4. Firebreaks and Shaded Fuelbreaks

You often hear the terms firebreak and shaded fuelbreak used interchangeably, but there is a big difference between the two (Table 4).

Firebreak

A firebreak is an area where all vegetation and organic matter is removed down to mineral soil, thereby removing the fuel leg of the fire triangle. The purpose of a firebreak is to deny a fire any combustible material. Firebreaks are used to prevent advancing surface flames from coming in direct contact with outbuildings or other important resources on your property. A firebreak may be 2 to 15 feet wide. A firebreak should be two to three times as wide as the height of the nearest surface vegetation (fuel), such as grass and shrubs (Figure 13a). Firebreaks may require annual maintenance (removal of invading vegetation). In addition, because mineral soil is exposed, there is a high probability of creating conditions for invasive weeds to establish.

To prevent weeds from establishing in a firebreak and to reduce future maintenance, consider using a landscape fabric in the cleared zone and placing a layer of crushed or ornamental rock on top of the fabric. This reduces the germination of invasive plants, prevents erosion, and reduces maintenance, and the rock provides a fireproof mulch that is much more attractive than mineral soil (Figure 13b). This option is particularly useful in protecting structures on your property.

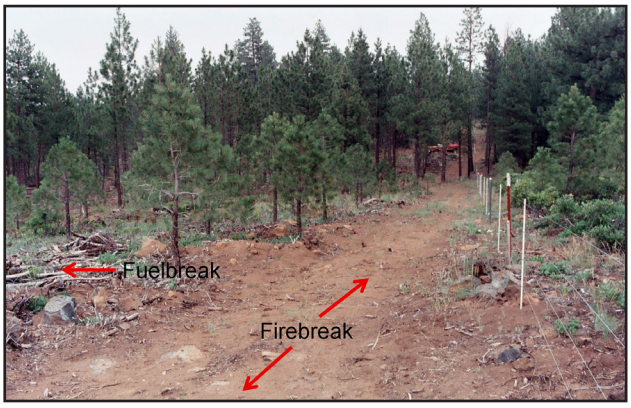

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Figure 13a. A perimeter dirt road serves as a firebreak. The area immediately to the left is a fuelbreak where young pine have been thinned and flammable shrubs have been mowed.

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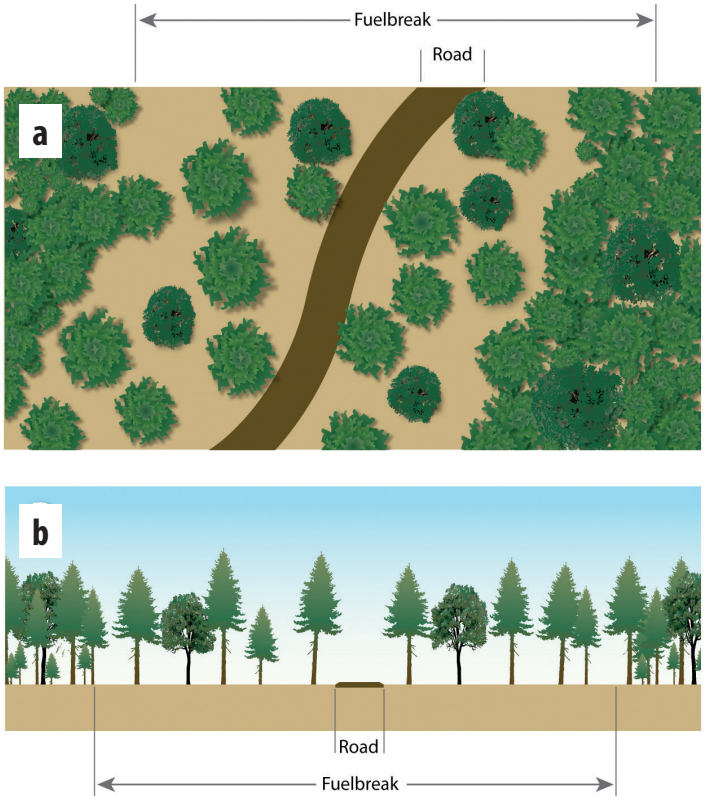
Figure 13b. Firebreak next to house.

Shaded fuelbreak

A shaded fuelbreak is a strip of land where fuel (for example, living trees and brush, and dead branches, needles, or downed logs) has been modified or reduced to limit the fire's ability to spread rapidly (Figure 14a).

Table 4. Pros and cons of constructing fire- and fuelbreaks.

