields, backflow valves)
 - Relocation/Elevation
 - Acquisition
 - Retrofitting
 - ✓ High Winds/Tornadoes
 - Safe Rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - ✓ Winter Storms
 - Immediate snow/ice removal from roofs, tree limbs
 - “Living” snow fences
 - ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
 - Anchoring, bracing, shear walls
 - Dewatering sites, agricultural practices
 - Catch basins
 - ✓ Drought
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (Tamarisk/Salt Cedar)
 - Water Restrictions/Water Saver Sprinklers/Appliances
 - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - ✓ Wildfire, Grassfires
 - Replacing building components with fireproof materials
 - Roofing, screening
 - Create “Defensible Space”
 - Installing spark arrestors
 - Fuels Modification

- ✓ Noxious Weeds/Insects
 - Mowing
 - Spraying
 - Replacement planting
 - Stop overgrazing
 - Introduce natural predators

➤ Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices (“BMPs”) are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground’s surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project’s design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

9. Avoidance: setting construction projects back from the stream.
10. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
11. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained

- Dumping Regulations
- Set-back regulations/buffers

- Fuels Management
- Water Use Restrictions
- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they “stop” flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection:

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Measures from 2016 Placer County LHMP (This is what we are updating)

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Placer County				
Multi-Hazard Actions				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Trail System Way Finding and Directional Signage				
Disaster Debris Management Plan				
Agricultural Actions				
Pest Detection Programs				
Noxious Weed Eradication Programs				
Dam Failure Actions				
Cottonwood Dam Restoration				
Drought Actions				
Retrofit of High Water Use Landscape & Irrigation				
Drought Public Education and Outreach				
Erosion Actions				
Bear Creek Bank Restoration				
Lake Tahoe Basin Environmental Improvement Program (EIP)				
Earthquake Actions				
Fire Station Seismic Upgrade				
Dewitt Demolition				
Health Care Facility Seismic Resiliency				
Flood Actions				
Community Rating System (CRS) Maintain and Enhance				
Stream Channel Clearing – Western Placer County				
Van Norden Dam Lowering and Meadow Restoration				
Miners Ravine Sewer Pipeline Repair				
Sewer System Management Plan Updates				
Stormwater Drainage Improvements				
Bridge and Culvert replacement and drainage improvements				
Urban Level of Flood Protection Mapping				
Elevate Remaining 95 Homes in the Dry Creek Watershed				
Elevate Repetitive Loss Structures in 100-year Floodplain				
Hazardous Material Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Natural Hazard Minimization Evaluation focusing on top 5 facilities in Placer County producing large quantities of hazardous waste/storage of such hazardous materials				
Wildfire Actions				
Large Strategic Fuel Break				
Fuel Breaks in the Wildland Urban Interface (WUI)				
Wildfire Public Education				
Natural Systems Protection / Education and Awareness Programs – Placer County Wildland Urban Interface (WUI) Strategic Planning				
North Fork American River Fuel Break				
Defensible Space Programs				
Project that focus on Open Space/Defensible Space				
Annual Multi-Agency Wildland Fire Drill				
Vegetation Management – Ongoing Maintenance of Fuel Breaks				
City of Auburn				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Lincoln Basin (Downtown) Drainage Infrastructure				
Creek and Stream Cleaning and Maintenance Program				
Implementation of Storm Water Treatment Plan				
Electric Street Diversion Project				
Old Town Auburn Storm Drain System				
American River Canyon Shaded Fuel Break				
Community Education on Wildfire				
Residential Home Inspections for Compliance of Fire Safe Standards; Defensible Space.				
Maintenance of the Private Lands Portion of the Shaded Fuel Break Along the Rim of the American River Canyon and the Auburn State Recreation Area (ASRA)				
City of Colfax				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Continue Annual Weed Abatement Ordinance				
Colfax Schools Evacuation Site Shaded Fuel Break				
Evaluate the Need and Feasibility of Improving Fire Prevention for the Historic Business District				
City of Lincoln				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Lincoln Boulevard: Auburn Ravine Bridge – Reconstruct Bridge				
McBean Park Drive: Auburn Ravine Bridge – Additional 110' Span				
Lakeview Farms Regional Volumetric Mitigation Facility				
Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream Restoration And Culvert Improvement				
"O" Street Drainage Improvements				
7th Street Drainage Improvements				
Auburn Ravine at State Route 193 Bridge				
Auburn Ravine at State Route 65 Bridge				
Ingram Slough – Orchard Creek Return Channel				
Markham Ravine – Updated FEMA Analysis And Mapping				
Markham Ravine Drainage Improvements – Union Pacific Railroad & State Route 65 Crossings				
Auburn Ravine Stream Restoration Projects (Analysis and Repairs)				
Auburn Ravine Stream Restoration Projects (Analysis and Repairs)				
Coon Creek Streambed Restoration Projects (Analysis Only)				
Fire Prevention and Fuels Management Plan				
City of Rocklin				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Federal Emergency Management Agency (FEMA) Floodplain/Community Rating System (CRS)				
Creek Channel and Drainage Way Clearing and Maintenance				
High Water Use Landscape and Irrigation Retrofit				
Open Space Fire Prevention & Vegetation Management Prescribed Grazing				
GIS Based Mapping of Pertinent Information that can be used by All Agencies in the Development of Plans and During Emergency Incidents				
Town of Loomis				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Local Bridges Evaluation Program				
Address signage for property addresses				
Delmar Avenue Headwall Reconstruction Project				
Creek Maintenance Secret Ravine & Antelope Creek				
Reconstruction of Brace Bridge at Secret Ravine				
Raise Flood-Prone Houses Along Loomis Creeks				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Alta Fire Protection District				
Apparatus Water Fill & Drafting Location Improvements				
Evacuation / Reunification Center Improvements				
Natural Systems Protection / Education and Awareness Programs and Community Fuel Breaks				
Natural Systems Protection / Education and Awareness Programs				
Emergency Communications and Information System Improvements.				
Alta Fire Protection District CERT Team				
Reflective Addressing				
Alpine Springs County Water District				
Emergency Electrical Generator Replacement Project				
Water Storage Tank Replacement Project				
Mineral Springs Soil Bank Stabilization Project				
Alpine Meadows Consolidated Defensible Space Continuation Project				
Foresthills Fire Protection District				
Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.				
Foresthill Biomass Project				
Assess and Enhance Foresthill Fire Protection District (FFPD) New Subdivision, Hazard Fuels Clearing and Maintenance Ordinance. Put Programs in Place with Homeowners Associations in CC&R's and Maintenance Contracts.				
Todd Valley Shaded Fuel Break				
Completion of Fuels Management Projects within the Foresthill/Iowa Hill Fire Safe Council, Greater Auburn Area Fire Safe Council and Placer Sierra Fire Safe Council Areas of the Western Slope of Placer County.				
Loomis Fire Protection District				
Identify and inspect ALL bridges in LFPD				
Vegetation Management for Open Areas				
Address Signs for Rural Residences				
Adopt 2016 CFC, CBC, and local standards				
Nevada Irrigation District				
Combie Phase 1 Replacement				
Centennial Water Storage and Power Supply Project				
Water Service Auburn Valley CSD				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
NID Headquarters Office Generator				
Orr Creek Diversion				
Reservoir Cleaning				
Canal Culvert Replacement Program				
Northstar Community Services District				
Martis Landing Drainage Swales and Catch Basins				
Continue Easement Access Road Water Bar Maintenance and Replacement Program				
Fuels Reduction @ Sawmill Reservoir				
Fuels Reduction Program				
Storm Water Drainage Inlet Maintenance				
Siphon Line				
Provide Power from Mobile Generator				
Green Waste Recycling Program				
Enhance our current Defensible Space Program by seeking funding to hire a part-time employee to assist the Fire Prevention department in running this program				
District Water Conservation Program				
North Tahoe Fire Protection District				
FCC P-25 Interoperability Radio Systems				
District GIS Technology, Equipment, Database and Mapping Improvements				
North Tahoe Fire Protection District Critical Facility Infrastructure Improvements				
Seiche Wave Warning Systems, Signs and Public Education				
Defensible Space Inspection, Tree Marking, Chipping Program, and Public Education				
Hazardous Wood Roof Replacement Program				
Regional Water System Fire Protection Upgrades and Interoperability				
Skid Steer Loader with Transport Trailer, Fuels Reduction Masticator Attachment and Snow Blower Attachment				
Hydrant Risers, Replacements and Markers				
North Tahoe Public Utility District				
Update SCADA Equipment and Telecommunications Infrastructure				
IT and Telecommunications Improvements for Disaster Preparedness				
Update Emergency Response Plan				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Backup Generator Installation at Critical Facilities				
Fuels Reduction around Critical Infrastructure and North Tahoe Regional Park				
Kingswood West Subdivision Emergency Evacuation Access				
North Tahoe Regional Park Road Improvements for Emergency Access				
Seismic Study and Retrofit of Critical Infrastructure				
Sewer Main Replacements in Shorezone of Lake Tahoe				
Water Booster Pump Station Rehabilitation/Replacement				
Increased Storage Capacity for Dollar Cove Water System				
Water System Interties				
Placer County Flood Control District				
FEMA CTP DFIRM Mapping Study				
Pursue Regional Detention and Retention Projects within the Dry Creek and Cross Canal Watersheds				
Update Hydrology and Hydraulic Models within the Cross Canal Watershed				
Upgrade of Flood Warning System to Include Additional Gage Locations and Flood Forecasting Capabilities				
Placer County Water Agency				
Hillside Slope Stabilization				
LL Anderson Dam Spill Way Modification				
Water System Interties				
Vegetation Management and Brushing				
Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas				
Replace Wooden Flume Structures				
De-Silt Reservoirs.				
Placer Hills Fire Protection District				
Assess And Enhance Placer Hills Fire Protection District (PHFPD) Onsite Water Requirements For Minor Lot Splits				
South Placer Fire Protection District				
Vegetation Management for Open Areas				
Address Signs for Rural Residences				
Adopt 2016 CFC, CBC, and local standards				
Squaw Valley Public Service District				
Emergency Water Supply Interconnection to Martis Valley				
Truckee River Siphon				

Action Title	Complete	Ongoing	Not Yet Started	In 2021 Plan Update
Squaw Creek Siphon				
Easement Abatement/Maintenance of Emergency Access				
Develop a Community-Wide Emergency Notification System Capable of Providing Information to Both Residents and Visitors by Utilizing Permanent, Roadside Changeable Message Boards and a Low-Power Radio Transmitter				
SVPSD/Mutual Water Company Inter-tie				
Water Tank Earthquake Retrofit Project				
Tahoe City Public Utility District				
Bunker Water Tank Replacement				
West Lake Tahoe Regional Water Treatment Plant				
Tahoe Main Emergency Water Supply				
Tahoe Truckee Unified School District				
North Tahoe High School and Middle School, Tahoe Lake Elementary School Emergency Generators.				
School Site and Community Education of Procedures Related to Safety and Emergency Situations. Improvement of District Wide Emergency Communication and Alert Systems.				
HVAC Control Upgrades				
Truckee Fire Protection District				
Community Wildfire Protection Plan				
Severe Winter Weather and Propane Issues Mainly in Serene Lakes				

Mitigation Strategy: Action (Implementation) Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect ...
 - ✓ The largest # of people exposed to risk?
 - ✓ The largest # of buildings?
 - ✓ The largest # of jobs?
 - ✓ The largest tax income?
 - ✓ The largest average annual loss potential?
 - ✓ The area impacted most frequently?

- ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization (Voting) Instructions

The mitigation actions and projects will be further collated by hazard and will be presented back to the HMPC for prioritization. **An email link to the voting site will be launched Friday March 5th; voting will be open for a week and will close Friday March 12th.** The voting website location is <https://fostermorrison.aweeba.com/>.

Each person will have 9 votes total to vote for their preferred mitigation actions/projects:

- *3 high priority votes (5 points each)*
- *3 medium priority votes (3 points each)*
- *3 low priority votes (1 point each)*

Your votes will indicate the consensus of the team.

Use the list of mitigation selection criteria (above) to help you make your determinations.

After the votes are tabulated, we will send out an email detailing mitigation action prioritization results and next steps.

Mitigation Action Worksheet

Jurisdiction:	
Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background:	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Cost Estimate:	
Benefits (Losses Avoided):	
Potential Funding:	
Timeline:	
Project Priority:	

Worksheet completed by:	
Name and Title:	
Phone:	

C.2 Mitigation Strategy Meetings – Action Prioritization

Placer County 2021 LHMP Update

Mitigation Strategy Meetings – Action Prioritization

50 Voting Members

Actions sorted by Vote Totals

Mitigation Action Title	Hazards Addressed	Points/Worksheet Status
Backup power supply for critical facilities and infrastructure/Generator projects	Multi-Hazard	37
Community Wildfire Protection Plans (CWPP) – Implementation of Projects	Wildfire/Tree Mortality	36
Fire Prevention and Fuels Management Plan	Wildfire/Tree Mortality	35
Continue to implement, and update as necessary, the Strategic Plan for Placer County Wildfire Protection and Biomass Utilization Program to seek ways to reduce the efforts of catastrophic wildfires, and convert unwanted woody biomass to produce heat and/or electrical power, alternative transportation fuels, or beneficial bio-based chemicals and products.	Wildfire/Tree Mortality	30
Critical Facility Infrastructure Improvements	Multi-Hazard	30
Fuel reduction projects	Wildfire/Tree Mortality	29
Open Space fire prevention & vegetation management prescribed grazing	Wildfire/Tree Mortality	29
Defensible space inspection, tree marking, chipping program and public education	Wildfire/Tree Mortality	27
Expand the county's capacity to restore conifer forest health on private and public lands, which includes active management to reduce fire risk, including removal and disposal of diseased trees and other fuels. Work with public and private partners to identify appropriate locations for mills, biomass facilities, or other facilities that support the reuse of trees for other uses, including composting and renewable energy.	Wildfire/Tree Mortality	26
Implement the actions contained within the Placer County Climate Adaptation Plan	Climate Change	24
Work with telecommunication companies to install fiber-optic infrastructure allowing for faster and higher-capacity broadband internet, including telecommunication systems that can be used to more effectively distribute emergency communications and alerts to members of the public	Multi-Hazard	24
Construct additional water storage facilities and improve existing facilities to augment surface and groundwater supplies for agricultural uses while continuing to provide ecosystem protections	Agricultural Hazard/Drought	22
Implement the actions contained within the Placer County Sustainability Plan	Climate Change	21

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Chipper program	Wildfire/Tree Mortality	21
Vegetation management – Ongoing maintenance of fuel breaks	Wildfire/Tree Mortality	21
Water source redundancy and reliability projects	Drought and Water Shortage	20
McBean Park Drive: Auburn Ravine bridge – additional 110' Span	Flood	20
Lakeview Farms regional volumetric mitigation facility	Flood	20
Water system intertie projects and connections	Drought and Water Shortage	19
Defensible space program	Wildfire/Tree Mortality	19
Establish a Biomass Facility – fixed/portable	Wildfire/Tree Mortality	19
Expand broadband/wifi access	Multi-Hazard	18
Develop an Avalanche Risk Reduction and Response Plan (multi-agency) for Placer County	Avalanche	17
Establish emergency water supply interconnections	Drought and Water Shortage	17
Implement organics waster (food and green waste) reduction/recycling programs to reduce emissions from the decomposition of organic waste in the landfill (organics creates methane, which contributes to climate change; Cal Recycle requires 75% reduction by 2025)	Climate Change	16
Vegetation management projects	Wildfire/Tree Mortality	16
Enhance public education and awareness of natural hazards and public understanding of disaster preparedness	Multi-Hazard	16
Increase broadband systems and access	Pandemic	15
Continue to support new FireWise communities/conduct FireWise community inspections	Wildfire/Tree Mortality	15
Explore creating wildfire abatement districts to provide fuel-clearing services and maintenance of defensible space on public and private land within the county.	Wildfire/Tree Mortality	15
Drainage improvement projects	Flood	14
Large strategic fuel breaks, including those in the Wildland Urban Interface (WUI) areas	Wildfire/Tree Mortality	14
Evacuation planning countywide	Multi-Hazard	14
Noxious weed eradication programs	Agricultural Hazard	13
Ensure that County facilities used as cooling centers are equipped with backup power supplies, including on-site renewable energy generation and energy storage systems as feasible	Severe Weather: Heat	13

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Home hardening projects	Wildfire/Tree Mortality	13
Pest detection programs	Agricultural Hazard	12
Enhance programs and improve capabilities/efficiency to receive/recycle green waste	Climate Change	12
FEMA CTP DFIRM mapping study	Flood	12
Undergrounding of utilities	Severe Weather: All	12
Improve water systems for suppression and resiliency against wildfires	Wildfire/Tree Mortality	12
Identify/support new or expanded fuel reduction projects, including those that provide assistance for biomass facilities.	Wildfire/Tree Mortality	12
Work with stakeholders to develop a pilot project on private or public land that demonstrates the cost-savings of treating and managing land for wildfire prevention in relation to air quality and other ecosystem services. The project could consider both direct (i.e. homes and roadways) and indirect costs (i.e. social capital and air quality), the costs of management and prevention compared to the costs of no action and recovery, and the emission reduction potential of good forest management to the extent possible.	Wildfire/Tree Mortality	11
GIS based mapping of pertinent information that can be used by all agencies in the development of plans and during emergency incidents	Multi-Hazard	11
Increase soil organic matter to improve soils' water-holding capacity, soil structure, and water infiltration, and to reduce erosion (use cover crops and mixes, native grasses, crop or livestock residues, compost, mulch, biochar, or other organic amendments)	Drought and Water Shortage	10
Lincoln Boulevard: Auburn Ravine bridge – reconstruct bridge	Flood	10
Auburn Ravine stream restoration projects	Flood	10
Wildfire smoke impact response – education and outreach	Wildfire/Tree Mortality	10
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Multi-Hazard	10
Interoperability radio systems	Multi-Hazard	10
Develop Climate Adaptation Plan	Climate Change	9
Sedimentation removal from reservoirs	Dam Failure	9
Floodproofing utilities and critical facilities and infrastructure	Flood	9
Repair and replace lift stations	Flood	9
Prescribed burns	Wildfire/Tree Mortality	9
Fuel reduction for previously burned areas	Wildfire/Tree Mortality	9
Explore the feasibility of installing a microgrid at the Placer County Government Center for backup power and evaluate the feasibility of microgrids in Tahoe or Foresthill to provide emergency response and economic resiliency.	Multi-Hazard	9

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Conduct seismic evaluation and retrofits of public buildings and critical facilities and infrastructure	Earthquake	8
Stream and creek channel and drainage way clearing and maintenance projects	Flood	8
Natural Systems Protection / Education and Awareness Programs – Placer County Wildland Urban Interface (WUI) Strategic Planning	Wildfire/Tree Mortality	7
Install piezometers in earthen dams	Dam Failure/ Earthquake	6
Increase the use of permeable surfaces and rainwater catchment/retention systems in developed areas to enhance groundwater recharge	Drought and Water Shortage	6
Support the West Placer Groundwater Sustainability Agency’s efforts to develop a Groundwater Sustainability Plan in accordance with state regulations	Drought and Water Shortage	6
Water tank earthquake retrofit project	Earthquake	6
Bridge and culvert replacement projects	Flood	6
Auburn Ravine at State Route 193 Bridge	Flood	6
Upgrade of flood warning systems to include additional gage locations and flood forecasting capabilities	Flood	6
Update hydrology and hydraulic models within the Cross Canal Watershed	Flood	6
Conduct avalanche mitigation in high risk areas	Avalanche	5
Foresthill Transfer Station – Increase the amount of tipping bays for green waste to improve efficiency.	Climate Change	5
Explore ways to improve the storage capacity and generation efficiency at PCWA/County hydroelectric power plants and to increase installation of small-scale hydroelectric facilities. Identify areas appropriate for small-scale hydroelectric facilities	Climate Change	5
Spillway projects to control the flow of water	Dam Failure	5
Water booster pump station rehabilitation/replacement	Drought and Water Shortage	5
Installation of SCADA systems	Flood	5
Pursue regional detention and retention projects within the Dry Creek and Cross Canal Watershed	Flood	5
Conduct structural retrofits of at-risk bridges to protect against flooding and landslides/debris flows. Emphasize bridges with lower stability ratings and higher traffic counts. E.g., Edgewood Road over Wise Canal and Dry Creek Road over Rock Creek	Flood/Landslide	5
Develop a communitywide emergency notification system capable of providing information to both residents and visitors by utilizing permanent, roadside changeable message boards and a low power transmitter	Multi-Hazard	5
IT and telecommunications improvements for disaster preparedness	Multi-Hazard	5
In coordination with utility companies, explore replacing streetlights with new models, or augmenting existing streetlights with additional features, allowing them to act as public Wi-Fi beacons, traffic counters, and relay stations for public emergency alerts. Prioritize development of smart street lights in the Tahoe Basin	Multi-Hazard	5

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Update the Emergency Operations Plan to include dam failure events	Dam Failure	4
Groundwater recharge projects	Drought and Water Shortage	4
Squaw Creek siphon	Drought and Water Shortage	4
Increased Storage Capacity for Dollar Cove Water System	Drought and Water Shortage	4
Elevate remaining 95 homes in the Dry Creek Watershed	Flood	4
Enhance/continue weed abatement ordinance/hazardous vegetation ordinance	Wildfire/Tree Mortality	4
Hydrant risers, replacements, and markers	Wildfire/Tree Mortality	4
GIS technology, equipment, database, and mapping improvements	Multi-Hazard	4
Local air quality sensors to provide instantaneous public information on local PM concentrations due to wildfire smoke	Multi-Hazard	4
Conduct ongoing public outreach about water conservation programs throughout Placer County	Drought and Water Shortage	3
Canal culvert replacement program	Flood	3
Ensure that wastewater infrastructure in flood-prone areas is hardened to minimize the risk of overflow	Flood	3
Erosion repair and control projects	Flood	3
Best Management Practices (BMP) implementation	Flood	3
Coon Creek streambed restoration projects	Flood	3
Urban level of flood protection mapping	Flood	3
Stormwater drainage inlet maintenance	Flood	3
Increase resiliency of single-access roads and trails (particularly popular trails and those that could provide access to isolated communities if the primary road is damaged or inaccessible) to flooding by improving drainage systems, increasing roadbed height, and other protective steps as feasible and appropriate	Flood	3
North Fork American River fuel break	Wildfire/Tree Mortality	3
Establish underground waterlines for delivery to fire hydrants	Wildfire/Tree Mortality	3
Improve access to canals and ditches by emergency vehicles to access water for fire fighting	Wildfire/Tree Mortality	3
Replace wooden flume structures	Wildfire/Tree Mortality	3
Coordinate with the California Department of Housing and Community Development, mobile home park owners, and mobile home tenants in wildfire hazard zones to reduce fuel availability and maximize defensible space.	Wildfire/Tree Mortality	3
New flood/hydrology related studies should factor climate change into models to accommodate future floods events	Climate Change	2

