LIVING WITH FIRE

IN SANTA CRUZ COUNTY

A guide for homeowners

Revised 2009

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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A lot of people assume that when a wildfire starts, it will be quickly controlled and extinguished. This is an accurate assumption 97% of the time. For most wildfires, firefighters have the ability, equipment, and technology for effective fire suppression. But 3% of the time wildfires burn so intensely that there is little firefighters can do.

LOCAL ORGANIZATIONS

WORKING TO PROTECT YOU AND YOUR PROPERTY:

IN AN EMERGENCY CALL 9-1-1

Local Fire Protection Agencies and Districts:

CAL FIRE/Santa Cruz County Fire Department:.....(831) 335-5353 www.fire.ca.gov
Aptos/La Selva Beach Fire Protection District:.....(831) 685-6690 www.aptosfire.com
Ben Lomond Fire Protection District: .....(831) 336-5495 www.benlomondfd.com
Branciforte Fire Protection District: .....(831) 423-8856 www.branciforte.net
Boulder Creek Fire Department: .....(831) 338-7222 www.bcfd.com
Central Fire Protection District: .....(831) 479-6842 www.centralfpd.com
(Capitola, Live Oak, Soquel)
Felton Fire Protection District: .....(831) 335-4422 www.feltonfire.com
Santa Cruz City Fire Department: .....(831) 420-5280 www.ci.santa-cruz.ca.us/fd/index.html
Scotts Valley Fire Protection District: .....(831) 438-0211 www.scottsvalleyfire.com
University of California Santa Cruz Fire Department:....(831) 459-3473 www2.ucsc.edu/fire-dept/
Watsonville Fire Department: .....(831) 768-3200
www.ci.watsonville.ca.us/departments/fire/firedept.html
Zayante Fire Protection District: .....(831) 335-5100 www.zayantefire.org

Law Enforcement Agencies:

Santa Cruz County Sheriff's Office:.....(831) 471-1121 www.scsheriff.org
California Highway Patrol: .....(831) 662-0511 www.chp.ca.gov

Local Public Resource Agencies:

Resource Conservation District of
Santa Cruz County:.....(831) 464-2950 www.rcdsantacruz.org
USDA Natural Resources Conservation Service: .....(831) 475-1967 www.ca.nrcs.usda.gov
County of Santa Cruz Environmental Health:.....(831) 454-2022
Planning Department: .....(831) 454-2580
Public Works: .....(831) 454-2160
Traffic Advisory & Road Closures .....(831) 477-3999 www.sccroadclosure.org
Soquel Fire Safe Council:..... www.soquelfiresafe.org
Pineridge Fire Safe Council:..... email: pineridgefsc@aol.com
South Skyline Fire Safe Council: ..... email: schwindr@yahoo.com

Information Phone Numbers and Websites:

Animal Services Authority: .....(831) 454-7303 www.scanimalservices.us
Santa Cruz County Equine Evacuation Unit.....www.equineevac.org
Red Cross of Santa Cruz County:.....(831) 462-2884 www.redcross.org
KSCO – AM 1080 Radio:.....(831) 475-1080 www.ksco.com
PG&E Report an Outage: .....(800) 743-5002
Governor's Office of Emergency Services .....www.oes.ca.gov/
California Fire Alliance .....www.cafirealliance.org
California Fire Safe Council.....www.firesafecouncil.org
California Native Plant Society.....http://www.cnps.org/archives/seeding.pdf
Community Emergency Response Team .....http://www.santacruzcountycert.org/
Disaster Safety .....http://disastersafety.org/megafire/
National Fire Protection Association .....www.nfpa.org
National Interagency Fire Center.....www.nifc.gov
U.S. Fire Administration .....www.usfa.dhs.gov
Wildfire Zone.....http://wildfirezone.org

