



# NORTHSTAR FIRE DEPARTMENT



## Fuel Modification Plans – Guidelines & Specifications

### Fire Prevention Guideline P-21

## PURPOSE

The community of Northstar is located in State Responsibility Area (SRA) and categorized as a Very High Fire Hazard Severity Zone.

As such, a fuel modification plan must be submitted to NFD for review and approval. The process of approval consists of reviewing aspects such as structure location and type of construction, topography, slope, amount and arrangement of vegetation and overall site settings. Our objective through this approval plan process is to create defensible space necessary for effective fire protection of the homes and buildings within our community. NFD believes managing the design and placement of vegetation in and around new structures will reduce the effects of a wildfire. Fire-safe landscaping and certain construction features help to improve community safety and reduce property loss during wildfire emergencies.

This guideline provides you with the information and steps necessary for design and submittal of landscaping plans.

## SCOPE

Whenever newly built or remodeled single-family homes, multi-family residential, and commercial structures require landscaping to be performed or fuels to be modified, a landscaping plan is required to be submitted to NFD for review/approval.

Public Resources Code Section 4126-4127; and the California Code of Regulations, Title 14, Division 1.5, Chapter 7, Article 1 Section 1220-1220.5, and NCS D 35-19.

## SUBMITTAL REQUIREMENTS

### 1. Submittal Requirements

- 1.1 Fuel Modification Plans must be submitted for all new construction, remodeling fifty percent or greater, construction of certain outbuildings and accessory structures over 120 square feet, parcel splits and subdivision/developments.
- 1.2 Fuel Modification Plans are required to meet Fire District Standards and shall be approved prior to framing inspection.
- 1.3 Fuel Modification Plans will only be accepted for review/approval after such plans or landscaping has been reviewed and approved by the local homeowners' associations (i.e. NPOA).

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- 1.4 Due to the number and/or complexity of corrections, all corrections should be made on the originals and re-submitted.
- 1.5 Applicants are required to submit one set of plans electronically (.pdf version), preferably prepared by a licensed Landscape Architect to NFD's Forestry Division at [jbarron@northstarcسد.org](mailto:jbarron@northstarcسد.org). The plans should at a minimum include the following criteria:
  - Provide plans with a readable (Engineer or Architect) scale.
  - Parcel number/Lot Number
  - Property address
  - Directional arrow
  - All proposed structures.
  - Delineation of fuel modification zones around structures (new or remodeled) with a general description of the zone's dimensions to property boundary.
  - Show all proposed and existing-to-remain vegetation on the property.
  - Designate irrigated areas on the plan.
  - Include a plant Legend with both botanical and common names for existing and proposed plant material.
  - Define all symbols, features, and shaded areas, etc. used on the plans.
  - All proposed and existing planting to remain (draw at 75% maturity)
  - Include quantities of trees and large shrubs being proposed.
  - Driveways and roadways must be depicted if landscaping is being performed near or along such access routes.

## 2. Definitions

- 2.1 DRIPLINE - Ground area at the outside edge of the canopy.
- 2.2 DROUGHT TOLERANCE - The ability of a plant or tree to survive on little water.
- 2.3 FINE FUELS - Fuels such as grass, leaves, and draped pine needles which, when dry, ignite readily and are consumed rapidly (also called flash fuels).
- 2.4 FIRE RESISTANT - Any plant will burn with enough heat and proper conditions. Resistance is often used as a comparative term relating to the ability of a plant to resist ignition.
- 2.5 FUEL MODIFICATION ZONE - A specific area where vegetation has been removed, planted, or modified in conjunction with an approved fuel modification plan that increases the likelihood that a structure will survive a wildfire, improve the defensible space around the structure for firefighting activities, and prevents direct flame contact with structures. Vegetation includes native and ornamental plants, non-native naturalized grasses, and other invasive or naturalized species. Fuel modification activities can include removal, partial or total replacement of existing plants with adequately spaced drought-tolerant and fire-resistive species and thinning of existing native or ornamental species.

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- 2.6 HORIZONTAL CONTINUITY - The extent or horizontal distribution of fuels at various levels or planes.
- 2.7 LADDER FUELS - Fuels which provide vertical continuity between strata. Fire is able to carry from surface fuels by convection into the crowns with relative ease.
- 2.8 NONCOMBUSTIBLE – Material at which no part will ignite and burn when subjected to fire.
- 2.9 VERTICAL CONTINUITY - The proximity of fuels to each other that governs the fire's capability to sustain itself. Vertical continuity applies to the relationship of aerial fuels to surface fuels or fuels low to the ground.

