

A Property Owner's Guide to Reducing the Wildfire Threat

Produced as a Public Service by the University of California, Cooperative Extension, Amador County
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Summary

Wildfire hazards are critical on many foothill and mountain home sites and business properties in California. Available research indicates the current 30 foot defensible space requirements required by California law should be revised to 100 feet on level parcels and up to 400 feet downslope on steep parcels.

Property owners and neighborhood groups must take steps to improve the survivability of their structures and of trees which make their property more desirable. Thinning out trees and removing shrubs and other flammable vegetation will help assure the survivability of the remaining trees. Researchers have found that thinned pine trees are more likely to survive bark beetle attack because of less competition for water.

History shows us that the native trees and shrubs are fire-adapted plants which have developed with fire and will burn. The question is, "When will a fire happen in your neighborhood?" Your buildings can be rebuilt but how long will it take to replace your trees? These guidelines are presented to help you take control of the situation.

Fire's Historic Role

The native trees and shrubs found in many foothill areas of California are fire-adapted plants. Fire was a major factor in development of plants in our climate. The ecosystem of which the plants are a part is dependent on fire for maintenance. Prior to the 1900s, fires set by lightning storms and by California's indigenous residents periodically burned the forests and oak woodlands. Low-intensity fires were useful in clearing out small trees, shrubs and dead or dying plant material. Frequently this gave the wildlands a park-like quality with wide-spaced, large trees and expanses of lush grassy areas rather than brush. Over the years land use has changed, subdivisions have been created and the low-intensity fires that once controlled the brush and removed fuels are not permitted.

Today's Disastrous Fires

Excessive amounts of fuel have built up in forests, woodlands and rural subdivisions as fire can no longer be allowed to perform its ecological role. When devastating wildfires break out, homes, businesses, and many of the native trees that make foothill living unique can be destroyed in a few moments.

Weather Plays a Role

Weather conditions that help create disastrous fires occur every summer and fall throughout California—dry plants and gusty winds. The fuel loads on wooded and brush-covered parcels of land that are covered with trees and shrubs must be managed if homes, businesses, and California native trees are to survive the next wildfire.

Protecting Your Property

Rural property owners should take steps to create defensible space to protect all that is valuable to them by following fire safety guidelines or methods. This publication will help owners identify the steps required to prepare their property so it can survive a wildfire. Definition of terms used throughout the publication are listed in Appendix A.

Steps to Increase Fire Safety on Wooded Rural Parcels

1. Create defensible space around buildings.
2. Recognize the impact of steep slopes on fire safety.
3. Identify and manage trees to be fire safe.
4. Set up a continuous management program to maintain a fire safe property environment.
5. Develop a fire safe landscape plan for your home or business.

How Much Defensible Space is Needed?

California law currently requires a 30 foot clearance (defensible space) around all structures. Researchers who have studied past wildfires found homeowners on level property have a much better chance of saving their buildings if flammable vegetation is greatly reduced within 100 feet of all structures and if fire-resistant roofing is used as illustrated below in Figure 1. This 100-foot clearance establishes a more effective defensible space than is required by current state law.