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TEAR THIS PAGE OUT AND POST IT ON YOUR REFRIGERATOR

EMERGENCY PHONE NUMBERS AND REFERENCES ARE ON THE BACK

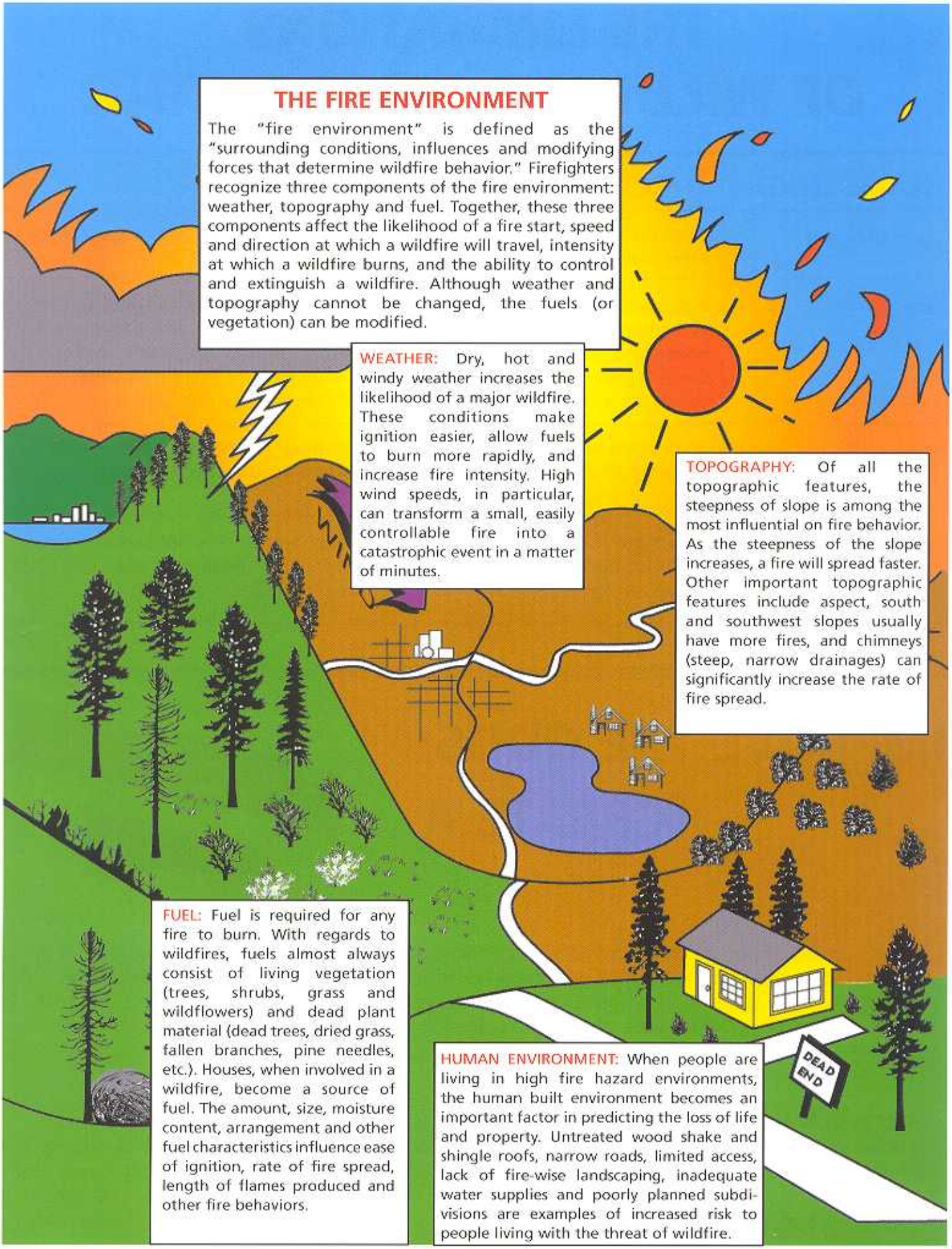
LONG BEFORE A FIRE THREATENS

Prepare an Evacuation Checklist and Get Organized:

- ❒ Critical medications
- ❒ Important personal papers and photos
- ❒ Essential valuables
- ❒ Pet and Livestock transport and equipment
  - Pet carriers, food, water, medications, halters, leashes, blankets, plastic bags, paper towels, first aid kit, toys, treats, etc.
- ❒ Change of comfortable clothing and toiletries
- ❒ Cell phone
- ❒ Critical papers in a fire proof safe
- ❒ An evacuation route map with at least 2 routes and a family meeting place
- ❒ Drive your planned route of escape before an actual emergency