### 3. Design Requirements

- 3.1 Fuel Modification plant selection and location should focus on the density and arrangement of plants related to structures. Second, choose zone appropriate species based on plant characteristics such as moisture content, resin/pitch and the production of dead litter from leaves, bark, seed pods etc.
- 3.2 The design and application of landscaping shall be to the following prescriptions broken down by zones. (The delineation of these zones must be reflected on the plans around the structures.)
  - Zone A (30' from any qualifying structure or the property line whichever is first)
    - Zone A should be planted "lean" with highly fire-resistant plants less than 2'-3' in height (**See Attachment B**) or regularly irrigated and mowed lawns.
    - Complete removal of combustible plant species within 10 feet of structures. (**See Attachment A**)
    - It is best not to plant woody trees, shrubs and perennial species or masses of unmowed grasses within 10 feet of the structure.
    - Occasional accents of woody plants can be used sparingly to soften hard edges of structures if the selections are widely spaced and zone appropriate.
    - Consider locating hardscape features such as walkways, patios, driveways, sport courts etc. adjacent to the structure itself. Potted plants can be used to soften walls if necessary. No planting, mulch, wood chips, pine needles within 0-5' of the structure.
  - Zone B (30'-100' from any qualifying structure)
    - Zone B can be planted with a slightly higher density than Zone A. However, care should be taken not to create horizontal or vertical fuel ladders (see basic fire behavior graphics).
    - Plant per **Attachment C**.
    - Screen plantings can be used to hide unsightly views. Hedging is discouraged as it promotes the accumulation of dead litter inside the live hedge.
    - Zone B is the ideal location to introduce larger shade trees provided they are zone appropriate and the canopies are not continuous.

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- Avoid planting woody plant species larger than 3' at maturity directly beneath any tree canopy.
  - Zone C (100'-200' from any qualifying structure)
    - Zone C often is not landscaped on many projects but is still subject to hazard reduction requirements (brush clearance and tree separation). Do not denude the property. Refer to NCSO Ordinance, Section 5 for Forest Fuels Reduction Standards – the required prescription for Zone C.
    - If Zone C is to be landscaped, avoid increasing plant density beyond guidelines for Zone B.
- 3.3 Undesirable Plants/Target Species Plants listed below are not allowed as part of an approved Fuel Modification Plan. In addition to this list, designers should avoid planting known invasive plants such as Pampas grass and Hottentot Fig. If there are questions, please reference the California Invasive Plant Council. <http://www.cal-ipc.org/>. See Attachment A for a list of Undesirable and Invasive Plant Species.
- 3.4 Miscellaneous
- All non-fire resistive trees, including conifers shall be planted and maintained so that the tree's drip line at maturity is a minimum of 30 feet from any combustible structure. All fire resistive tree species shall be planted and maintained at a minimum of 10 feet from the tree's drip line to any combustible structure.
  - For streetscape plantings, all non-fire resistive trees shall be planted so that the center of the tree trunk is 20 feet from edge of curb. Fire resistive trees may be planted 10 feet from edge of curb to center of tree trunk. Care should be given to the type of tree selected so that it will not encroach into the right-of-way or produce a closed canopy effect.
  - Trees and large shrubs shall be limited to groups of two to three trees with mature foliage of any group separated horizontally by at least 10 feet if planted on less than a 20 percent slope and 20 feet if planted on greater than a 20 percent slope.
  - Only low growing water retentive vegetation will be permitted underneath a tree's drip line.
  - Existing trees may be pruned 10 feet away from roof, eave or exterior siding, depending on the tree's physical or flammable characteristics and a building's construction features.
  - All tree branches and palm fronds shall be removed within 10 feet of a fireplace chimney or outdoor barbecue.

## 4. Inspection Requirements

- 4.1 Site inspection, for certificate of occupancy, will be conducted upon completion of landscape installation. Please request inspection via email: [jbarron@northstarcsd.org](mailto:jbarron@northstarcsd.org).

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### Attachment A Non-Approved Species

#### Highly Flammable Plant List: PLANTS THAT WILL IGNITE QUICKLY AND BURN READILY

The Northstar Fire Department will not allow these plants to be planted on vacant properties or properties with structures, fenced outbuildings, or decks. This list is NOT all-inclusive as other plants with similar characteristic, such as: low moisture, dry limbs and needles and abundant oils are potentially hazardous. Plant smart and use fire-resistant vegetation to create defensible space around all structures.

