LIVING WITH FIRE

IN SANTA CRUZ COUNTY

A guide for homeowners

NOT IF, BUT WHEN... PREPARE FOR FIRE

The Southern California Fires of Fall 2003 remind us all about the need to be proactive in preventing the spread of fires. This publication has been distributed in order to provide Santa Cruz County residents a comprehensive resource of fire prevention information.

Santa Cruz County has grown tremendously in the past decade with more homes and neighborhoods spreading into the rural and fire hazardous areas of the Santa Cruz Mountains. Being a property owner in these areas, as in all areas of the County, means taking on the responsibility to insure that your home and neighborhood is fire safe. By following the guidelines in this publication and contacting your local fire district/agency or the California Department of Forestry and Fire Protection for further information and assistance you can insure that your home, property, loved ones and neighbors are well prepared for a potential fire event.

LOCAL ORGANIZATIONS WORKING TO PROTECT YOU AND YOUR PROPERTY:

IN AN EMERGENCY CALL 9-1-1

Aptos/La Selva Beach Fire Protection District: (831) 685-6690
Ben Lomond Fire Protection District: (831) 336-5495
Branciforte Fire Protection District: (831) 423-8856
Boulder Creek Fire Department: (831) 338-7222
California Department of Forestry and Fire Protection/Santa Cruz County Fire Department: (831) 335-5353
Central Fire Protection District (serving Capitola, Live Oak, Soquel): (831) 479-6842
Felton Fire Protection District: (831) 335-4422
Santa Cruz City Fire Department: (831) 420-5280
Scotts Valley Fire Protection District: (831) 438-0211
University of California Santa Cruz Fire Department: (831) 459-3473
Watsonville Fire Department: (831) 728-6060
Zayante Fire Protection District: (831) 335-5100

The Coast-Cascade Region of the California Department of Forestry and Fire Protection

The CDF Mission

The Department of Forestry and Fire Protection protects the people of California from fires, responds to emergencies and protects and enhances forest, range and watershed values providing social, economic and environmental benefits to rural and urban citizens.

California Fire Plan

The California Board of Forestry and the California Department of Forestry and Fire Protection (CDF) have developed a fire plan for wildland fire protection in California. The goal of the plan is to reduce the overall costs and losses from wildfire in California.

The Santa Cruz County Fire Chiefs Association

The purpose of the Santa Cruz Fire Chiefs Association is to:

- conduct meetings at regular intervals to discuss matters pertinent to County Wildfire service issues
- promote uniformity of the fire service throughout the County
- provide a medium for exchange of information and ideas amoung fire service personnel
- develop and coordinate solutions to fire service problems that are common throughout the County
- exercise and evaluate various County fire service operational plans
- promote the general welfare of the public and fire service

The Santa Cruz County Chipper Program

The Santa Cruz County Fire Chiefs Association has purchased a chipper for use by local fire districts and fire departments to assist neighborhood and road associations with fuel load management projects in the County. For further information on the Chipper Program, refer to the back cover of this informational guide.

This publication has been revised and printed by the Santa Cruz County Resource Conservation District through a grant from the Sacramento Regional Foundation's Community-based Wildfire Prevention Program.

THE CONCERN ABOUT WILDFIRE EQUATION

Fire is a natural part of the environment. Forests, shrublands and grasslands were burning long before there existed an urban interface.

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People are now living in the fire prone environments, and many homes are built and maintained without regard to wildfires.

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With more people inhabiting the wildlands, more fires are likely to occur.

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Wildfires burn intensely and can be difficult to control.

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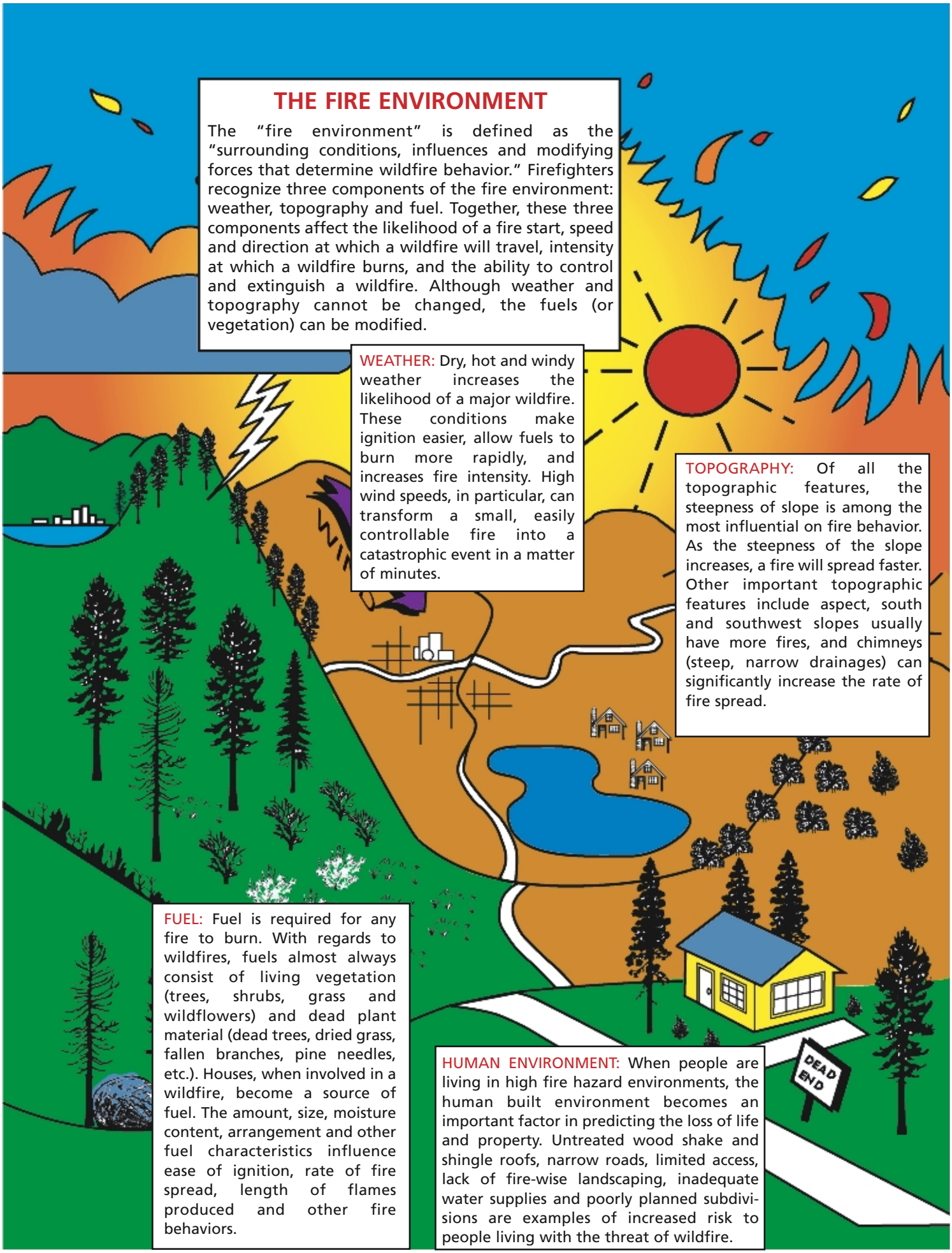
- Greater loss of life.
- Increased property losses.
- Damage to natural resources.
- More money spent on firefighting.

Because firefighters have the ability, equipment and technology for effective fire suppression, 97% of all wildfires are controlled quickly and extinguished while approximately 3% of the wildfires that occur burn so intensely there is little firefighters can do.



THE FIRE ENVIRONMENT

The "fire environment" is defined as the "surrounding conditions, influences and modifying forces that determine wildfire behavior." Firefighters recognize three components of the fire environment: weather, topography and fuel. Together, these three components affect the likelihood of a fire start, speed and direction at which a wildfire will travel, intensity at which a wildfire burns, and the ability to control and extinguish a wildfire. Although weather and topography cannot be changed, the fuels (or vegetation) can be modified.

WEATHER: Dry, hot and windy weather increases the likelihood of a major wildfire. These conditions make ignition easier, allow fuels to burn more rapidly, and increases fire intensity. High wind speeds, in particular, can transform a small, easily controllable fire into a catastrophic event in a matter of minutes.