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Provide education and outreach on organic waste and GHG emissions	Climate Change	1
Increase access to organics recycling and edible food recovery capacity	Climate Change	1
Sewer main replacements in Shorezone of Lake Tahoe	Drought and Water Shortage	1
Elevate repetitive loss structures in 100-year floodplain	Flood	1
Relocation of 36" sewer line that crosses the Truckee River below Lake Tahoe. (The river water level reaches this pipe at a release of 2000 cfs from Lake Tahoe)	Flood	1
Auburn Ravine at State Route 65 Bridge	Flood	1
HVAC system upgrades	Pandemic	1
Place warning signage in key areas around Lake Tahoe	Seiche	1
Using cool roofing products that reflect sunlight and heat away from buildings	Severe Weather: Heat	1
Regional water system fire protection upgrades and interoperability	Wildfire/Tree Mortality	1
Work with dam owners to maintain all dams in Placer County to a high degree of structural integrity	Dam Failure/ Earthquake	0
Enhance canals by converting earthen canals to gunite-lined canals in critical areas	Drought and Water Shortage	0
Develop a rebate program for greywater and rainwater catchment systems	Drought and Water Shortage	0
West Lake Tahoe regional water treatment plant	Drought and Water Shortage	0
Community Rating System (CRS) - maintain and enhance	Flood	0
Develop/update/implement stormwater master plans	Flood	0
Raise/relocate utilities out of the floodplain/above base flood elevation	Flood	0
Elevate roads above base flood elevation to maintain dry access	Flood	0
Gladding Parkway, Lincoln Boulevard, McCourtney Road – Stream restoration and culvert improvement	Flood	0
"O" Street drainage improvements	Flood	0
7th Street drainage improvements	Flood	0
Ingram Slough – Orchard Creek return channel	Flood	0
Markham Ravine – Updated FEMA analysis and mapping	Flood	0
Markham Ravine drainage improvements – Union Pacific Railroad & State Route 65 crossings	Flood	0
Conduct regular cleaning and maintenance of storm drains along key roadways, especially in advance of the rainy season. Improve storm drain capacity in areas where ponding is regularly observed	Flood	0
Siphon lines	Flood	0
Annually distribute flood protection safety pamphlets to educate citizens about safety during flood conditions, including the dangers of driving on flooded roads	Flood	0

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Hillside Slope Stabilization	Flood/Landslide	0
Install warning/siren system	Seiche	0
Severe Weather Annex update and revision	Severe Weather: All	0
Increase tree plantings around buildings to shade parking lots and along public rights-of-way	Severe Weather: Heat	0
Fuel reduction around critical infrastructure and North Tahoe Regional Park	Wildfire/Tree Mortality	0
Shaded fuel break along west shore of Folsom Lake – Granite Bay	Wildfire/Tree Mortality	0
Evaluate the need and feasibility of improving fire prevention for the historic business districts	Wildfire/Tree Mortality	0
Acquire skid steer loader with transport trailer, fuels reduction masticator/snow blower attachment	Wildfire/Tree Mortality	0
Easement abatement/maintenance of emergency access areas	Wildfire/Tree Mortality	0
North Tahoe Regional Park road improvements for emergency access	Multi-Hazard	0

C.3 Categories of Mitigation Measures Considered

The following categories of mitigation measures are based on the Community Rating System.

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information

C.4 Placer County Analysis of Alternative Mitigation Measures per Category

Note: This review of mitigation measures is in compliance with the FEMA's nationally accepted six mitigation categories and FEMA's CRS Program requirement to provide a comprehensive evaluation of the six mitigation categories with a specific requirement that Preventative Measures be thoroughly reviewed. This review leads to the projects incorporated into the mitigation strategy action plan.

C.4.1. Preventive Measures

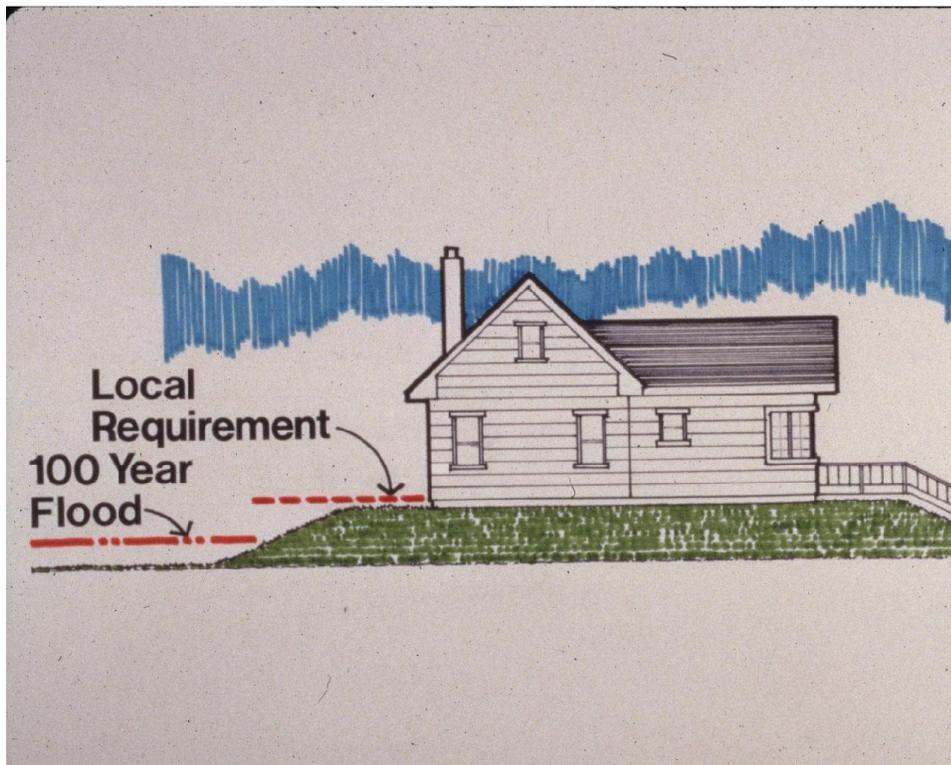
Preventive measures are designed to keep a problem - such as flooding - from occurring or from getting worse. The objective of preventive measures is to ensure that future development is not exposed to damage and does not cause an increase in damages to other properties. Building, zoning, planning and code enforcement offices usually administer preventive measures. Some examples of types of preventive measures include:

- Building codes and floodplain regulations
- Comprehensive land use planning, zoning, and open space preservation
- Stormwater management and subdivision regulations

Building Codes

Building codes provide one of the best methods of addressing natural hazards. When properly designed and constructed according to code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. Building codes can ensure that the first floors of new buildings are constructed to be higher than the elevation of the 100-year flood (the flood that is expected to have a one percent chance of occurring in any given year). This is shown in Figure 0-1.

Figure 0-1 Building Codes and Flood Elevations



Floodplain Regulations

Most communities with a flood problem participate in the National Flood Insurance Program (NFIP). The NFIP sets minimum requirements for the participating communities' standards for development, subdivision of land, construction of buildings, installation of mobile homes, and improvements and repairs to buildings. These are usually spelled out in a separate ordinance.

The NFIP minimum requirements are summarized below. It should be stressed that these are minimum requirements. Local conditions, such as high velocity flooding or the presence of a potential dam failure, may warrant higher local standards.

Enforcement

To ensure that communities are meeting the NFIP standards, FEMA periodically conducts a Community Assessment Visit. During this visit, the maps and ordinances are reviewed, permits are checked, and issues are discussed with staff. Failure to meet all of the requirements can result in one or more consequences:

- Reclassification under the Community Rating System to a higher class
- Probation, which entails a \$50 surcharge on every flood insurance policy in the community, or
- Suspension from the NFIP.

Suspension is the most serious. It means that the community is out of the NFIP and the following sanctions are imposed:

- Flood insurance will not be available. No resident will be able to purchase a flood insurance policy.
- Existing flood insurance policies will not be renewed.
- No direct federal grants or loans for development may be made in identified flood hazard areas under programs administered by federal agencies, such as HUD, EPA, and the Small Business Administration.
- Federal disaster assistance will not be provided to repair insurable buildings located in identified flood hazard areas for damage caused by a flood.
- No federal mortgage insurance or loan guarantees may be provided in identified flood hazard areas. This includes policies written by FHA, VA, and others.
- Federally insured or regulated lending institutions, such as banks and credit unions, must notify applicants seeking loans for insurable buildings in flood hazard areas that there is a flood hazard and the property is not eligible for federal disaster relief.

These sanctions can be severe for any community with a substantial number of buildings in the floodplain. Most communities with a flood problem have joined the NFIP and are in full compliance with their regulatory obligations.

One way to assure good administration and enforcement is to have Certified Floodplain Managers on staff. The Association of State Floodplain Managers administers the national Certified Floodplain Manager (CFM®) program.

Minimum National Flood Insurance Program Regulatory Requirements

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA). As a condition of making flood insurance available for their residents, communities that participate in the NFIP agree to regulate new construction in the area subject to inundation by the 100-year (base) flood. The floodplain subject to these requirements is shown as an A or V Zone on the Flood Insurance Rate Map (FIRM).

There are five major floodplain regulatory requirements. Additional floodplain regulatory requirements may be set by state and local laws.

1. All development in the 100-year floodplain must have a permit from the community. The NFIP regulations define "development" as any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.
2. Development along a river or other channel cannot obstruct flows so as to cause an increase in flooding on other properties. An analysis must be conducted to demonstrate that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.
3. New buildings may be built in the floodplain, but they must be protected from damage from the base flood. In riverine floodplains, the lowest floor of residential buildings must be elevated to be at or above the base flood elevation (BFE). Nonresidential buildings must be either elevated or floodproofed.

4. Under the NFIP, a "substantially improved" building is treated as a new building. The NFIP regulations define "substantial improvement" as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This requirement also applies to buildings that are substantially damaged.
5. Communities are encouraged to adopt local ordinances that are more comprehensive or provide more protection than the federal criteria. The NFIP's Community Rating System provides insurance premium credits to recognize the additional flood protection benefit of higher regulatory standards.

Local Implementation

Placer County has adopted the 2019 California Building Code based on the 2018 International Building Code. Placer County has Floodplain Damage Prevention Regulations that exceed minimum NFIP standards and implement floodplain regulations that include some higher regulatory standards.

Just as important as having code standards is the enforcement of the code. Adequate inspections are needed during the course of construction to ensure that the builder understands the requirements and is following them. Making sure a structure is properly elevated and anchored requires site inspections at each step.

Reduce Future Flood Losses

Future flood losses should be reduced by enforcement of current floodplain regulations. For new residential construction and substantial improvement, Placer County requires that the lowest floor be elevated a minimum of one foot above the base flood elevation. It is recommended that the finish floor be a minimum of two feet above the base flood elevation in order to prevent inundation of floor joists, insulation and other appurtenant components located on the underside of the finish floor. Non residential construction shall either be elevated to conform to the residential standard or be floodproofed so that below the base flood level the structure is watertight, "with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy." This reduces future flood losses by keeping development out of known floodplains. This is done by enacting and enforcing the current standards and/or adopting higher regulatory standards.

Current Standards

As mentioned above, Placer County has Flood Damage Prevention Regulations that meet all of the NFIP's minimum floodplain regulatory requirements and exceed some of them such as establishing one foot of freeboard. Their regulations include methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increase in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Controlling fill, grading, dredging, and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

In addition, all new construction or substantial improvements shall be:

- Designed or modified and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy
- Constructed in ways that minimize flood damage
- Constructed with materials resistant to flood damage
- Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities designed or located so as to prevent water from entering or accumulating within components during flooding

Placer County also requires that:

- All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from systems into floodwaters.
- On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

Placer County also has regulations that exceed minimum NFIP standards. These include:

- Floodways are delineated and certain requirements apply to construction within these floodways so as to not result in any increase in flood levels during the occurrence of the base flood discharge.
- Requiring new construction and substantial improvements to have the lowest flood, including basement, elevated a minimum of one foot above the base flood elevation.
- All building permit applicants who may be located in Flood Zone A must have a California registered engineer prepare an engineering study including an evaluation of the building site, determination as to whether the structure will be located in a 100-year flood zone and supporting flood data.
- Restrictions and standards are included on the use of enclosures below elevated buildings.

In addition, Placer County's floodplain management program is implemented by Certified Floodplain Managers on staff with the County's Department of Public Works Stormwater and Floodplain Programs.

Manufactured Homes

Manufactured or mobile homes are usually not regulated by local building codes. They are built in a factory in another state and are shipped to a site. They do have to meet construction standards set by the U.S. Department of Housing and Urban Development. All mobile homes constructed after 1976 must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements. Local jurisdictions may regulate the location of these structures and their on-site installation.

Local Implementation

Placer County requires that all manufactured homes that are placed or substantially improved within a special flood hazard area on the community's Flood Insurance Rate Map: (1) outside of a manufactured home park or subdivision, (2) in a new manufactured home park or subdivision, (3) in an expansion to an existing manufactured home park or subdivision, (4) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood: will be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to a minimum

of one foot above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation collapse and lateral movement. All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision on the community's Flood Insurance Rate Map that are not subject to the provisions of subsection A of this section will be elevated so that either: 1) The lowest floor of the manufactured home is a minimum of one foot above the base flood elevation; or 2) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than thirty-six (36) inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.

CRS Credit

Building Codes: The CRS encourages strong building codes. It provides credit in two ways: points are awarded based on the community's BCEGS classification and points are awarded for adopting the International Code series. Placer County's BCEGS rating is a Class 2 for both residential and commercial. Placer County uses the 2019 California Building Code.

The CRS also has a prerequisite for a community to attain a Class 6 or better within the CRS program, the community must have a BCEGS class of 5/5 or better. To attain a Class 4 or better in the CRS program, the community must have a BCEGS class of 4/4 or better. Placer County has a BCEGS classification of 2/2. Placer County has also adopted the 2018 International Code series.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. The National Flood Insurance Reform Act of 1994 codified the Community Rating System in the NFIP.

- The CRS recognizes 18 creditable activities, organized under four categories numbered 300 through 600:
 - ✓ Public Information
 - ✓ Mapping and Regulations
 - ✓ Flood Damage Reduction
 - ✓ Flood Preparedness
- Placer County participates in the Community Rating System (CRS) of the National Flood Insurance Program.
- By implementing these floodplain management activities, the residents of Placer County can qualify for a flood insurance premium rate reduction. When communities go beyond the minimum standards for floodplain management, the CRS can provide discounts up to 45% off flood insurance premiums.

The County of Placer is currently a Class 5 community, which provides a 25% discount on flood insurance to properties located in the Special Flood Hazard Area.

Floodplain management regulations: There are many higher regulatory standards that warrant CRS credit. These standards include:

- Delineating a floodway, the area of higher hazard near the channel. This would allow development outside the floodway (called the "floodplain fringe") without engineering studies to determine their impact on others.

- Requiring all new construction to be elevated one or two feet above the base flood elevation to provide an extra level of protection from waves and higher floods. This extra protection is reflected in a distinct reduction in flood insurance rates.
- Having all developers (not just the larger ones) provide flood data where none are available.
- Specifications to protect foundations from erosion, scour and settling.
- Prohibiting critical facilities from all or parts of the floodplain.
- Prohibiting hazardous materials.
- Requiring buffers adjacent to streams or natural areas.
- Restrictions on use of enclosures below elevated buildings.
- Flood storage lost due to filling and construction must be compensated for by removal of an equal volume of storage.
- The CRS also provides credit for having trained staff and a higher credit if the staff members are Certified Floodplain Managers.

It should be noted that one of the prerequisites for participation in the CRS is that the community be in full compliance with the minimum requirements of the NFIP. A community with a number of "potential violations" risks being removed from the CRS entirely.

Manufactured homes: The NFIP allows communities to exempt mobile homes in existing mobile home parks from some of the flood protection requirements. The CRS provides up to 50 points if the community does not use this exemption.

Comprehensive Land Use Planning, Zoning, and Open Space Preservation

Building codes provide guidance on how to build in hazardous areas. Planning and zoning activities direct development away from these areas, particularly floodplains and wetlands. They do this by designating land uses that are compatible with the natural conditions of land that is prone to flooding, such as open space or recreation. Planning and zoning activities can also provide benefits by simply allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach.

General and Comprehensive Plans

These plans are the primary tools used by communities to address future development. They can reduce future flood-related damages by indicating open space or low density development within floodplains and other hazardous areas. Unfortunately, natural hazards are not always emphasized or considered in the specific land use recommendations.

Generally, a plan has limited authority. It reflects what the community would like to see happen. Its utility is that it guides other local measures, such as capital improvement programs, zoning ordinances, and subdivision regulations.

Capital Improvement Plans

A capital improvement plan can guide a community's major public expenditures for a 5- to 20-year period. Capital expenditures may include acquisition of open space within the hazardous areas, extension of public services into hazardous areas, or retrofitting existing public structures to withstand a hazard.

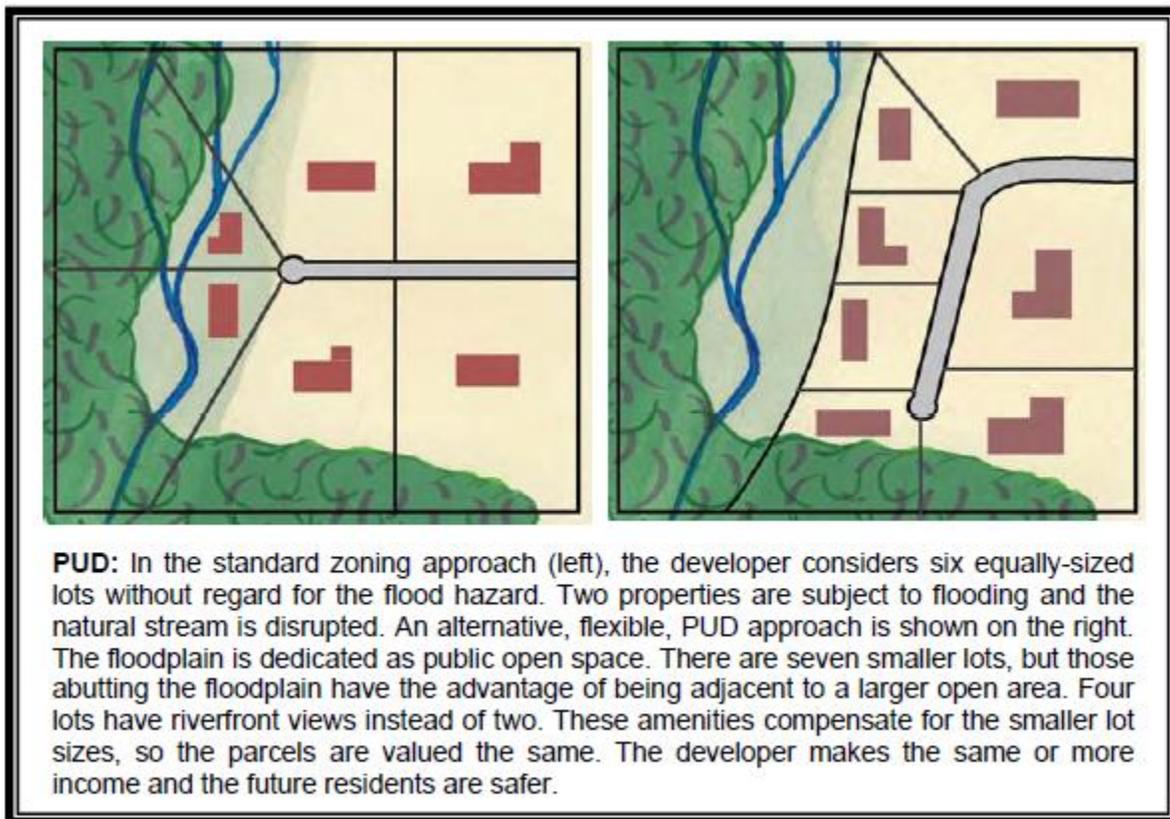
Zoning

A zoning ordinance regulates development by dividing a community into zones or districts and setting development criteria for each of those zones or districts. Zoning codes are considered the primary tool to implement a general/comprehensive plan's guidelines for how land should be developed.

Zoning ordinances can limit development in hazardous areas, such as reserving floodplain zones for agricultural uses. Often, developers will produce a standard grid layout. The ordinance and the community can allow flexibility in lot sizes and location so developers can avoid hazardous areas.

One way to encourage such flexibility is to use the planned unit development (PUD) approach or cluster development. The PUD and cluster approach's allows the developer to easily incorporate flood hazard mitigation measures into the project. Open space or floodplain preservation can be facilitated as site design standards and land use densities can be adjusted to fit the property's specific characteristics, as shown in Figure 0-2.

Figure 0-2 Zoning for Development in the Floodzone



Open Space Preservation

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. Open space can be maintained in agricultural use or can serve as parks, greenway corridors and golf courses.

Comprehensive and capital improvement plans should identify areas to be preserved by acquisition and other means, such as purchasing an easement. With an easement, the owner is free to develop and use private property, but property taxes are reduced or a payment is made to the owner if the owner agrees to not build on the part set aside in the easement.

Although there are some federal programs that can help acquire or reserve open lands, open space lands and easements do not always have to be purchased. Developers can be encouraged to dedicate park land and required to dedicate easements for drainage and maintenance purposes. These are usually linear areas along property lines or channels. Maintenance easements also can be donated by streamside property owners in return for a community maintenance program.

Local Implementation

General Plan: On May 21, 2013, Placer County adopted their new General Plan. As part of the 2013 General Plan update, the County revised the standards pertaining to new flood protection requirements. This included changes to the Safety Element and other areas of the General Plan and includes the introduction of the term “County Regulatory Floodplains” that includes both the 100-year FEMA floodplain and the 200-year floodplain. No update to the flood damage prevention ordinance is required since current regulations already regulate projects in the regulatory floodplain. Under this program the County is also considering the 200-year storm when reviewing projects.