#### Non-Approved Tree Species

Common Name	Scientific Name
Acacia	<i>Acacia sp.</i>
Arborvitae	<i>Thuja sp.</i>
Cedar	<i>Cedrus sp.</i>
Cedar/Cypress	<i>Chamaecyparis sp.</i>
Cypress	<i>Cupressus sp.</i>
Douglas fir	<i>Pseudotsuga menziesi</i>
Fir	<i>Abies sp.</i>
Hemlock	<i>Tsuga sp.</i>
Juniper	<i>Juniperus sp.</i>
Pine	<i>Pinus sp.</i>
Sequoia	<i>Sequoia sp.</i>
Spruce	<i>Picea sp.</i>
Yew	<i>Taxus sp.</i>

#### Non-Approved Shrub Species

Common Name	Scientific Name
Blackberry	<i>Rubus armeniacus</i>
Bitterbrush	<i>Purshia tridentata</i>
Juniper	<i>Juniperus sp.</i>
Laurel sumac	<i>Malosma laurina</i>
Manzanita*	<i>Arctostaphylos sp.</i> *except for Kinnikinnick
Oregon grape*	<i>Mahonia aquifolium</i> *except for 'Compacta'
Rosemary*	<i>Rosmarinus sp.</i> ) *except for 'Prostratus'
Sagebrush	<i>Artemisia sp.</i>
Scotch broom	<i>Cytisus scoparius</i>
Scrub oak	<i>Quercus sp.</i>
Wild Lilac	<i>Ceanothus sp.</i>

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#### Non-Approved Grasses & Ground Cover

Common Name	Scientific Name/Remarks
Dry annual grasses	
*Bark mulch	*within 5' of any part of the structure. Beyond this distance a 1"-2" depth.
Pampas grass	<i>Cortaderia selloana</i>
*Pine needle mulch	*within 5' of any part of the structure. Beyond this distance a 1"-2" depth.
*Woodchip mulch	*within 5' of any part of the structure. Beyond this distance a 1"-2" depth.

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### Attachment B

#### FUEL MODIFICATION ZONE PLANT LIST

Please note that there may be other vegetative species that are appropriate for planting and this list has been modified to demonstrate what is best suited for the Community of Northstar based on our elevation and climate.

#### Approved Trees

Common Name	Scientific Name
Apple	<i>Malus spp.</i>
Bigtooth maple	<i>Acer grandidentatum</i>
Cherry	<i>Prunus spp.</i>
Chokecherry	<i>Prunus virginiana</i>
Cottonwood	<i>Populus trichocarpa</i>
Hawthorne	<i>Crataegus spp.</i>
Hedge maple	<i>Acer campestre</i>
Maple	<i>Acer spp.</i>
Mountain ash	<i>Sorbus spp.</i>
Northern red oak	<i>Quercus rubra</i>
Paper birch	<i>Betula papyrifera</i>
Poplar	<i>Populus spp.</i>
Quaking aspen	<i>Populus tremuloides</i>
Western larch	<i>Larix occidentalis</i>
Western river birch	<i>Betula occidentalis</i>

#### Shrubs

Common Name	Scientific Name
American Cranberry	<i>Viburnum trilobum</i>
Amur Maple	<i>Acer ginnala</i>
Bearberry Cotoneaster	<i>Cotoneaster dammeri`Eichholz`</i>
Bearberry Manzanita	<i>Arctostaphylos uva-ursi cv.</i>
Buffaloberry	<i>Shepherdia spp.</i>
Chokecherry	<i>Prunus virginiana</i>
Currant	<i>Ribes spp.</i>
Douglas Hawthorne	<i>Crataegus douglasii</i>

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Dwarf Burning Bush	<i>Euonymus alatus`compactus`</i>
Dwarf Purple Willow	<i>Salix purpurea`nana`</i>
French Lilac	<i>Syringa vulgaris</i>
Goldflame Spirea	<i>Spiraea x bumalda`Goldflame`</i>
Hardy Shrub Rose	<i>Rosa spp.</i>
Lilac	<i>Syringa spp.</i>
Malus sargentii	<i>Sargent Crabapple</i>
Mockorange	<i>Philadelphus lewisii</i>
Mountain Alder	<i>Alnus tenuifolia</i>
Mountain lover	<i>Paxistima canbyi</i>
Mountain Maple	<i>Acer glabrum</i>
Mountain Spray	<i>Holodiscus spp.</i>
Northern Lights Azalea	<i>Rhododendron`North`n Lights`</i>
Oregon Grape	<i>Mahonia spp.</i>
Raspberry	<i>Rubus spp.</i>
Red-twig Dogwood	<i>Cornus sericea</i>
Russian Olive	<i>Eleagnus angustifolia</i>
Sandcherry	<i>Prunus besseyi</i>
Scouler's Willow	<i>Salix scouleriana</i>
Serviceberry	<i>Amelanchier spp</i>
Shrubby Cinquefoil	<i>Potentilla fruticosa</i>
Sierra Currant	<i>Ribes nevadense</i>
Skunkbush	<i>Rhus trilobata</i>
Snowberry	<i>Symphoricarpos spp.</i>
Sumac	<i>Rhus spp.</i>
Thimbleberry	<i>Rubus parviflorus</i>
Vine Maple	<i>Acer circinatum</i>
Western Spirea	<i>Spiraea douglasii</i>
Willow	<i>Salix spp.</i>
Wood's Rose	<i>Rosa woodsii ultramontana</i>

