



Spring 2003

*Special Edition*

Vol. XII No.2

# **LIVING WITH WILDFIRE IN TRINITY COUNTY**

*The "WHY WE'RE WORRIED ABOUT WILDFIRE" Equation*



## 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. These components affect the likelihood of a fire starting, the speed and direction at which a wildfire will travel, the 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. Consequently, many of our opportunities to reduce the wildfire threat lie in proper management and manipulation of wildland vegetation.

### WEATHER

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

### TOPOGRAPHY

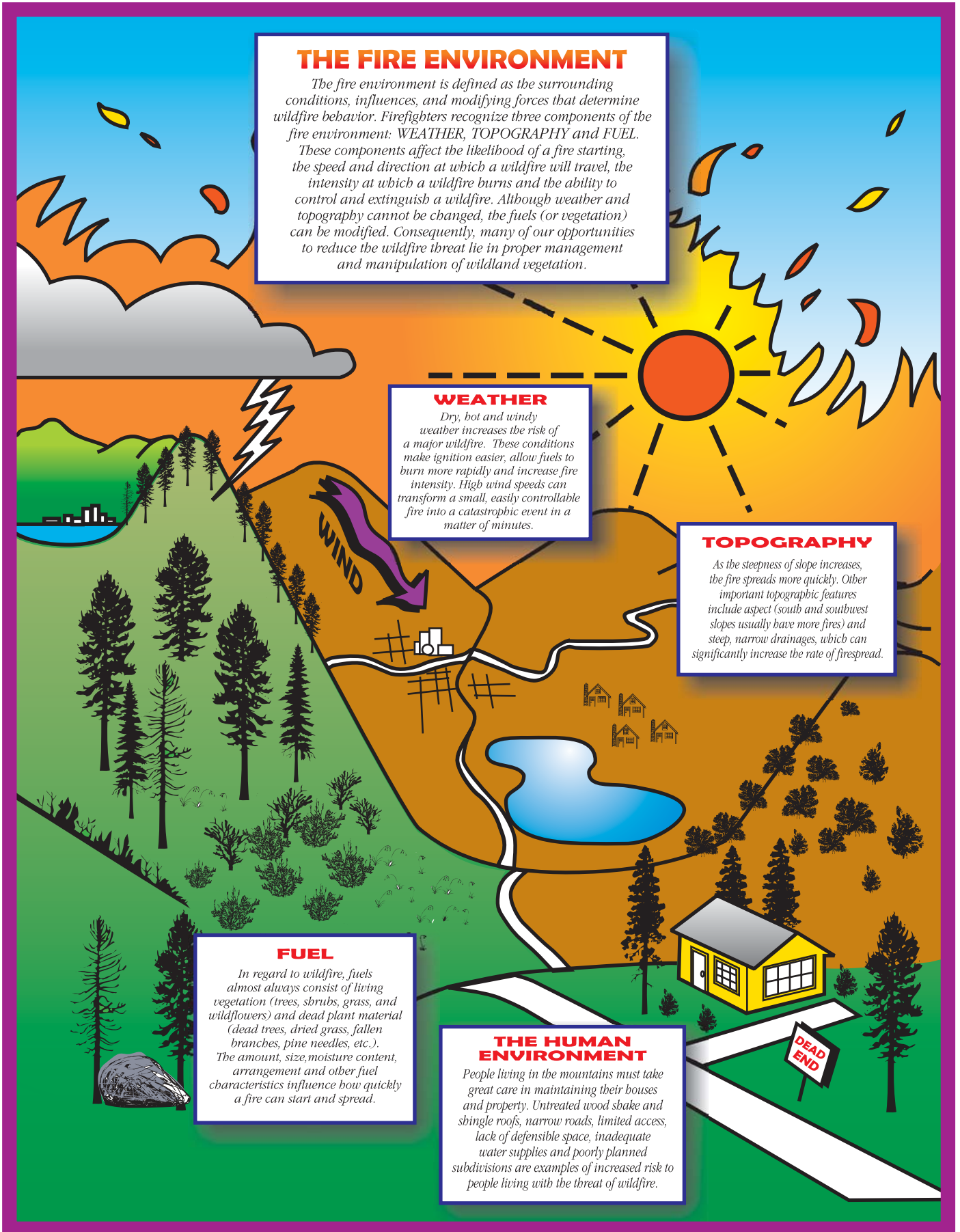
As the steepness of slope increases, the fire spreads more quickly. Other important topographic features include aspect (south and southwest slopes usually have more fires) and steep, narrow drainages, which can significantly increase the rate of firespread.