Zoning and Open Space Preservation: Placer County’s General Plan, in coordination with the local Codes, protects current open space. In addition, the General Plan includes a statement:

The County shall support the preservation and enhancement of natural land forms, natural vegetation, and natural resources as open space to the maximum extent feasible. The County shall permanently protect, as open space, areas of natural resource value, including wetlands, riparian corridors, unfragmented woodlands, and floodplains.

Reduce Future Flood Losses

Enacting the General Plans and the comprehensive zoning and future land uses contained in the County General Plan will help to reduce future flood losses by helping to keep development out of hazardous areas and known floodplains.

Current Standards

Placer County’s zoning codes do not provide for any additional restrictions on development in floodplains, aside from what is required under each jurisdiction’s floodplain regulations regarding building standards for floodplains.

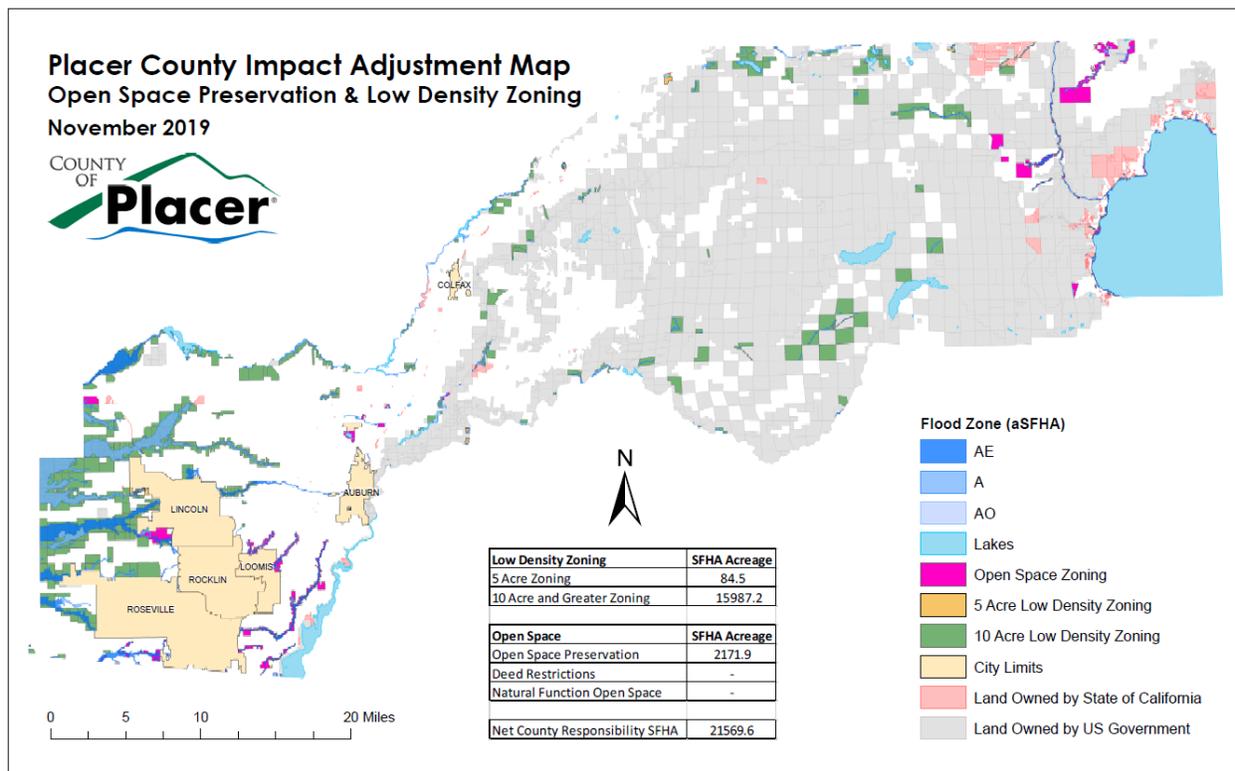
CRS Credit

The CRS provides flood insurance discounts to those communities that implement various floodplain management activities that meet certain criteria. Comparing local activities to those national criteria helps determine if local activities should be improved.

Credits are provided for regulations that encourage developers to preserve floodplains or other hazardous areas from development. There is no credit for a plan, only for the enforceable regulations that are adopted pursuant to a plan. Credits are also provided for setting aside floodplains for low density zoning, such as five acre lots or conservation. The County has placed zoning requirements within floodplain areas that are for low density development, open space and deed restrictions.

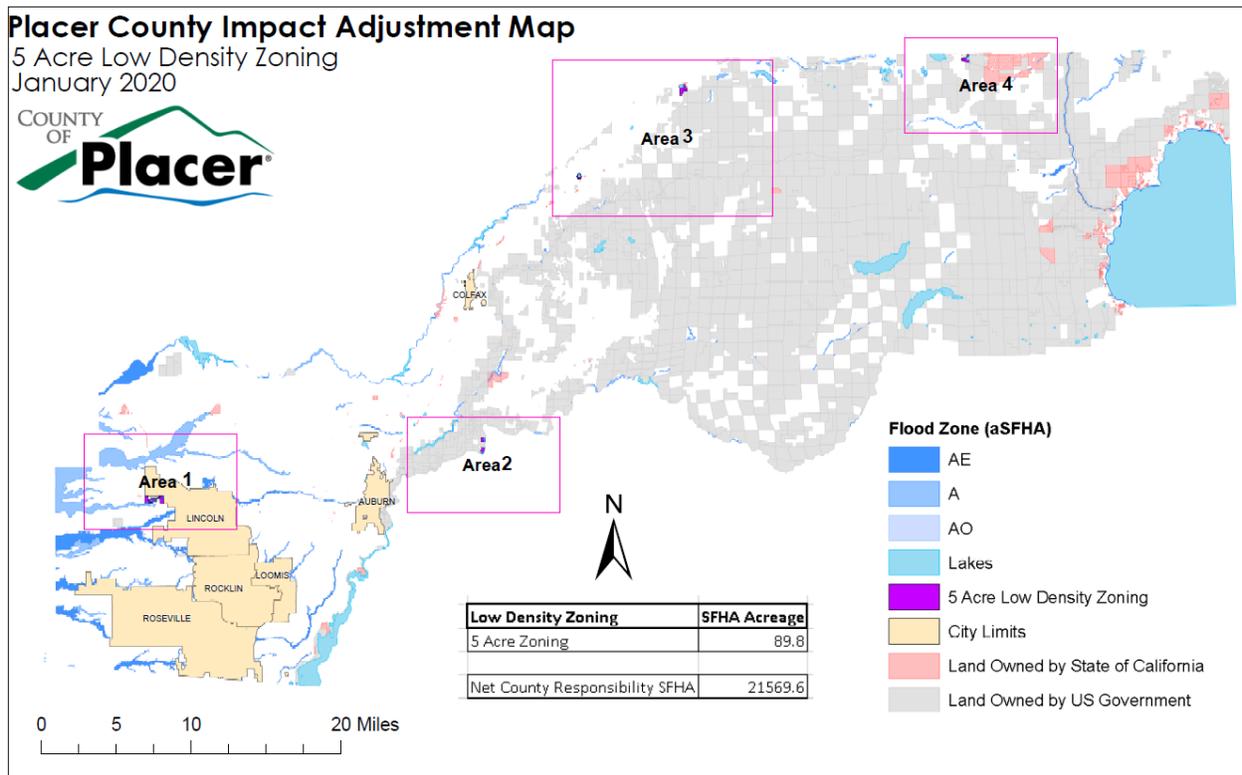
Preserving flood prone areas as open space is one of the highest priorities of the Community Rating System. Up to 1,450 points can be given, based on how much of the floodplain is in community public undeveloped properties, parks, wildlife refuges, golf courses, or other uses that can be depended on to stay open (Activity 420 - Open Space Preservation). Placer County has over 2000 acres designated as open space zoning within the SFHA. See Figure 0-3 for these areas. Figures C-5 and C-6 show additional information for areas of low density zoning.

Figure 0-3 Placer County Impact Adjustment



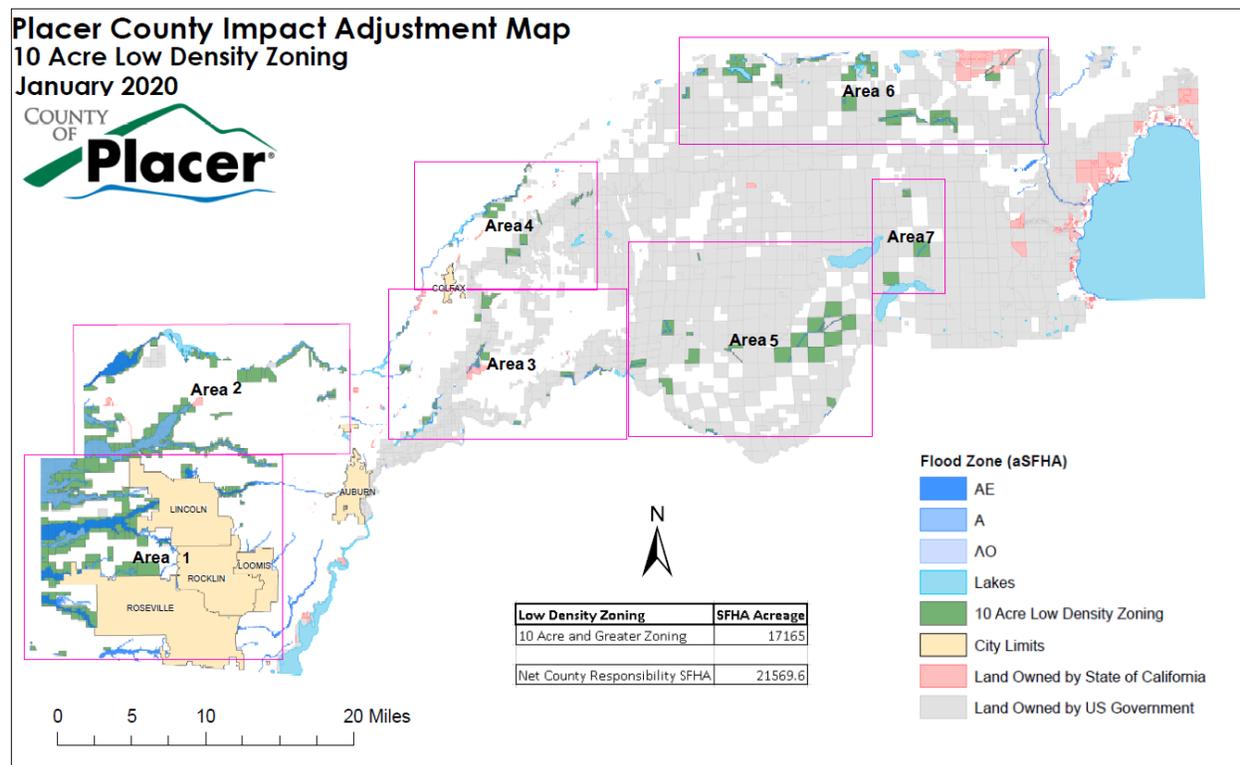
Source: Placer County

Figure 0-5 Placer County Impact Adjustment – 5- Acre Overall Map



Source: Placer County

Figure 0-6 Placer County Impact Adjustment – 10 Acre Overall Map



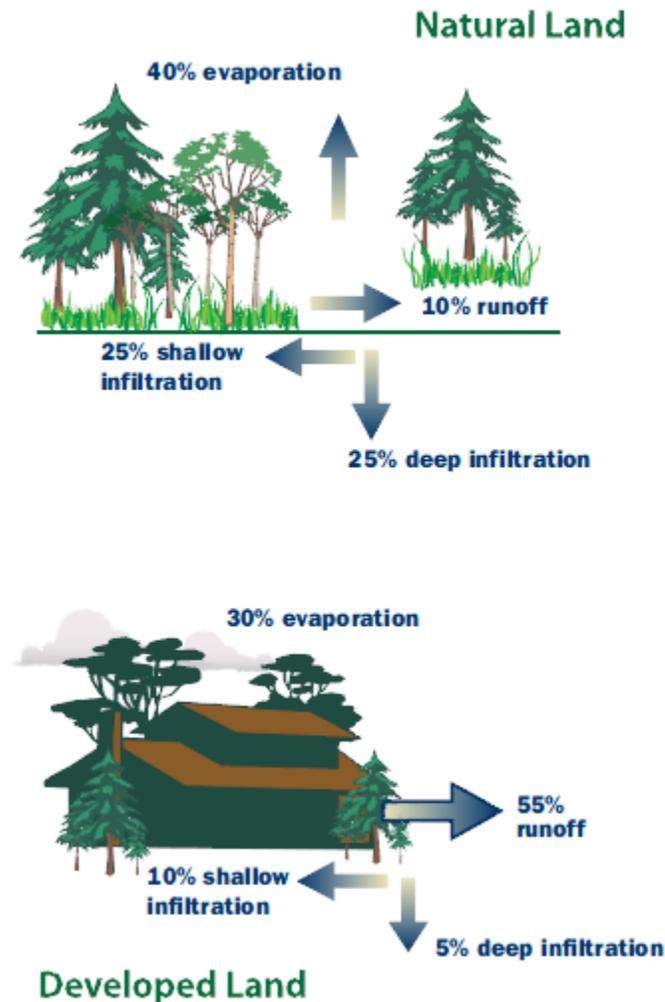
Source: Placer County

Stormwater Management and Subdivision Ordinance

Development in floodplains is development in harm's way. New construction in the floodplain increases the amount of development exposed to damage and can aggravate flooding on neighboring properties.

Development outside a floodplain can also contribute to flooding problems. Stormwater runoff is increased when natural ground cover is replaced by urban development (see Figure 0-4). Development in the watershed that drains to a river can aggravate downstream flooding, overload the community's drainage system, cause erosion, and impair water quality.

Figure 0-4 Runoff and Infiltration of Natural and Developed Land



There are three ways to prevent flooding problems caused by stormwater runoff:

- Regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties, and
- Regulating all development to ensure that the post-development peak runoff will not be greater than it was under pre-development conditions.
- Set construction standards so buildings are protected from shallow water.

Most communities participate in the NFIP, which sets minimum requirements for regulating development in the floodplain. All new buildings must be protected from the base or 100-year flood and no development can cause an increase in flood heights or velocities.

Stormwater runoff regulations require developers to build retention or detention basins to minimize the increases in the runoff rate caused by impervious surfaces and new drainage systems. Generally, each

development must not let stormwater leave at a rate higher than what existed under pre-development conditions.

Standards for drainage requirements are typical in subdivision regulations. Standards for storm sewers, ditches, culverts, etc., are best set when an area is laid out and developed. Traditionally, the national standard is to require that the local drainage system carry the 10-year storm. Recently, communities are finding that older estimates of the 10-year storm understated the true hazard, so they are addressing larger storms.

One problem with requiring the drainage system to carry water away is that runoff increases with urban development. The runoff equivalent of a 10-year storm occurs more frequently, and from smaller storms. The problem is just sent downstream onto someone else's property.

Accordingly, modern subdivision regulations require new developments to ensure that the post-development peak runoff will not be greater than it was under pre-development conditions. This is usually done by constructing retention or detention basins to hold the runoff for a few hours or days, until flows in the system have subsided and the downstream channels can accept the water without flooding.

If the storm sewers or roadside ditches cannot handle a heavy rain, the standard subdivision design uses the streets to carry excess runoff. If the flows exceed the streets' capacity, adjacent properties will flood. Therefore, the third approach to protecting from stormwater flooding is to make sure new buildings are elevated one or two feet above the street or above adjacent grade.

Local Implementation

Reduce Future Flood Losses

Current practices and tracking mechanisms are seeking to reduce flood risks. Future flood control and stormwater improvements in the County will help reduce localized flood risks by improving flood control mechanisms and drainage within the County. In order to reduce future flood losses, the County may consider revisiting their stormwater management ordinances.

Current Standards

Placer County has a stormwater management ordinance. Subdivision design standards require that subdivisions provide for adequate drainage of surface waters and erosion control. All land development must be related to the surrounding drainage pattern, with provisions made for proper drainage facilities. All drainage facilities shall be designed and engineered to carry surface and subsurface waters to the nearest adequate street, storm drain, natural watercourse, or other juncture. All areas shall be graded and drained so that drainage will not cause erosion or endanger the stability of any cut or fill slope or any building or structure. When surface drainage is discharged onto any adjoining property, it shall be discharged in such a manner that it will not cause erosion or endanger any cut or fill slope or any building or structure. Runoff shall not be discharged from the site in quantities or at velocities substantially above those which occurred before grading except into drainage facilities, whose design has been specifically approved by the community development resource agency. In addition, all natural drainage courses into which other

drainage courses empty shall be left undisturbed and shall be provided with adequate dedicated rights of way. Street alignment should follow contour lines or be generally parallel to drainage ways.

Subdivision Regulations

In addition to controlling stormwater runoff as described above, subdivision regulations govern how land will be subdivided and they set construction standards. These standards generally address roads, sidewalks, utilities, storm sewers, and drainage ways. They can include the following flood protection standards:

- Requiring that the final plat show all hazardous areas
- Requiring that each lot be provided with a building site above the flood level
- Requiring that all roadways be no more than one foot below the flood elevation

Local Implementation

Placer County implements local subdivision regulations which require hazard areas to be shown on the final plat. In addition, Placer County's subdivision regulations require, at a minimum, the following to protect the natural and beneficial functions of the floodplain:

- The subdivider shall design the subdivision so that it shall be protected from inundation, flood hazard, sheet overflow and ponding of local storm water, springs and other surface waters.
- The design of improvements shall be such that water occurring within the subdivision will be carried off such subdivision without injury to any improvements, residential sites, or residences to be installed on sites within the subdivision, or to adjoining areas or cause erosion or siltation that would be detrimental to the environment of the area.
- Waters occurring within the subdivision shall be carried to a storm drainage facility or to a natural watercourse by such improvements as may be required to meet the design standards herein set forth, and as outlined within the land development manual.
- Drainage design within the subdivision shall accommodate reasonably anticipated future development within the drainage area.
- Any off-tract outlet drainage facility required to carry storm water from the proposed subdivision to a defined channel or conduit shall be made adequate for the ultimate state of development in the drainage area.
- In any case when a watercourse traverses or serves a subdivision, adequate on-site and/or off-site easements for storm drainage purposes shall be provided.
- A storm drainage maintenance district or acceptable alternate which includes the entire subdivision shall be established for the maintenance of storm drainage facilities within the subdivision and any off-site drainage easements.
- If a storm drainage maintenance district has previously been established within a particular drainage area, where said subdivision is being proposed, the proposed subdivision shall be annexed to the existing district.
- In the event that the county has adopted a drainage plan for said particular drainage area, the subdivider shall be required to pay a fee consisting of a pro rata share of the cost of contracting or estimated cost of constructing drainage facilities within the drainage area.

CRS Credit

CRS credit is provided for both higher regulatory standards in the floodplain and stormwater management standards for new developments. Credit is based on how those standards exceed the minimum NFIP requirements.

Conclusions and Recommendations

- Placer County has Flood Damage Prevention Regulations that exceed minimum national and state standards and will be helpful in preventing flood problems from increasing.
- As DFIRM maps change for Placer, the floodplain regulations for the County may need to be revisited.
- Placer County should continue to implement CRS activities. The County should consider amending its floodplain ordinance for additional higher standards.
- State administration of installation of mobile or manufactured homes does not guarantee that they will be adequately tied down or protected from flooding and other hazards.
- Most zoning ordinances do not designate floodprone areas for any special type of land use.
- Placer County should continue to enforce stormwater management best management practices to control post development site runoff. Consideration of a unified countywide stormwater ordinance will provide consistent regulations between all communities within the Placer County planning area.
- Standards in subdivision regulations for public facilities should account for the hazards present at the site. New building sites, streets, and water systems should facilitate access and use by fire and emergency equipment.

C.4.2. Property Protection Measures

Property protection measures are used to modify buildings or property subject to damage. Property protection measures fall under three approaches:

- Modify the site to keep the hazard from reaching the building,
- Modify the building so it can withstand the impacts of the hazard, and
- Insure the property to provide financial relief after the damage occurs.

Property protection measures are normally implemented by the property owner, although in many cases technical and financial assistance can be provided by a government agency.

Keeping the Hazard Away

Generally, natural hazards do not damage vacant areas. As noted earlier, the major impact of hazards is to people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. For example, a berm can be built to prevent floodwaters from reaching a house.

Flooding

There are five common methods to keep a flood from reaching and damaging a building:

- Erect a barrier between the building and the source of the flooding.
- Move the building out of the floodprone area.

- Elevate the building above the flood level.
- Demolish the building.
- Replace the building with a new one that is elevated above the flood level.

Barriers

A flood protection barrier can be built of dirt or soil (a "berm") or concrete or steel (a "floodwall"). Careful design is needed so as not to create flooding or drainage problems on neighboring properties. Depending on how porous the ground is, if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that will fall inside the perimeter. This is usually done with a sump or drain to collect the internal groundwater and surface water and a pump and pipe to pump the internal drainage over the barrier.

Figure 0-5 Types of Barriers



Barriers can only be built so high. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and properly maintained. A berm can also settle over time, lowering its protection level. A floodwall can crack, weaken, and lose its watertight seal. Therefore, barriers need careful design and maintenance (and insurance on the building, in case of failure).

Relocation

Moving a building to higher ground is the surest and safest way to protect it from flooding. While almost any building can be moved, the cost increases for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings.

In areas subject to flash flooding, deep waters, or other high hazard, relocation is often the only safe approach. Relocation is also preferred for large lots that include buildable areas outside the floodplain or where the owner has a new flood-free lot (or portion of the existing lot) available.

Building Elevation

Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

One concern with elevation is that it may expose the structure to greater impacts from other hazards such as wind and groundshaking. If not braced and anchored properly, an elevated building may have less resistance to the shaking of an earthquake and the pressures of high winds.

Demolition

Some buildings, especially heavily damaged or repetitively flooded ones, are not worth the expense to protect them from future damages. It is cheaper to demolish them and either replace them with new, flood protected structures ("pilot reconstruction"), or relocate the occupants to a safer site. Demolition is also appropriate for buildings that are difficult to move - such as larger, slab foundation or masonry structures - and for dilapidated structures that are not worth protecting. Generally, demolition projects are undertaken by a government agency, so the cost is not borne by the property owner, and the land is converted to public open space use, like a park.