## Herbaceous and Perennial Ground Cover

Common Name	Scientific Name
Allium	<i>Allium spp.</i>
Bergenia	<i>Bergenia cordifolia</i>
Bishop's Weed	<i>Aegopodium podagraria</i>
Blanket Flower	<i>Gaillardia spp.</i>
Bugleweed	<i>Ajuga reptans</i>
California poppy	<i>Eschschilzia californica</i>



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Candytuft	<i>Iberis sempervirens</i>
Columbine	<i>Aquilegia spp.</i>
Coral Bells	<i>Heuchera spp.</i>
Coreopsis	<i>Coreopsis spp.</i>
Creeping Phlox	<i>Phlox subulata</i>
Creeping Thyme	<i>Thymus praecox</i>
Creeping Yarrow	<i>Achillea tomentosa</i>
Daylily	<i>Hemerocalis spp.</i>
Delphinium	<i>Delphinium spp.</i>
Dianthus	<i>Dianthus spp.</i>
Dwarf periwinkle	<i>Vinca minor</i>
English Lavender	<i>Lavendula angustifolia</i>
Evening Primrose	<i>Oenothera spp.</i>
Fescue	<i>Festuca spp.</i>
Fireweed	<i>Epilobium angustifolium</i>
Flax	<i>linum spp.</i>
Fleabane	<i>Erigeron spp.</i>
Hardly Ice Plant	<i>Delosperma spp.</i>
Hardy Geranium	<i>Geranium spp.</i>
Hens and Chicks	<i>Sempervivum tectorum</i>
Honeysuckle	<i>Lonicera spp.</i>
Hosta/Funkia	<i>Hosta spp.</i>
Iris	<i>Iris spp.</i>
Ivy	<i>hedera helix</i>
Jupiter's Beard	<i>Centranthus ruber</i>
Lamb's Ear	<i>Stachys byzantina</i>
Lamium/Deadnettle	<i>Lamium spp.</i>
Lavandin	<i>Lavendula x intermedia</i>
Lavender Cotton	<i>Santolina virens</i>
Lily-of-the-Valley	<i>Convallaria majallis</i>
Mahonia	<i>Berberis spp.</i>
Penstemon	<i>Penstemon spp.</i>
Poppy	<i>Papaver spp.</i>
Purple Coneflower	<i>Echinaceae spp.</i>
Pussytoes	<i>Antennaria spp.</i>
Red Hot Poker	<i>Kniphoffia uvaria</i>
Rock Cress	<i>Aubretia deltoidia</i>
Rocky Mountain Penstemon	<i>Penstemon strictus</i>
Sage/Slavia	<i>Salvia spp.</i>
Sea Thrift	<i>Armeria maritima</i>
Shasta Daisy	<i>Leucanthemum x superbum</i>
Snow in Summer	<i>Cerastium tomentosum</i>
Spotted Lungwort	<i>Pulmonaria longifolia</i>