### FUEL

In regard to wildfire, 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.). The amount, size, moisture content, arrangement and other fuel characteristics influence how quickly a fire can start and spread.

### THE HUMAN ENVIRONMENT

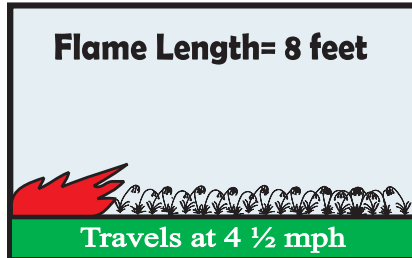
People living in the mountains must take great care in maintaining their houses and property. Untreated wood shake and shingle roofs, narrow roads, limited access, lack of defensible space, inadequate water supplies and poorly planned subdivisions are examples of increased risk to people living with the threat of wildfire.



# EXAMPLES OF LOCAL FIRE BEHAVIOR

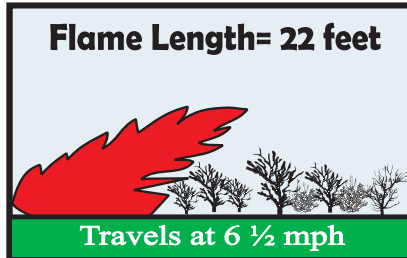
Presented below are six types of vegetation common to our region with computer generated estimates of how they would burn under certain conditions. These predications assume a wind speed of 20 mph, typical moisture contents of living and dead vegetation for summertime, and normal August weather for our area. (Conditions similar to the Oregon Mountain and Lowden Fires).

## ANNUAL GRASS



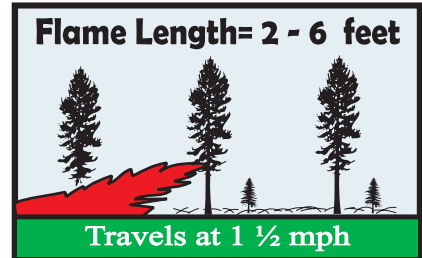
Annual grass occupies pastures, disturbed areas, and areas that have rocky, clayey, excessively drained, wet, or shallow soils.

## BRUSHFIELD



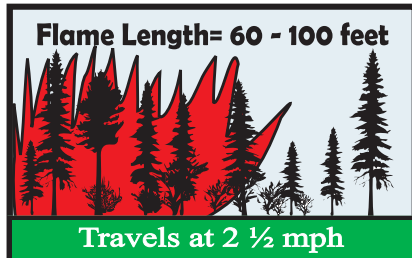
Manzanita, buckbrush, and/or deerbrush are the dominant shrubs in this type. There may be grasses and wildflowers in the understory. This type is found on old burns, harsh sites, shallow, rocky, and/or excessively drained soils, and some timber harvest areas.

## CONIFER FOREST



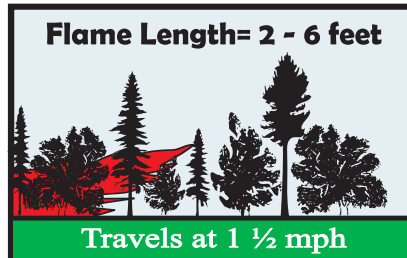
Ponderosa pine or Douglas-fir often dominate, but generally two to five coniferous species are found in these forests. Conifer needles, twigs, limbs, and occasionally logs cover the ground. Some seedling and sapling trees are scattered throughout the forest.