TOPOGRAPHY: Of all the topographic features, the steepness of slope is among the most influential on fire behavior. As the steepness of the slope increases, a fire will spread faster. Other important topographic features include aspect, south and southwest slopes usually have more fires, and chimneys (steep, narrow drainages) can significantly increase the rate of fire spread.

FUEL: Fuel is required for any fire to burn. With regards to wildfires, fuels almost always consist of living vegetation (trees, shrubs, grass and wildflowers) and dead plant material (dead trees, dried grass, fallen branches, pine needles, etc.). Houses, when involved in a wildfire, become a source of fuel. The amount, size, moisture content, arrangement and other fuel characteristics influence ease of ignition, rate of fire spread, length of flames produced and other fire behaviors.

HUMAN ENVIRONMENT: When people are living in high fire hazard environments, the human built environment becomes an important factor in predicting the loss of life and property. Untreated wood shake and shingle roofs, narrow roads, limited access, lack of fire-wise landscaping, inadequate water supplies and poorly planned subdivisions are examples of increased risk to people living with the threat of wildfire.

THE LIMITATIONS OF WILDLAND FIREFIGHTING

FLAME LENGTH	EFFECTIVE FIREFIGHTING TACTICS
Less than 4 ft	Firelines constructed with hand tools, such as shovels and axes, can be effective at the front of the fire.
4 to 8 ft	Bulldozers and other heavy equipment will be needed to construct an effective fireline. Where bulldozers are not available, fire engines with hoses and water will be required to "knock down" the flames before the fire crews with hand tools can be effective, or fire crews must construct a fireline at a considerable distance from the fire.
8 to 11 ft	Airtankers with fire suppressing retardant or helicopters with water are required to reduce the fire's rate of spread before fireline construction by crews or bulldozers can be effective.
More than 11 ft	Direct fire suppression efforts will be ineffective. Firefighters retreat to existing roads, streams and other barriers and attempt to burn out fuels between the fireline and the advancing fire front.

IMPROVE THE ODDS: CREATE A... DEFENSIBLE SPACE

As the number of people living in and adjacent to wildlands grows, the likelihood of homes being threatened by wildfire also grows. A critical factor in determining whether or not a home will survive a wildfire is the type, amount, and maintenance of vegetation surrounding the house. In the 1980's, the term "defensible space" was coined to describe vegetation management practices aimed at reducing the wildfire threat to homes.

WHAT IS DEFENSIBLE SPACE?

Defensible space refers to that area between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and to provide an opportunity for firefighters to effectively defend a home. Sometimes, a defensible space is simply a homeowner's properly maintained backyard.

FREQUENTLY ASKED QUESTIONS ABOUT DEFENSIBLE SPACE

WHAT IS THE RELATIONSHIP BETWEEN VEGETATION AND WILDFIRE THREAT?

All vegetation, including naturally occurring native plants and ornamental plants in the residential landscape, is potential wildfire fuel. If vegetation is properly modified and maintained, a wildfire can be slowed, the length of flames shortened, and the amount of heat reduced, all of which assist firefighters to defend a home against an oncoming wildfire.

THE FIRE DEPARTMENT IS SUPPOSED TO PROTECT MY HOUSE, SO WHY BOTHER WITH DEFENSIBLE SPACE?

During a major wildfire, it is unlikely there will be enough firefighting resources available to defend every home. In these instances, firefighters will likely select homes they can safely and effectively protect. Even with adequate resources, some wildfires may be so intense that there may be little firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. This can be accomplished by reducing the amount of flammable vegetation surrounding a home. The action taken by the owner before the wildfire occurs (such as proper landscaping) is critical.

DOES DEFENSIBLE SPACE REQUIRE A LOT OF BARE GROUND IN MY LANDSCAPE?

No. Unfortunately that is a common misconception. While bare ground may be effective in reducing the wildfire threat, it lacks in appearance and may cause soil erosion. Landscaping can be designed to create an attractive well-vegetated property that also provides effective defensible space for homes.

DOES CREATING A DEFENSIBLE SPACE REQUIRE ANY SPECIAL SKILLS OR EQUIPMENT?

No. For the most part, creating a defensible space employs routine gardening and landscape maintenance practices; such as, pruning, mowing, weeding, plant removal, appropriate plant selection and irrigation. The necessary equipment consists of common tools, like a chain saw, pruning saw, pruning shears, loppers, weed-eater, shovel and a rake. A chipper, compost bin or a large rented trash dumpster may be useful in disposing of unwanted plant material.

HOW BIG IS AN EFFECTIVE DEFENSIBLE SPACE?

Defensible space size is usually expressed as the distance from the house in which vegetation is managed to reduce the wildfire threat. The necessary distance for an effective defensible space is not the same for everyone, but varies by slope and type of wildland vegetation growing near a house. See the section entitled “Creating An Effective Defensible Space” on page 8 for specific information.

DOES DEFENSIBLE SPACE MAKE A DIFFERENCE?

Yes. Investigations of homes threatened by wildfire indicate that houses with an effective defensible space are much more likely to survive a wildfire. Furthermore, homes with both an effective defensible space and a nonflammable roof (composition shingles, tile, metal, etc.) are many times more likely to survive a wildfire than those without defensible space and flammable roofs (wood shakes or shingles). These conditions give firefighters the opportunity to effectively and safely defend a home.

DOES HAVING A DEFENSIBLE SPACE GUARANTEE MY HOUSE WILL SURVIVE A WILDFIRE?

No. Under extreme conditions, almost any house can burn. But having a defensible space will significantly improve the odds of your home surviving a wildfire.

WHY DOESN'T EVERYONE LIVING IN A HIGH WILDFIRE HAZARD AREA CREATE A DEFENSIBLE SPACE?

The specific reasons for not creating a defensible space are varied. Many individuals believe "It won't happen to me." Others think the costs (time, money, effort, loss of privacy, etc.) outweigh the benefits. And some have failed to implement defensible space practices because of lack of knowledge or misconceptions.

HOW BIG IS AN EFFECTIVE DEFENSIBLE SPACE?

The size of the defensible space area is usually expressed as a distance extending outward from the sides of a house. This distance varies by the type of wildland vegetation growing near a house and steepness of the terrain.

For example, if your property is surrounded by wildland grasses, and is located on flat land, your recommended defensible space distance would extend out 30 feet from the sides of your house. If your house sits on a slope and the adjacent wildland vegetation is tall dense brush, your recommended defensible space distance would be 100 feet.

If the recommended defensible space goes beyond your property boundaries, contact the adjacent property owner and work cooperatively on creating a defensible space. The effectiveness of defensible space increases when multiple property owners work together. The local assessor's office can provide assistance if the owners of adjacent properties are unknown. Do not work on someone else's property without their permission.

Temporarily mark the recommended distance with flagging or strips of cloth tied to shrubs, trees, or stakes around your home. This is your defensible space area.

HOW DO I CHANGE THE VEGETATION ON MY PROPERTY TO REDUCE THE WILDFIRE THREAT?

The objective of defensible space is to reduce the wildfire threat to a home by changing the characteristics of the adjacent vegetation. Defensible space practices include:

- Increasing the moisture content of vegetation.
- Decreasing the amount of flammable vegetation.
- Shortening plant height.
- Altering the arrangement of plants.

This is accomplished through the "Three R's of Defensible Space" (see chart below).

THE THREE R's OF DEFENSIBLE SPACE

Removal	This technique involves the elimination of entire plants, particularly trees and shrubs, from the site. Examples of removal would be the cutting down of a dead tree or the cutting out of a flammable shrub.
Reduction	The removal of plant parts, such as branches or leaves, constitute reduction. Examples of reduction are pruning dead wood from a shrub, removing low tree branches, and mowing dried grass.
Replacement	Replacement is the substitution of less flammable plants for more hazardous vegetation. For example, removal of a dense stand of flammable shrubs and planting an irrigated, well maintained flower bed would be a type of replacement.

CREATING A DEFENSIBLE SPACE

A Step-by-Step Guide

Are you worried about the wildfire threat to your home, but are not sure how to get started in making your home defensible? Follow these steps to create an effective defensible space.

STEP 1) Find the percent slope which best describes your property.

