

STRUCTURE / FUEL MITIGATION GUIDELINE

Experience has shown that structure and landscape design is one of the most important factors in a home's survival. Using the appropriate building materials combined with an aggressive defensible space and fuels reduction plan can greatly increase your home's chance of survivability in a wildfire without decreasing the aesthetic value of your home.

Structure Protection:

- **Chimneys should have spark arresters and screens.**
- **Roofs:** The following roof coverings in natural colors (brown, tan, black, or green), are acceptable.
 - APPROVED: Color-impregnated metal roofing with a non-reflective finish is the preferred roof material.
 - APPROVED: Composition "Class A" shingles, clay, or cement tile materials are allowed. Composition roofing such as "3-D shingles" look very much like natural wood.
 - Wooden shake and wooden shingles are not recommended in the forest setting due to increased fire hazard. Existing wooden shake / shingle roofs will be allowed to remain but will eventually need to be replaced with approved fire-resistant material when (1) resident desires to replace the roof, or (2) the roof is in unacceptable condition and requires replacement.
- **Recommended Material for Exterior Wall and Decks/Porches:**
 - Textured exterior plywood if stained or painted, wooden or manufactured vertical or horizontal siding, peeled logs, native stone, or manufactured logs or decking. Combination of these material are often more aesthetically pleasing than a single material. Note: While vinyl siding is difficult to ignite, it can fall away or melt when exposed to extreme heat.
 - Small concrete block, lightweight aggregate blocks, split face block, and similar materials in muted tan, grey, green and charcoal work well in appropriate combination with wood.
- **Use Double-Pane or Tempered Glass Recommended.**
 - Double-pane glass can help reduce the risk of fracture or collapse during extreme wildfire. Tempered glass is most effective. For skylights, glass is a better choice than plastic or fiberglass.
- **Recommended to Enclose Eaves, Fascia's, Soffits and Vents.**
 - It is recommended to 'box' eaves, soffits and vents, or enclose them with metal screens. Vent openings should be covered with 1/8" or smaller opening metal screen.
- **Recommended to Protect Overhangs and other attachments:**
 - It is recommended to remove all vegetation and other fuels from around overhangs and other attachments (room additions, bay windows, decks, porches, carports and fences). Box in the underside of overhangs, decks, and balconies with noncombustible or fire resistant materials.

- Anything attached to the house (decks, porches, fences and outbuildings), should be considered part of the house. These act as fuel bridges, particularly if constructed from flammable materials.
 - If wood fence is attached to house, it is recommended to separate the fence from the house with a masonry or metal barrier.
 - Decks and elevated porches should be kept free of combustible material and debris.

Defensible Space Zoning

To create an effective Firewise landscape, remember that the primary goal is fuel reduction. To this end, create defensible space zones around your home. Zone 1 is the closest to your house with Zones 2 and 3 moving progressively away from your house.

Zone 1: (0 – 30 feet from residence)

(0-5 feet from residence)

- All trees should be removed.
- Create a “fire-free” area using non-flammable landscaping material, (i.e. decorative rock or gravel), and/or high-moisture content annual or perennials. Other flammable plant material should be removed.
- Firewood should not be stacked directly next to or within 20 feet of structures.
- Remove dead vegetation from under and around decks.
- Consider fire-resistant material for patio furniture, swing sets, etc.

(5-30 feet from residence)

- Thin conifer trees to a spacing of 30 feet between crowns. Prioritize removal of Juniper trees first, removal of Lodgepole and Sub-alpine fir second, and Douglas fir third to meet the conifer spacing recommendation. Note: Lodgepole pines have shallow root systems that make them prone to blow-over. For Lodgepole pine, leave 30 feet between clusters of two to three lodgepole trees to help prevent this problem. Given their flame resistance, aspen trees do not need to be removed and are ideal in this area.
- Trim back trees that overhang the house or are within 10 feet of the chimney.
- Prune trees so that the lowest branches are 6-10 feet above the ground, or up to 1/3 of the tree height if the tree is less than 18 ft.
- Standing dead and dead topped trees should be removed.
- Dispose of all slash and dead, down trees by hauling off, or piling and burning
- Mow grasses to keep them low, a maximum of 6 inches high
- If desired, plant dispersed fire-safe trees and/or shrubs, such as aspen
- Propane tanks should not be located in this zone.
- Water plants, trees, and mulch regularly.