Firebreak	Shaded fuelbreak
Pros	**Pros**
• Deprives the fire of fuel and reduces radiant and convective heat transfer. • Prevents flames from coming in direct contact with structures.	• Aesthetically pleasing. • Less costly to construct on per area basis. • Sale of merchantable trees can offset costs. • Tree health and vigor are improved.
Cons	**Cons**
• Expensive to construct and maintain on a per area basis. • Invasive weeds may establish unless non-combustible mulch (e.g., crushed rock) or herbicide is used. • Aesthetically, they look unnatural.	• Fires can burn through the fuelbreak, although at reduced intensity and rate of spread. • Effective shaded fuelbreaks need to be much wider than firebreaks. • Need to be retreated aproximately every 10 years depending on site productivity.



In addition, shaded fuelbreaks maintain cooler and moister understory conditions and understory vegetation remains greener longer into the growing season. This helps to reduce fire spread within the fuelbreak.

The need for a shaded fuelbreak on your property and its width depends on the following:

- The potential or risk of ignition either from people in subdivisions, roads, railroads, and so forth, and homes below or adjacent to your property, or from lightning in your area.
- The type of forest (Douglas-fir vs. ponderosa pine), stand density, amount and arrangement of fuels.
- Slope and terrain.

Within the shaded fuelbreak, overstory trees are thinned to reduce crown-to-crown overlap, particularly between conifers. Some crown overlap may be acceptable. Thinning can be done just in the fuelbreak area or as part of a larger thinning operation in adjacent stands. In the area of the shaded fuelbreak (for example, the first 100 feet from the edge

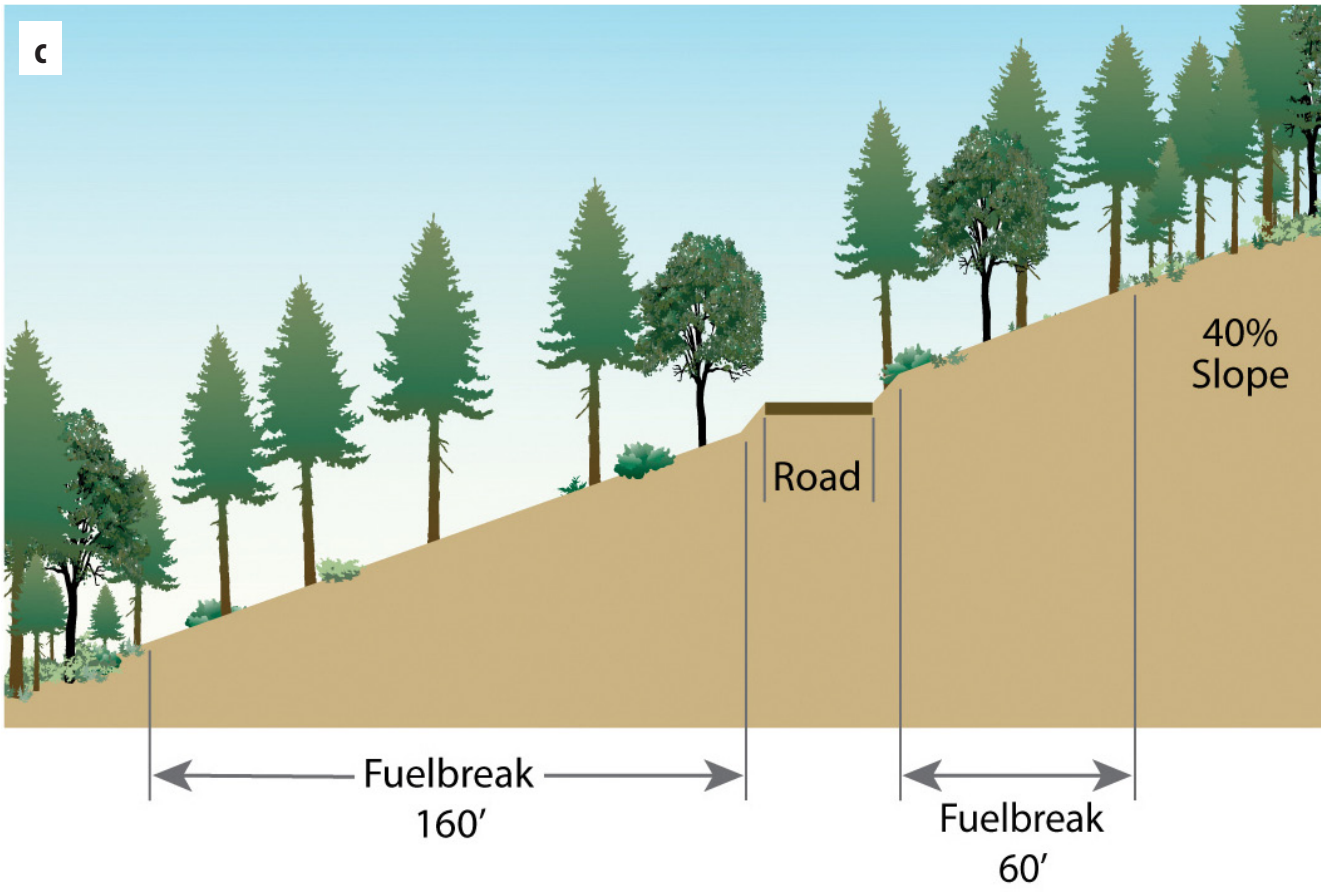


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Figure 14. Fuelbreak, (a) bird's-eye and (b) ground-level views. (c) Fuelbreak above and below a road.