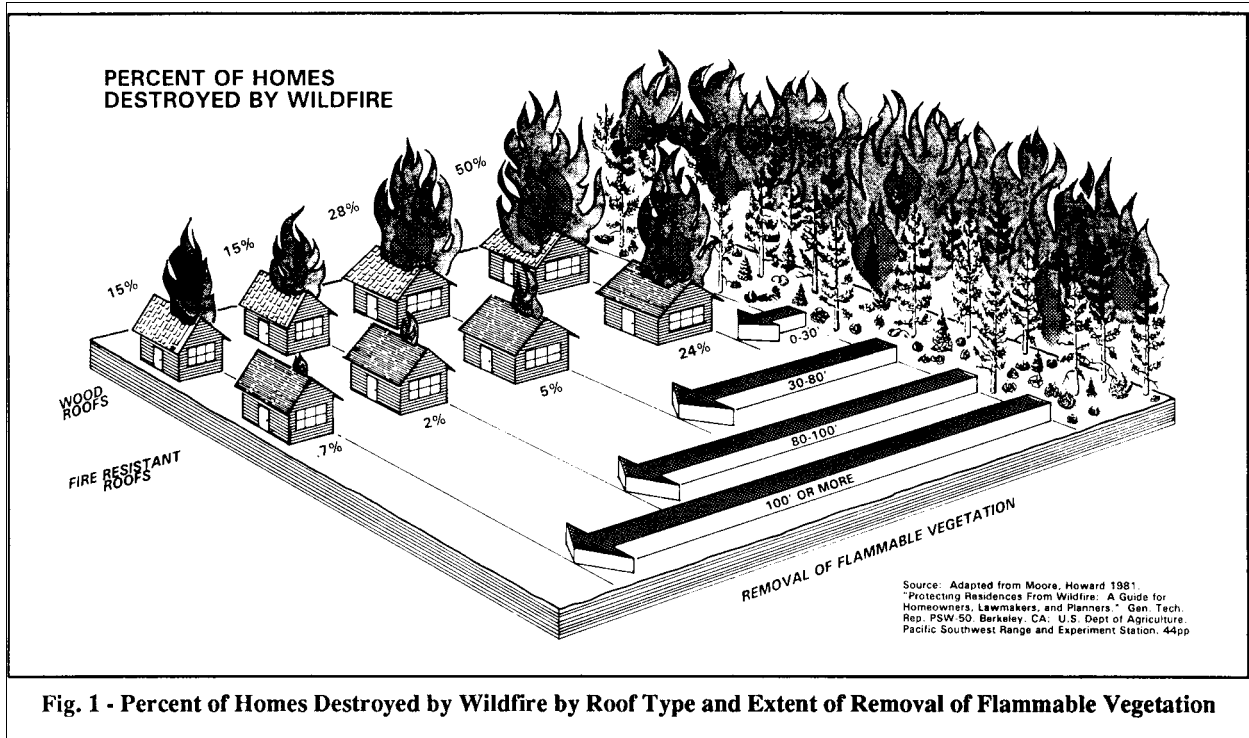


Fig. 1 - Percent of Homes Destroyed by Wildfire by Roof Type and Extent of Removal of Flammable Vegetation

Slopes Require Greater Clearance

The width of defensible space is greater on steep slopes. The information in **Table 1, Defensible Space Distances**, shows how buildings located on steep slopes or at the tops of steep slopes require management of flammable vegetation up to 400 feet downslope and 200 feet to the sides and upslope.

TABLE 1. DEFENSIBLE SPACE DISTANCES*

Percent Slope	Distance From House		
	Uphill*	Sides*	Downhill*
Level to 20%	100 ft.	100 ft.	100 ft.
21% to 40%	150 ft.	150 ft.	200 ft.
41% to 60%	200 ft.	200 ft.	400 ft.

*Adapted from "Wildland Home Fire Risk Meter", Simmerman and Fischer [1990]

Homeowners can determine the percent slope of their property by using the following materials and method: a) a straight five foot (60 inches) long board; b) carpenter's level; and c) a steel tape.

Place the board with one end on the ground upslope. Level the board with the carpenter's level. Measure vertical distance to ground with steel tape. Divide distance to ground in inches by 60 and multiply by 100 to determine percent slope. You can also use Table 2 to determine your slope category.