Zone 2: (30 – 100 feet from residence, 0-100 feet from main egresses and driveways)

- Leave 30 feet between clusters of two to three trees, or 20 feet between individual trees.
- Prune trees so that the lowest branches are 6-10 feet above the ground, or up to 1/3 of the tree height if the tree is less than 18 ft.
- Remove standing dead and dead topped trees
- Dispose of most slash and dead, down trees by hauling off, or piling and burning
- *Small* amounts of slash can be lopped and scattered for decomposition
- If desired, plant aspen trees in open areas

Zone 3 (100 – 200 feet from residence)

- Reduce the density of tall trees so canopies are not touching. Remove small conifers that are growing between taller trees. Remove heavy accumulation of woody debris.
- Pruning is not necessary in this zone
- Treat slash by lop-and-scatter, or piling and burning
- Remove most standing dead and dead topped trees; two per acre could be left for wildlife as long as the trees pose no threat to structures or access roads.

Insect & Disease Attack Prevention

An aggressive defensible space and fuels reduction plan will also promote healthy vegetation in the forest surrounding your home. Insect and disease attacks such as Comandra Blister Rust, Dwarf Mistletoe, and Mountain Pine Beetle can devastate an unhealthy, overgrown forest in a very short time. However, with selective fuels reduction you can promote tree health and improve growth while inhibiting the spread of insects and diseases.

Comandra Blister Rust is a disease that is caused by a fungus growing in the inner bark. The fungus has a complex life cycle. It infects lodgepole pines, but needs an alternate host, an unrelated plant to spread from one pine to another.

On lodgepole pines, the fungus causes growth reduction, stem deformity, and mortality. In addition, pines with stem cankers produce significantly fewer cones and seeds than healthy trees.

Dwarf Mistletoe is a native, parasitic, seed plant that occurs essentially throughout the range of western conifers in North America. It is the most damaging disease agent in coniferous trees, causing severe growth loss and increased tree mortality.

In the United States, the principle host of Dwarf Mistletoe is the lodgepole pine. It is occasionally found on limber and ponderosa pines, Engelmann spruce, blue spruce, whitebark pine, and Rocky Mountain bristlecone pines as well.

Abnormally tufted branches characterize affected trees. These growths, which are caused by the Dwarf Mistletoe, are called witches' brooms. Dwarf Mistletoe can cause the tree's growth to slow and eventually the crown will die. It also reduces the seed production of the host trees and can cause deformities such as cankers and knots.

Mountain Pine Beetle is a member of a group of beetles known as bark beetles. Except when the adults emerge and attack new trees, the mountain pine beetle completes its life cycle under the bark of the tree.

The beetle attacks and kills lodgepole, ponderosa, and western white pines. Outbreaks frequently develop in lodgepole pine stands that are grouped in dense stands of trees.

During epidemics, widespread tree mortality alters the forest ecosystem. Often, beetles have almost completely depleted the commercial pine forests. Moreover, the dead trees that are left after an epidemic are a source of readily ignitable fuel that will burn unless removed.

Douglas-fir Beetle is an insect that infests and kills Douglas-fir throughout most of its range in western United States. Douglas-fir beetles normal kill small groups of trees, but during outbreaks hundreds of infected tree groups are not uncommon. Losses can be devastating during periodic outbreaks.

At low or endemic levels, the beetle infests scattered trees, including windfalls and trees injured by fire, defoliation, or root disease. Where such susceptible trees are abundant, once they have been infested and killed, beetle populations can build up rapidly and spread to adjacent green, standing trees.

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