## CONIFER FOREST W/ LADDER FUELS



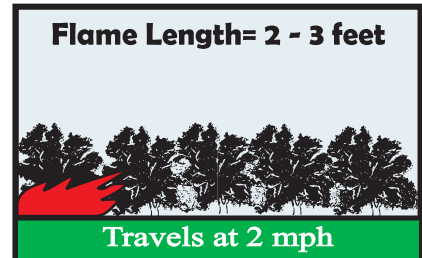
This forest is like the Conifer Forest, but has many seedling, sapling, and pole size trees (up to 11" in diameter) that act as fuel ladders. These fuel ladders enable ground fires to burn into the overstory tree canopy.

## MIXED HARDWOOD- CONIFER FOREST



Usually ponderosa pines and/or Douglas-fir are interspersed equally with black, white, and/or live oaks and/or madrone. Leaves, needles, twigs, limbs, and occasionally logs cover the ground. Some seedling and sapling trees are scattered throughout the forest.

## HARDWOOD FOREST



This forest is usually dominated by black, white, and/or live oaks and/or madrone, often with interspersed ponderosa pines and/or Douglas-fir. Leaves, needles, twigs, limbs, and occasionally logs cover the ground. Some seedling and sapling trees are scattered throughout the forest.

### THE LIMITATIONS OF WILDLAND FIREFIGHTING

#### FLAME LENGTH

#### EFFECTIVE FIRE SUPPRESSION TACTICS\*

**Less than 4 feet**

Fireline constructed with hand tools, such as shovels and axes, can be effective at the front of the fire.

**4 to 8 feet**

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 crews must construct a fireline at considerable distance from the fire.

**8 to 11 feet**

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 feet**

Direct fire suppression efforts will be ineffective. Retreat to existing roads, streams and other barriers. Burn out vegetation between the fireline and the advancing fire front to eliminate wildfire fuels.

\*Adapted from information provided by John Swanson, USDA Forest Service.



# CREATING AN EFFECTIVE DEFENSIBLE SPACE\*

## ...A Step-by-Step Guide

Are you worried about the wildfire threat to your home, but aren't sure how to get started in making your home defensible? Follow these six steps to an effective defensible space..

### STEP ONE: HOW BIG IS AN EFFECTIVE DEFENSIBLE SPACE?

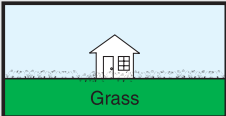

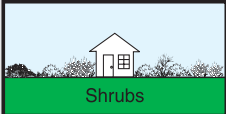
The size of the defensible space area is usually expressed as a distance extending outward from the sides of the house. This distance varies by the type of wildland vegetation growing near the house and the steepness of the terrain.

On the "Recommended Defensible Space Distance" chart presented below, find the vegetation type and percent slope (see "Homeowners Guide to Calculating Percent Slope") which best describes the area where your house is located. Then find the recommended defensible space distance for your situation.

For example, if your property is surrounded by grasses and is located on flat land, your recommended defensible space distance would extend 30 feet from the sides of the house. If your house is on a 25% slope and the adjacent wildland vegetation is dense tall brush, your recommended defensible space distance would be 200 feet.

If the recommended distance 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 will be your defensible space area.