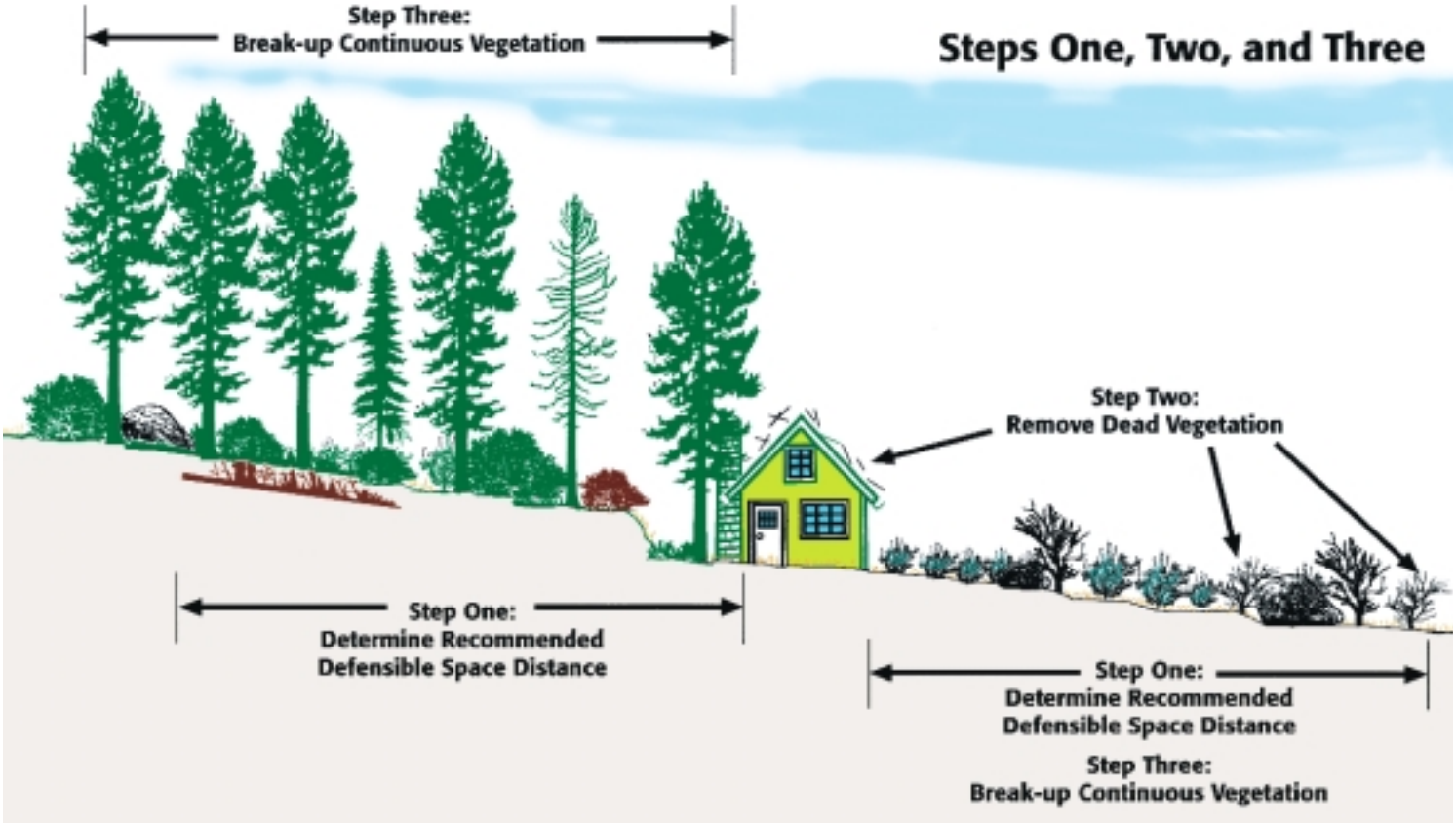
STEP 2) Remove all dead and dry vegetation.

STEP 3) Break up continuous vegetation.

STEP 4) Determine whether or not there are ladder fuels present.

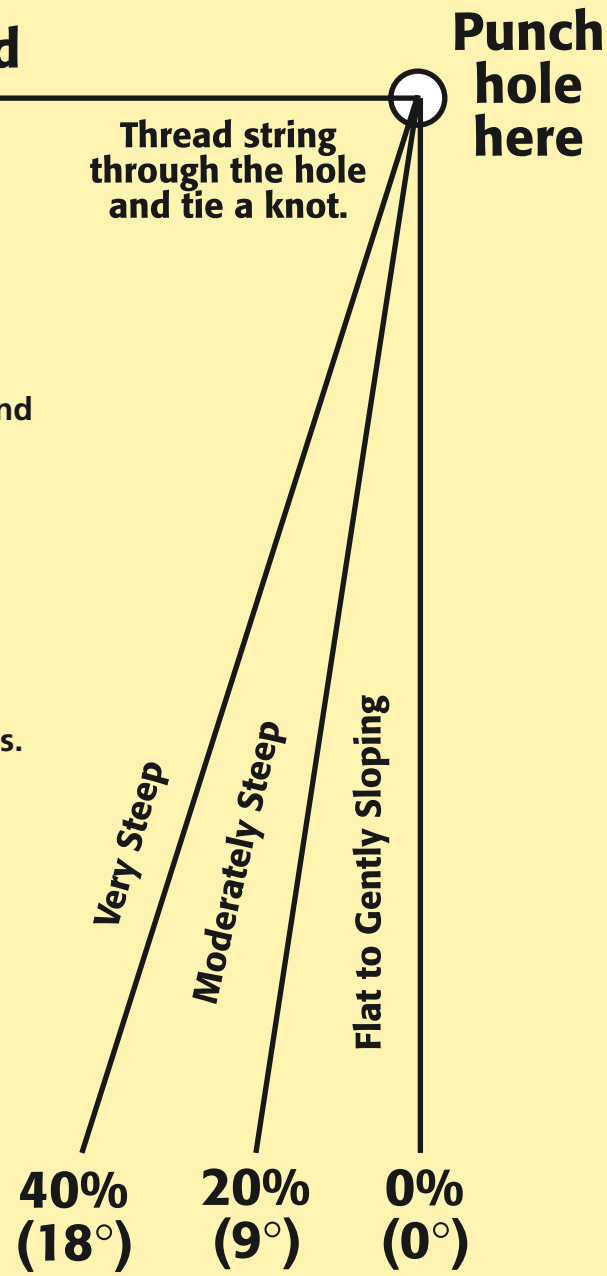
STEP 5) Create a 30-foot wide "lean, clean and green" area.

STEP 6) Maintain the vegetation within the defensible space.



STEP ONE: FIND THE PERCENT SLOPE WHICH BEST DESCRIBES YOUR PROPERTY.

Hold this line parallel to the ground



1. Punch a hole through this diagram at the designated spot. Mount diagram on cardboard if needed.
2. Thread a 12" piece of string through the hole and tie a knot in the end of the string on the backside of the diagram.
3. Tie a 1" or larger washer to weight the other end of the string.
4. Hold the designated line parallel to the ground, sighting up slope along the edge of the diagram.
5. The weighted string will indicate the percent of slope steepness. For convenience, steepness of slope in degrees is listed in parenthesis.

STEP TWO: IS THERE ANY DEAD VEGETATION WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?

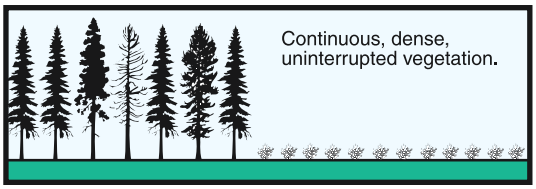
Dead vegetation includes dead trees and shrubs, dead branches lying on the ground or still attached to living plants, dried grass, flowers and weeds, dropped leaves and needles, and firewood stacks. In most instances, dead vegetation should be removed from the recommended defensible space area. A description of the types of dead vegetation you're likely to encounter and the recommended actions are listed below.