Figure 0-6 Demolition of Flooded Home



One problem that sometimes results from an acquisition and demolition project is a "checkerboard" pattern in which nonadjacent properties are acquired. This can occur when some owners, especially those who have and prefer a waterfront location, are reluctant to leave their homes. Creating such an acquisition pattern in a community simply adds to the maintenance costs that taxpayers must support.

Pilot Reconstruction

If a building is not in good shape, elevating it may not be worthwhile or it may even be dangerous. An alternative is to demolish the structure and build a new one on the site that meets or exceeds all flood and wind protection codes. This was formerly known as "demo/rebuild." FEMA funding programs refer to this approach as "pilot reconstruction." It is still a pilot program, and not a regularly funded option.

Certain rules must be followed to qualify for federal funds for pilot reconstruction:

- Pilot reconstruction is only possible after it has been shown that acquisition or elevation are not feasible, based on the program's criteria.
- Funds are only available to people who owned the property at the time of the event for which funding is authorized.
- It must be demonstrated that the benefits exceed the costs.
- The new building must be elevated to the advisory base flood elevation.
- The new building must not exceed more than 10% of the old building's square footage.
- The new building must meet all flood and wind protection codes.
- There must be a deed restriction that states the owner will buy and keep a flood insurance policy.
- The maximum federal grant is 75% of the cost, up to \$150,000. FEMA is developing a detailed list of eligible costs to ensure that disaster funds are not used to upgrade homes.

Local Implementation

Within the Placer County planning area, acquisition projects have occurred within the City of Roseville, which is not a participant to this plan. However, following the 1995 floods, Placer County, through a hazard mitigation grant, elevated 38 structures along Miners Ravine and Dry Creek.

CRS Credit

The CRS provides the most credit points for acquisition and relocation, because this measure permanently removes insurable buildings from the floodplain. The CRS credits barriers and elevating existing buildings (Activity 530 - Flood Protection). Elevating a building above the flood level will also reduce the flood insurance premiums on that individual building. Because barriers are less secure than elevation, not as many points are provided. Higher scores are possible, but they are based on the number of buildings removed compared to the number remaining in the floodplain.

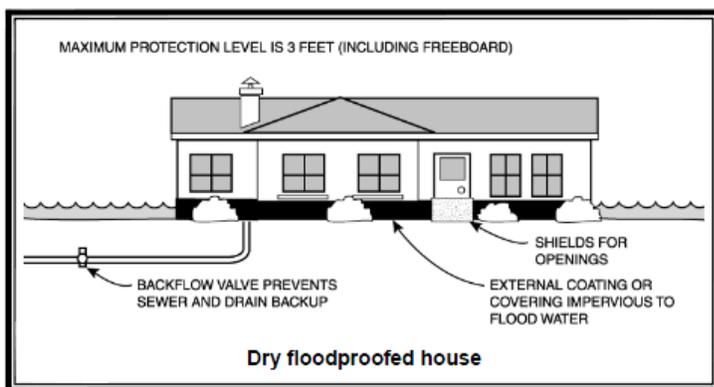
Retrofitting

An alternative to keeping the hazard away from a building is to modify or retrofit the site or building to minimize or prevent damage. There are a variety of techniques to do this, as described below.

Dry Floodproofing

Dry floodproofing means making all areas below the flood protection level watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings, such as doors, windows and vents, are closed, either permanently, with removable shields, or with sandbags. Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under state, FEMA and local regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

Figure 0-7 Dry Floodproofing



Dry floodproofing is only effective for shallow flooding, such as repetitive drainage problems. It does not protect from the deep flooding along lakes and larger rivers caused by hurricanes or other storms.

Wet Floodproofing

The alternative to dry floodproofing is wet floodproofing: water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

Local Implementation

Dry flood proofing would likely be most appropriate for most of Placer County due to the current base flood elevations and the nature of flooding in the County (relatively low level flooding).

CRS Credit

Credit for dry and wet floodproofing and sewer backup protection is provided under Activity 530 - Retrofitting. Because these property protection measures are less secure than barriers and elevation, not as many points are provided.

Insurance

Technically, insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild, and hopefully afford to incorporate some of the other property protection measures in the process. Insurance offers the advantage of protecting the property, as long as the policy is in force, without requiring human intervention for the measure to work.

Private Property

Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the NFIP. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area.

Figure 0-8 Flood Insurance Coverage

Building Exposure	Premium
In the Special Flood Hazard Area (AE Zone)	
Pre-FIRM ("subsidized") rate	\$1,689
Post-FIRM (actuarial) rates	
2 feet above the base flood elevation	\$440
1 foot above the base flood elevation	\$643
At the base flood elevation	\$1,167
1 foot below the base flood elevation	\$4,379
Outside the Special Flood Hazard Area	
	\$1,029

Premiums are for \$150,000 in building coverage and \$75,000 in contents coverage for a one story house with no basement and a \$500 deductible, using the October 2008 Flood Insurance Manual. Premiums include the 5% Community Rating System discount in unincorporated St. Tammany Parish. Premiums are higher in the municipalities, which are not in the CRS.

Most people purchase flood insurance because it is required by the bank when they get a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Contents coverage can be purchased separately. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. Most people don't realize that there is a 30-day waiting period to purchase a flood insurance policy and there are limits on coverage.

Public Property

Governments can purchase commercial insurance policies. Larger local governments often self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can drain the government's budget. Communities cannot expect federal disaster assistance to make up the difference after a flood.

Under Section 406(d) of the Stafford Act:

"If an eligible insurable facility damaged by flooding is located in a [mapped floodplain] ... and the facility is not covered (or is underinsured) by flood insurance on the date of such flooding, FEMA is required to reduce Federal disaster assistance by the maximum amount of insurance proceeds that would have been received had the buildings and contents been fully covered under a National Flood Insurance Program (NFIP) standard flood insurance policy. [Generally, the maximum amount of proceeds for a non-residential property is \$500,000.]"

[Communities] need to:

- Identify all insurable facilities, and the type and amount of coverage (including deductibles and policy limits) for each. The anticipated insurance proceeds will be deducted from the total eligible damages to the facilities.

- Identify all facilities that have previously received Federal disaster assistance for which insurance was required. Determine if insurance has been maintained. A failure to maintain the required insurance for the hazard that caused the disaster will render ineligible for Public Assistance funding...
- [Communities] must obtain and maintain insurance to cover [their] facility - buildings, equipment, contents and vehicles - for the hazard that caused the damage in order to receive Public Assistance funding. Such coverage must, at a minimum, be in the amount of the eligible project costs. FEMA will not provide assistance for that facility in future disasters if the requirement to purchase insurance is not met. - FEMA Response and Recovery Directorate Policy No. 9580.3, August 23, 2000

In other words, the law expects public agencies to be fully insured as a condition of receiving federal disaster assistance.

Local Implementation

NFIP insurance data indicates that as of August 21, 2020, there were 817 policies in force in the unincorporated County, resulting in \$233,180,600 of insurance in force. Of these, 802 are for residential properties; 15 are nonresidential. 249 of these are in A zones; 568 policies are for parcels in the B, C, & X zones. There have been 236 closed paid losses totaling \$4,788,314.79; 229 of these were for residential properties and 7 were nonresidential. Of these 236 paid losses, 102 were parcels in A zones and 120 parcels were in B, C, & X zones. Information was not provided on the other 4 claims. There are 44 repetitive loss (RL) structures, and 0 severe repetitive loss (SRL) structures in the County – with 60 paid losses totaling \$1,590,452.20. Of these RL buildings, 22 are in the A zones and 22 are in the B, C, or X zone. Only one of these RL buildings is a post-FIRM building. According to the County, only 9 RL properties are not mitigated. There have been 25 substantial damage claims since 1978.

CRS Credit

There is no credit for purchasing flood insurance, but the CRS does provide credit for local public information programs that explain flood insurance to property owners. The CRS also reduces the premiums for those people who do buy NFIP coverage.

The Government's Role

Property protection measures are usually considered the responsibility of the property owner. However, local governments should be involved in all strategies that can reduce flood losses, especially acquisition and conversion of a site to public open space. There are various roles a municipality can play in encouraging and supporting implementation of these measures.

One of the first duties of a local government is to protect its own facilities. Fire stations, water treatment plants and other critical facilities should be a high priority for retrofitting projects and insurance coverage. Often public agencies discover after the disaster that their "all-hazard" insurance policies do not cover the property for the type of damage incurred. Flood insurance is even more important as a mitigation measure because of certain Stafford Act provisions.

Providing basic information to property owners is the first step in supporting property protection measures. Owners need general information on what can be done. They need to see examples, preferably from nearby.

Communities can help owners by helping to pay for a retrofitting project. Financial assistance can range from full funding of a project to helping residents find money from other programs. Some communities assume responsibility for sewer backups, street flooding, and other problems that arise from an inadequate public sewer or public drainage system. Less expensive community programs include low interest loans, forgivable low interest loans and rebates. A forgivable loan is one that does not need to be repaid if the owner does not sell the house for a specified period, such as five years. These approaches don't fully fund the project, but they cost the community less and they increase the owner's commitment to the flood protection project. Often, small amounts of money act as a catalyst to pique the owner's interest to get a self-protection project moving.

The more common outside funding sources are listed below. Unfortunately, the last three are only available after a disaster, not before, when damage could be prevented.

Pre-disaster funding sources:

- FEMA's Pre-Disaster Mitigation (PDM) grants
- FEMA's Flood Mitigation Assistance (FMA) grants
- Community Development Block Grants
- Conservation organizations, although generally these organizations prefer to purchase vacant land in natural areas, not properties with buildings on them.

Post-disaster funding sources:

- Insurance claims
- The NFIP's Increased Cost of Compliance. This provision increases a flood insurance claim payment to help pay for a flood protection project required by code as a condition to rebuild the flooded building. It can also be used to help pay the non-federal cost-share of an elevation project.

Post-disaster funding sources, federal disaster declaration needed:

- FEMA's disaster assistance (for public properties). However, after a flood, the amount of assistance will be reduced by the amount of flood insurance that the public agency should be carrying on the property.
- Small Business Administration disaster loans (for non-governmental properties)
- FEMA's Hazard Mitigation Grant Program

Acquisition Agent

The community can be the focal point in an acquisition project. Most funding programs require a local public agency to sponsor the project. The local government could process the funding application, work with the owners, and provide some, or all, of the local share. In some cases, the local government would be the ultimate owner of the property, but in other cases another public agency could assume ownership and the attendant maintenance responsibilities.

Mandates

Mandates are considered a last resort if information and incentives are insufficient to convince a property owner to take protective actions. An example of a retrofitting mandate is the requirement that communities have to disconnect downspouts from the sanitary sewer line.

There is a mandate for improvements or repairs made to a building in the mapped floodplain. If the project equals or exceeds 50% of the value of the original building, it is considered a "substantial improvement." The building must then be elevated or otherwise brought up to current flood protection codes.

Another possible mandate is to require less expensive hazard protection steps as a condition of a building permit. For example, many communities require upgraded electrical service as a condition of a home improvement project. If a person were to apply for a permit for electrical work, the community could require that the service box be moved above the base flood elevation or the installation of a separate ground fault interrupter circuits in the basement.

Local Implementation

Within Placer County several homes have been retrofitted for flood protection and others have been elevated, while no homes have been acquired and relocated. The largest retrofit project within the unincorporated county was after the 1995 flood event, along with the 38 elevations, located along Miners Ravine and Dry Creek.

CRS Credit

Except for public information programs, the CRS does not provide credit for efforts to fund, provide incentives, or mandate property protection measures. CRS credits are provided for the actual projects after they are completed. However, to participate in CRS, a community must certify that it has adequate flood insurance on all properties that have been required to be insured. The minimum requirement is to insure those properties in the mapped floodplain that have received federal aid, as specified by the Flood Disaster Protection Act of 1973.

Repetitive Loss Properties and Analysis

Repetitive loss properties deserve special attention because they are more prone to damage by natural hazards than any other properties in the County planning area. Further, protecting repetitive loss buildings is a priority with FEMA mitigation funding programs.

Unincorporated Placer County's vulnerability to flooding is highlighted by its number of Repetitive Losses. According to the August 21, 2020 data from the state on NFIP communities, There are 44 repetitive loss (RL) structures, and 0 severe repetitive loss (SRL) structures in the County – with 60 paid losses totaling \$\$1,590,452.20. Of these RL buildings, 22 are in the A zones and 22 are in the B, C, or X zone. Only one of these RL buildings is a post-FIRM building. According to the County, only 9 RL properties are not mitigated. There have been 25 substantial damage claims since 1978.

Conclusions and Recommendations

- There are several ways to protect individual properties from damage by natural hazards. The advantages and disadvantages of each should be examined for each situation.
- Property protection measures can protect the most damage-prone buildings in the County planning area including repetitive loss properties.
- 29% of the buildings in the floodplains in unincorporated Placer County are covered by flood insurance, up from less than 19% from the 2016 LHMP.
- Property owners can implement some property protection measures at little cost, especially for sites in areas of low hazards (e.g., shallow flooding, sewer backup, and thunderstorms). For other measures, such as relocation and elevation, the owners may need financial assistance.
- Local government agencies can promote and support property protection measures through several activities, ranging from public information to financial incentives to full funding.
- It is unlikely that most government properties, including critical facilities, have any special measures to protect them from flooding.
- Because properties in floodplains will be damaged at some point, efforts should continue to provide information and advice to floodplain property owners. Special attention should be given to repetitive loss and high hazard areas.
- Public education materials can be developed/enhanced to explain property protection measures that can help owners reduce their exposure to damage by floods and the various types of insurance that are available.
- All property protection projects should be voluntary. Other than state and federally mandated regulations, local incentives should be positive as much as possible, such as providing financial assistance.
- A FEMA Hazard Mitigation Assistance (HMA) Grant workshop focused on private firms and citizens could be conducted annually to showcase the assistance that FEMA (HMGP, BRIC, FMA, RFC and SRL) provides and to encourage public participation.
- A standard checklist could be developed to evaluate a property's exposure to damage from floods. It should include a review of insurance coverage and identify where more information can be found on appropriate property protection measures. The checklist should be provided to each agency participating in this planning process and made available to the public.
- Placer County should evaluate its own properties using the standard checklist. A priority should be placed on determining critical facilities' vulnerability to damage and whether public properties are adequately insured.
- Placer County should protect their own publicly owned facilities with appropriate mitigation measures.

C.4.3. Natural Resource Protection

Resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. These activities enable the naturally beneficial functions of fields, floodplains, wetlands, and other natural lands to operate more effectively. Natural and beneficial functions of watersheds, floodplains and wetlands include:

- Reduction in runoff from rainwater and snow melt in pervious areas
- Infiltration that absorbs overland flood flow
- Removal and filtering of excess nutrients, pollutants and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour
- Water quality improvement
- Groundwater recharge

- Habitat for flora and fauna
- Recreational and aesthetic opportunities

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions. The regulatory programs are discussed in Section 5.3 Preventive Measures of the base plan. This section covers the resource protection programs and standards that can help mitigate the impact of natural hazards, while they improve the overall environment. Seven areas are reviewed:

- Wetland protection
- Erosion and sedimentation control
- River restoration
- Best management practices
- Dumping regulations
- Urban forestry
- Farmland protection

Wetland Protection

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and they provide habitat for many species of fish, wildlife and plants.

Wetlands that are determined to be part of the waters of the United States are regulated by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (US EPA) under Section 404 of the Clean Water Act. Before a "404" permit is issued, the plans are reviewed by several agencies, including the Corps and the U.S. Fish and Wildlife Service. Each of these agencies must sign off on individual permits.

There are also nationwide permits that allow small projects that meet certain criteria to proceed without individual permits. Wetlands not included in the Corps' jurisdiction or that are addressed by a nationwide permit may be regulated against by local authorities.

If a permit is issued by the Corps, County, or one of the cities, the impact of the development is typically required to be mitigated. Wetland mitigation can include creation, restoration, enhancement or preservation of wetlands elsewhere. Wetland mitigation is often accomplished within the development site, however, mitigation is allowed off-site and sometimes in another watershed. The appropriate type of mitigation is addressed in each permit.

Some developers and government agencies have accomplished the required mitigation by buying into a wetland bank. Wetland banks are large wetlands created for the purpose of mitigation. The banks accept money to reimburse the owner for setting the land aside from development.

When a wetland is mitigated at a separate site there are drawbacks to consider. First, it takes many years for a new wetland to approach the same quality as an existing one. Second, a new wetland in a different location (especially if it is in a different watershed) will not have the same flood damage reduction benefits as the original one did.

Local Implementation

Placer County has ordinances that reduce the ability to develop near a wetland. The building and development section of the municipal code restricts grading and soil disturbances in wetlands, drainage ways, stream environment zones, or water bodies.

CRS Credit

The CRS focuses on activities that directly affect flood damage to insurable buildings. While there is no credit for relying on the Corps of Engineers' 404 regulations, there is credit for preserving open space in its natural condition or restored to a state approximating its natural condition. The credit is based on the percentage of the floodplain that can be documented as wetlands protected from development by ownership or local regulations.

The CRS focuses on activities that directly affect flood damage to insurable buildings. While there is no credit for relying on the Corps of Engineers' 404 regulations, there is credit for maintaining water quality buffers that protect streams, rivers, lakes and shorelines in their natural condition or restoring them to an approximate natural state. Credit is also available for an approved habitat conservation plan.

Erosion and Sedimentation Control

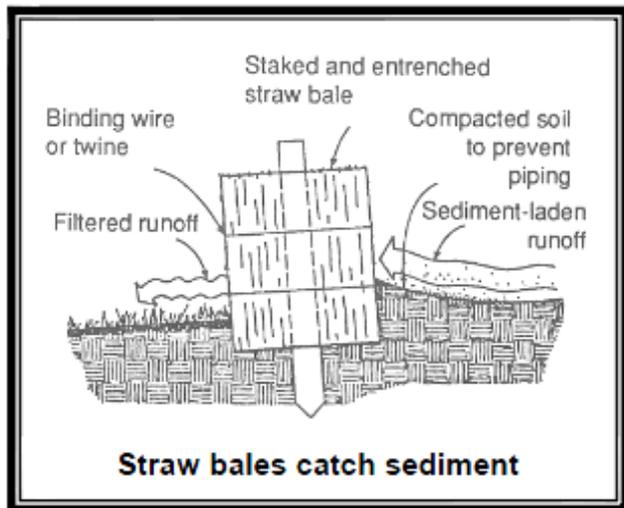
Farmlands and construction sites typically contain large areas of bare exposed soil. Surface water runoff can erode soil from these sites, sending sediment into downstream waterways. Erosion also occurs along stream banks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil.

Sediment suspended in the water tends to settle out where flowing water slows down. This can clog storm drains, drain tiles, culverts and ditches and reduce the water transport and storage capacity of river and stream channels, lakes and wetlands. When channels are constricted and flooding cannot deposit sediment in the bottomlands, even more sediment is left in the channels. The result is either clogged streams or increased dredging costs.

Not only are the drainage channels less able to perform their job, but the sediment in the water reduces light, oxygen and water quality, and often carries chemicals, heavy metals and other pollutants. Sediment has been identified by the US EPA as the nation's number one nonpoint source pollutant for aquatic life.

There are two principal strategies to address these problems: minimize erosion and control sedimentation. Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil stabilizing practices.

Figure 0-9 Erosion Control



If erosion occurs, other measures are used to capture sediment before it leaves the site. Silt fences, sediment traps and vegetated filter strips are commonly used to control sediment transport. Runoff from the site can be slowed down by terraces, contour strip farming, no-till farm practices, hay or straw bales, constructed wetlands, and impoundments (e.g., sediment basins and farm ponds). Slowing surface water runoff on the way to a drainage channel increases infiltration into the soil and reduces the volume of topsoil eroded from the site.

Erosion and sedimentation control regulations mandate that these types of practices be incorporated into construction plans. The most common approach is to require applicants for permits to submit an erosion and sediment control plan for the construction project. This allows the applicant to determine the best practices for the site.

Local Implementation

The County has ordinances that include standards for erosion and sedimentation control. The Placer County Flood Control District has an annual stream clearing program. Placer County completed water quality monitoring in the Truckee River Basin and monitors sediment loading the Lake Tahoe Basin.

CRS Credit

Local governments whose ordinances include erosion and sedimentation control provisions can qualify for up to 45 points for this measure.

River Restoration

There is a growing movement that has several names, such as "stream conservation," "bioengineering," or "riparian corridor restoration." The objective of these approaches is to return streams, stream banks and

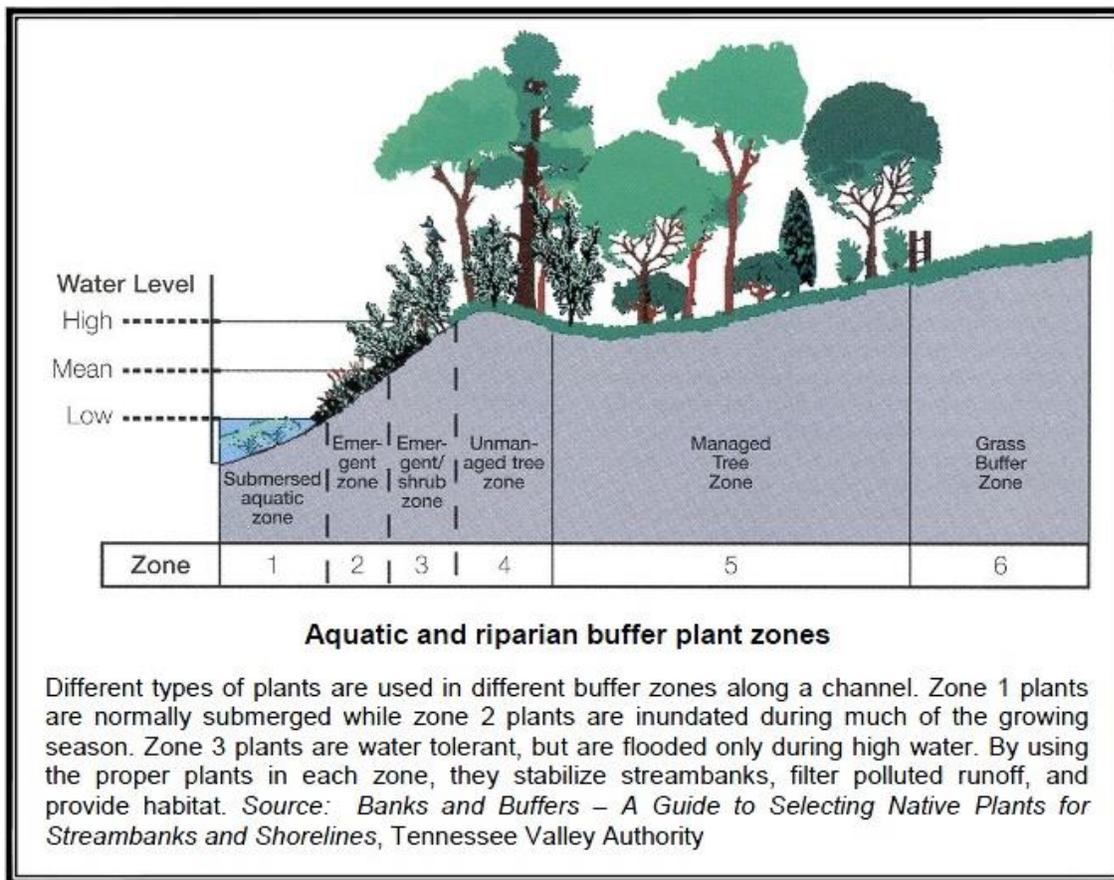
adjacent land to a more natural condition, including the natural meanders. Another term is "ecological restoration," which restores native indigenous plants and animals to an area.