TABLE 2. GUIDELINES FOR DETERMINING SLOPE FOR ESTABLISHING DEFENSIBLE SPACE DISTANCES AND TREE CANOPY SPACING

Percent Slope	Inches on steel tape from ground to leveled 5' board
Level to 12% slope	Less than 7.2 inches
21% to 40%	14 inches to 24 inches
41% to 60%	Greater than 24.6 inches

*Adapted from “Wildland Home Fire Risk Meter”, Simmerman and Fischer (1990)

Properly Space Your Trees

Tree spacing is critical. The distance between trees should increase with slope steepness. The clear distance between branches (canopy) of adjacent trees that are left in the defensible space increases from a minimum of 10 feet on level ground to 30 feet on very steep ground (**Table 3**).

TABLE 3

Recommended distances between tree canopies by percent slope	Recommended distances between tree canopies
0 to 20%	10 feet
21% to 40%	20 feet
41% to 60%	30 feet

*Adapted from “Wildland Home Fire Risk Meter”, Simmerman and Fischer (1990)

Crowded stands of trees need to be thinned on the entire parcel of land to prevent wildfire from ‘crowning’ through the tops of the trees. Crown fires are likely to kill all or most of the trees in the stand. Thinning of trees and pruning of lower branches is critical within your defensible space and needs to be implemented on all of your property to help the trees survive a wildfire. Trees should be thinned to give more than the recommended distance between crowns because tree branches will grow.

Defensible Space Need Not be Bare

Green grass and other low-growing, fire-resistant plants should be planted to protect soils from erosion. Well-maintained trees spaced as noted in Table 3 to prevent crown fires and a few fire-resistant shrubs can be maintained in the defensible space.

Figure 2 below rates the defensible space requirements for a home or business located on a 30% slope. Note that trees which were left out of this illustration for simplification can be left in the defensible space if proper distance between tree canopies shown in Table 3 is established and maintained.

If your home is located on a hilltop or hillside view lot with many trees located on the slope, the defensible space can be made more attractive by selectively clearing away trees, shrubs and fuel leaving mosaics of cleared land. You should also remove fuel ladders from remaining trees and shrubs.

Removing Trees to Improve Defensible Space

Permits are needed from the California Department of Forestry and Fire Protection (CDF) if tree products are sold or bartered. Most conifers and black oaks are commercial species which come under the rules and regulations of the California Forest Practice Act that is administrated in each county by the State Department of Forestry and Fire Protection (CDF). Always call CDF for an update on current rules as they are subject to change. Look in the California state government pages in the phone book under State of California, Department of Forestry.