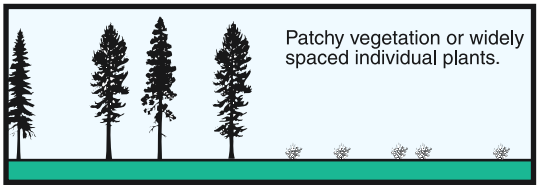
TYPES OF DEAD VEGETATION AND RECOMMENDED PRACTICE

DEAD FUEL TYPE	RECOMMENDED PRACTICE
STANDING DEAD TREE	Remove all standing dead trees from within the defensible space area.
FALLEN DEAD TREE	Remove all dead trees within the defensible space area if they have recently fallen and are not yet embedded into the ground. Downed trees that are embedded into soil which cannot be removed without soil disturbance should be left in place. Remove all exposed branches from an embedded downed dead tree.
DEAD SHRUBS	Remove all dead shrubs from within the defensible space area.
DRIED GRASSES AND WILDFLOWERS	Once grasses and wildflowers have dried out or "cured," mow and remove from the defensible space area.
DEAD NEEDLES, LEAVES, BRANCHES AND CONES (ON THE GROUND)	Reduce thick layers of pine needles to a depth of two inches. Do not remove all needles. Take care not to disturb the "duff" layer (dark area at the ground surface where needles are decomposing) if present. Remove dead leaves, twigs, cones and branches.
DEAD NEEDLES, LEAVES, BRANCHES AND TWIGS (OTHER THAN ON THE GROUND)	Remove all dead leaves, branches, twigs and needles still attached to living trees and shrubs to height of 15 feet above ground. Remove all debris which accumulates on the roof and in rain gutters on a routine basis (at least once annually).
FIREWOOD AND OTHER COMBUSTIBLE DEBRIS	Locate firewood and other combustible debris (wood scraps, grass clippings, leaf piles, etc.) at least 30 feet uphill from the house.

STEP THREE: IS THERE A CONTINUOUS DENSE COVER OF SHRUBS OR TREES PRESENT WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?

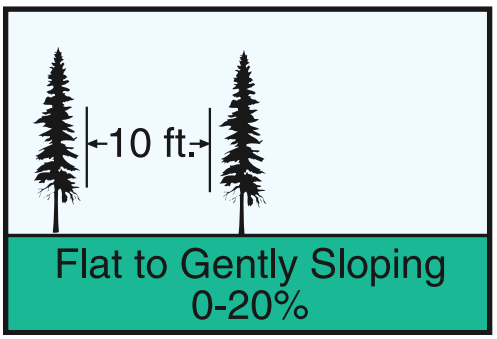
Sometimes wildland plants can occur as an uninterrupted layer of vegetation as opposed to being patchy or widely spaced individual plants. The more continuous and dense the vegetation, the greater the wildfire threat. If this situation is present within your recommended defensible space area, you should "break-it-up" by providing for a separation between plants or small groups of plants.



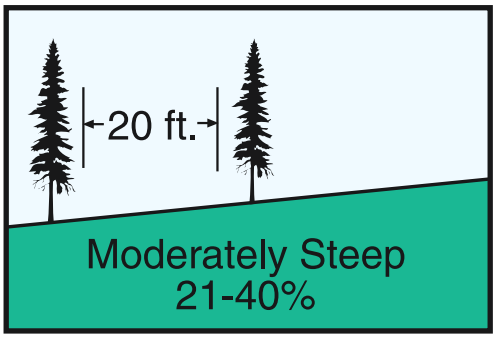


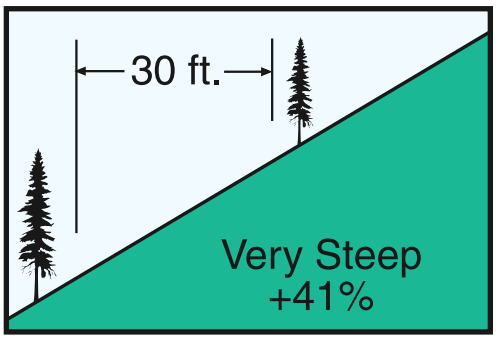
STEP THREE, continued

Recommended Separation Distances Between Tree Canopies



For forested areas, the recommended amount of separation between tree canopies is determined by steepness of slope. The specific recommendations are shown to the left.





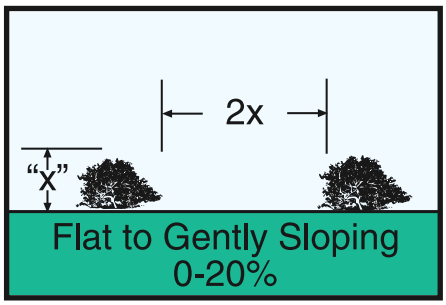
Note: Separation distances are measured between canopies (outer most branches) and not between trunks.

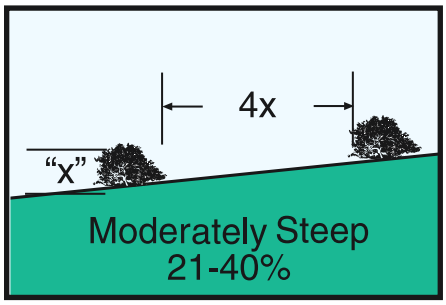
For example, if a home is situated on a 30% slope, the separation of tree canopies within the defensible space should be 20 feet. Creating separation between tree canopies can be accomplished through tree removal.

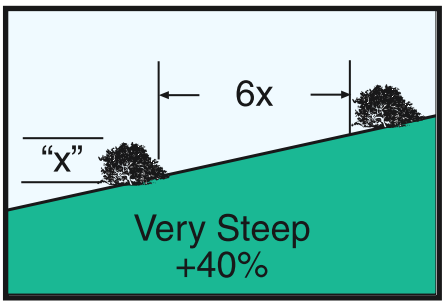
Not only are steep slopes often considered high wildfire areas, they are also highly erodable. When removing shrubs and trees from steep slopes, keep soil disturbance to a minimum. Also, it may be necessary to replace flammable vegetation with other plant materials to prevent excessive soil erosion.

Recommended Separation Distances for Shrubs

For areas with dense brush or thick trees, the recommended separation distance is dependent upon shrub height and steepness of slope. Specific recommendations are illustrated below.