A key component of these efforts is to use appropriate native plantings along the banks that resist erosion. This may involve retrofitting the shoreline with willow cuttings, wetland plants, or rolls of landscape material covered with a natural fabric that decomposes after the banks are stabilized with plant roots.

In all, restoring the right vegetation to a stream has the following advantages:

- Reduces the amount of sediment and pollutants entering the water
- Enhances aquatic habitat by cooling water temperature
- Provides food and shelter for both aquatic and terrestrial wildlife
- Can reduce flood damage by slowing the velocity of water
- Increases the beauty of the land and its property value
- Prevents property loss due to erosion
- Provides recreational opportunities, such as hunting, fishing and bird watching
- Reduces long-term maintenance costs

Figure 0-10 River Restoration Zones



Local Implementation

Placer County has implemented these activities for water quality and floodplain management purposes. See <https://www.placer.ca.gov/DocumentCenter/View/50871/PCCP-Requirements-Stream-System-Grading-Permits?bidId=>

CRS Credit

The CRS focuses on activities that directly affect flood damage to insurable buildings. However, there are credits for preserving open space in its natural condition or restored to a state approximating its natural condition. There are also credits for channel setbacks, buffers and protecting shorelines. Placer County currently receives some credit for open space conservation.

Best Management Practices

Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the US EPA and the California Department of Water Resources. Nonpoint source pollutants come from non-specific locations and harder to regulate. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, other chemicals, animal wastes, oils from street surfaces and industrial areas, and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams.

The term "best management practices" (BMPs) refers to design, construction and maintenance practices and criteria that minimize the impact of stormwater runoff rates and volumes, prevent erosion, protect natural resources and capture nonpoint source pollutants (including sediment). They can prevent increases in downstream flooding by attenuating runoff and enhancing infiltration of stormwater. They also minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple usages of drainage and storage facilities.

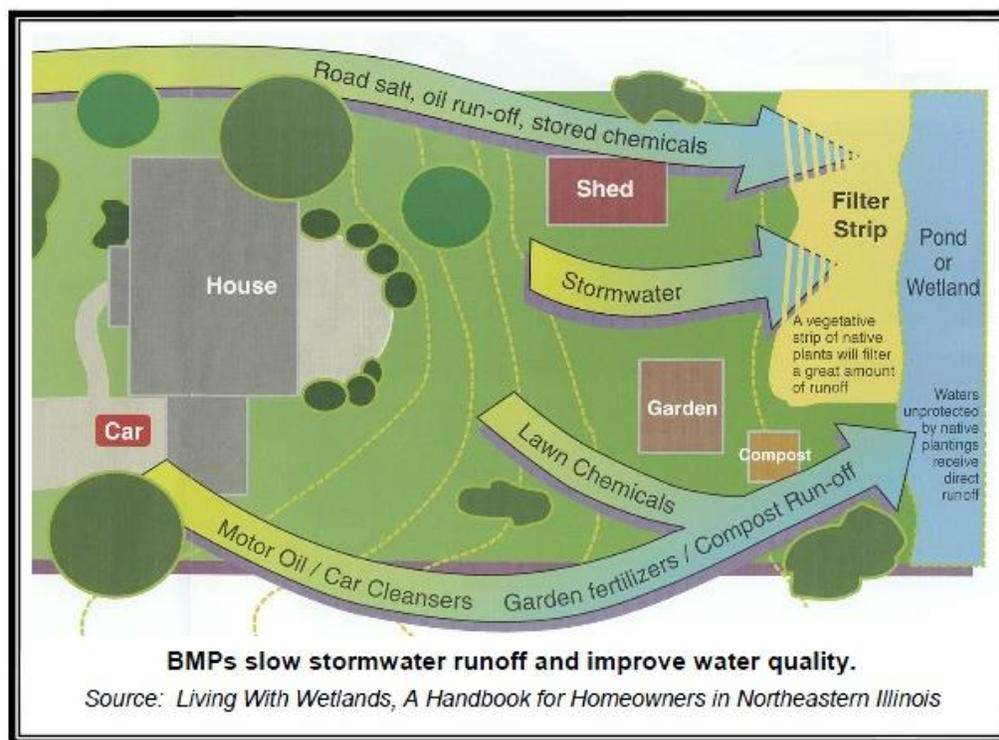
Local Implementation

Placer County participates in the National Pollutant Discharge Elimination System permitting program and require BMPs to minimize stormwater impacts.

CRS Credit

A community can receive CRS points if regulations require new developments to include in the design of their permanent stormwater management facilities appropriate BMPs that will improve the quality of surface waters.

Figure 0-11 Stormwater Best Management Practices



Dumping Regulations

BMPs usually address pollutants that are liquids or are suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels' and wetlands' abilities to convey or clean stormwater.

Many communities have nuisance ordinances that prohibit dumping garbage or other "objectionable waste" on public or private property. Waterway dumping regulations need to also apply to "non-objectionable" materials, such as grass clippings or tree branches, which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard without realizing that is needed to drain street runoff. They may not understand how regarding their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem to themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

Local Implementation

Placer County ordinances makes it unlawful for anyone to deposit waste, grass, weeds, brush or other refuse in any street, ditch or watercourse, or on others' property, or on public property. It is also illegal to dispose of certain wastes in public sewers.

CRS Credit

The CRS provides credit for enforcing and publicizing a regulation that prohibits dumping in the drainage system.

Farmland Protection

Farmland protection is quickly becoming an important piece of comprehensive planning and zoning throughout the United States. The purpose of farmland protection is to provide mechanisms for prime, unique, or important agricultural land to remain as such, and to be protected from conversion to nonagricultural uses.

Frequently, farm owners sell their land to residential or commercial developers and the property is converted to non-agricultural land uses. With development comes more buildings, roads and other infrastructure. Urban sprawl occurs, which can lead to additional stormwater runoff and emergency management difficulties.

Figure 0-12 Floodplain Damages to Farmland



Farms on the edge of cities are often appraised based on the price they could be sold for to urban developers. This may drive farmers to sell to developers because their marginal farm operations cannot afford to be taxed as urban land. The Farmland Protection Program in the United States Department of Agriculture's 2002 Farm Bill (Part 519) allows for funds to go to state, tribal, and local governments as well as nonprofit organizations to help purchase easements on agricultural land to protect against the development of the land. Eligible land includes cropland, rangeland, grassland, pastureland, or forest land that is part of an agricultural operation. Certain lands within historical or archaeological resources are also included.

The hazard mitigation benefits of farmland protection are similar to those of open space preservation:

- Farmland is preserved for future generations,
- Farmland in the floodplain keeps damageable structures out of harm's way,
- Farmland keeps more stormwater on site and lets less stormwater runoff downstream,
- Rural economic stability and development is sustained,
- Ecosystems are maintain, restored or enhanced, and
- The rural character and scenic beauty of the area is maintained.

Local Implementation

Placer County currently requires farmland protection provisions under the Williamson Act.

CRS Credit

Credit is given for preserving open space in the floodplain, regardless of why it is being preserved. Credit is also provided for density zoning of floodprone areas.

Conclusions and Recommendations

- A hazard mitigation program can use resource protection programs to support protecting areas and natural features that can mitigate the impacts of natural hazards.
- Placer County ordinances prohibit illicit discharges into public sewers or onto public or private property.
- Preserving farmland in the floodplain will maintain open space and prevent damage to homes, businesses, and other development.
- The public and decision makers should be informed about the hazard mitigation benefits of restoring rivers, wetlands and other natural areas. Restoration and protection techniques should be explained.
- Placer County may consider publicizing its illicit discharge rules more widely.
- The public should be informed about the need to protect streams and wetlands from dumping and inappropriate development and the relevant codes and regulations.

C.4.4. Emergency Services Measures

Emergency services measures protect people during and after a disaster. A good emergency management program addresses all hazards, and it involves all local government departments. At the state level, emergency services programs are coordinated by the California Office of Emergency Services (Cal OES). Locally, emergency services are coordinated by the Placer County Office of Emergency Services.

This section reviews emergency services measures following a chronological order of responding to an emergency. It starts with identifying an impending problem (threat recognition) and continues through post-disaster activities.

Threat Recognition

The first step in responding to a flood, storm, or other natural hazard is to know when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

The National Weather Service (NWS) is the prime agency for detecting meteorological threats, such as tornadoes, thunderstorms and winter storms. Severe weather warnings are transmitted through NOAA's Weather Radio System. Federal agencies can only look at the large scale, e.g., whether conditions are appropriate for the formation of a thunderstorm. Local emergency managers can provide more site-specific and timely recognition by sending out NWS trained spotters to watch the skies when the Weather Service issues a watch or a warning.

Severe snow storms can often be forecast days in advance of the expected event, which allows time for warning and preparation. Though more difficult, the NWS can also forecast ice storms.

A flood threat recognition system predicts the time and height of a flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels.

On larger rivers, this measuring and calculating is performed by the NWS, a part of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). Support for NOAA's efforts is provided by cooperating partners from state and local agencies. Forecasts of expected river stages are made through the Advanced Hydrologic Prediction Service (AHPS) of the National Weather Service. Flood threat predictions are disseminated on the NOAA Weather Wire or NOAA Weather Radio. NOAA Weather Radio is considered by the federal government as the official source for weather information.

On smaller rivers, locally established rainfall and river gauges are needed to establish a flood threat recognition system. The NWS may issue a "flash flood watch." This is issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain nor imminent. These events are so localized and so rapid that a "flash flood warning" may not be issued, especially if no remote threat recognition equipment is available. In the absence of a gauging system on small streams, the best threat recognition system is to have local personnel monitor rainfall and stream conditions. While specific flood crests and times will not be predicted, this approach will provide advance notice of potential local or flash flooding.

Local Implementation

The County has an Emergency Operations Plan which is currently being updated in 2021 that includes procedures for threat identification. The County is not currently a StormReady certified County. StormReady communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education, and awareness. Placer County OES does, however, work closely with the National Weather Service for issuing an Emergency Alert System (EAS). Additional County's threat identification mechanisms include:

ALERT System. The County's network of ALERT Flood Warning gauges, including numerous precipitation gages and stream level gages located throughout western Placer County provide real time monitoring information on current flood conditions which assist in informing the activation of additional warning and evacuation of affected areas.

Dam Protocols. Should an event trigger the activation of an Emergency Action Plan (EAP) for a potential dam failure, County OES receives this information via direct phone calls from the originating source/agency

or from PCSO Dispatch and/or Cal OES. County OES then follows the notification and evacuation procedures called for in the EAP.

CRS Credit

Credit can be received for using river flood stage predictions for the NWS's gages. The actual score is based on how much of the community's floodplain is affected by these systems. Potential CRS credit is possible under Activity 610 - Flood Warning Program and Response.

Warning

After the threat recognition system tells the emergency services office that a flood, tornado, thunderstorm, or other hazard is coming, the next step is to notify the public and staff of other agencies and critical facilities. More people can implement protection measures if warnings are early and include specific detail.

The NWS issues notices to the public using two levels of notification:

- Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.
- Warning: a flood, tornado, etc., has started or been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Placer Alert/Everbridge
- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens
- Sirens on public safety vehicles
- Door-to-door contact
- Mobile public address systems
- Email notifications

Multiple or redundant systems are most effective - if people do not hear one warning, they may still get the message from another part of the system. Each has advantages and disadvantages:

- Radio and television provide a lot of information, but people have to know when to turn them on. They are most appropriate for hazards that develop over more than a day, such as a tropical storm, hurricane, or winter storm.
- NOAA Weather Radio can provide short messages of any impending weather hazard or emergency and advise people to turn on their televisions for more information, but not everyone has a Weather Radio.
- Outdoor warning sirens can reach many people quickly as long as they are outdoors. They do not reach people in tightly-insulated buildings or those around loud noise, such as at a factory, during a thunderstorm, or in air conditioned homes. They do not explain what hazard is coming, but people should know to turn on a radio or television when they hear the siren.

- Automated telephone notification services are also fast, but can be expensive and do not work when phone lines are down. Nor do they work for unlisted numbers, call screening services, or cellular service, unless people sign up for notifications.
- Where a threat has a longer lead time, going door-to-door and manual telephone trees can be effective.

Just as important as issuing a warning is telling people what to do in case of an emergency. A warning program should have a public information aspect. Citizens should know the difference between a tornado warning (when they should seek shelter in a low spot), a flood warning (when they should stay out of low areas), and other appropriate warnings and responses.

StormReady

The National Weather Service established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather related warnings for the public. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center,
- Have more than one way to receive severe weather warnings and forecasts and to alert the public,
- Create a system that monitors weather conditions locally,
- Promote the importance of public readiness through community seminars, and
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

Being designated a StormReady community by the National Weather Service is a good measure of a community's emergency warning program for weather hazards. It is also credited by the CRS.

Local Implementation

The Placer County Office of Emergency Services serves as the emergency manager during an emergency. Local police and fire departments are also responsible for enforcing actions required during an emergency. In the event of a severe flood, wildfire or other natural hazard event, the Placer County OES webpage will identify current emergencies at: <https://www.placer.ca.gov/1379/Current-Emergency-Information>. The County will also provide emergency information and broadcast warnings on local radio and television stations as well as on social media websites such as Facebook and Twitter. The new Everbridge system, described further below, may be activated and helicopters may be used to broadcast warnings/alerts via a PA system. If time and condition/safety permits, vehicle patrol units may also broadcast warnings in affected areas.

Everbridge. In 2015, Placer County and all participating cities to this plan established the Everbridge/Placer Alert System employed for issuing flood warnings, alerts and evacuation notices to the public. The Placer County Flood Control and Water Conservation District coordinated with County OES, Sheriff, County Planning, and Department of Public Works for this system. Flood warning zones across the County were created and Sheriff's dispatch is the lead agency in employing Everbridge and issuing specific flood event warnings as necessary. The District will continue to assist during an event by providing technical input to OES as to the need for a warning issuance as well as any resulting evacuations.

CRS Credit

Community Rating System points are based on the number and types of warning media that can reach the community's flood prone population. Depending on the location, communities can receive credit for the telephone calling system and more points if there are additional measures, like telephone trees. Being designated as a StormReady community can provide additional points. These credits are in Activity 610 - Flood Warning Program and Response.

Response

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the emergency operations center (emergency preparedness),
- Closing streets or bridges (police or public works),
- Shutting off power to threatened areas (utility company),
- Passing out sand and sandbags (public works),
- Holding children at school or releasing children from school (school superintendent),
- Opening evacuation shelters (the American Red Cross),
- Monitoring water levels (public works), and
- Establishing security and other protection measures (police).

An emergency action plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

A flood stage forecast map shows areas that will be under water at various flood stages. Different flood levels are shown as color coded areas, so the emergency manager can quickly see what will be affected. Emergency management staff can identify the number of properties flooded, which roads will be under water, which critical facilities will be affected, and who to warn. With this information, an advance plan can be prepared that shows problem sites and determines what resources will be needed to respond to the predicted flood level.

Emergency response plans should be updated annually to keep contact names and telephone numbers current and to ensure that supplies and equipment that will be needed are still available. They should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and of changing conditions. The end result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner possible.

Local Implementation

Placer County Office of Emergency Services serves as the Emergency Manager for the County. Response is provided cooperation with the County Sheriff, city police, and fire departments. The Placer County Emergency Operations Plan (currently being updated in 2021) includes addresses the planned response to emergency situations associated with natural disasters and emergencies in or affecting Placer County. The EOP is intended to facilitate multi-agency and multi-jurisdictional coordination in emergency operations.

It seeks to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system to return the County the local jurisdictions to their normal state of affairs.

CRS Credit

The CRS program provides credit under Activity 610- Flood Warning for a warning system that effectively notifies residents of a flood and has procedures for testing and monitoring the system.

Evacuation and Shelter

According to Emergency Management: Principles and Practice, "The principle of evacuation is to move citizens from a place of relative danger to a place of relative safety, via a route that does not pose significant danger." There are six key ingredients to a successful evacuation:

- Adequate warning
- Adequate routes
- Proper timing to ensure the routes are clear
- Traffic control
- Knowledgeable travelers
- Care for special populations (e.g., the handicapped, prisoners, hospital patients, and schoolchildren)

Those who cannot get out of harm's way need shelter. Typically, the American Red Cross will staff a shelter and ensure that there is adequate food, bedding, and wash facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring in their pets, and the potential for an overcrowded facility.

Local Implementation

The Placer County EOP includes multiple annexes, one of which is the Mass Evacuation Annex. This Annex addresses evacuation policies and procedures due to natural hazards and other events. Emergency evacuation planning involves multiple governmental agencies and private organizations performing such functions as threat identification, warning, evacuation decision making, communications, traffic control, and shelter and medical needs management. A component of this is Pre-Disaster Public Awareness and Education which is major component in successfully reducing loss of life and property in a community when faced with a potentially catastrophic incident.

In addition to the Mass Evacuation Annex to the EOP, the County has several evacuation plans covering various areas of the County.

CRS Credit

Because it is primarily concerned with protecting insurable buildings, the CRS does not provide any special credit for evacuation or sheltering of people (minimal credit is given in Activity 510 - Floodplain Management for evacuation policies and procedures). It is assumed that the emergency response plan would include all necessary actions in response to a flood.

Post-Disaster Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

- Patrolling evacuated areas to prevent looting,
- Providing safe drinking water,
- Monitoring for diseases,
- Vaccinating residents for tetanus and other diseases,
- Clearing streets, and
- Cleaning up debris and garbage.

Throughout the recovery phase, everyone wants to get "back to normal." The problem is that "normal" means the way they were before the disaster, exposed to repeated damage from future disasters. There should be an effort to help prepare people and property for the next disaster. Such an effort would include:

- Public information activities to advise residents about mitigation measures they can incorporate into their reconstruction work,
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs,
- Identifying other mitigation measures that can lessen the impact of the next disaster,
- Acquiring substantially or repeatedly damaged properties from willing sellers,
- Planning for long-term mitigation activities, and
- Applying for post-disaster mitigation funds.

Regulating Reconstruction

Requiring permits for building repairs and conducting inspections are vital activities to ensure that damaged structures are safe for people to reenter and repair. There is a special requirement to do this in floodplains, regardless of the type of disaster or the cause of damage. The NFIP requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in the mapped floodplain equals or exceeds 50% of the building's market value, the building must be retrofitted to meet the standards of a new building in the floodplain. In most cases, this means that a substantially damaged building must be elevated above the base flood elevation.

This requirement can be very difficult for understaffed and overworked offices following a disaster. However, if these activities are not carried out properly, not only does the community miss a tremendous opportunity to redevelop or clear out a hazardous area, it may be violating its obligations under the NFIP. In some areas, mutual aid agreements have been established so building inspectors from a community not affected by the disaster can work in the communities that were hit the hardest.

Local Implementation

The Placer County EOP has post-disaster recovery policies in place for the County. The Placer County EOP is intended to facilitate multi-agency and multi-jurisdictional coordination during emergencies including hazard events. Through its policies and procedures it seeks to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhanced response during emergencies and provide necessary assistance, and establish a recovery system in order to return the

community to their normal state of affairs. The County is in the process of updating the EOP and annexes in 2021. Post disaster recovery procedures for all hazards, including flood, are primarily addressed the Recovery Annex to the EOP, and are detailed further in Section 4.4 of the base plan.

CRS Credit

The CRS does credit post-disaster mitigation procedures if the policies and procedures are incorporated into a flood mitigation or multi-hazard plan through Activity 510 - Floodplain Management Planning.

Conclusions and Recommendations

- Placer County should consider StormReady certification.
- There are several threat recognitions systems that can provide the County with advance notice of an impending emergency.
- Placer County depends on local media outlets, sirens, telephones and door-to-door notices to warn residents. These media should reach most people who need to know of a threat.
- Emergency management guidance could be very helpful when things happen quickly and for hazards that have predictable impacts, such as tornado, winter storms and flooding.
- Placer County should update and exercise its EOP on a regular basis.
- Placer County and its jurisdictions should continue to work together to protect people before and after a disaster including an outreach program to promote each community's warning system.

C.4.5. Flood Control Measures

Four general types of flood control projects are reviewed here: levees, reservoirs, diversions, and dredging. These projects have three advantages not provided by other mitigation measures:

- They can stop most flooding, protecting streets and landscaping in addition to buildings,
- Many projects can be built without disrupting citizens' homes and businesses, and
- They are constructed and maintained by a government agency, a more dependable long-term management arrangement than depending on many individual private property owners.

However, as shown below, structural measures also have shortcomings. The appropriateness of using flood control depends on individual project area circumstances.

Pros and Cons of Structural Flood Control Projects

- Advantages
 - ✓ They may provide the greatest amount of protection for land area used.
 - ✓ Because of land limitations, they may be the only practical solution in some circumstances.
 - ✓ They can incorporate other benefits into structural project design, such as water supply and recreational uses.
 - ✓ Regional detention may be more cost-efficient and effective than requiring numerous small detention basins.
- Disadvantages
 - ✓ They can disturb the land and disrupt the natural water flows, often destroying wildlife habitat.
 - ✓ They require regular maintenance, which if neglected can have disastrous consequences.