of the stand), space trees (thin them) wider than the rest of the stand. In addition, within the shaded fuelbreak, understory trees and combustible shrubs (e.g., ladder fuels), heavy ground fuels, and snags should be reduced or removed. Thinning and cutting small trees and shrubs can create a lot of slash, so for an effective shaded fuelbreak, remove this fire hazard (refer to the "Fuel Reduction Methods" section).

In western Oregon and Washington, deciduous hardwood tree species such as red alder, bigleaf maple, and Oregon white oak are often present within Douglas-fir forests. These species are generally fire resistant because of high water content in their leaves. It takes a lot of heat to drive off water within a hardwood tree's canopy, and the biomass left in shriveled leaves does not contribute much in the way of additional fuel to the fire. A hardwood canopy can absorb and deflect a lot of radiant heat and possibly reduce the potential of crown combustion of conifers, which have more flammable foliage. In western Oregon and Washington forests, consider leaving, or even planting, hardwoods in your fuelbreak. Some understory deciduous shrubs, such as vine maple, can be left for the same purpose, adding to the diversity and naturalness of your fuelbreak.

Shaded fuelbreak width depends on the type of forest, fuel loading, and terrain steepness. To improve their effectiveness and to take advantage of a noncombustible road surface, shaded fuelbreaks are usually placed above and below existing roads (Figure 14c) or in other strategic areas, such as adjacent to wet meadows, streams, and rocky outcroppings. In drier forests in parts of eastern Oregon and Washington and in Idaho, the minimum recommended width for a shaded fuelbreak is approximately 200 feet. Topography matters: On a steep slope of 40 percent, for example, a fuelbreak of 160 feet below and 60 feet above a road should be created. In flat terrain, a shaded fuelbreak of 100 feet on both sides of a road may be sufficient. Table 5 provides recommendations for above- and below-road shaded fuelbreak widths given the percent of slope. In very steep areas with heavy fuels, consider increasing the shaded fuelbreak beyond 200 feet.

Specific shaded fuelbreak guidelines have not been developed for western Oregon and Washington. Forests in western Oregon and Washington are much taller and denser than forests in eastern Oregon, Washington and Idaho; because they are often in very steep topography, consider a shaded fuelbreak of 300 feet or more. These are only general guidelines. Consult your state stewardship forester for advice on shaded fuelbreak widths for your particular situation.

Under moderate weather conditions, shaded fuelbreaks can provide easy access and a good line of defense for firefighters. Shaded fuelbreaks under normal or moderate weather conditions can slow an advancing fire (fire spread) and reduce fire intensity. For example, in a number of recent wildfires that have burned into shaded fuelbreaks or other areas where fuels have been reduced, the fire dropped to the ground where it was more easily suppressed by firefighters. Shaded fuelbreaks also provide important areas for firefighters to attack and suppress a wildfire. For example, fire lines can be anchored or tied into your shaded fuelbreak.

Shaded fuelbreaks must be maintained periodically. How often you need to retreat your shaded fuelbreak depends on your forest's productivity (which affects how fast fuels re-accumulate) and how open a condition you want to maintain. Maintenance of a shaded fuelbreak may include cutting, piling, burning, grazing, or herbicide treatments to reduce or prevent fuel accumulation. Develop a retreatment plan and do a little maintenance every year.

Table 5. Minimum fuelbreak distance uphill and below road depending on percent slope.[1]

Percent Slope (%)	Uphill Distance (feet)	Downhill Distance (feet)	Total Fuelbreak Width (feet)
0	100	100	200
10	90	115	205
20	80	130	210
30	70	145	215
40	60	160	220
50	50	175	225
60	40	190	230

[1] Measurements are from the toe of the fill for downhill distances and above the road cut for uphill distances. All distances are measured along the slope. The minimum recommended fuelbreak is approximately 200 feet. Because fire spread and intensity increase as slope increases, however, the fuelbreak width must also increase. Adapted from "Fuelbreak Guidelines for Forested Subdivisions" (Dennis 1983).