WHEN WILDFIRE APPROACHES AND EVACUATION IS A POSSIBILITY

- ❒ Locate your evacuation checklist and place items in your vehicle
- ❒ Park your vehicle facing outward and carry your car keys with you
- ❒ Locate your pets and keep them nearby
- ❒ Prepare farm animals for transport
- ❒ Close windows and doors to the house – air conditioning off.
- ❒ Close garage doors and all inside doors
- ❒ Take down drapes and curtains to prevent combustion from radiant heat
- ❒ Turn on all lights so your house is visible in heavy smoke
- ❒ Charge pre-positioned hose lines for use in combating the fire
- ❒ If the roof is combustible, wet it down or, if equipped, turn on roof sprinklers
- ❒ Turn off gas at the meter and propane at the tank
- ❒ Move propane BBQ appliances away from structures
- ❒ Keep the radio tuned to local stations for timely reports on the fire status and for evacuation instructions
- ❒ Cover up. Wear long pants, long sleeve shirt, heavy shoes or boots, cap, bandana for face cover, goggles or glasses. 100% cotton is preferable.
- ❒ If told to evacuate, leave the area as directed. All evacuation instructions provided by officials should be followed immediately for your safety.
- ❒ If the fire cannot be stopped and passes over your home before you and your family evacuate, the safest place for you protection is inside the house with all the doors closed.


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 increase 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.
DEAD END

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 and is also required by the Public Resources Code.

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.

WHAT DOES THE LAW SAY?

Public Resources Code 4291 requires that any person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any land covered with flammable material shall at all times maintain **100 feet** of defensible space.

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.

WHY 100 FEET?

Two zones make up the required 100 feet of defensible space. The first 30 feet immediately surrounding your home should be an area of lean, clean and green vegetation. The remaining 70 feet (or to the property line) should be a reduced fuel zone. Comply with the law and help save your home by creating defensible space.

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 and an area from 30 to 100 feet with reduced fuel.

STEP 6) Maintain the vegetation within the defensible space.

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

Vegetation on steeper slopes should be more widely spaced as illustrated in Step Three.

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

The most important vegetation treatment to reduce the severity of a fire that burns into your defensible space is removal of the dead vegetation on the surface of the ground (also called fine dead fuels.) 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. A description of the types of dead vegetation you're likely to encounter and the recommended actions are listed below.

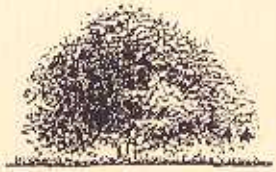
TYPES OF DEAD VEGETATION AND RECOMMENDED PRACTICE

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.

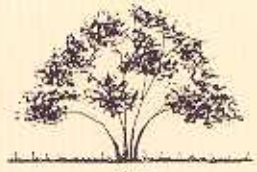
BRUSH PRUNING

When doing thinning and pruning use the following guidelines:

1. Remove dead or dying material, trim back lower large branches, and thin crowded plants so that 50 percent of material in the retained plants is removed.
2. Plants which are not to be saved, should be cut off at six inches above the ground.
3. The lowest branches of trees and large shrubs should be three times higher than the height of the vegetation below the plant, or six feet, whichever is higher.
4. Minimize walking and maintenance activities on steep slopes since this promotes erosion and causes soil to become compacted and increases the amount of runoff.



Before

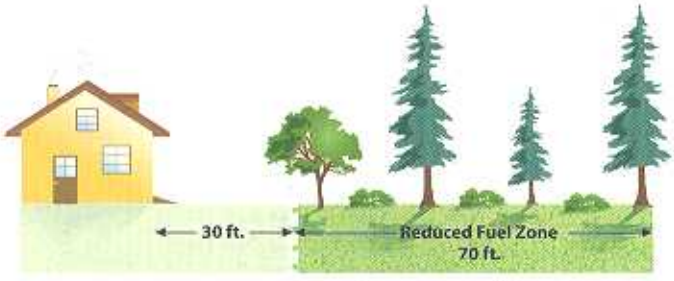


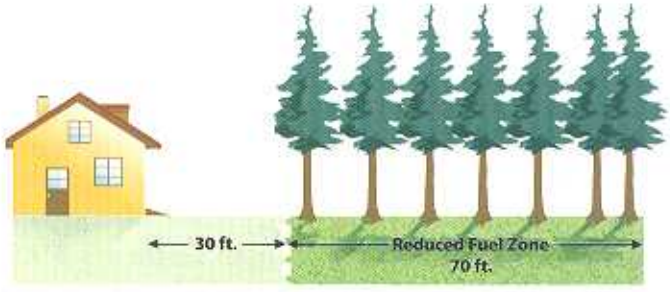
After

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 separation between plants or small groups of plants like the picture below.

