Quick Facts...

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Defensible Space

One factor has emerged as the primary determinant of a home’s ability to survive wildfire. This is the vegetative clearance around the house, or what fire professionals call “defensible space.” Defensible space is room for the fire fighters to do their jobs. Your house is more likely to withstand a wildfire if grasses, brush, trees, and other common forest fuels are removed, reduced, or modified to reduce a fire’s intensity. These activities can keep fire away from the home and restrict a fire on your property from damaging adjacent lands.

Historically, small areas of fuels were modified or thinned around homes within a larger area of dense fuels. This created a “cookie cutter” effect. While helpful, this did not provide adequate protection, particularly in fuels such as lodgepole pine. Recently, this practice was reviewed and improvements for an expanded system, a series of zones and segments, were recommended (Figure 1).

Fire Safety Zones

Zone 1 is the original (cookie cutter) defensible space. It is the area of maximum modification and management (described in Colorado State Forest Service [CSFS] publications Home Fire Protection in the Wildland Urban Interface and Wildfire Protection in the Wildland Urban Interface).

Zone 2 is a transitional area between zones 1 and 3. The downhill, uphill and side distance measurements for this area generally are the same as in zone 1, but combined they should extend at least 75 to 100 feet from the house. Within this area, the intent is to “feather” the heavy thinning of zone 1 into the more traditional forest cover of zone 3. This eliminates the wall of dense, unthinned forest fuels that currently exists around defensible space areas, while enhancing homestead safety and the aesthetics of the property.

Zone 3 is an area of traditional forest management activities, no specific size, and should extend from the defensible space area to the property boundaries.

Prescriptions

Zone 1. Size of this zone depends on the structure size and the slope of the ground. See Figure 2 for downhill, uphill and side distances for specific slopes. Dispose of all slash in this area by piling and burning, shipping or hauling away. (Contact your local sheriff’s office or CSFS district office for more information on burning recommendations.)
Leave no dead (wildlife) trees, except possibly one or two widely-spaced trees at the outer edge of the zone. Be sure such trees cannot fall on the house. An occasional tree may be allowed closer to the house if it is topped to a maximum 10 to 15 feet.

**Segment A**, the area immediately adjacent to the structure, is 3 to 5 feet wide (Figure 3). Do not plant here, particularly if the house is sided with wood, logs or other flammable material. Decorative rock or gravel creates an attractive, easily maintained nonflammable ground cover.

- If the house has non-combustible siding, widely-spaced foundation plantings of low-growing shrubs are acceptable. Do not plant shrubs directly under windows or next to foundation vents. Be sure there are no areas of continuous grass adjacent to the shrubs in this area.
- Do not store firewood or other combustible materials in this area. Enclose or screen decks and extend gravel coverage underneath decks. Do not use the area under the deck for storage.

**Segment B** is the area that extends from segment A out approximately 15 feet. Allow about 10 feet between tree crowns in this area (Figure 3). Prune trees so that lowest branches are 8 to 10 feet above the ground. Remove all ladder fuels beneath the trees. (Ladder fuels are small shrubs, trees, and tree limbs that can allow a fire to climb into the tree tops.)

- Isolated shrubs may remain, provided they are not under tree crowns. Prune shrubs periodically to maintain vigorous growth and low form. Remove all dead stems from trees and shrubs annually. (For proper pruning techniques, refer to fact sheet 7.205, Pruning evergreens; 7.206, Pruning shrubs; and 7.207, Pruning deciduous trees.)
- Mow grasses (or remove with a weed-eater) as needed throughout the growing season to keep them low, a maximum of 6 inches high. This is extremely critical in the fall when grasses dry out and cure, or in the spring before they green up.
- Locate firewood and propane tanks in the outer portion of this segment. Stack firewood uphill from the house, not below, and do not stack beneath trees. Keep grasses clear from firewood stacks and propane tanks. Locate propane tanks where service trucks can reach them. If possible, locate on a contour away from structures and ideally on gravel pads. Do not screen propane tanks with shrubs or trees.