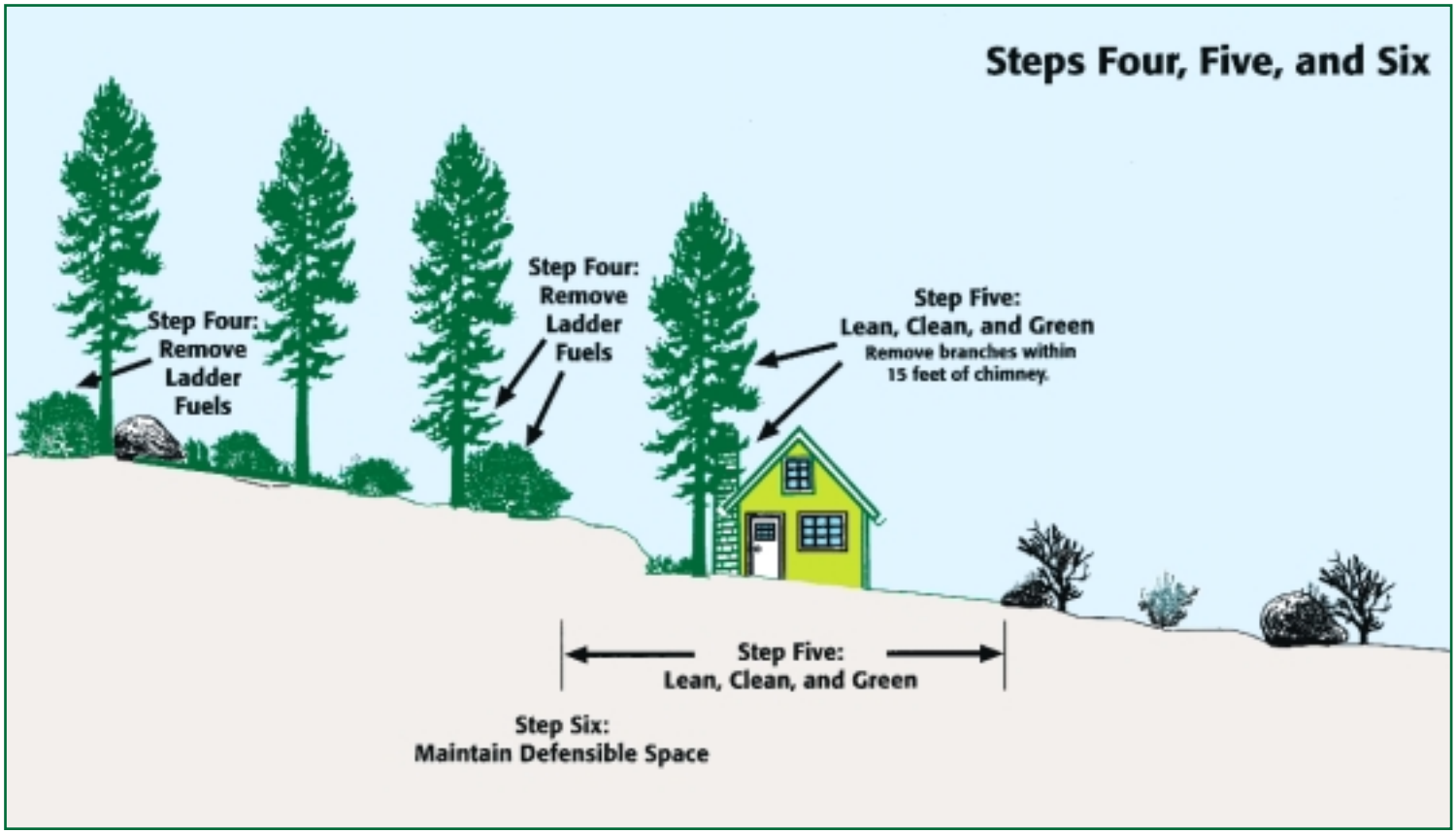






Note: Separation distances are measured between canopies (outermost branches) and not between trunks.

For example, if a house is located on a 10% slope and the brush is four feet tall, the separation distance would be two times the shrub height or eight feet (2 x 4 ft shrub height equals 8 ft of separation between shrubs). The recommended separation distance can be accomplished by removing plants or through pruning that reduces the diameter or height (shorter height means less separation) of shrubs.

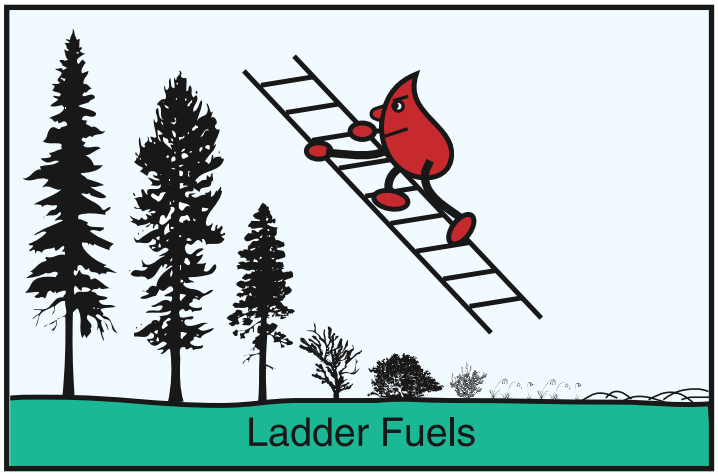


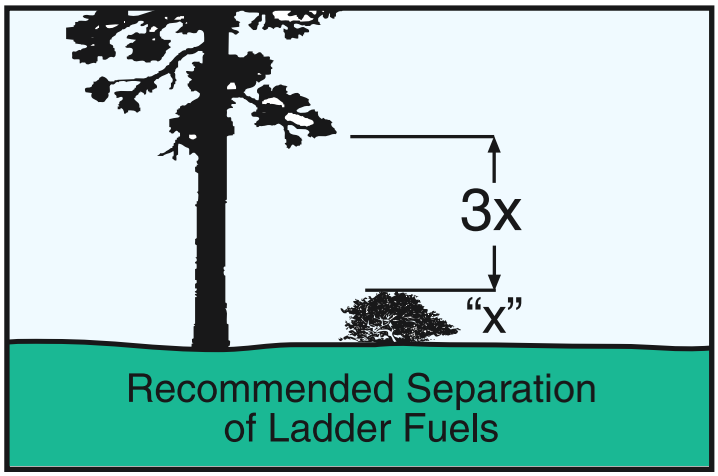
STEP FOUR:

ARE THERE LADDER FUELS PRESENT WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?

Vegetation is often present at varying heights, similar to the rungs of a ladder. Under these conditions, flames from fuels burning at ground level, such as a thick layer of pine needles, can be carried to shrubs which can ignite still higher fuels like tree branches. Vegetation that allows a fire to move from lower growing plants to taller ones is referred to as "ladder fuel." The ladder fuel problem can be corrected by providing a separation between the vegetation layers.

Within the defensible space area, a vertical separation of three times the height of the lower fuel layer is recommended. For example, if a shrub growing adjacent to a large tree is three feet tall, the recommended separation distance would be 9 feet (3 ft shrub height x 3 = 9 feet). This could be accomplished by removing the lower tree branches, reducing the height of the shrub, or both. A maximum height of 18" for all shrubs within 30' is recommended.





STEP FIVE:

IS THERE AN AREA AT LEAST 30 FEET WIDE SURROUNDING YOUR HOUSE THAT IS "LEAN, CLEAN AND GREEN"?

The area immediately adjacent to a house is particularly important in terms of an effective defensible space. It is also the area that is usually landscaped. Within an area extending at least 30 feet from any structure, vegetation should be:

- Lean—small amounts of flammable vegetation.
- Clean—no accumulation of dead vegetation or other flammable debris.
- Green—plants are healthy and green during the fire season.

The "Lean, Clean and Green Zone Checklist" will help you evaluate the area immediately adjacent to your home.

STEP SIX:

IS VEGETATION WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA MAINTAINED ON A REGULAR BASIS?

Keeping your defensible space effective is a continual process. At least annually, review these defensible space steps and take action accordingly. An effective defensible space can be quickly diminished through neglect.

DEFENSIBLE SPACE

LEAN, CLEAN & GREEN CHECKLIST

- ❑ **Emphasize the use of low growing herbaceous (non-woody) plants that are kept green during the fire season through irrigation as needed. Herbaceous plants include lawn, clover, a variety of groundcovers, bedding plants, bulbs, perennial flowers and native, perennial grasses.**
- ❑ **Emphasize use of mulches, rock and non-combustible hard surfaces (concrete sidewalks, brick patios and asphalt driveways).**
- ❑ **Deciduous ornamental trees and shrubs are acceptable if they are kept green, free of dead plant material, ladder fuels are removed, and individual plants or groups of plants are arranged in a manner in which adjacent wildland vegetation cannot convey a fire to structures through them. Shorter deciduous shrubs are preferred.**
- ❑ **Minimize the use of ornamental coniferous shrubs and trees and tall exotic grasses (such as pampas grass).**
- ❑ **Where permitted, most wildland native shrubs and trees should be removed from this zone and replaced with fire resistant plant varieties. Individual specimens or small groups of wildland shrubs and trees can be retained provided ladder fuels are first removed and they are kept healthy, free of dead wood and pruned.**
- ❑ **For some areas, substantial removal of wildland vegetation may not be allowed. In these instances, wildland vegetation should conform to the recommended separation distances, be kept free of dead plant material, pruned to remove ladder fuels and fuel load, and arranged so it cannot readily convey a fire from the wildlands to a structure. Please become familiar with local requirements before removal of wildland vegetation.**
- ❑ **Tree limbs within 10 feet of a chimney, encroaching on powerlines, or touching a structure should be removed.**

FIRESCAPE

FIRE SAFE LANDSCAPE DESIGN

If a wildfire comes through your neighborhood, could your house survive on its own?" A dramatic question, but one we need to consider when living in an environment where wildfire is a common occurrence. Firescaping is landscape design that reduces house and property vulnerability to wildfire. The goal is to develop a landscape design and choice of plants that offers the best fire protection and enhances the property. The ideal is to surround the house with plants that are less likely to burn. It is imperative that when building homes in wildfire-prone areas that fire safety be a major factor in landscape design. Appropriate manipulation of the landscape can make a significant contribution towards wildfire survival.

The ideal is to surround the house with plants that are less likely to burn.