For areas with continous tree canopy within the defensible space zone, large trees do not have to be cut and removed as long as all the plants beneath them are removed. Dead fuel in the understory should be removed and lower limbs of trees pruned. This will eliminate a vertical "fire ladder."



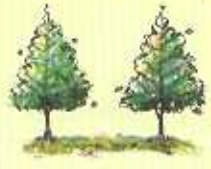


Recommended Separation Distances Between Tree Canopies

TREES

From edge of one tree canopy to the edge of the next

Flat to mild slope
(0% to 20% slope)

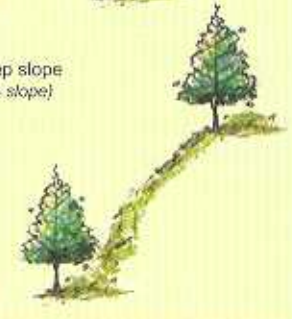


10 feet

Mild to moderate slope
(20% to 40% slope)

20 feet

Moderate to steep slope
(greater than 40% slope)



30 feet

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

SHRUBS

From edge of one shrub to the edge of the next

Flat to mild slope
(0% to 20% slope)
Two times (2x) the height of the shrub
(Two shrubs 2' high should be spaced 4' apart)

Mild to moderate slope
(20% to 40% slope)
Four times (4x) the height of the shrub
(Two shrubs 2' high should be spaced 8' apart)

Moderate to steep slope
(greater than 40% slope)
Six times (6x) the height of the shrub
(Two shrubs 2' high should be spaced 12' apart)

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 here.

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.

Fire "climbs" neighboring trees – don't give it a ladder that reaches from low to high. Limb live trees up to 10 feet or 1/3 of live crown height, whichever is greater.

Minimum Vertical Clearance

3X HEIGHT OF SHRUB = MINIMUM VERTICAL CLEARANCE

Example: A five foot shrub is growing near a tree.
3 x 5 = 15 feet of clearance needed between the top of the shrub and the lowest tree branches.

3x height of shrub to lowest branches of tree.

Note: A grouping of vegetation may be treated as a single plant if the foliage of the grouping does not exceed 10 feet in width. For example, three individual manzanita plants growing in a cluster with a total foliage width of 8 feet can be "grouped" and considered as one plant. This may be especially important to consider if your home is located within a sensitive habitat.

ADDITIONAL DEFENSIBLE SPACE CONSIDERATIONS

- ❑ **SENSITIVE HABITATS - Some areas in Santa Cruz County require special attention due to their sensitive habitat value. For example, riparian corridors, wetlands, sandhills habitat and long-toed salamander habitat. The Santa Cruz County Planning Department has provided information on their website to assist homeowners who may be located in sensitive habitats. Please see County of Santa Cruz and Defensible Space Frequently Asked Questions at: http://www.sccoplanning.com/html/devrev/defspace_faq.htm Additionally, questions regarding permit requirements and defensible space in sensitive habitats can be directed to the Environmental Coordinator at (831) 454-2580**

- ❑ **TREE REMOVAL - Sometimes in our heavily forested communities trees may need to be removed in order to achieve defensible space or because they are at risk of falling onto a residence or access road. Please contact a CAL FIRE Forester at (831) 335-6740 to get information regarding the removal of trees. In some cases a permit is required by the county for tree removal. See the website provided by the Santa Cruz County Planning Department called Tree Removal in Santa Cruz County at: http://www.sccoplanning.com/html/env/tree_removal.htm**

STEP FIVE:

IS THERE A LEAN, CLEAN, GREEN ZONE OF 30 FEET SURROUNDING YOUR HOME AND A FUEL REDUCTION ZONE IN THE NEXT 70 FEET (or to the property line)?

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. Remove dead fuels. Provide separation of trees and shrubs consistent with the recommendation in step three. Remove ladder fuels between shrubs and trees to provide vertical clearance.

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.

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.
- ❑ 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 in the 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.