DEFENSIBLE SPACE			
Recommended Distances - Steepness of Slope			
Vegetation Type	Flat to Gently Sloping 0 to 20%	Moderately Steep 21% to 40%	Very Steep +40%
<b>Wildland grasses, weeds, and widely scattered shrubs with grass understory.</b>  Grass	30 feet	100 feet	100 feet
<b>Includes shrub dominant areas (such as manzanita, buckbrush, deerbrush) and gray pine - shrubs.</b>  Trees	100 feet	200 feet	200 feet
<b>Includes forested areas. If substantial grass or shrub understory is present, use those values shown above.</b>  Shrubs	30 feet	100 feet	200 feet

- 1) Find the percent slope that best describes your property.
- 2) Find the type of vegetation that best describes the wildland plants growing on or near your property.
- 3) Locate the number in feet corresponding to your slope and vegetation. This is your recommended defensible space distance.

\*Please note the recommendations presented in this article are suggestions made by local firefighters experienced in protecting homes from wildfire. They are not requirements nor do they take precedence over local ordinances.



## 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 presented in the chart to the right.

## 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 defensible space area, you should "break-it-up" by providing a separation between plants or small groups of plants.

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 and Live Oak

For areas with dense brush or thick live oak trees, the recommended separation distance is dependant upon shrub height and steepness of slope. Specific recommendations are presented below. For example, if your home 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. The recommended separation distance can be accomplished by removing plants or through pruning that reduces the diameter or height of shrubs (shorter height means less separation is needed).

Removal works best for buckbrush. For shrubs which readily resprout, such as greenleaf manzanita and deerbrush, pruning to reduce height may be the best approach.

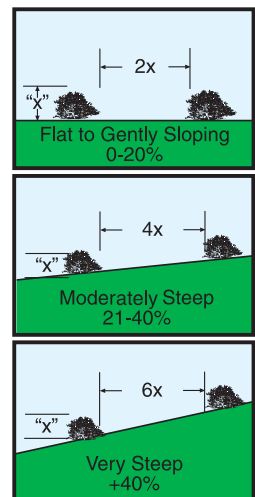
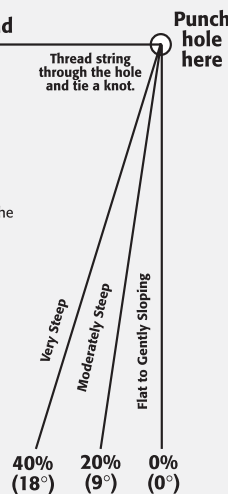
TYPES OF DEAD VEGETATION AND RECOMMENDED PRACTICE	
DEAD FUEL TYPE	RECOMMENDED PRACTICE
<b>Standing Dead Tree</b>	Remove all standing dead trees from within the defensible space area.
<b>Down Dead Tree</b>	Remove all down dead trees within the defensible space area if they have recently fallen and are not yet embedded into the ground. Downed trees that are embedded into soil and which cannot be removed without soil disturbance should be left in place. Remove all exposed branches from an embedded downed dead tree.
<b>Dead Shrubs</b>	Remove all dead shrubs from within the defensible space area.
<b>Dried Grasses and Wildflowers</b>	Once grasses and wildflowers have dried out or "cured," cut down and remove from the defensible space area.
<b>Dead Needles, Leaves, Branches, Cones (on the ground)</b>	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.
<b>Dead Needles, Leaves, Branches, and Twigs (other than on the ground)</b>	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 that accumulates on the roof and in rain gutters on a routine basis (at least once annually).
<b>Firewood and Other Combustible Debris</b>	Locate firewood and other combustible debris (wood scraps, grass clippings, leaf piles, etc.) at least 30 feet uphill from the house.