**Segment C** is the outer segment of zone 1, running from the outer edge of segment B to the edge between zone 1 and zone 2. Thin and prune trees and shrubs as described for segment B. Within the outer portions of the zone, small groups of trees and widely-separated individual trees may be left unpruned for landscape purposes.

- Cut or mow as needed to keep grass height at a maximum of 8 inches. Again this is critical in the fall and early spring.

**Zone 2**. The size of zone 2 is based on structure size and slope of the ground. These are the same distances as those of zone 1, but the total treated area for zones 1 and 2 combined should extend at least 75 to 100 feet from the house, especially on the downhill side.
Dispose of slash through piling and burning or chipping. A few small, widely distributed brush piles may be left for wildlife purposes – no more than two or three per acre. Small amounts of slash can be lopped and scattered for decomposition. If lop and scatter is used, do not leave continuous areas or large concentrations of slash. (Contact your local office of the CSFS or your local sheriff's office for information on burning slash piles.)

Limit the number of dead trees in this zone. Wildlife only need two or three per acre. Be sure that these snags cannot fall onto the house or block access roads or driveways.

Because zone 2 acts as additional protection for the structure, forms an aesthetic buffer, and provides transition between zones, it is necessary to blend the requirements for zones 1 and 3.

- The inner portion of the zone will be thinned essentially to the same prescription as zone 1, segment C. Tree density will gradually increase until it reaches that of zone 3. A good rule of thumb for tree spacing in the outer portions of this zone is 4 to 6 feet between tree crowns (see Figure 4).
- Prune trees to a height of about 8 feet at the inner portion of the zone, gradually decreasing to a height of about 5 feet at the outer portions of the zone. The closer the proximity to zone 3, the higher the number of unpruned trees that can be left in this zone.
- Mowing is generally not necessary in this zone except under trees such as spruce where low-growing branches have been left for aesthetic purposes.

![Figure 3: Segment A, segment B and segment C of zone 1 and the edge between zones 1 and 2.](image)

**Zone 3.** This zone is of no specified size – it extends from the edge of zone 2 to the property line. Any approved method of slash treatment is acceptable for this zone, including piling and burning, chipping or lop-and-scatter.

A greater number of (dead) wildlife trees can remain in this zone, but generally only two or three per acre are necessary for good wildlife habitat. Make sure that dead trees and snags pose no threat to power lines or fire access roads.

Zone 3 is an area of traditional forest thinning. Typical management objectives for areas surrounding homesites or subdivisions are: provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust, and visual intrusions; support limited production of firewood, fence posts and other forest commodities; and sustain the growth of Christmas trees or transplants.
Specific thinning requirements are dictated by landowners' objectives for their land. However, most thinnings are done from below (leaving the biggest and best trees) and on an individual tree selection basis.

Thinnings sanitize and improve the forest stand by removing trees that are damaged, attacked by insects, infected by disease, or are of poor form or low vigor. (For more information about thinning the trees on your property, see the CSFS publication *Landowner Guide to Thinning.*

Tree spacing usually depends on the species being managed and factors such as susceptibility to windthrow or damage from heavy snow loading. For ponderosa pine and Douglas-fir, a good rule of thumb for stem spacing is diameter + 7. For lodgepole pine and Engelmann spruce, the stem spacing guide is diameter + 5. (Diameter is measured in inches and converted to feet. For example, if the average tree to be left after thinning was an 8-inch ponderosa pine, 8 + 7 = 15, for a spacing of 15 feet between trees, as measured between tree stems.)

While pruning generally is not necessary in zone 3, it is a good idea from the standpoint of personal safety to prune those trees along trails and fire access roads. Or, if you prefer the aesthetics for a well-manicured forest, you might prune the entire area. In any case, any pruning helps reduce “ladder” fuels within the tree stand, thus enhancing fire safety.

Mowing is not necessary in zone 3.

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Figure 4: X = crown spacing; Y = stem spacing. (Do not measure between stems for crown – measure between the edges of tree crowns.)

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