FIRESCAPING WITH NATIVE PLANTS
Santa Cruz County, CA
USDA Natural Resources Conservation Service

DROUGHT TOLERANT & FIRE RESISTANT SHRUBS

Common Name	Scientific Name
Lemonade Berry	*Rhus integrifolia*
Coffee Berry	*Rhamnus californica*
Rock Rose	*Helianthemum scoparium*
California Fuchsia	*Epilobium canum (Zauschneria californica)*
Sugar Bush	Malosma (*Rhus) ovata*
California Lilac, Blue Blossom	*Ceanothus thyrsiflorus*
Golden Yarrow	*Eriophyllum confertiflorum*
California Rose	*Rosa California*
Snowberry	*Symphoricarpos albus*

FIRE RESISTANT TREES (upland)

Coast Live Oak	*Quercus* agrifolia
Toyon	*Heteromeles arbutifolia*
California Wax Myrtle	*Myrica californica (may need some water)*
Catalina Ironwood	*Lyonothamnus floribundus*
Yellow Willow	*Salix lucida*
Western Redbud	*Cercis occidentalis*
Santa Cruz Island Oak	*Quercus tomentella*
Tanoak	*Lithocarpus densiflora*

FIRE RESISTANT TREES & SHRUBS
(riparian, irrigated, or wet areas)

Coast Redwood	*Sequoia sempervirens*
Western Sycamore	*Platanus racemosa*
Willow (yellow, red, arroyo, coastal)	*Salix, spp*
Big Leaf Maple	*Acer macrophyllum*
Blue Elderberry	*Sambuscus Mexicana*
Thimbleberry	*Rubus parviflorus*
California Hazelnut	*Corylus cornuta var.californica*
Creek Dogwood	*Cornus sericea ssp. occidentalis*
Flowering Currant	*Ribes sanguineum var. glutinosum*
Bush Anemone	*Carpenteria californica*

FIRE RESISTANT NATIVE PERENNIAL FORBS

Yarrow	*Achileia spp.*
California Poppy	*Eschscholzia californica*
Penstemon	*Penstemon spp.*
Blue-Eyed Grass	*Sysyrinchium bellum.*
California Buttercup	*Ranunculus californica*
Bracken Fern	*Pteridium aquilinum var.pubescens*

FIRE RESISTANT NATIVE GROUNDCOVERS / SHORT GRASSES

Douglas Iris and related spp.	*Iris douglasiana and other native Iris*
Alum Root	*Heuchera, spp.*
Sword Fern	*Polystichum munitum*
Redwood Sorrel	*Oxalis oregano*
Dudleyas	*Dudleya, spp.*
Pine Grass	*Calamagrostis rubescens*
Idaho Fescue	*Festuca idahoensis*
Molate Fescue	*Festuca rubra*

INVASIVE AND/OR HIGH FIRE HAZARD SHRUBS AND TREES

Acacia; pampas grass; juniper; eucalyptus; chamise; all pines, including knob cone and Monterey pine; cypress trees; coyote brush; greasewood; sagebrush; buckwheat; sage; pepper tree; bamboo; palms; periwinkle/vinca; Algerian, English or German ivy; French, Spanish and Scotch broom, hemlock, spruce, cedar, and Douglas fir.

Note: This list was prepared by Rich Casale, Certified Professional Erosion & Sediment Control Specialist #3/District Conservationist, USDA-NRCS in consultation with the Santa Cruz Chapter of the California Native Plant Society, Resource Conservation District of Santa Cruz County, NRCS Plant specialists, and local native plant ecologists. Version September 2008

Photos courtesy of the California Native Plant Society.

The Right Tree For the Right Place

Tree Planting Precautions

When siting trees during landscaping be sure to consider overhead power lines and underground utilities in addition to fire hazard, sun exposure and soil conditions before deciding what plant goes where.

The best way to prevent conflicts between trees and power lines is to plant the "right tree in the right place." Though some large trees grow under power lines naturally, many are planted there because people don't realize how large they will get. Remember that a four foot tall, two foot wide tree might end up being 60 feet tall and 30 feet across. Avoid planting trees of any size directly under main power supply lines since utility crews may need access to these areas as part of routine maintenance. Small trees (up to 20 feet tall) can be planted adjacent to power lines but off to one side. Medium or large trees should be spaced 20 to 30 feet horizontally from power lines.

Visit selectree.calpoly.edu or pge.com/trees for assistance with tree selections.

Santa Cruz County adopted the International Fire Code as the Fire Code of Santa Cruz County in 2008. Many codes relate to new construction or remodels and are listed here for homeowners to be aware of the most up to date standards.