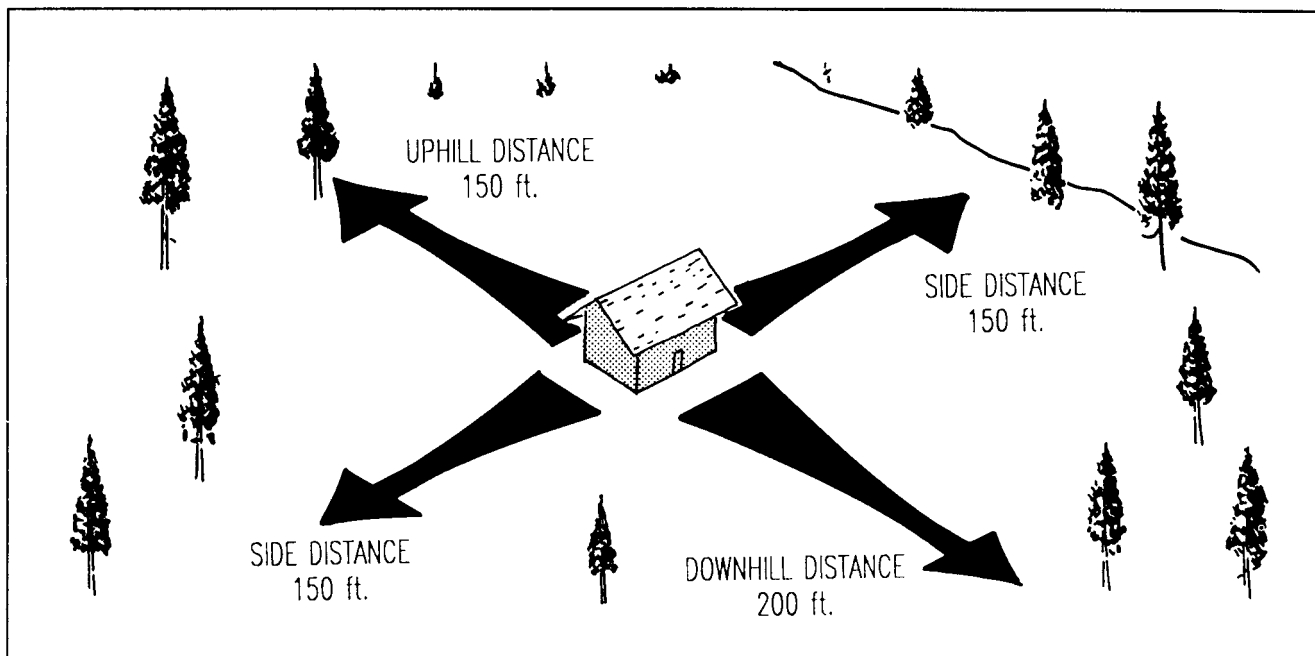


Figure 2. Recommended Defensible Space Distances For A 30 Percent Slope

As of February 1, 1993, the rules are:

You may cut your own trees to create defensible space and use the firewood for personal use; permits are not needed. You may not barter with the trees you cut for other services or labor. For example, you cannot give the wood or logs of commercial species to the tree faller who cuts living trees on your property as payment for labor.

If your parcel is three acres or less, CDF may grant an exemption which allows the property owner to sell the commercial species removed by a tree-thinning operation to create defensible space. Owners of parcels larger than three acres may file with the CDF for a one-time exemption to clear or selectively harvest up to three acres to make their property more fire safe. See the CDF for details.

Remember, if you plan to thin out your conifer and/or oak tree stand and sell the logs or wood, you need to file your permit and have the approval of CDF before you start. You may also wish to hire a professional forester to help with the selection process and to evaluate the health of your trees.

Three Methods Used to Develop Defensible Space

1. Remove fuel. Remove most of the native shrubs and young sapling trees that are growing within the defensible space. Leave only a few well-spaced, large trees and saplings (Table 2) and an occasional young shrub. Remove branches within 10 feet of the ground from all trees left on the site. This helps prevent fire from climbing a fuel ladder from grass, pine needles, and leaves on the ground up into the tops of the trees.

2. Reduce fuel. Prune shrubs and trees left within the defensible space around structures. Remove rocks that will cause sparks when hit by a lawn mower. Clean up pine needles, mow grasses and other small plants while they are green at a time when fire danger is not high. Your mower must have a spark arrester and you should have water and a fire extinguisher available just in case your mower strikes a rock and ignites dry materials.

3. Replace native fire hazardous plants with fire-resistant landscaping. Many introduced plants such as junipers are extremely fire hazardous. Well-maintained and irrigated turf, flower beds, and groundcovers will offer less fuel for a wildfire. A list of fire-resistant plants can be obtained from your farm advisor's office or local CDF office. Don't overplant or allow dead landscape materials to accumulate.

Which Trees Do You Save?

Some of our native trees have thin bark and are more likely to die or die to the ground and sprout from the tree stump after a wildfire. You may wish to select and save the more fire-resistant thick-barked trees and thin out more of the sensitive, thin-barked trees:

Bark Sensitive To Fire

Common Name	Botanical Name
Canyon Live Oak	<i>Quercus chrysolepis</i>
Interior Live Oak	<i>Quercus wislizeni</i>
California Black Walnut	<i>Juglans hindsii</i>
Madrone	<i>Arbutus menziesii</i>
White Fir	<i>Abies concolor</i>
Red Fir	<i>Abies magnifica</i>
Douglas Fir	<i>Pseudotsuga menziesii</i>