Firescape integrates traditional landscape functions and needs into a design that reduces the threat from wildfire. It need not look much different than a traditional design. In addition to meeting a homeowner's aesthetic desires and functional needs such as entertaining, playing, storage, erosion control, firescape also includes vegetation modification techniques, planting for fire safety, defensible space principles and use of fire safety zones.

There are three things which determine wildfire intensity: topography, weather and vegetation. We can only affect vegetation. Through proper plant selection, placement and maintenance, we can diminish the possibility of ignition, lower fire intensity, and reduce how quickly a fire spreads to increase a home's survivability.

In firescaping, plant selection is primarily determined by a plant's ability to reduce the wildfire threat. Other considerations may be important such as appearance, ability to hold the soil in place, and wildlife habitat value. The traditional foundation planting of junipers is not a viable solution in a firescape design. Minimize use of evergreen shrubs and trees within 30 feet of a structure, because junipers, other conifers and broadleaf evergreens contain oils, resins and waxes that make these plants burn with great intensity. Use ornamental grasses and berries sparingly because they also can be highly flammable. Choose "fire smart" plants— plants with a high moisture content. They are low growing. Their stems and leaves are not resinous, oily or waxy. Deciduous trees are generally more fire resistant than evergreens because they have a higher moisture content when in leaf, but a lower fuel volume when dormant.

Placement and maintenance of trees and shrubs is as important as actual plant selection. When planning tree placement in the landscape, remember their size at maturity. Keep tree limbs at least 10 feet from chimneys, power lines and structures. Specimen trees can be used near a structure if pruned properly and well irrigated.

When planning tree placement in the landscape, remember their size at maturity.

Firescape design uses driveways, lawns, walkways, patios, parking areas, areas with inorganic mulches, and fences constructed of nonflammable materials such as rock, brick, or cement to reduce fuel loads and create fuel breaks. Fuel breaks are a vital component in every firescape design. Water features, pools, ponds or streams can also be fuel breaks. Areas where wildland vegetation has been thinned or replaced with less flammable plants are the traditional fuelbreak. Remember, while bare ground is effective from the wildfire viewpoint, it is not promoted as a firescape element due to aesthetic, soil erosion, and other concerns.

A home located on a brushy site above a south or west facing slope will require more extensive wildfire safety landscape planning than a house situated on a flat lot with little vegetation around it. Boulders and rocks become fire retardant elements in a design. Whether or not a site can be irrigated will greatly influence location of hardscape (concrete, asphalt, wood decks, etc.), plant selection and placement. Prevailing winds, seasonal weather, local fire history, and characteristics of native vegetation surrounding the site are additional important considerations.

In firescaping, open spaces are more important than the plants.

The area closest to a structure out to 30 feet will be the highest water use area the in fire safe landscape. Highly flammable fuels should be kept to a minimum and plants kept green throughout the fire season. Use well-irrigated perennials here. Another choice is low growing or non-woody deciduous plants. Lawn is soothing visually, and is also practical as a wildfire safety feature. Rock mulches are good choices. Patios, masonry or rock planters are excellent fuel breaks and increase wildfire safety. Be creative with boulders, riprap, dry streambeds and sculptural inorganic elements.

When designing a fire-safe landscape remember less is better. Simplify visual lines and groupings. A firesafe landscape lets plants and garden elements reveal their innate beauty by leaving space between plants and groups of plants. In firescaping, open spaces are more important than the plants.

Lawn can be an effective firescape feature. But extensive areas of turfgrass may not be right for everyone. Some good alternatives include clover, groundcovers, and native, perennial grasses that are kept green during the fire season through irrigation.

PLANTING TREES NEAR POWER LINES

When deciding on trees as part of a landscape design, remember to consider the height of the tree at maturity if overhead power lines are present.

To avoid conditions like those shown in the illustrations below (*fig. 1-3*), plant trees that have a mature height of 20 feet or less when near power lines, so that at maturity, they will not reach overhead wires.

Fig 1. Example of top direct trimming done to trees with a decurrent growth habit.

Fig 2. Example of side trimming.

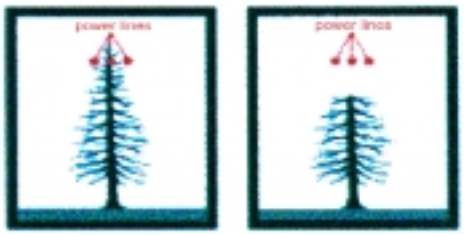


Fig 3. Example of top pruning done to redwoods and other trees with an excurrent growth habit.

The International Society of Arboriculture (ISA) recommends planting medium size trees, those that reach up to 40 feet at maturity, at least 15 feet or more to the side of overhead power lines and taller trees, those reaching up to 60 feet, at an even greater distance (*see fig. 4 below*).

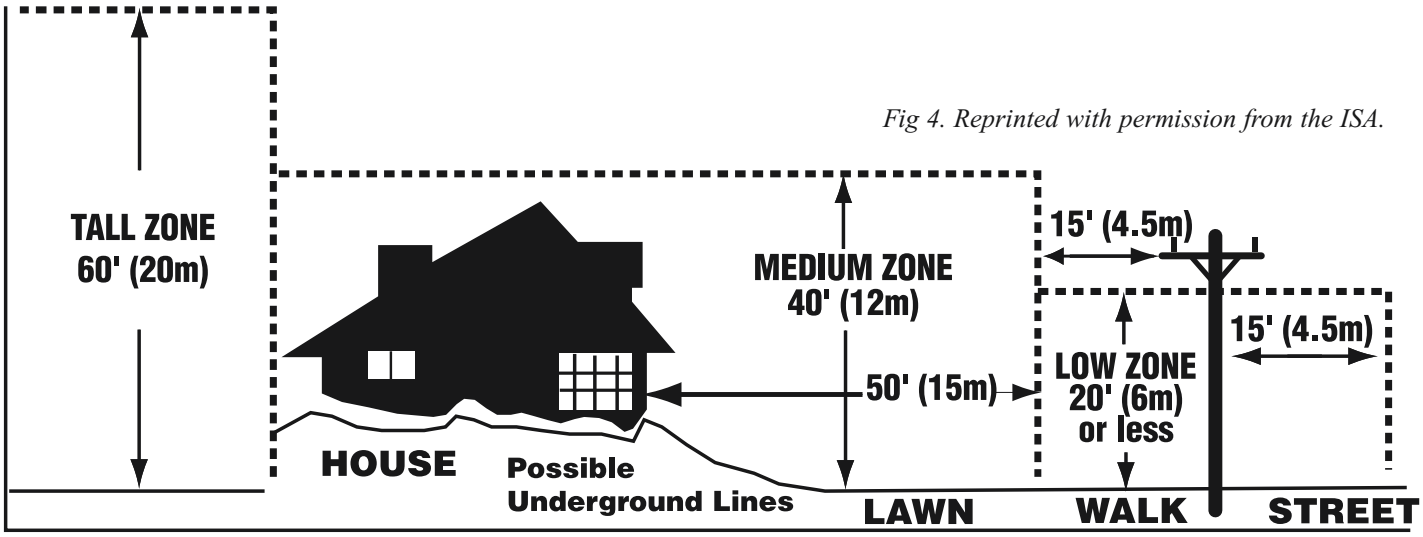


Fig 4. Reprinted with permission from the ISA.

There are thousands of species of trees in the world and countless varieties to choose from. For complete information on how to select tree species, visit to the International Society of Arboriculture at **www.isa-arbor.com** or call 217.355.9411 and the Urban Forest Ecosystems Institute at **www.ufei.org** or call 805.756.5171.

Before planting trees, notify Underground Service Alert at least two work days before digging at 1.800.227.2600 or go to **www.usanorth.org**. For more information about planting trees under power lines, visit Pacific, Gas & Electric Company at **www.pge.com**, call 1.800.743.5002 or contact your local electric company.

ADDITIONAL SAFETY RECOMMENDATIONS

Listed below are additional safety recommendations from the California Department of Forestry Publication "How to Make Your Home Fire Safe." For the safety of your family and preservation of your property, follow these recommendations for additional protection. See picture on page 17 with corresponding numbers.