Access and Roads

- Property and street identification: Addresses must be plainly legible and visible from the street. Numbers must be at least 4 inches high on contrasting background. Streets and roads must be identified with approved signs. (SCCC 505.1 & 505.2)
- Width and vertical clearance: Fire apparatus access shall have an unobstructed road width of at least 20 feet. An 18 foot road width is required outside the Urban Service Line for roads or driveways serving more than two homes and 12 feet for access to a driveway serving two or fewer homes. (SCCC 503.2.1)
- Gates: The installation of a security gate shall be approved by the fire chief. Gates shall have an approved means of emergency operation and shall be 2 feet wider than the access road. (SCCC 503.6)
- Bridges: Bridges must be constructed and maintained to carry the load of fire apparatus. Load limits shall be posted at both entrances to the bridge. (SCCC 503.2.6)

Water Supply

- Storage: Minimum water supply for new dwellings shall be capable of supplying a flow of 500 gallons per minute for 20 minutes (10,000 gallons). (SCCC 508.1)
- Sprinklers: Automatic sprinkler systems are required for new construction. (SCCC 903.1 & 903.3.1.3)
- Hydrants: The hydrant shall be 30 - 36 inches above grade, 8 feet from flammable vegetation, no closer than 6 feet nor farther than 8 feet from a roadway. It shall be brass with 2 1/2 inch National hose male thread with cap. (PRC 4290)

Defensible Space

- Vegetation Clearance: 10 feet on both sides of roads (public or private) and 13' 6" vertically shall be cleared of flammable vegetation. (SCCC 7.92.5200) A person that owns, leases, controls, operates or maintains a building or structure shall within 30 feet maintain a firebreak and within 30 to 100 feet provide a reduced fuel zone. (PRC 4291)
- Ignition Resistance: Roofs must have a minimum Class B Fire Resistive rating. Other requirements regarding eaves, gutters, attic ventilation, exterior walls, exterior windows and doors, decking and decking enclosures are all covered in the California Building Code for new construction depending on the location.
- Smoke Alarms: Single and multiple station smoke alarms shall be installed. (SCCC 907.3.2)
- Spark Arrestors: Spark arrestors are required on all chimneys. Spark arrestor shall be contructed with heavy wire mesh with openings not to exceed ½ inch. (SCCC5207)
- Fireworks: The possession, manufacture, storage, sale, handling and use of fireworks are prohibited. (SCCC 3301.1.3)

For additional information on these codes visit the CAL FIRE website at:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php

And the Santa Cruz County website at:
http://www.sccoplanning.com/html/bldg/resfirerqs_2007.htm

SCCC: Santa Cruz County Code PRC: Public Resources Code

California Department of Forestry and Fire Protection

Homeowner Checklist

How to Make Your Home Fire Safe

INSIDE

Kitchen

- ❒ Keep a working fire extinguisher in the kitchen
- ❒ Maintain electric and gas stoves in good operating condition
- ❒ Keep baking soda on hand to extinguish stovetop grease fires
- ❒ Turn handles of pots and pans away from the front of the stove
- ❒ Install curtains and towel holders away from stove burners
- ❒ Store matches and lighters out of reach of children
- ❒ Make sure that electrical outlets are designed to handle appliance loads

Living Room

- ❒ Install a screen in front of fireplace or wood stove
- ❒ Store the ashes from your fireplace (and barbecue) in a metal container and dispose of only when cold
- ❒ Clean fireplace chimneys and flues at least once a year

Hallway

- ❒ Install smoke detectors between living and sleeping areas
- ❒ Test smoke detectors monthly and replace batteries twice a year, when clocks are changed in the spring and fall
- ❒ Replace electrical cords that do not work properly, have loose connections, or are frayed

Bedroom

- ❒ Install smoke detectors in bedrooms
- ❒ Turn off electrical blankets and other electrical appliances when not in use
- ❒ Do not smoke in bed
- ❒ If you have security bars on your windows or doors, be sure they have an approved quick release mechanism so you and your family can get out in the event of a fire

Bathroom

- ❒ Disconnect appliances such as curling irons and hair dryers when done; store in a safe location until cool
- ❒ Keep items such as towels away from the wall and floor heaters