### Homeowner's Guide to Calculating Percent Slope

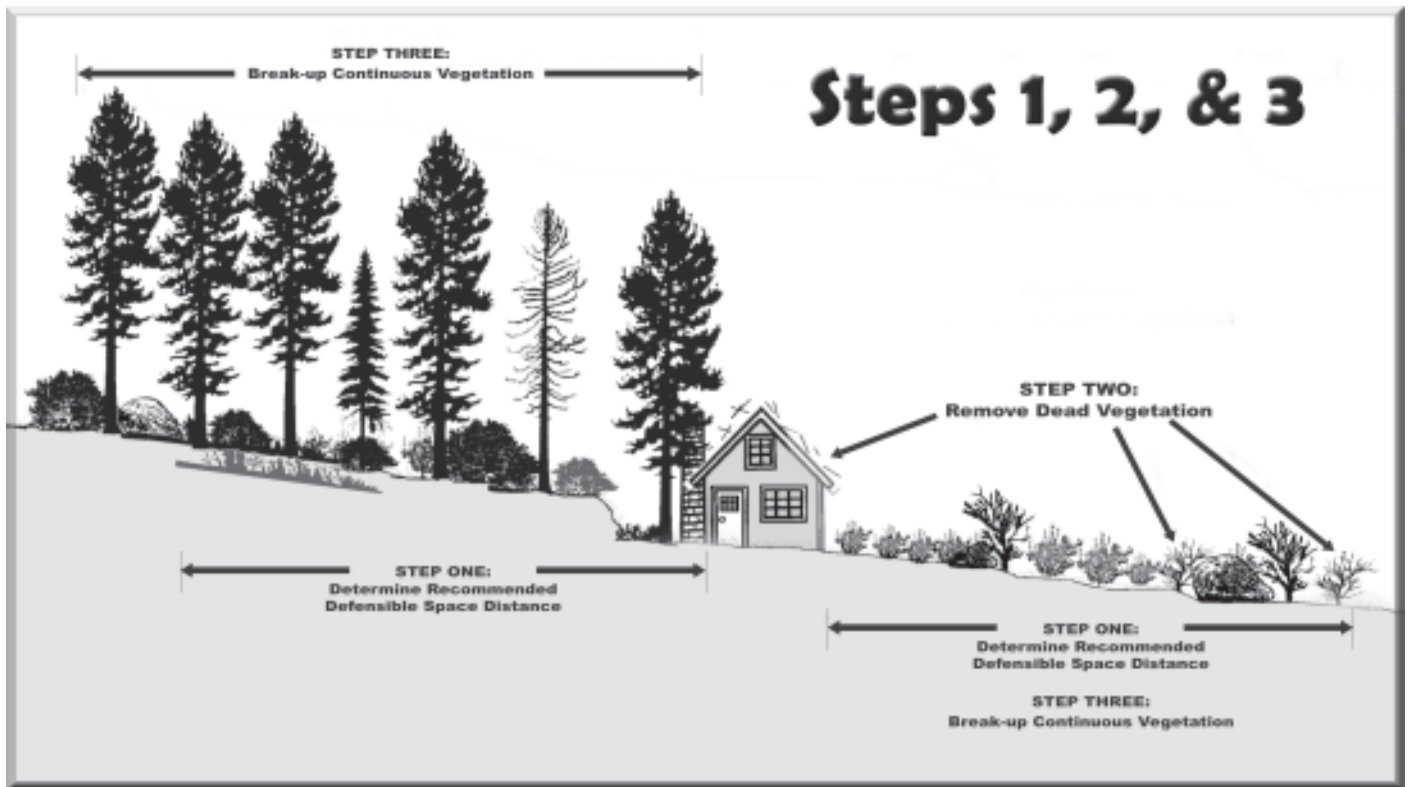
Hold this line parallel to the ground

#### INSTRUCTIONS:

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



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



## Illustrations of the Steps to Creating DEFENSIBLE SPACE

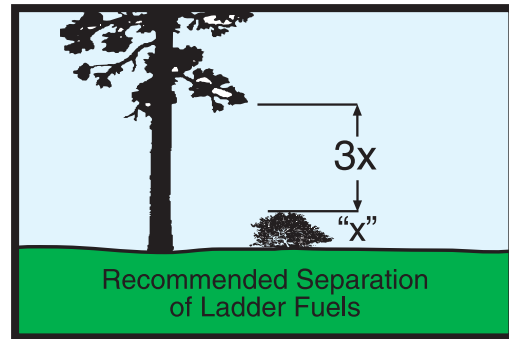
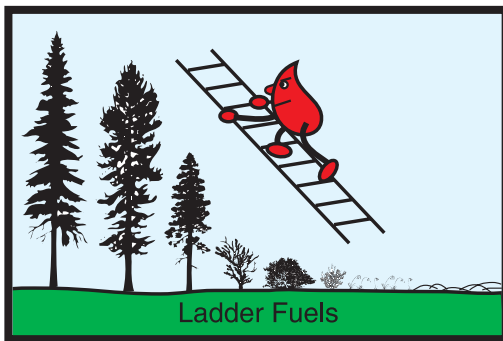


## STEP FOUR: ARE THERE LADDER FUELS PRESENT WITHIN THE RECOMMENDED DEFENSIBLE SPACE AREA?

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.

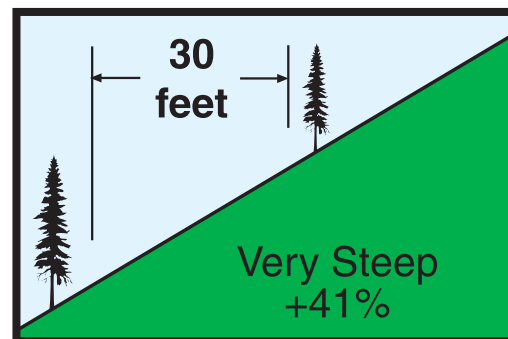
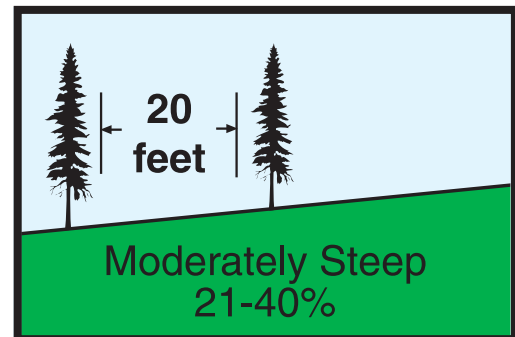
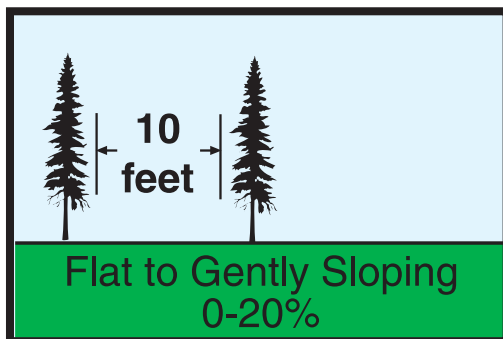
Within the defensible space area, a vertical separation of three times the height of the lower fuel layer is recommended.

For example, if a shrub growing adjacent to a large pine tree is three feet tall, the recommended separation distance would be nine feet. This could be accomplished by removing the lower tree branches, reducing the height of the shrub, or both. The shrub could also be removed.



### 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 presented here. Separation distances are measured between canopies (outer most branches) and not between trunks.



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



## **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 your 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 the house, the vegetation should be kept....

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

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

No. Unfortunately, many people have this misconception. While bare ground is certainly effective in reducing the wildfire threat, it is unnecessary and unacceptable due to appearance, soil erosion, and other reasons. Many homes have attractive, well vegetated landscapes that also serve as effective defensible space.

## **STEP SIX: IS THE 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.

### **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 are cutting down a dead tree or cutting out 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 substituting less flammable plants for more hazardous vegetation. Removal of a dense stand of flammable shrubs and planting an irrigated, well maintained flower bed is an example of replacement.

## **FIRE BRANDS AND THE WOOD SHAKE ROOF HAZARD**

Firebrands are burning embers produced by wildfire that 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 one-half 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.

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 roof of the house is the most vulnerable to firebrands.