- ✓ They are built to a certain flood protection level that can be exceeded by larger floods, causing extensive damage.
- ✓ They can create a false sense of security, as people protected by a project often believe no flood can ever reach them.
- ✓ Although it may be unintended, in many circumstances they promote more intensive land use and development in the floodplain.

Levees and Floodwalls

Probably the best known flood control measure is a barrier of earth (levee) or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour. Key considerations when evaluating the use of a levee include:

- Design and permitting costs,
- Right of way acquisition,
- Removal of fill to compensate for the floodwater storage that will be displaced by the levee,
- Internal drainage of surface flows from the area inside the levee,
- Cost of construction,
- Cost of maintenance,
- Mitigation of adverse impacts to wetlands and other habitats,
- Loss of river access and views, and
- Creating a false sense of security, because while levees may reduce flood damage for smaller more frequent rain events, they may also overtop or breach in extreme flood events and subsequently create more flood damage than would have occurred without the levee.

Levees placed along the river or stream edge degrade the aquatic habitat and water quality of the stream. They also are more likely to push floodwater onto other properties upstream or downstream. To reduce environmental impacts and provide multiple use benefits, a setback levee is the best project design. The area inside a setback levee can provide open space for recreational purposes and provide access sites to the river or stream.

Floodwalls perform like levees except they are vertical-sided structures that require less surface area for construction. Floodwalls are constructed of steel sheet pile or reinforced concrete, which makes the expense of installation cost prohibitive in many circumstances. Floodwalls also degrade adjacent habitat and can displace erosive energy to unprotected areas of shoreline downstream.

Reservoirs and Detention

Reservoirs reduce flooding by temporarily storing flood waters behind dams or in storage or detention basins. Reservoirs lower flood heights by holding back, or detaining, runoff before it can flow downstream. Flood waters are detained until the flood has subsided, and then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream.

Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created. The lake may provide recreational benefits or water supply (which could also help mitigate a drought).

Flood control reservoirs are most commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs, or detention basins, are built to protect property from the stormwater runoff impacts of new development.

Figure 0-13 Retention Pond



Regardless of size, reservoirs protect the development that is downstream from the reservoir site. Unlike levees and channel modifications, they do not have to be built close to or disrupt the area to be protected. Reservoirs are most efficient in deeper valleys where there is more room to store water, or on smaller rivers where there is less water to be stored.

In urban areas, some reservoirs are simply manmade holes, excavated to store floodwaters. Reservoirs in urban areas are typically constructed adjacent to streams (though usually outside of the floodplain). When built in the ground, there is no dam for these retention and detention basins and no dam failure hazard. Wet or dry basins can also serve multiple uses by doubling as parks or other open space uses.

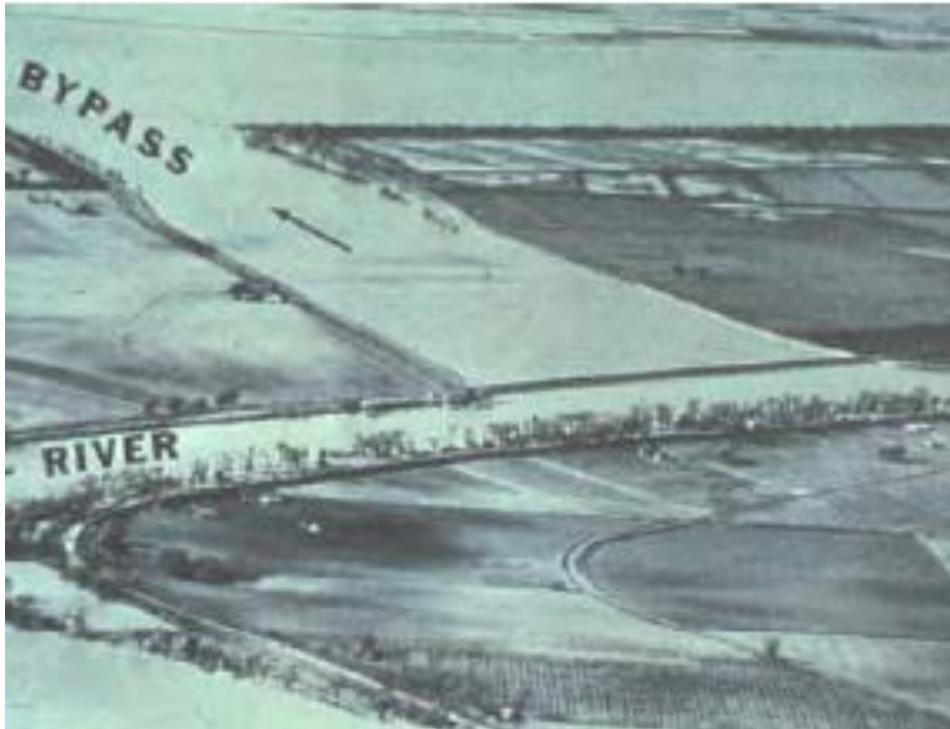
There are several considerations when evaluating the use of reservoirs and detention:

- There is the threat of flooding the protected area should the reservoir's dam fail,
- There is a constant expense for the management and maintenance of the facility,
- They may fail to prevent floods that exceed their design levels,
- Sediment deposition may occur and reduce the storage capacity over time,
- They can impact water quality as they are known to affect temperature, dissolved oxygen and nitrogen, and nutrient levels, and
- If not designed correctly, in-stream reservoirs may cause backwater flooding problems upstream

Diversion

A diversion is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During floods, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river.

Figure 0-14 Diversion



Diversions are limited by topography; they will not work in some areas. Unless the receiving water body is relatively close to the floodprone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive.

Dredging

Dredging is often viewed as a form of conveyance improvement. However, it has the following problems:

- Given the large volume of water that comes downstream during a flood, removing a foot or two from the bottom of the channel will have little effect on flood heights.
- Dredging is often cost prohibitive because the dredged material must be disposed of somewhere.
- Unless in-stream or tributary erosion is corrected upstream, the dredged areas usually fill back in within a few years, and the process and the expense have to be repeated.
- If the channel has not been disturbed for many years, dredging will destroy the habitat that has developed.

Figure 0-15 Dredging Activity



To protect the natural values of the stream, federal law requires a U.S. Army Corps of Engineers permit before dredging can proceed. This can be a lengthy process that requires a lot of advance planning and many safeguards to protect habitats, which adds to the cost of the project.

CRS Credit

Structural flood control projects that provide 100-year flood protection and that result in revisions to the Flood Insurance Rate Map are not credited by the CRS in order to avoid duplicating the larger premium reduction provided by removing properties from the mapped floodplain.

The CRS credits smaller flood control projects that meet the following criteria:

- They must provide protection to at least the 25-year flood,
- They must meet certain environmental protection criteria,
- They must meet federal, state and local regulations, such as the Corps of Engineers' 404 permit and California Division of Dam Safety for dam safety rules, and
- They must meet certain maintenance requirements.

These criteria ensure that credited projects are well-planned and permitted. Any of the measures reviewed in this section would be recognized under Activity 530 - Flood Protection, although it would be very hard to qualify a dredging project. Credit points are based on the type of project, how many buildings are protected, and the level of flood protection provided.

Local Implementation

In coordination with California Department of Water Resources and the Placer County Flood Control and Water Conservation District, flood control and drainage facilities are being brought to current standards of flood protection and prevention.

Conclusions and Recommendations

- The County has previously received funding for construction of flood control and drainage facilities that will move storm and flood waters more efficiently and reduced potential for overbank flooding. The County is also considering additional projects in the Placer County Planning Area.
- Placer County, the cities, and special districts should continue to implement countywide drainage improvement projects to reduce the potential from overbank flooding along local drainages and flooding from localized stormwater events.

C.4.6. Public Information Measures

A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, and businesses about hazards and ways to protect people and property from these hazards. These activities can motivate people to take the steps necessary to protect themselves and others.

Information can bring about voluntary mitigation activities at little or no cost to the government. Property owners mitigated their flooding problems long before government funding programs existed. The typical approach to delivering information involves two levels of activity. The first is to broadcast a short and simple version of the message to everyone potentially affected. The second level provides more detailed information to those who respond and want to learn more.

This section starts with activities that reach out to people and tell them to be advised of the hazards and some of the things they can do. It then covers additional sources of information for those who want to learn more. It ends with a general public information strategy.

Outreach Projects

Outreach projects are the first step in the process of orienting property owners to the hazards they face and to the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties.

Research has shown that outreach projects work. However, awareness of the hazard is not enough; people need to be told what they can do about the hazard. Thus, projects should include information on safety, health and property protection measures. Research has also shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Community newsletters/direct mailings: The most effective types of outreach projects are mailed or distributed to everyone in the community. In the case of floods, they can be sent only to floodplain property owners.

News media: Local newspapers can be strong allies in efforts to inform the public. Press releases and story ideas may be all that's needed to gain their interest. After a flood in another community, people and the media become interested in their flood hazard and how to protect themselves and their property. Local radio stations and cable TV channels can also help. These media offer interview formats and cable TV may be willing to broadcast videos on the hazards.

Other approaches: Examples of other outreach projects include:

- Presentations at meetings of neighborhood, civic or business groups,
- Displays in public buildings or shopping malls,
- Signs in parks, along trails and on waterfronts that explain the natural features (such as the river) and their relation to the hazards (such as floods),
- Brochures available in municipal buildings and libraries, and
- Special meetings, workshops and seminars.

Local Implementation

Placer County maintains a website that provides in-depth flood protection information. The County also provides a direct mailing annually to residents, with a focus on repetitive loss areas, which include flyers on flood protection and property protection measures. The County also provides direct mailings on flood protection information to insurance brokers and realtors located throughout the County. In addition, the County's flood protection and stormwater group also conduct and participate in a variety of public community events throughout the year such as community fairs, river runs, river cleanups, etc. and provide information to the public on stormwater management and flood protection measures. The County also has a variety of flood materials placed in public locations.

CRS Credit

The Community Rating System provides credit for outreach projects which cover six flood-related topics. Credit is also available for producing flood response materials. Another way to achieve credit for outreach is for producing a plan for public information (PPI). A 40% bonus is applied to outreach credits which are included in a PPI.

Real Estate Disclosure

Many times after a flood or other natural disaster, people say they would have taken steps to protect themselves if they had known they had purchased a property exposed to a hazard. There are some federal and state requirements about such disclosures, but they have their limits.

Federal law: Federally regulated lending institutions must advise applicants for a mortgage or other loan that is to be secured by an insurable building whether the property is in a floodplain as shown on the Flood Insurance Rate Map. If so, flood insurance is required for buildings located within the floodplain if the mortgage or loan is federally insured. However, because this requirement has to be met only 10 days before closing, the applicant is often already committed to purchasing the property when he or she first learns of the flood hazard.

State law: State laws set standards for real estate sales and licensing of agents and brokers.

Local Implementation

Placer County receives credit for providing for the local real estate agents disclosure of flood hazards to prospective buyers. Credit is also provided for state and community regulations requiring disclosure of flood hazards.

CRS Credit

Communities in areas that have additional disclosure requirements are eligible for five points under the "Other disclosure requirements" as well as 10 points for the "Disclosure of other hazards."

Libraries and Websites

The two previous activities tell people that they are exposed to a hazard. The next step is to provide information to those who want to know more. The community library and local websites are obvious places for residents to seek information on hazards, hazard protection, and protecting natural resources.

Books and pamphlets on hazard mitigation can be given to libraries, and many of these can be obtained for free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures and other projects, which can augment the activities of the local government. Today, websites are commonly used as research tools. They provide fast access to a wealth of public and private sites for information. Through links to other websites, there is almost no limit to the amount of up to date information that can be accessed on the Internet.

In addition to online floodplain maps, websites can link to information for homeowners on how to retrofit for tornadoes and floods or a website about floods for children. The "FEMA for Kids" website teaches children how to protect their home and what to have in a family disaster kit.

Local Implementation

Placer County provides a variety of flood materials placed in public locations, including public buildings such as County Public Works Department and public libraries. The County also has an extensive flood protection websites at: <http://www.placer.ca.gov/departments/Works/FloodControl.aspx>

CRS Credit

The Community Rating System provides credit for having a variety of flood references in the local public library and additional credits for similar material included on municipal websites (Activity 350 - Flood Protection Information).

Technical Assistance

Hazard Information

Many benefits stem from providing map information to inquirers. Residents and business owners that are aware of the potential hazards can take steps to avoid problems or reduce their exposure to flooding. Real

estate agents and house hunters can find out if a property is floodprone and whether flood insurance may be required.

Communities can easily provide map information from FEMA's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is located outside the mapped floodplain.

Some communities supplement what is shown on the FIRM with information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. They should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never get wet.

Property Protection Assistance

While general information provided by outreach projects or the library is beneficial, most property owners do not feel ready to retrofit their buildings without more specific guidance. Local building department staffs are experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track.

- Building or public works department staffs can provide the following types of assistance:
- Visit properties and offer protection suggestions,
- Recommend or identify qualified or licensed contractors,
- Inspect homes for anchoring of roofing and the home to the foundation,
- Provide advice on protecting windows and garage doors from high winds, and
- Explain when building permits are needed for home improvements.

There is a concern that a local official might provide the wrong information and the community would be sued if a project failed. To counter this, there are guidelines for local programs and training on how to identify the right measures. FEMA conducts a free week-long course at its Emergency Management Institute on property protection measures for flooding. FEMA and the Corps of Engineers periodically conduct one- or two-day retrofitting workshops.

Local Implementation

FEMA floodplain maps are available on FEMA's website, which is linked through the Placer County Floodplain Management website. The County also responds to requests on whether a property is located in a Special Flood Hazard Area. (see Figure 0-16 for example of what is provided on a floodplain determination request). The County also maintains elevation certificates for many existing homes within or near the SFHA. Elevation Certificates and LOMA's are listed on Placer County's website. Placer County is working with FEMA to update the current SFHA mapping completed in 2018 and expects an update for specific watershed labeled as Zone A without BFE to Zone AE with BFE in 2022.

Figure 0-16 Placer County Floodplain Determination



CRS Credit

The Community Rating System provides points for providing map information to inquirers. Points are available for providing one-on-one flood protection assistance to residents and businesses and for making site visits. Both services must be publicized.

Public Information Program Strategy

A public information program strategy is a document that receives CRS credit. It is a review of local conditions, local public information needs, and a recommended plan of activities. A strategy consists of the following parts, which are incorporated into this plan:

- The local flood hazard (discussed in Chapter 4 of this plan)
- The property protection measures appropriate for the flood hazard (discussed in Chapter 5 of this plan)
- Flood safety measures appropriate for the local situation (discussed in Chapter 5 of this plan)
- The public information activities currently being implemented within the community, including those being carried out by non-government agencies (discussed in Chapter 4 of this plan and jurisdictional annexes)
- Goals for the community's public information program (discussed in Chapter 3 and 5 of this plan)
- The outreach projects that will be done each year to reach the goals (discussed in Chapter 5 of this plan)
- The process that will be followed to monitor and evaluate the projects (discussed in Chapter 7)

Figure 0-17 illustrates several flood safety tips that can be used in an outreach campaign to better inform the public of the hazards associated with flooding.

Figure 0-17 Flood Safety Tips for Outreach Campaign

Flood Safety
<p>Pay attention to evacuation orders. Listen to local radio or TV stations for forecasts and emergency warnings. Know about evacuation routes and nearby shelters and have plans for all family members on how to evacuate and where to meet if you're split up during an emergency.</p>
<p>Do not drive through a flooded area. During a flood, more people drown in their cars than anywhere else. Don't drive around road barriers; the road or bridge may be washed out.</p>
<p>Do not walk through flowing water. Flash flooding is the leading cause of weather-related deaths in the U.S. Currents can be deceptive; 6 inches of moving water can knock you off your feet in a strong current. If you walk in standing water, use a stick to help you locate the ground.</p>
<p>Stay away from power lines and electrical wires. Electrical currents can travel through water. Report downed power lines to the police or sheriff by calling 911.</p>
<p>Have the power company turn off your electricity. Some appliances, like TV sets, keep electrical charges even after they've been unplugged. Don't use appliances or motors that have gotten wet unless they have been taken apart, cleaned and dried.</p>
<p>Look before you step. After a flood, the ground and floors are covered with debris like broken bottles and nails. Floors and stairs that are covered with mud can also be slippery.</p>
<p>Be alert for gas leaks. Use a flashlight to inspect damage. Don't smoke or use candles, lanterns, or open flames unless you know the gas has been shut off and the area has been ventilated.</p>
<p>Look out for animals that may have been flooded out of their homes and who may seek shelter in yours. Use a pole or stick to turn things over and scare away small animals.</p>
<p>Look before you step. After a flood, the ground and floors are covered with debris. Floors and stairs that have been covered with mud will be very slippery.</p>
<p>Carbon monoxide exhaust kills. Use a generator or other gasoline-powered machine outdoors. The same goes for camping stoves. Charcoal fumes are especially deadly – cook with charcoal outdoors.</p>
<p>Clean everything that got wet in the flood. Floodwaters have picked up sewage and chemicals from roads, farms, factories, and storage buildings. Spoiled food, and flooded cosmetics and medicines can be health hazards. When in doubt, throw it out.</p>
<p>Take care of yourself. Recovering from a flood is a big job. It is tough on both the body and the spirit and the effects a disaster has on you and your family may last a long time.</p>

Local Implementation

Placer County conducts a public information campaign using a variety of mechanisms to inform residents of the flood and other hazards and to provide information to foster better floodplain management throughout the County Planning Area. An overview of the County's outreach efforts can be seen at: <https://www.placer.ca.gov/1498/Floodplain-Management>. The County does not currently utilize a PPI for outreach.

CRS Credit

The CRS provides up to 350 points for a Plan for Public Information (PPI).

Conclusions and Recommendations

- There are many ways that public information can be used so that people and businesses will be more aware of the hazards they face and how they can protect themselves.
- Libraries and websites are currently being used as public information tools in Placer County.
- The most important topics to cover in public information activities are:
 - ✓ Safety precautions for all types of hazards, but especially tornados, earthquakes, thunder storms, winter storms, wildfires, and floods.
 - ✓ Knowing where emergency evacuation shelters are in town.
 - ✓ Flood protection measures, including rules for new construction and insurance.
 - ✓ Keeping drainage ways clear and protection from local drainage problems.
 - ✓ Family and emergency preparedness measures.
 - ✓ What the County and cities are doing and sources of assistance.
 - ✓ Protecting water quality and wetlands and the benefits of open space.
- The most appropriate ways to spread this information are:
 - ✓ Websites and social media
 - ✓ Mailings to everyone, in utility bills or otherwise
 - ✓ News releases or newspaper articles
 - ✓ Newsletters
 - ✓ Displays, particularly at special events
 - ✓ Handouts, flyers and other materials, which can be distributed at special events and presentations
- County and City staff should continue to reach out to residents, civic organizations and other organizations to help spread the word about flood hazards, flood protection, and safety measures.



Appendix D Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the participating jurisdictions and added to this appendix. Two model resolutions are provided below. The first sample resolution is for the County and incorporated communities; the second is for participating districts.

Sample Resolution: Placer County and incorporated communities

Resolution # _____

Adopting the Placer County Local Hazard Mitigation Plan Update

WHEREAS, The (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

WHEREAS, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

WHEREAS, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Placer County Local Hazard Mitigation Plan and approve it contingent upon this official adoption of the participating governing body; and

WHEREAS, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Placer County Local Hazard Mitigation Plan by reference into the Safety Element of the General Plan in accordance with the requirements of AB 2140; and

WHEREAS, adoption by the governing body for the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) demonstrates the jurisdiction’s commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan; and

WHEREAS, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

NOW, THEREFORE, BE IT RESOLVED that the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) adopts the Placer County Local Hazard Mitigation Plan as an official plan; and

BE IT RESOLVED, that the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) adopts the Placer County Local Hazard Mitigation Plan by reference into the safety element of their general plan in accordance with the requirements of AB 2140; and

BE IT FURTHER RESOLVED, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan’s final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirement of AB 2140.