Garage

- ❒ Mount a working fire extinguisher in the garage
- ❒ Have tools such as shovel, hoe, rake and bucket available for use in a wildfire emergency
- ❒ Install a solid door with self closing hinges between living areas and the garage
- ❒ Dispose of oily rags in UL approved metal containers
- ❒ Store all combustibles away from ignition sources such as water heaters
- ❒ Disconnect electrical tools and appliances when not in use
- ❒ Allow hot tools such as glue guns and soldering irons to cool before storing
- ❒ Properly store flammable liquids in approved containers and away from ignition sources such as pilot lights

Disaster Preparedness

- ❒ Maintain at least a three-day supply of drinking water and food that does not require refrigeration and generally does not need cooking
- ❒ Maintain a portable radio, flashlight, emergency cooking equipment, lanterns and batteries
- ❒ Outdoor cooking appliances such as barbecues should never be taken indoors for use as heaters
- ❒ Maintain first aid supplies to treat the injured until help arrives
- ❒ Keep a list of valuables to take with you in an emergency; if possible, store these valuables together
- ❒ For safety, securely attach all water heaters and furniture such as cabinets and bookshelves to walls
- ❒ Have a contingency plan to enable family members to contact each other. Establish a family/friend phone tree
- ❒ Designate an emergency meeting place outside your home
- ❒ Practice emergency drills in the house (EDITH) regularly
- ❒ Make sure that all family members understand how to STOP, DROP AND ROLL if their clothes catch on fire

California Department of Forestry and Fire Protection

Homeowner Checklist

How to Make Your Home Fire Safe

OUTSIDE

Design/Construction

- ❒ Contact your local Fire Marshal's office for current fire code requirements for new construction
- ❒ Local building requirements address: ignition resistant construction; eave, balcony and deck enclosures; fire sprinklers; water storage; access road/driveway design and vehicle turn around design
- ❒ All new construction in Santa Cruz County requires installation of fire sprinklers
- ❒ New construction requires 10,000 gallons of water storage for fire suppression

Access

- ❒ Make sure that your street name sign is visibly posted at each street intersection
- ❒ Post your house address so it is easily visible from the street especially at night
- ❒ Address numbers must be at least 4 inches tall and on a contrasting background
- ❒ Identify at least two exit routes from your neighborhood
- ❒ Clear flammable vegetation at least 10 feet from roads and driveways
- ❒ Cut back overhanging tree branches above access at least 13' 6" above access roads
- ❒ Make sure dead end roads and long driveways have turn-around areas wide enough for emergency vehicles
- ❒ Design bridges to carry heavy emergency vehicles
- ❒ Post clear road signs to show traffic restrictions such as dead-end roads and weight and height limitations

Roof

- ❒ Install fire resistant roofing when replacing your roof
- ❒ Remove dead leaves and needles from your roof and gutters
- ❒ Remove branches overhanging your roof and keep branches 10 feet from your chimney
- ❒ Cover your chimney outlet and stovepipe with a nonflammable screen of ½ inch or smaller mesh

Landscape

- ❒ Create a Defensible Space of 100 feet around your home. It is required by law
- ❒ Create a "LEAN, CLEAN AND GREEN ZONE" by removing all flammable vegetation within 30 feet immediately surrounding your home
- ❒ Then create a "REDUCED FUEL ZONE" in the remaining 70 feet or to your property line

  You have two options in this area:

  A. Create horizontal and vertical spacing between plants. The amount of space will depend on how steep your property is and the size of your plants.

  B. Large continuous tree canopies do not have to be removed as long as all the understory plants are removed.
- ❒ Remove lower tree branches at least 6 feet from the ground
- ❒ Landscape with fire resistant plants
- ❒ Maintain all plants with regular water and keep dead branches, leaves and needles removed
- ❒ When clearing vegetation, use care when operating equipment such as lawnmowers. One small spark may start a fire; a string trimmer is much safer

Yard

- ❒ Stack woodpiles at least 30 feet from all structures and remove vegetation within 10 feet of woodpiles
- ❒ Locate LPG tanks (butane and propane) at least 30 feet from any structure and maintain 10 feet of clearance
- ❒ Remove all stacks of construction materials, pine needles, leaves and other debris from your yard

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
  - ○ 10,000 gallons of water storage for new construction
- ❒ 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

PARTNERS IN PREPAREDNESS AND PREVENTION IN SANTA CRUZ COUNTY

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