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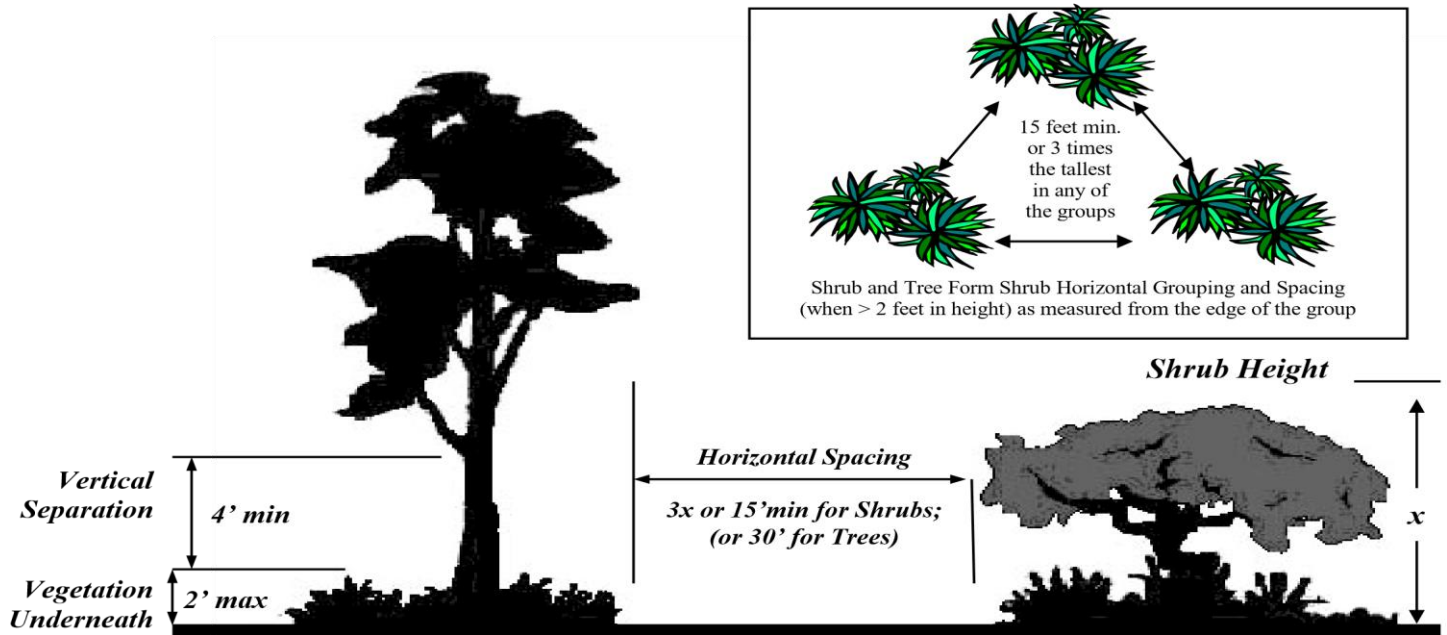
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Spring Cinquefoil	<i>Potentilla (herbaceous spp.)</i>
Statice	<i>Limonium perezii</i>
Stonecrop/Sedum	<i>Sedum spp.</i>
Strawberry	<i>Fragaria spp.</i>
Sunrose	<i>Helianthemum nummularium</i>
Sweet William	<i>Dianthus barbatus</i>
Violet/Viola	<i>Viola spp.</i>
Wild Ginger	<i>Asarum caudatum</i>
Yarrow	<i>Achillea spp.</i>
Yucca	<i>Yucca spp.</i>

**Remember, there are NO fire-proof plants, but some are more fire-resistant than others. Fire-resistant plants have the following characteristics:**

- Are less flammable and likely to ignite in a wildfire -Have high moisture content, succulent plants.
- Are low growing or a small species -Have stems or leaves that are not resinous, oily, or waxy.
- Easy to maintain and prune -Have less accumulated debris and fewer dead branches.
- Have an open, loose branching pattern -Are drought resistant, requiring less irrigation.
- Burn less intensely when ignited and spread the fire slower.

**Attachment C**  
**Vegetation Management Maintenance Guideline**



**Horizontal Spacing**

**Vegetation Less than 2 Feet in Height:**

- No horizontal spacing or vertical separation is required. Ground cover shall not exceed 2 feet in height. In Zone B, ground cover shall cover the entire ground between groups of shrubs, trees, or grasses and grasses are not considered ground cover. Limited compartments of grasses are acceptable as approved on the planting plans. In Zone C grasses can cover the entire area.

**Shrubs and Trees 2 Feet in Height or Greater:**

Shrub and Tree Group Size:

- All Shrubs and Trees can be in groups of 3 specimens or less. No horizontal spacing is required inside the group.

Shrub / Tree-form Shrub Group Spacing:

- Groups of shrubs shall be spaced by the greater of the following two measurements: A distance of 15 feet minimum (or) 3 times the height of the tallest specimen in any of the groups.
- No vegetation over 2 feet in height is allowed within 15 feet from the edge of tree canopy(s).

Tree Group Spacing:

- Groups of Trees shall be spaced by a distance of 30 feet minimum regardless of height. In Zone "A" full growth tree branches are not allowed within 10 feet of enclosed combustible structures.

**Vertical Separation**

**Shrubs and Trees Less than 10 Feet in Height:**

- When the fuel modification zone is within 30 feet of the structure, a vertical separation of 2 feet minimum is required from the vegetation below. (Not required if shrubs are further than 30 feet from structure).

**Shrubs and Trees 10 Feet in Height or Greater:**

- A vertical separation of 4 feet minimum is required to be maintained from the vegetation below.
- Trees only: All vegetation located underneath trees, shall be a maximum of 2 feet in height.