Passed: _____
(date)

Certifying Official

Sample Resolution: Special Districts in Placer County

Resolution # _____

Adopting the Placer County Local Hazard Mitigation Plan Update

Whereas, (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Placer County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Placer County Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the (Name of Government/District/Organization), demonstrates the jurisdiction’s commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Placer County Local Hazard Mitigation Plan as an official plan; and

Be it further resolved, (Name of Government/District/Organization) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan’s final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

Passed: _____
(date)

Certifying Official

Appendix E Threatened and Endangered Species

Table E-1 Special Status Species in Placer County

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals – Amphibians					
<i>Ambystoma californiense</i>	California tiger salamander	Threatened	Threatened	WL	–
<i>Ambystoma macrodactylum sigillatum</i>	southern long-toed salamander	None	None	SSC	–
<i>Batrachoseps diabolicus</i>	Hell Hollow slender salamander	None	None	–	–
<i>Hydromantes platycephalus</i>	Mount Lyell salamander	None	None	WL	–
<i>Lithobates pipiens</i>	northern leopard frog	None	None	SSC	–
<i>Rana boylei</i>	foothill yellow-legged frog	None	Endangered	SSC	–
<i>Rana draytonii</i>	California red-legged frog	Threatened	None	SSC	–
<i>Rana muscosa</i>	southern mountain yellow-legged frog	Endangered	Endangered	WL	–
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	Endangered	Threatened	WL	–
<i>Spea hammondi</i>	western spadefoot	None	None	SSC	–
Animals – Arachnids					
<i>Banksula galilei</i>	Galile's cave harvestman	None	None	–	–
Animals – Birds					
<i>Accipiter cooperii</i>	Cooper's hawk	None	None	WL	–
<i>Accipiter gentilis</i>	northern goshawk	None	None	SSC	–
<i>Accipiter striatus</i>	sharp-shinned hawk	None	None	WL	–
<i>Aquila chrysaetos</i>	golden eagle	None	None	FP ; WL	–
<i>Buteo regalis</i>	ferruginous hawk	None	None	WL	–
<i>Buteo swainsoni</i>	Swainson's hawk	None	Threatened	–	–
<i>Circus hudsonius</i>	northern harrier	None	None	SSC	–
<i>Elanus leucurus</i>	white-tailed kite	None	None	FP	–
<i>Haliaeetus leucocephalus</i>	bald eagle	Delisted	Endangered	FP	–
<i>Eremophila alpestris actia</i>	California horned lark	None	None	WL	–
<i>Aythya americana</i>	redhead	None	None	SSC	–
<i>Histrionicus histrionicus</i>	harlequin duck	None	None	SSC	–
<i>Cypseloides niger</i>	black swift	None	None	SSC	–
<i>Ardea alba</i>	great egret	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Ardea herodias</i>	great blue heron	None	None	–	–
<i>Botaurus lentiginosus</i>	American bittern	None	None	–	–
<i>Egretta thula</i>	snowy egret	None	None	–	–
<i>Nycticorax nycticorax</i>	black-crowned night heron	None	None	–	–
<i>Pica nuttalli</i>	yellow-billed magpie	None	None	–	–
<i>Falco mexicanus</i>	prairie falcon	None	None	WL	–
<i>Falco peregrinus anatum</i>	American peregrine falcon	Delisted	Delisted	FP	–
<i>Antigone canadensis tabida</i>	greater sandhill crane	None	Threatened	FP	–
<i>Progne subis</i>	purple martin	None	None	SSC	–
<i>Riparia riparia</i>	bank swallow	None	Threatened	–	–
<i>Agelaius tricolor</i>	tricolored blackbird	None	Threatened	SSC	–
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	None	None	SSC	–
<i>Icteria virens</i>	yellow-breasted chat	None	None	SSC	–
<i>Lanius ludovicianus</i>	loggerhead shrike	None	None	SSC	–
<i>Chlidonias niger</i>	black tern	None	None	SSC	–
<i>Larus californicus</i>	California gull	None	None	WL	–
<i>Pandion haliaetus</i>	osprey	None	None	WL	–
<i>Baeolophus inornatus</i>	oak titmouse	None	None	–	–
<i>Setophaga petechia</i>	yellow warbler	None	None	SSC	–
<i>Aimophila ruficeps canescens</i>	southern California rufous-crowned sparrow	None	None	WL	–
<i>Ammodramus savannarum</i>	grasshopper sparrow	None	None	SSC	–
<i>Melospiza melodia</i>	song sparrow (–in Modesto–in population)	None	None	SSC	–
<i>Pelecanus erythrorhynchos</i>	American white pelican	None	None	SSC	–
<i>Melanerpes lewis</i>	Lewis' woodpecker	None	None	–	–
<i>Picoides arcticus</i>	black-backed woodpecker	None	None	–	–
<i>Sphyrapicus ruber</i>	red-breasted sapsucker	None	None	–	–
<i>Laterallus jamaicensis coturniculus</i>	California black rail	None	Threatened	FP	–
<i>Asio otus</i>	long-eared owl	None	None	SSC	–
<i>Athene cunicularia</i>	burrowing owl	None	None	SSC	–
<i>Strix occidentalis occidentalis</i>	California Spotted Owl	None	None	SSC	–
<i>Contopus cooperi</i>	olive-sided flycatcher	None	None	SSC	–
<i>Empidonax traillii</i>	willow flycatcher	None	Endangered	–	–
Animals – Crustaceans					
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	Endangered	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	Threatened	None	–	–
<i>Stygobromus lacicolus</i>	Lake Tahoe amphipod	None	None	–	–
<i>Stygobromus taboensis</i>	Lake Tahoe stygobromid	None	None	–	–
<i>Linderiella occidentalis</i>	California linderiella	None	None	–	–
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	Endangered	None	–	–
Animals – Fish					
<i>Catostomus platyrhynchus</i>	mountain sucker	None	None	SSC	–
<i>Siphateles bicolor pectinifer</i>	Lahontan Lake tui chub	None	None	SSC	–
<i>Entosphenus tridentatus</i>	Pacific lamprey	None	None	SSC	–
<i>Lampetra ayresii</i>	western river lamprey	None	None	SSC	–
<i>Oncorhynchus clarkii henshawi</i>	Lahontan cutthroat trout	Threatened	None	–	–
<i>Oncorhynchus mykiss irideus</i> <i>pop. 11</i>	steelhead – Central Valley DPS	Threatened	None	–	–
<i>Oncorhynchus tshawytscha</i> <i>pop. 13</i>	chinook salmon – Central Valley fall / late fall–run ESU	None	None	SSC	–
<i>Oncorhynchus tshawytscha</i> <i>pop. 6</i>	chinook salmon – Central Valley spring–run ESU	Threatened	Threatened	–	–
<i>Oncorhynchus tshawytscha</i> <i>pop. 7</i>	chinook salmon – Sacramento River winter–run ESU	Endangered	Endangered	–	–
<i>Prosopium williamsoni</i>	mountain whitefish	None	None	SSC	–
Animals – Insects					
<i>Andrena subapasta</i>	An andrenid bee	None	None	–	–
<i>Bombus caliginosus</i>	obscure bumble bee	None	None	–	–
<i>Bombus morrisoni</i>	Morrison bumble bee	None	None	–	–
<i>Bombus occidentalis</i>	western bumble bee	None	Candidate Endangered	–	–
<i>Orobittacus obscurus</i>	gold rush hanging scorpionfly	None	None	–	–
<i>Capnia lacustra</i>	Lake Tahoe benthic stonefly	None	None	–	–
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	Threatened	None	–	–
<i>Hydrochara rickseckeri</i>	Ricksecker's water scavenger beetle	None	None	–	–
<i>Cryptochia excella</i>	Kings Canyon cryptochian caddisfly	None	None	–	–
<i>Desmona bethula</i>	amphibious caddisfly	None	None	–	–
<i>Rhyacophila spinata</i>	spiny rhyacophilan caddisfly	None	None	–	–
Animals – Mammals					
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	None	None	SSC	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	Proposed Endangered	Threatened	–	–
<i>Vulpes vulpes patwin</i>	Sacramento Valley red fox	None	None	–	–
<i>Erethizon dorsatum</i>	North American porcupine	None	None	–	–
<i>Lepus americanus taboensis</i>	Sierra Nevada snowshoe hare	None	None	SSC	–
<i>Lepus townsendii townsendii</i>	western white-tailed jackrabbit	None	None	SSC	–
<i>Gulo gulo</i>	California wolverine	Proposed Threatened	Threatened	FP	–
<i>Martes caurina sierrae</i>	Sierra marten	None	None	–	–
<i>Pekania pennanti</i>	Fisher	None	None	SSC	–
<i>Taxidea taxus</i>	American badger	None	None	SSC	–
<i>Ochotona princeps schisticeps</i>	gray-headed pika	None	None	–	–
<i>Antrozous pallidus</i>	pallid bat	None	None	SSC	–
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	None	None	SSC	–
<i>Euderma maculatum</i>	spotted bat	None	None	SSC	–
<i>Lasionycteris noctivagans</i>	silver-haired bat	None	None	–	–
<i>Lasiurus blossevillii</i>	western red bat	None	None	SSC	–
<i>Lasiurus cinereus</i>	hoary bat	None	None	–	–
<i>Myotis thysanodes</i>	fringed myotis	None	None	–	–
<i>Myotis volans</i>	long-legged myotis	None	None	–	–
<i>Myotis yumanensis</i>	Yuma myotis	None	None	–	–
Animals – Mollusks					
<i>Monadenia mormonum buttoni</i>	Button's Sierra sideband	None	None	–	–
<i>Margaritifera falcata</i>	western pearlshell	None	None	–	–
<i>Helisoma newberryi</i>	Great Basin rams-horn	None	None	–	–
<i>Vespericola sierranus</i>	Siskiyou hesperian	None	None	–	–
<i>Anodonta californiensis</i>	California floater	None	None	–	–
Animals – Reptiles					
<i>Emys marmorata</i>	western pond turtle	None	None	SSC	–
<i>Phrynosoma blainvillii</i>	coast horned lizard	None	None	SSC	–
Community – Terrestrial					
–	Alkali Meadow	None	None	–	–
–	Alkali Seep	None	None	–	–
–	Big Tree Forest	None	None	–	–
–	Northern Hardpan Vernal Pool	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
	Northern Volcanic Mud Flow Vernal Pool	None	None	–	–
Plants – Brophytes					
<i>Bruchia bolanderi</i>	Bolander's bruchia	None	None	–	4.2
<i>Meesia triquetra</i>	three-ranked hump moss	None	None	–	4.2
<i>Mielichhoferia elongata</i>	elongate copper moss	None	None	–	4.3
Plants – Vascular					
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	None	None	–	1B.2
<i>Allium jepsonii</i>	Jepson's onion	None	None	–	1B.2
<i>Allium sanbornii</i> var. <i>congdonii</i>	Congdon's onion	None	None	–	4.3
<i>Allium sanbornii</i> var. <i>sanbornii</i>	Sanborn's onion	None	None	–	4.2
<i>Artemisia tripartita</i> ssp. <i>tripartita</i>	threetip sagebrush	None	None	–	2B.3
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	None	None	–	1B.2
<i>Erigeron miser</i>	starved daisy	None	None	–	1B.3
<i>Erigeron petrophilus</i> var. <i>sierrensis</i>	northern Sierra daisy	None	None	–	4.3
<i>Eurybia merita</i>	subalpine aster	None	None	–	2B.3
<i>Packera layneae</i>	Layne's ragwort	Threatened	Rare	–	1B.2
<i>Cryptantha glomeriflora</i>	clustered-flower cryptantha	None	None	–	4.3
<i>Hackelia amethystina</i>	amethyst stickseed	None	None	–	4.3
<i>Arabis rigidissima</i> var. <i>demota</i>	Galena Creek rockcress	None	None	–	1B.2
<i>Rorippa subumbellata</i>	Tahoe yellow cress	None	Endangered	–	1B.1
<i>Streptanthus longisiliquus</i>	long-fruit jewelflower	None	None	–	4.3
<i>Downingia pusilla</i>	dwarf downingia	None	None	–	2B.2
<i>Githopsis pulchella</i> ssp. <i>serpentinicola</i>	serpentine bluecup	None	None	–	4.3
<i>Legenere limosa</i>	legenere	None	None	–	1B.1
<i>Viburnum ellipticum</i>	oval-leaved viburnum	None	None	–	2B.3
<i>Pseudostellaria sierrae</i>	Sierra starwort	None	None	–	4.2
<i>Stellaria obtusa</i>	obtuse starwort	None	None	–	4.3
<i>Calystegia vanzoukiae</i>	Van Zuuk's morning-glory	None	None	–	1B.3
<i>Carex davyi</i>	Davy's sedge	None	None	–	1B.3
<i>Carex lasiocarpa</i>	woolly-fruited sedge	None	None	–	2B.3
<i>Carex sheldonii</i>	Sheldon's sedge	None	None	–	2B.2
<i>Eriophorum gracile</i>	slender cottongrass	None	None	–	4.3
<i>Arctostaphylos menziesii</i> ssp. <i>truei</i>	True's manzanita	None	None	–	4.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Arctostaphylos nissenana</i>	Nissenan manzanita	None	None	–	1B.2
<i>Astragalus austiniiae</i>	Austin's astragalus	None	None	–	1B.3
<i>Astragalus whitneyi</i> var. <i>lenophyllus</i>	woolly-leaved milk-vetch	None	None	–	4.3
<i>Lathyrus sulphureus</i> var. <i>argillaceus</i>	dubious pea	None	None	–	3
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	None	None	–	1B.2
<i>Juncus hemiendytus</i> var. <i>abjectus</i>	Center Basin rush	None	None	–	4.3
<i>Juncus leiospermus</i> var. <i>abartii</i>	Ahart's dwarf rush	None	None	–	1B.2
<i>Juncus leiospermus</i> var. <i>leiospermus</i>	Red Bluff dwarf rush	None	None	–	1B.1
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	None	None	–	1B.2
<i>Lycopus uniflorus</i>	northern bugleweed	None	None	–	4.3
<i>Utricularia intermedia</i>	flat-leaved bladderwort	None	None	–	2B.2
<i>Calochortus clavatus</i> var. <i>avius</i>	Pleasant Valley mariposa-lily	None	None	–	1B.2
<i>Fritillaria agrestis</i>	stinkbells	None	None	–	4.2
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	None	None	–	3.2
<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>	Humboldt lily	None	None	–	4.2
<i>Sphaeralcea munroana</i>	Munro's desert mallow	None	None	–	2B.2
<i>Claytonia megarhiza</i>	fell-fields claytonia	None	None	–	2B.3
<i>Claytonia parviflora</i> ssp. <i>grandiflora</i>	streambank spring beauty	None	None	–	4.2
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	Hutchison's lewisia	None	None	–	3.2
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	Kellogg's lewisia	None	None	–	3.2
<i>Lewisia longipetala</i>	long-petaled lewisia	None	None	–	1B.3
<i>Lewisia serrata</i>	saw-toothed lewisia	None	None	–	1B.1
<i>Myrica hartwegii</i>	Sierra sweet bay	None	None	–	4.3
<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegee's clarkia	None	None	–	4.2
<i>Clarkia virgata</i>	Sierra clarkia	None	None	–	4.3
<i>Botrychium ascendens</i>	upswept moonwort	None	None	–	2B.3
<i>Botrychium crenulatum</i>	scalloped moonwort	None	None	–	2B.2
<i>Botrychium minganense</i>	Mingan moonwort	None	None	–	2B.2
<i>Piperia colemanii</i>	Coleman's rein orchid	None	None	–	4.3
<i>Piperia leptopetala</i>	narrow-petaled rein orchid	None	None	–	4.3
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid salty bird's-beak	None	None	–	1B.1
<i>Cordylanthus tenuis</i> ssp. <i>brunneus</i>	serpentine bird's-beak	None	None	–	4.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	None	Endangered	–	1B.2
<i>Glyceria grandis</i>	American manna grass	None	None	–	2B.3
<i>Poa sierrae</i>	Sierra blue grass	None	None	–	1B.3
<i>Leptosiphon acicularis</i>	bristly leptosiphon	None	None	–	4.2
<i>Navarretia myersii</i> ssp. <i>myersii</i>	pincushion navarretia	None	None	–	1B.1
<i>Eriogonum tripodum</i>	tripod buckwheat	None	None	–	4.2
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	Donner Pass buckwheat	None	None	–	1B.2
<i>Potamogeton epihydrus</i>	Nuttall's ribbon-leaved pondweed	None	None	–	2B.2
<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	slender-leaved pondweed	None	None	–	2B.2
<i>Ceanothus fresnensis</i>	Fresno ceanothus	None	None	–	4.3
<i>Rhamnus alnifolia</i>	alder buckthorn	None	None	–	2B.2
<i>Ivesia sericoleuca</i>	Plumas ivesia	None	None	–	1B.2
<i>Brodiaea rosea</i> ssp. <i>vallicola</i>	valley brodiaea	None	None	–	4.2
<i>Brodiaea sierrae</i>	Sierra foothills brodiaea	None	None	–	4.3
<i>Viola tomentosa</i>	felt-leaved violet	None	None	–	4.2

Sources: California Natural Diversity Database BIOS Viewer Tool

Federal Status

Endangered: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Threatened: The classification provided to an animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed Endangered: The classification provided to an animal or plant that is proposed for federal listing as Endangered in the Federal Register under Section 4 of the Endangered Species Act.

Proposed Threatened: The classification provided to an animal or plant that is proposed for federal listing as Threatened in the Federal Register under Section 4 of the Endangered Species Act.

Candidate: The classification provided to an animal or plant that has been studied by the United States Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.

None: The plant or animal has no federal status.

Delisted: The plant or animal was previously listed as Endangered or Threatened, but is no longer listed on the Federal Endangered and Threatened species list.

CDFW Status

FP: Fully Protected: This classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction.

SSC: Species of Special Concern: To this end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability.

WL: Watch List: Species that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CA Rare Plant Rank

1A: Plants presumed extinct in California and rare/extinct elsewhere

1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California

1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California

1B.3: Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California

- 2A: Plants presumed extirpated in California, but more common elsewhere
- 2B.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
- 2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
- 2B.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
- 3.1: Plants about which we need more information; seriously threatened in California
- 3.2: Plants about which we need more information; fairly threatened in California
- 3.3: Plants about which we need more information; not very threatened in California
- 4.1: Plants of limited distribution; seriously threatened in California
- 4.2: Plants of limited distribution; fairly threatened in California
- 4.3: Plants of limited distribution; not very threatened in California



Appendix F Critical Facilities

Table F-1 Placer County Critical Facilities

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	Fairground	Roseville Fairgrounds	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Fairground	Gold Country Fairgrounds	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Finnish Temperance Hall	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Polish American Community Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Joss House	Auburn	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Lincoln Heritage Theater	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Woman's Club of Lincoln	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Rocklin Civic Center	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Colfax Veterans Memorial Hall	Colfax	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Foresthill Veterans Memorial Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Auburn Elks Lodge	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	Hall	Tahoe Club	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Moose Lodge No 2264	Auburn	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Moose Lodge 1293	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Thermalands Community Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Roseville Masonic Temple # 222	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Central S.D. Community Hall	Lincoln	Other Areas	Zone X (unshaded)	Non-Wildland/Non-Urban		
Class 3	Hall	Roseville Alano Club	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Lions Club	Unincorporated Placer County	1% Annual Chance Flood Hazard	Zone AE	Urban Unzoned		
Class 3	Hall		Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Gold Hill Grange	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Loomis Grange	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall		Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Lakeview Hills Clubhouse	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Mount Pleasant Farm Bureau Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	Hall	Newcastle Portugese Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Fruitvale Community Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Long Valley Community Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Mt. Vernon Grange Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hall	Foothills Recreation Club	Auburn	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Oddfellows Lodge #81 Io	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Clay Lodge Masonic Hall	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Dutch Flat Community Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Meadow Vista Grange #721	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 3	Hall	Dutch Flat Swimming Pool	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall		Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Carpenters Local Union No 1789	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Auburn Trapshooting Club	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Stanford Alpine Chalet	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	Hall	Resort at Squaw Creek	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Hall	Jewish Community Center Chabad of Placer County	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hall	Roseville Elks Lodge	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hazardous Materials Facility	Enterprise Products Oper LP	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hazardous Materials Facility	NID/Locksley	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		Y
Class 3	Hazardous Materials Facility	PCWA - Bowman Treatment	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hazardous Materials Facility	PCWA - Foothill Treatment	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hazardous Materials Facility	Placer County DPW	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		Y
Class 3	Hazardous Materials Facility	Placer County DPW	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		Y
Class 3	Hazardous Materials Facility	Rio Bravo Rocklin	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hazardous Materials Facility	San Juan Suburban Water Dist	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Hazardous Materials Facility	Sierra Pacific Industries	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Hazardous Materials Facility	United Natural Foods	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Independence High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Roseville High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Oakhills Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Ridgeview Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Lincoln Crossing Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Twelve Bridges Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Foskett Ranch Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Rocklin Academy	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Ruhkala Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Victory High School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Independent High School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Whitney High School	Rocklin	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Newcastle Charter School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Newcastle Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Phoenix High School (Continuation)	Lincoln	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Lincoln High School	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Glen Edwards Middle School	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	First Street Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Alta-Dutch Flat Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Rocklin Academy at Meyers Street	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Rocklin Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Maidu High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Chana High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Bowman School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Foresthill High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Colfax Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	PCOE K-8 Community Independent Study Home	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 3	School	North Tahoe High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	North Tahoe Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Alta Vista Elementary School	Auburn	Other Areas	Zone X (unshaded)	High		
Class 3	School	Antelope Creek Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Auburn Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Blue Oaks Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Bradford Woodbridge Fundamental Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Breen Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Carlin C. Coppin Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Non-Wildland/Non-Urban		
Class 3	School	Catheryn Gates Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Cobblestone Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Colfax High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Coyote Ridge Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Creekside Oaks Elementary School	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Crestmont Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Del Oro High School	Loomis	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Diamond Creek Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Dry Creek Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	E. V. Cain Middle School	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Emigrant Gap Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Eureka Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Excelsior Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Ferris Spanger Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Foresthill Divide Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Foresthill Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Franklin Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	George A. Buljan Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Sierra College	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Sierra College	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	George Cirby Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	George Sargeant Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Granite Bay High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Granite Oaks Middle School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Greenhills Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	H. Clarke Powers Elementary School	Loomis	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Heritage Oak Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Horizon Charter School	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Kings Beach Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Loomis Elementary School	Loomis	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Maidu Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Oakmont High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Olympus Junior High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Ophir Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Parker Whitney Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Penryn Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Placer Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Placer High School	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Placer School for Adults	Auburn	Other Areas	Zone X (unshaded)	High		
Class 3	School	Quail Glen Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Robert C. Cooley Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Rock Creek Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Rock Creek Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Rocklin High School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Roseville Adult School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Secret Ravine School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Sheridan Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Sierra Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Sierra Gardens Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Sierra Hills Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Silverado Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Skyridge Elementary School	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Spring View Middle School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Stoneridge Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Tahoe Lake Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Thomas Jefferson Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Twelve Bridges Middle School	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Twin Oaks Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Valley View Elementary School	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Vencil Brown Elementary School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Warren T. Eich Intermediate School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	School	Weimar Hills Middle School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	William Kaseberg Elementary	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Willma Cavitt Junior High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Woodcreek High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	School	Alder Creek Middle School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Donner Trail Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Glenshire Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Sierra High School (Continuation)*	Adjacent Counties	–	–	–	–	–
Class 3	School	Tahoe-Truckee Community Adult School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Tahoe Truckee High School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Truckee Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Antelope Crossing Middle School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Antelope Meadows Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Barrett Ranch Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Olive Grove Elementary School*	Adjacent Counties	–	–	–	–	–
Class 3	School	Adelante High School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	School	Coldstream Alternative School	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	School	Lincoln Adult School	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Donner Summit Public Utility District*	Adjacent Counties	-	-	-	-	-
Class 3	Water Treatment Plant	Foresthill Public Utility District	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Water Treatment Plant	Pleasant Grove Wastewater Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Dry Creek Wastewater Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Water Treatment Plant	Placer County SMD NO 1 Wastewater Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 3	Water Treatment Plant	San Juan Suburban Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	NID North Auburn Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		Y
Class 3	Water Treatment Plant	Placer County SMD NO 3 Wastewater Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Pleasant Grove Wastewater Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 3	Water Treatment Plant	Colfax Water Treatment Plant	Colfax	Other Areas	Zone X (unshaded)	Very High		
Class 3	Water Treatment Plant	Newcastle Sanitary Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 3	Water Treatment Plant	NTPUD National Ave. WTP & Lake Intake	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Water Treatment Plant	Lincoln Wastewater Treatment Plant	Lincoln	Other Areas	Zone X (unshaded)	Non-Wildland/Non-Urban		
Class 3	Water Treatment Plant	Sunset 8 MGD Water Treatment Plant	Rocklin	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Monte Vista 0 MGD Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 3	Water Treatment Plant	Foothill 55 MGD Water Treatment Plants	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Bowman 7 MGD Water Treatment Plants	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Auburn 6 MGD Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 3	Water Treatment Plant	Applegate 0 MGD Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 3	Water Treatment Plant	Alta 0 MGD Water Treatment Plant	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Airport	Lincoln Municipal Airport	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Airport	Auburn Municipal Airport	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Airport	Blue Canyon-Nyack Airport	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Airport	Truckee-Tahoe Airport*	Adjacent Counties	-	-	-	-	-
Class 2	CHP Station	Gold Run Office	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	CHP Station	Auburn Office	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	CHP Station	Truckee Communications Center*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	PCF FS #32 - Dutch Flat	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	PCF FS #70 - Lincoln	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #73 - Fowler	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #74 - Thermalands	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #75 - Paige	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Non-Wildland/Non-Urban		
Class 2	Fire Station	PCF FS #77 - Sunset	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	CALFIRE/PCF FS #10 - Bowman	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 2	Fire Station	PCF FS #100 - Dry Creek	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #180 - Atwood	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	PCF FS #182 - Ophir	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #184 - Lone Star	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	CALFIRE/PCF FS #30 - Colfax	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Fire Station	Alpine Meadows FS #56	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Auburn City FD FS #121	Auburn	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Auburn City FD FS #122	Auburn	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Auburn City FD FS #123	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Foresthill FPD FS #88	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Colfax City Vol. FD FS #36	Colfax	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Foresthill FPD FS #89	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Foresthill FPD FS #90	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	CALFIRE/PCF FS #33 - Alta	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Lincoln City FD FS #33	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Lincoln City FD FS #34	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Lincoln City FD FS #35	Lincoln	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Loomis FPD FS #28	Loomis	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Newcastle FPD FS #41	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Fire Station	Northstar FD FS #31	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Northstar FD FS #32	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	North Tahoe FPD FS #51	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	North Tahoe FPD FS #52	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	North Tahoe FPD FS #53	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	North Tahoe FPD FS #54	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	North Tahoe FPD FS #55 / CALFIRE FS #55	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Rocklin City FD FS #23	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Rocklin City FD FS #24	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Rocklin City FD FS #25	Rocklin	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Penryn FPD FS #38	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Placer Hills FPD FS #84	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 2	Fire Station	Placer Hills FPD FS #85	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Placer Hills FPD FS #86	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Fire Station	Roseville City FD FS #1	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Roseville City FD FS #2	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Roseville City FD FS #3	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Fire Station	Roseville City FD FS #4	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Roseville City FD FS #5	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Roseville City FD FS #6	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	South Placer FPD FS #17	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Loomis FPD FS #29	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Truckee FPD FS #98	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Truckee FPD FS #96*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Truckee FPD FS #97*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	South Placer FPD FS #19	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	South Placer FPD FS #16	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	South Placer FPD FS #20	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Fire Station	South Placer FPD FS #15	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Fire Station	Squaw Valley FD FS #21	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Alta Vol. FPD FS #98	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	CALFIRE FS #11 - Foresthill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Roseville City FD FS #7	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	PCF FS #78 - Sheridan	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	Colfax City Vol. FD FS #37	Colfax	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	USFS FS #41- Foresthill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	USFS FS #42- Foresthill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	USFS FS #34- Soda Springs	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High	Y	
Class 2	Fire Station	Roseville City FD FS #9	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Fire Station	CALFIRE FS #50*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Iowa Hill Fire Co #31	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Fire Station	Truckee FPD FS #93*	Adjacent Counties	-	-	-	-	-