1 ROOF

- Remove dead branches overhanging your roof.
- Remove any branches within 10 feet of your chimney.
- Clean all dead leaves and needles from your roof and gutters. Install a roof that meets the fire resistance classification of “Class A.”
- Cover your chimney outlet and stovepipe with a nonflammable screen of 1/2 inch or smaller mesh.

2 CONSTRUCTION

- Build your home away from ridge tops, canyons and areas between high points on a ridge.
- Build your home at least 30 feet from your property line .
- Use fire resistant building materials.
- Enclose the underside of balconies and above-ground decks with fire resistant materials.
- Limit the size and number of windows in your home that face large areas of vegetation.
- Install only dual-paned or triple-paned windows.
- Consider sprinkler systems within the house. They may protect your home while you’re away or prevent a house fire from spreading into the wildlands.

3 LANDSCAPE

- See “Creating An Effective Defensible Space” (page 8) and “Firescape-Fire Safe Landscape Design” (page 14).

4 YARD

- Stack woodpiles at least 30 feet from all structures and clear away flammable vegetation within 10 feet of woodpiles.
- Locate LPG tanks (butane and propane) at least 30 feet from any structure and surround them with 10 feet of clearance.
- Remove all stacks of construction materials, pine needles, leaves and other debris from your yard.

5 EMERGENCY WATER SUPPLY

- Maintain an emergency water supply that meets local fire department standards if there are no street fire hydrants.
- Clearly mark all emergency water sources and notify your local fire department of their existence.
- 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.

6 OUTSIDE

- Designate an emergency meeting place outside your home.
- Practice emergency exit drills regularly.
- Make sure that electric service lines, fuse boxes and circuit breaker panels are installed and maintained as prescribed by code.
- Contact qualified individuals to perform electrical maintenance and repairs.

7 ACCESS

- Identify at least two exit routes from your neighborhood.
- Construct roads that allow two way traffic.
- Design road width, grade and curves to allow access for large emergency vehicles.
- Construct driveways to allow large emergency equipment to reach your house.
- Design bridges to carry heavy emergency vehicles, including bulldozers carried on large trucks.
- Post clear road signs to show traffic restrictions such as dead-end roads, and weight and height limitations.
- Make sure dead-end roads and long driveways have turnaround areas wide enough for emergency vehicles. Construct turnouts along one-way roads.
- Clear flammable vegetation at least 10 feet from roads and five feet from driveways.
- Cut back overhanging tree branches above roads.
- Make sure that your street is named or numbered, and a sign is visibly posted at each street intersection.
- Post your house address at the beginning of your driveway, or on your house if it is easily visible from the road. Using at least 4”-high numbers for easy identification.

FIRE RESISTANT PLANTS

A fire resistant plant is a species that is less likely to burn as easily or rapidly as other types of plants. Remember that any plant can become fire hazardous if it is not well maintained. It is important to prune and water your plants regularly in order to retain their fire resistance. Taking out invasive plants is a great start to fire resistant landscaping. French Broom, Scotch Broom, Acacia, Eucalyptus, and Arundo are some of the invasive plants found in Santa Cruz County that are particularly fire hazardous. Using native plants can be a great way to insure that the plants in your garden are well adapted to local soils, rainfall, and temperature. Ask your local nursery for suggestions of fire resistant plants specifically adapted to the type of environment where your home is located. We do have several rare native plant species in Santa Cruz County whose populations are at risk so it is important to get advice about planting species that will not become invasive and that will not hybridize with these rare native plant populations.

The following is a sample list of deer, drought and fire resistant plants. ✪ Indicates erosion control, ◆ indicates not deer resistant, and *spp.* indicates more than one species are commonly grown. For specific selections appropriate to your area, contact your local nursery or visit the National Wildland/Urban Interface Fire Program at **www.firewise.org**.

Ground Covers

Candytuft (*Iberis sempervirens*) Evergreen with tiny white flowers. Sun to part shade. **NOT Native to CA**

Rosea Ice Plant (*Drosanthemum floribundum*) ✪ Succulent, grows on steep slopes. Bright blooms. Full sun. **NOT Native to CA**

Wooly Yarrow (*Achillea tomentosa*) Bright yellow blooms with fernlike fuzzy leaves. Sun to shade. **NOT Native to CA**

Woody Ground Covers

Dwarf Rosemary (*Rosmarinus officinalis*) ✪ Tiny blue flowers. Grows on steep slopes. Full sun. **NOT Native to CA**

Shrubs

Lemonade Berry (*Rhus integrifolia*) ✪ Large green leaves with flower clusters. Sun to part shade. **Native to CA**

Toyon (*Heteromeles arbutifolia*) Dark green leathery leaves with white blooms. Sun to part shade. **Native to CA**

Evergreen Vines

Cape Honeysuckle (*Tecomaria capensis*) Fine dark green foliage with red-orange clusters. Sun to shade. **NOT Native to CA**

Star Jasmine (*Trachelospermum jasminoides*) ✪ ◆ White fragrant blooms with glossy leaves. Sun to part shade. **NOT Native to CA**

Evergreen Trees

African Sumac (*Rhus lancea*) Grows 15-20 feet. Full weepy branches with berry-like clusters. Sun to part shade. **NOT Native to CA**

Catalina Cherry (*Prunus lyonii*) ◆ Shrub/tree to 30 feet. Showy white flowers followed by red fruits. Full sun. **Native to CA**

Coast Live Oak (*Quercus agrifolia*) Grows to 40 feet. Shiny texture leaves with dark bark. Sun to part shade. **Native to CA** **To avoid the spread of Sudden Oak Death, make sure the tree(s) you plant are locally grown and healthy.**

Carob (*Ceratonia siliqua*) Grows up to 40 feet. Bears dark "fruit pods" with dark green leaves. Sun to part shade. **NOT Native to CA**

Western Redbud (*Cercis occidentalis*) Shrub/tree to 18 feet. Color dramatically changes with seasons. Deciduous. Full sun. **Native to CA**

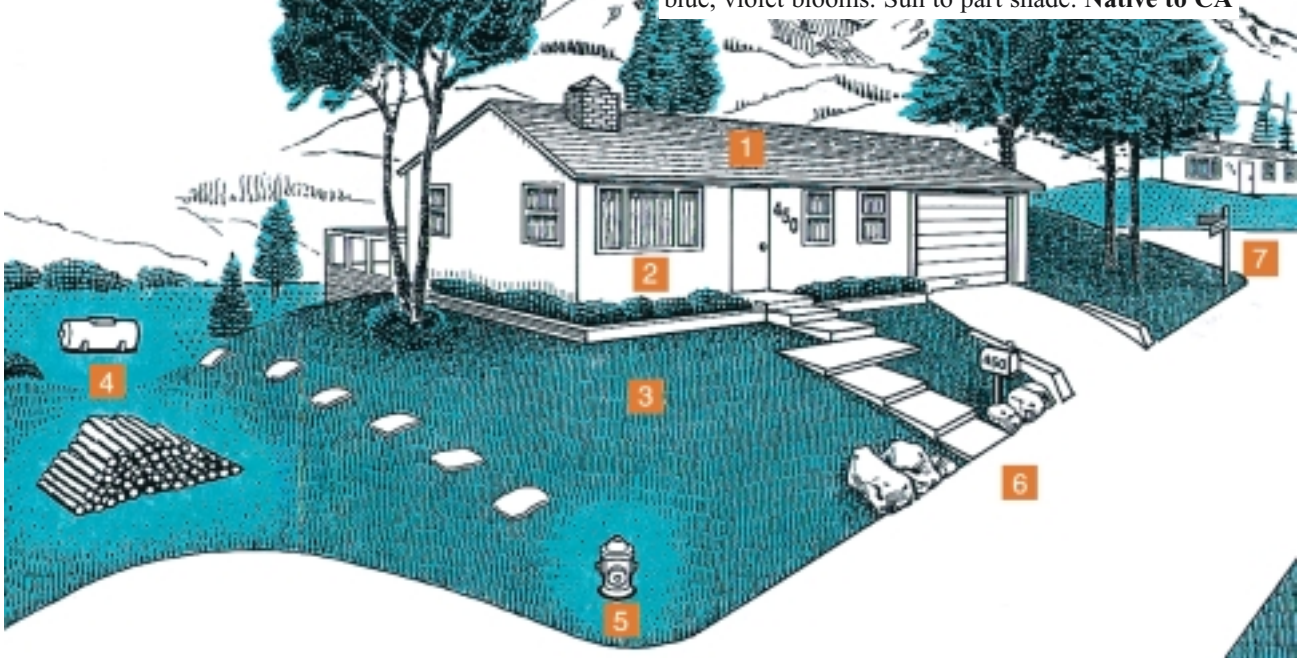
Perennials

California Fuschia (*Zauschneria californica*) Dark red trumpet blooms, re-growth in spring. Full sun. **Native to CA**