Bark Less Sensitive To Fire

Common Name	Botanical Name
Blue Oak	<i>Quercus douglasi</i>
Valley Oak	<i>Quercus lobata</i>
Black Oak	<i>Quercus kelloggi</i>
Ponderosa Pine	<i>Pinus ponderosa</i>
Sugar Pine	<i>Pinus lambertiana</i>
Jeffrey Pine	<i>Pinus jeffreyi</i>
Foothill Pine	<i>Pinus sabiniana</i>
Incense Cedar	<i>Calocedrus decurrens</i>

Disposal of Fuel

1. Shrubs and branches should be stacked in small piles and allowed to dry for a period of at least three weeks. Contact your local fire department or CDF for an update on current burning regulations. They may ask that you call on your burn day so the fire trucks don't get called out by a concerned neighbor. The county air pollution control district (APCD) sets burn days and regulates burning during the non-fire season. Cut up larger material and use as firewood. Alternatives to burning include grinding material into chips and spreading chips as a moisture conservation and weed control mulch. Keep the mulch at least 30 feet away from structures.

2. Trees. Conifer trees with the exception of Foothill pine are commercial species. Harvest is regulated by the California Department of Forestry and Fire Protection. Discuss your tree thinning plans with CDF and obtain necessary permits before you start the operation. The harvested trees often have sufficient commercial value to offset many of the costs associated with developing defensible space around your buildings. Bark beetles will breed in pine logs if they are left lying on the ground. Peel the bark off the logs if they are not sold and moved off the property.

Defensible Space Requires Maintenance

Yearly maintenance of the defensible space is required. Herbicides may be needed to keep stumps of oaks and other shrubs from resprouting. New seedlings will develop after the land is cleared. Herbicides or hand pulling will help with their control. Goats, sheep and horses can help control the regrowth of shrubs and trees if suitable fencing is developed. Soil erosion may become serious if the animals are held year round on small parcels. Predators such as dogs, coyotes and mountain lions may make sheep and goats impractical in some foothill communities.

Plan Ahead to Accommodate Firefighters

- Have you notified the local firefighting agency of your presence? Firefighters often don't know the location of residences in the forest.
- Emergency water supply. Maintain an emergency water supply that meets fire department standards through one of the following:
 - A community water/hydrant system.*
 - A cooperative emergency storage tank with neighbors.*
 - A minimum storage supply of 2,500 gallons on your property.*
- Clearly mark all emergency water sources.
- Create easy firefighter access to your closest emergency water source.
- If your water comes from a well, consider an emergency generator to operate the pump during a power failure.

APPENDIX A - GLOSSARY

BURN DAY: Set by the county Air Pollution Control District (APCD) who regulates burning during the non-fire season.

CROWN FIRE: Occurs when fire moves from one tree to another through the branches and tops of crowded trees.

DEFENSIBLE SPACE: That area which lies between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and which provides an opportunity for firefighters to safely defend a structure.

ECOSYSTEM: Consists of three levels: 1) green plants as primary food manufacturing organisms; 2) plant-consuming animals and organisms; and 3) flesh-consuming animals and organisms.

FIRE ENVIRONMENT: The surrounding conditions, influences, and modifying forces of topography, fuel, and weather that determine fire behavior.

FUEL: Any combustible material. In regards to wildfire, fuel typically refers to living and dead vegetation.

FUEL LADDER: Fuels which provide vertical continuity between strata. Fire is able to move from surface fuels into tree crowns with relative ease.

PERCENT SLOPE: A measure of the amount of vertical drop or rise of a slope over a given horizontal distance.

TREE CANOPY: See "Tree Crown."

TREE CROWN: The upper part of a tree or other woody plant carrying the main branch system and foliage.

WILDLAND FIRE: An uncontrolled fire outside an urban area or occurring on wildland that is not meeting management objectives and requires suppression.

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