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Fire Station	Truckee FPD FS #94*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Truckee FPD FS #95*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Truckee FPD FS #91*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Truckee FPD FS #92*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #25*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #26*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #41*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #111*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #112*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #116*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Sac Metro Fire FS #117*	Adjacent Counties	-	-	-	-	-
Class 2	Fire Station	Pleasant Grove FD	Adjacent Counties	-	-	-	-	-
Class 2	National/Coast Guard	First 184th Infantry Regiment, Charlie Company	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	National/Coast Guard	115th Support Group, CA National Guard	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	National/Coast Guard	U.S. Coast Guard Station Lake Tahoe	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Police Station	Auburn Police	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Police Station	Rocklin Police	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Police Station	Roseville Police	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Police Station	Auburn Main Station	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Police Station	Colfax Substation	Colfax	Other Areas	Zone X (unshaded)	Very High		
Class 2	Police Station	Foresthill Service Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Police Station	Granite Bay Service Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Police Station	Kings Beach Service Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Police Station	South Placer Substation	Loomis	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Police Station	Tahoe Substation	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 2	Police Station	Lincoln Police	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Hospital	Sutter Roseville Medical Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 2	Hospital	Tahoe Forest Hospital*	Adjacent Counties	-	-	-	-	-

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 2	Hospital	Sutter Auburn Faith Hospital	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 2	Hospital	Kaiser Fnd Hospital - Sacramento/Roseville-Eureka	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Dispatch Center	CHP Truckee Communications Center*	Adjacent Counties	-	-	-	-	-
Class 1	Dispatch Center	Grass Valley CDF*	Adjacent Counties	-	-	-	-	-
Class 1	Dispatch Center	CHP Sacramento Communications Center*	Adjacent Counties	-	-	-	-	-
Class 1	Dispatch Center	Auburn Police Department	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Dispatch Center	Rocklin Police Department	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Dispatch Center	Lincoln Police/Fire Department Dispatch	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Dispatch Center	Roseville Police Department	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Dispatch Center	Placer County Sheriff-auburn	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Emergency Operation Center	City of Rocklin EOC	Rocklin	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Emergency Operation Center	City of Lincoln EOC	Lincoln	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Emergency Operation Center	City of Auburn EOC	Auburn	Other Areas	Zone X (unshaded)	Urban Unzoned		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 1	Emergency Operation Center	Placer County OES EOC	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Emergency Operation Center	County - Tahoe EOC	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 1	Emergency Operation Center	City of Roseville EOC	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Hospital Control Facility	Sutter Roseville Medical Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Telecommunications	COMIT Radio (Side A)	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Telecommunications	COMIT Telephone/Network (Side B)	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Computer Information Systems Infrastructure	Primary Data Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Urban Unzoned		
Class 1	Computer Information Systems Infrastructure	Backup Data Center (SPJC)	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Alpine Meadows	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Beacon Hill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 1	Communication Transmission Sites*	Cave Rock	Adjacent Counties	-	-	-	-	-
Class 1	Communication Transmission Sites	Dewitt	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Foresthill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		

Facility Class	Facility Type	Facility Name	Jurisdiction	LHMP_ZNTYP	Flood Zone	Fire Hazard Severity Zone	High Hazard Dam Inundation	Extremely High Hazard Dam Inundation
Class 1	Communication Transmission Sites	Foresthill	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 1	Communication Transmission Site*s	Genoa Peak	Adjacent Counties	–	–	–	–	–
Class 1	Communication Transmission Sites	Gold Run	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 1	Communication Transmission Sites	Iron Mine	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Mount Pluto	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Very High		
Class 1	Communication Transmission Sites	PCWA Rocklin	Rocklin	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	PCWA	Unincorporated Placer County	Other Areas	Zone X (unshaded)	High		
Class 1	Communication Transmission Sites	Penryn	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites*	Signal Peak	Adjacent Counties	–	–	–	–	–
Class 1	Communication Transmission Sites	South Placer Justice Center	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Thermaland	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Moderate		
Class 1	Communication Transmission Sites	Volcano	Unincorporated Placer County	Other Areas	Zone X (unshaded)	Non-Wildland/Non-Urban		

Source: Placer County GIS

*This facility is located in an adjacent county. Hazard zones for these are unknown.

Appendix G Fire History

Table G-1 Placer County Wildfire History 1950-2020

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Volcano		Smoking	144,798	42,528.97
(blank)		Unknown / Unidentified	155,791	31,957.67
King	9/13/2014	Arson	59,583	29,488.87
Deadwood	(blank)	Unknown / Unidentified	94,293	27,875.51
American	8/10/2013	Miscellaneous	67,099	27,425.87
Mckenzie Mill	(blank)	Unknown / Unidentified	56,683	21,284.78
Star	8/25/2001	Miscellaneous	35,844	16,461.80
Westville	6/21/2008	Lightning	33,876	11,088.30
Government	6/21/2008	Lightning	31,424	9,218.21
Ralston	9/5/2006	Miscellaneous	30,115	8,410.01
(blank)	(blank)	Miscellaneous	26,593	4,714.96
Applegate	9/16/1965	Unknown / Unidentified	4,531	3,528.69
Roadside #51	9/19/1964	Unknown / Unidentified	7,727	3,450.80
Madonna #2	10/30/1959	Unknown / Unidentified	4,677	3,163.71
Ponderosa	8/17/2001	Vehicle	6,709	2,777.60
Robbers	7/11/2012	Arson	4,759	2,634.76
Deadman's Flat	7/18/1925	Miscellaneous	11,802	2,587.41
Gap	8/12/2001	Campfire	8,273	2,408.08
Slate	6/11/1986	Lightning	9,713	2,039.91
Omohundro	7/29/1954	Unknown / Unidentified	2,712	2,025.69
Roadside 3 4 5 6	7/3/1985	Unknown / Unidentified	8,979	1,853.82
Bald Mtn	9/26/1949	Smoking	5,517	1,464.29
Blue Oaks	9/15/2001	Miscellaneous	9,694	1,426.85
Rubicon	8/9/1931	Unknown / Unidentified	4,724	1,274.03
North	9/3/2018	Campfire	14,499	1,119.59

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Gladding	9/1/2008	Arson	2,947	1,089.68
Wizwell	7/22/1951	Unknown / Unidentified	3,143	1,049.62
Gillis Hill	9/13/1961	Unknown / Unidentified	2,525	953.58
Phillips	7/16/2007	Equipment Use	2,171	935.49
Stevens	8/8/2004	Structure	2,632	934.24
Big	8/31/1987	Lightning	6,540	894.42
Curtis	6/29/1984	Unknown / Unidentified	1,773	876.48
Codfish	8/31/2003	Lightning	5,189	841.28
None	9/13/1983	Unknown / Unidentified	3,332	820.78
PG&E #5	6/14/1981	Equipment Use	1,678	812.35
Animal	6/7/1979	Unknown / Unidentified	1,463	771.40
Sunset	8/1/2018	Unknown / Unidentified	2,044	692.44
Auburn	7/17/1961	Unknown / Unidentified	940	653.01
Helester	8/11/1995	Equipment Use	4,518	627.27
Mammoth	7/15/2009	Miscellaneous	1,627	624.93
Sierra	9/18/2002	Vehicle	1,117	594.25
Locust	7/27/2015	Arson	736	587.46
Peavine	6/21/2008	Lightning	5,580	580.54
(blank)	10/29/1986	Debris	1,874	551.57
Lightning #6	7/28/1958	Unknown / Unidentified	1,783	551.16
Green Valley	10/1/1961	Unknown / Unidentified	2,722	526.76
Halsey	8/12/1951	Unknown / Unidentified	813	480.55
Baseline	8/20/2010	Unknown / Unidentified	737	478.84
Iowa Hill	8/9/1969	Unknown / Unidentified	1,962	464.33
Applegate	10/8/2014	Unknown / Unidentified	1,477	458.90
Andressen	6/27/1982	Equipment Use	992	439.41
Nadeic	6/2/1981	Miscellaneous	851	425.16

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Beacon	9/3/1950	Unknown / Unidentified	800	406.95
Wild Cat	6/12/1918	Lightning	2,710	386.78
Jacinto	6/5/1970	Unknown / Unidentified	2,473	385.11
Lincoln City Asst	5/30/2001	Arson	1,597	372.04
Drivers	8/2/2000	Smoking	1,233	348.87
Forty Nine	8/30/2009	Arson	705	343.28
Elliot Ranch	9/8/1949	Lightning	2,164	342.37
Royal	11/17/2003	Debris	1,031	338.75
(blank)		Lightning	4,850	324.25
Sam Babb	9/5/1956	Unknown / Unidentified	2,117	316.52
Big Reservoir	9/8/1959	Campfire	837	299.20
Ponderosa	7/19/1970	Unknown / Unidentified	855	296.64
Brewer	6/19/1964	Unknown / Unidentified	508	292.99
Garden	6/9/2002	Powerline	719	284.20
Pennsylvania	10/4/1921	Miscellaneous	1,601	273.39
SPRR #71	9/16/1965	Unknown / Unidentified	587	268.40
Dyer	7/20/2009	Unknown / Unidentified	1,478	262.24
Mooney	8/5/1953	Unknown / Unidentified	353	258.52
Roseville	9/13/1980	Unknown / Unidentified	525	236.71
Section 28	10/5/1917	Miscellaneous	868	223.36
Eureka	7/18/1951	Unknown / Unidentified	523	221.04
Roadside 83	7/24/1986	Arson	980	189.19
Sierra College	6/22/1972	Unknown / Unidentified	401	188.57
Gale	11/26/1976	Debris	1,289	187.37
Conouck	5/23/1987	Equipment Use	318	183.42
PFE	6/13/2013	Unknown / Unidentified	577	179.70
Miller Diggins Fire	10/28/1917	Unknown / Unidentified	769	170.51

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Fiddymment	6/14/2012	Unknown / Unidentified	2,326	168.45
Volcano	8/20/1960	Unknown / Unidentified	991	164.59
Trailhead	6/28/2016	Miscellaneous	1,230	157.92
(blank)		Debris	1,308	157.19
Athens	5/17/2016	Unknown / Unidentified	1,396	155.13
American	8/27/2000	Unknown / Unidentified	338	148.39
Dyer	6/26/2019	Unknown / Unidentified	1,273	147.62
Roadside 82	7/24/1986	Unknown / Unidentified	304	143.14
Whitney	7/4/2001	Unknown / Unidentified	210	142.61
Stanford	9/23/1949	Smoking	827	125.49
Brewer	1/22/2014	Vehicle	677	104.17
Roadside #20	7/5/1962	Unknown / Unidentified	410	102.54
Blacksmith	12/1/2011	Debris	2,086	101.26
Cold Stream	8/6/1949	Smoking	634	99.66
Waltz	6/15/2012	Equipment Use	628	96.72
Deadwood	8/16/2000	Equipment Use	3,773	95.80
Sunset	9/30/2009	Vehicle	4,269	93.78
Wise	6/11/2008	Unknown / Unidentified	832	92.30
Black	9/18/2010	Unknown / Unidentified	819	90.48
Bear	8/19/2001	Lightning	2,274	90.08
Fiddymment	7/2/2011	Miscellaneous	308	80.91
Riosa	7/18/2008	Unknown / Unidentified	485	80.07
Brewer	10/5/2012	Debris	418	79.66
Moore	6/21/2016	Equipment Use	233	78.46
Longjohn	11/30/2011	Debris	1,317	75.97
Riosa	6/8/2015	Unknown / Unidentified	967	75.29
Prairie	6/28/2007	Arson	1,297	72.22
Nelson	6/25/2009	Arson	346	71.26

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Fiddymment	7/5/2009	Unknown / Unidentified	3,815	70.48
Valley	7/6/2007	Arson	241	69.96
Athens	5/15/2008	Unknown / Unidentified	273	69.03
Twin Bridges	7/26/2010	Arson	244	67.56
Roadside 84	7/24/1986	Unknown / Unidentified	190	65.32
Sugar	5/10/2019	Lightning	1,855	64.89
Fiddymment	6/1/2007	Playing With Fire	1,711	62.62
Newton	8/6/2018	Unknown / Unidentified	117	62.26
Meadowlark Incident	6/18/2010	Playing With Fire	324	59.77
Nicolaus Westland	6/4/2013	Equipment Use	208	58.54
Dyer Incident	6/8/2010	Unknown / Unidentified	833	55.88
Foresthill	6/21/2008	Lightning	521	54.54
Phyllip	5/8/2008	Unknown / Unidentified	297	52.35
Valley	6/25/2003	Debris	243	52.14
Sunset	10/11/2008	Vehicle	2,993	49.57
Rocklin_Clover Incident	6/14/2010	Unknown / Unidentified	140	49.31
Bridge Incident	10/11/2010	Unknown / Unidentified	380	48.33
Nicolaus	6/11/2008	Arson	289	48.18
Baseline	6/7/2009	Unknown / Unidentified	84	47.65
Ponderosa	8/18/2002	Arson	106	46.05
Tanner	1/24/2015	Debris	3,164	44.54
(blank)	2/20/1977	Miscellaneous	4,681	42.55
Athens	6/16/2015	Unknown / Unidentified	485	41.14
Old	6/30/2008	Unknown / Unidentified	389	40.33
Foresthill	8/20/2006	Unknown / Unidentified	400	40.03
Pines	9/24/2003	Arson	269	38.79
Hampshire Rock	10/11/1950	Miscellaneous	201	36.20
Mcoulloh	1/24/2015	Debris	1,678	35.27

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Nader2 Incident	7/11/2010	Equipment Use	241	33.51
Nelson	6/5/2013	Equipment Use	161	33.07
Butcher	7/28/2004	Unknown / Unidentified	243	31.90
Sixty-Five 2	9/14/2007	Unknown / Unidentified	346	30.92
Orr Incident	10/21/2010	Unknown / Unidentified	457	30.23
Nelson	6/29/2018	Unknown / Unidentified	847	30.20
Fork	9/22/2005	Campfire	1,085	29.69
Sixty-Five	7/23/2007	Unknown / Unidentified	258	29.60
(blank)	12/6/1988	Debris	530	29.22
Blackford	8/1/2017	Unknown / Unidentified	226	29.14
Sierra	7/9/2003	Vehicle	238	26.92
Watt	6/7/2019	Unknown / Unidentified	204	26.64
Ramsey Crossing	10/24/1939	Lightning	727	25.75
Riosa2 Incident	6/23/2010	Unknown / Unidentified	381	25.41
Foothills	11/25/2019	Arson	665	24.59
Mccourtney	5/4/2013	Unknown / Unidentified	120	24.32
Wilson	4/9/2007	Debris	215	24.32
Dyer2 Incident	7/4/2010	Arson	146	24.20
Sierra	8/10/2013	Railroad	115	23.57
Ravine	6/22/2008	Equipment Use	126	23.07
Chicken	3/1/2016	Arson	449	22.82
Chamberlin Fire	7/13/2010	Unknown / Unidentified	343	22.29
Hell Hole	6/22/1964	Miscellaneous	914	21.94
Dyer	6/22/2012	Powerline	479	21.76
Baxter	7/22/2015	Unknown / Unidentified	135	21.75
Martis	6/17/2001	Campfire	252	21.28
Auburn	6/23/2007	Arson	66	20.99
Crosby	5/28/2007	Lightning	147	20.31

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Lesvos	9/1/2015	Unknown / Unidentified	1,589	20.31
Sierra 2	10/13/2019	Miscellaneous	768	20.31
Shooting	8/11/2008	Miscellaneous	226	20.24
Yellow Hound	8/7/1960	Smoking	1,195	19.86
Washoe	8/18/2007	Miscellaneous	308	19.81
Indian	6/26/1987	Lightning	592	18.95
Gladding	8/19/2013	Miscellaneous	301	17.19
Riosa Incident	6/16/2010	Unknown / Unidentified	76	16.82
Brewer	9/17/2016	Unknown / Unidentified	204	16.63
West Wise Fire	8/13/2011	Unknown / Unidentified	161	16.47
Nader	7/29/2007	Unknown / Unidentified	139	16.27
Brewer	9/12/2014	Unknown / Unidentified	440	16.12
(blank)	12/29/1989	Debris	620	15.86
Palladay	5/31/2016	Arson	77	15.76
West Wise	5/25/2009	Unknown / Unidentified	258	15.64
Athens	8/2/2007	Vehicle	719	15.18
Star	8/18/2012	Lightning	2,598	15.10
Bake	5/23/2004	Lightning	1,150	14.42
Iowa	7/21/2014	Miscellaneous	189	14.23
Baseline	7/3/2018	Unknown / Unidentified	147	14.20
Baseline	9/24/2007	Unknown / Unidentified	636	13.97
Sunset	10/1/2016	Miscellaneous	73	13.91
Vista	9/30/2016	Unknown / Unidentified	183	13.18
Fiddymnt	7/2/2012	Unknown / Unidentified	2,527	13.05
Catlett	8/5/2017	Unknown / Unidentified	398	12.88
Thousand	7/18/2018	Powerline	62	12.74
Baseline	6/15/2008	Arson	363	12.63
Gilardi	6/8/2008	Unknown / Unidentified	78	12.41

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Country	7/7/2015	Unknown / Unidentified	563	12.06
Stagecoach	7/20/2017	Smoking	296	11.93
Forest	8/20/2006	Debris	282	11.92
Cement Hill	11/8/1925	Miscellaneous	660	11.90
Placer Roadside #51	9/21/1964	Unknown / Unidentified	383	11.37
Manzanita	7/5/2009	Unknown / Unidentified	497	10.35
Granite	7/10/2007	Lightning	937	10.11
Maverick	8/3/2017	Unknown / Unidentified	945	10.00
Burnett	8/5/2015	Lightning	177	9.87
Foresthill	8/28/2009	Unknown / Unidentified	179	9.69
Mccourtney	9/29/2009	Unknown / Unidentified	395	9.33
Devil	7/3/1989	Lightning	624	9.20
North Wallace Canon	8/31/1918	Unknown / Unidentified	730	9.01
Vista	10/14/2017	Equipment Use	426	7.34
PFE	7/4/2014	Arson	101	7.30
Walegra	9/30/2016	Vehicle	174	6.55
Dog Bar	10/7/1980	Unknown / Unidentified	252	6.14
Mitchell	11/20/2004	Debris	1,256	5.63
Ridge	6/30/2018	Equipment Use	22	4.95
Nicolaus	7/1/2018	Equipment Use	168	4.86
Bilderback	7/28/1961	Unknown / Unidentified	160	3.46
Spring	8/12/1996	Lightning	485	3.06
Thousand Oaks	6/1/2013	Equipment Use	122	1.88
Middle	7/9/2017	Campfire	763	1.21
Long	9/12/2017	Lightning	692	0.89
Dog Bar	7/9/1985	Smoking	12	0.16
Brown Bar Canyon	9/3/1955	Unknown / Unidentified	8	0.03
Baseline	9/10/2011	Unknown / Unidentified	7	0.01
(blank)		(blank)	0	0

Wildfire Name	Date	Cause Description	Total Acres Burned by Fire	Acres Burned in Placer County
Grand Total			1,032,061	294,434.70