Daylily (*Hemerocallis spp.*) Semi-evergreen with large bright blooms. Sun to part shade. **NOT Native to CA**

Lily of the Nile (*Agapanthus spp.*) ◆ Smooth green foliage with blue, violet or white blooms. Sun to shade. **NOT Native to CA**

Sonoma Sage (*Salvia sonomensis*) Herbaceous foliage with blue, violet blooms. Sun to part shade. **Native to CA**



ROOFING MATERIALS

Defensible Space Factor Study: Findings from the 1990 Painted Cave Fire Santa Barbara, California

Characteristics of Structure and Site	Probability that Structure Survived
Wood roof, <30′ of defensible space, no defensive action taken	4%
Wood roof, <30′ defensible space	15%
Wood roof	19%
Non-wood roof	70%
Non-wood roof, >30′ defensible space	90%
Non-wood roof, >30′ defensible space, defensive action taken	99%

FIREBRANDS

Firebrands are burning embers produced by wildfire which are lifted high into the air and carried beyond the fire front. Firebrands are one of the major causes of homes burned due to wildfire.

Typical firebrand materials include pine cones, bark, and if houses are involved, wood shakes and shingles. Depending on wind speed and size of materials, firebrands can be carried more than 1/2 mile ahead of the fire front.

A shower of thousands of firebrands can be produced during a major wildfire event. If these firebrands land in areas with easily ignited fuels, numerous spot fires can start. Homes located blocks away from the main fire front can be threatened.

When wildfire flame lengths exceed 11 feet, direct firefighting efforts are ineffective. Under these conditions firefighters use roads, streams and other barriers to control the wildfire.

THE WOOD SHAKE AND SHINGLE ROOF HAZARD

A house can be threatened by a wildfire in three ways: direct exposure from flames, radiated heat, and airborne firebrands. Of these, firebrands account for the majority of homes burned by wildfire. The most vulnerable part of a house to firebrands is the roof.

Because of the angle, a roof can catch and trap firebrands. If a roof is constructed of combustible materials such as untreated wood shakes and shingles, the house is in jeopardy of igniting and burning. Not only are combustible roofing materials a hazard to a structure on which they are installed, but also to other houses in the vicinity.

Burning wood shakes, for example, can become firebrands, lifted from the burning roof, carried blocks away, and land in receptive fuel beds such as other combustible roofs. Unfortunately for homeowners with existing combustible roofs, there are no long-term reliable measures available to reduce roof vulnerability to wildfire other than re-roofing with fire resistant materials.

For complete information about fire safe roofing, visit the Committee for Firesafe Dwellings at **www.firesafedwellings.org** or call 1.800.962.4540.

WHEN WILDFIRE APPROACHES

In the event of a wildfire, evacuation may become necessary. A homeowner may choose to remain on the property. Homeowners are permitted to remain on the property, provided that individuals do not hinder firefighting efforts. If residents are unable to evacuate or elect not to evacuate, the following checklist will assist in protecting property and maintaining the safety of all family members.

- ❑ Evacuate, if possible, all family members not essential to protecting the house, as well as pets.
- ❑ Contact a friend or relative and relay your plans.
- ❑ Make sure family members are aware of a pre-arranged meeting place.
- ❑ Tune to a local radio station and listen for instructions.
- ❑ Place vehicles in the garage, have them pointing out and roll up windows.
- ❑ Place valuable papers and mementos in the car.
- ❑ Close the garage door, but leave it unlocked. If electric, release the garage door from the center track so the door can be opened manually.
- ❑ Place combustible patio furniture in the house or garage.
- ❑ Shut off propane at the tank or natural gas at the meter.
- ❑ Wear only cotton or wool clothes. Proper attire should include long pants, long sleeved shirt or jacket and boots. Carry gloves, a handkerchief to cover face, water to drink and goggles.
- ❑ Close all exterior vents.
- ❑ Prop a ladder against the house so firefighters have easy access to the roof.
- ❑ Make sure that all garden hoses are connected to faucets and attach a nozzle set on "spray."
- ❑ Soak rags, towels, or small rugs with water to use in beating out embers or small fires.
- ❑ Inside, fill bathtubs, sinks and other containers with water. Outside, do the same with garbage cans and buckets. The water heater and toilet tank are also available sources of water.
- ❑ Close all exterior doors and windows.
- ❑ Close all interior doors.
- ❑ Open the fireplace damper, but place the screen over the hearth to prevent sparks and embers from entering the house.
- ❑ Leave a light on in each room.
- ❑ Remove curtains and other combustible materials from around windows.
- ❑ If installed, close fire resistant drapes, shutters or venetian blinds. Attach pre-cut plywood panels to the exterior side of windows and glass doors.
- ❑ Turn off all pilot lights.
- ❑ Move overstuffed furniture (e.g. couches, easy chairs, etc.) to the center of the room.
- ❑ Keep wood shake or shingle roofs moist by spraying water. Do not waste water. Consider placing a lawn sprinkler on the roof if water pressure is adequate. Do not turn on until burning embers begin to fall on the roof.
- ❑ Continually check the roof and attic for embers, smoke or fire.

The American Red Cross provides 24-hour emergency assistance to disaster victims and may provide counseling and support, temporary housing, food, medicine, eyeglasses, clothing and other essential items to those in need. To learn more about the services offered by American Red Cross, visit **www.redcross.org** or call the local Santa Cruz County Red Cross Chapter at 831.462.2881.

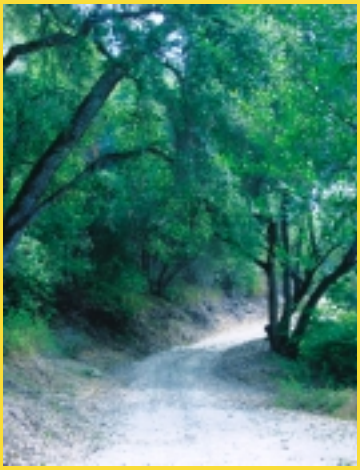
CHIPPER PROGRAM

The Santa Cruz County Fire Chiefs Association has purchased a chipper to promote fuel load reduction in Santa Cruz County. If your neighborhood or road association is planning on doing brush clearing and you are in need of a chipper, **you can contact your local fire protection district or fire department about the Chipper Program.**

The purpose of the Chipper Program will be to assist in fire prevention by helping landowners with fuel load management projects in their neighborhood. This chipper assistance will be offered to those groups who consult with their local fire protection district or fire departments and that follow the preparation requirements.

Example of a fuel load reduction project on a rural road.

BEFORE **AFTER**



SAFETY FIRST:

- Make sure your neighbors are made aware of when the chipping will occur.
- Make sure there is a designated road safety zone to provide clearance where chipping will take place.
- Only the Chipper Crew from local fire protection districts/fire departments will operate the chipper.
- At least two people should be available to assist the chipper crew by pulling brush piles to the chipper location.
- If you plan to assist by pulling brush piles to the chipper location:
  - Wear ear and eye protection.
  - Wear gloves, long sleeves, a hard hat and a dust mask.

PREPARING THE BRUSH TO BE CHIPPED:

- NO POISON OAK WILL BE CHIPPED
- If your French Broom has gone to seed it is not a good idea to chip it, as this will spread the seed. It is better to lay it on the ground where you cut it, so you don't spread the seed to any other areas
- Cut all brush into manageable pieces.
- No brush larger than 5 inches in diameter.
- Vines should be no longer than 4 feet.
- Dead brush is not preffered as it can be dangerous to chip and dulls the chipper blades.

IT IS RECOMMENDED THAT APPROPRIATE EROSION CONTROL MEASURES BE TAKEN FOLLOWING BRUSH CLEARING.

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