Because of its angle, the roof can catch and trap firebrands. If the 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 the structure on which they are installed, but they also pose a threat to other houses in the vicinity. Burning wood shakes can become firebrands, be lifted from the burning roof, and 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.



# OTHER CONSIDERATIONS IN MAKING YOUR HOME DEFENSIBLE

How a house is designed, where it is built, materials used in its construction and landscape, and access to the home all influence survivability during wildfire. Presented below are recommendations from **California Department of Forestry and Fire Protection's** publication "**How to Make Your Home Fire Safe.**" These recommendations will make a home much easier to defend and will improve its chances of surviving a wildfire.

## 1. ROOF

- Remove dead branches hanging over your roof.
- Remove any branches within 15 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 C" or better. Local jurisdictions may require a higher fire resistance rating. Check with the building dept. or your local volunteer fire dept.
- Cover your chimney outlet and stovepipe with a nonflammable screen of one-half 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"

## 4. YARD

- Stack woodpiles at least 30 feet from all structures and clear away flammable vegetation within 10 feet of woodpiles.
- Locate propane tanks 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.
- Contact your local fire department to see if open burning is allowed in your area; if so, obtain a permit before burning debris.
- Where burn barrels are allowed, clear flammable materials at least 10 feet around the barrel; cover the open top with a non-flammable screen with mesh no larger than one-quarter inch.

## 5. EMERGENCY WATER SUPPLY

- Maintain an emergency water supply that meets fire department standards through one of the following:
  - a community water/hydrant system
  - a cooperative emergency storage tank with neighbors
  - a minimum storage supply of 2,500 gallons on your property
- Clearly mark all emergency water sources 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. 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.

## 7. 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.



# FOR MORE INFORMATION-

Or to schedule your **Fire Safe Home Visit** call the volunteer fire department nearest to you. To find out which is your fire department call CDF at:

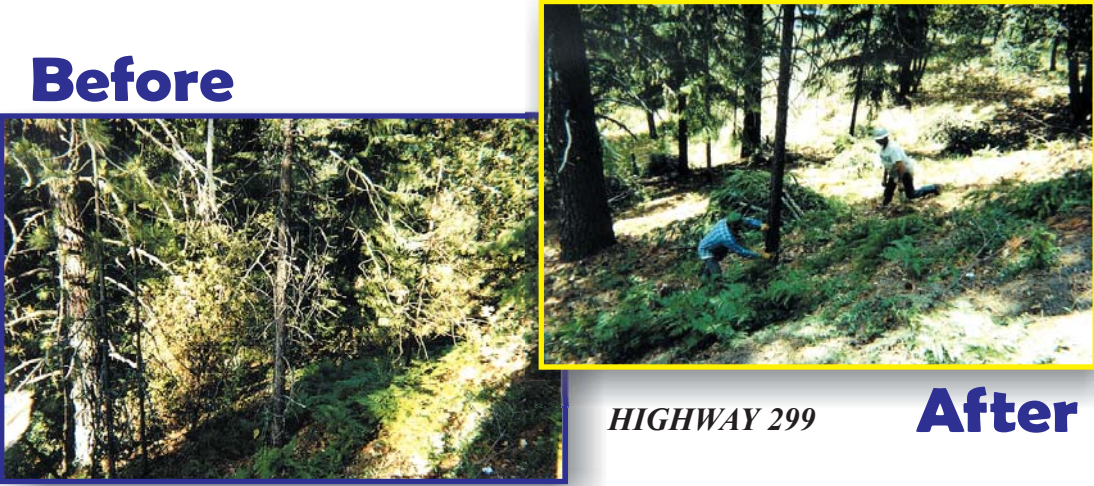
HAYFORK 628-4755  
WEAVERVILLE 623-4201

<p><b>Barker Valley</b></p>  <p><b>FIRE COMPANY</b> 628-4296</p>	<p>COFFEE CREEK VOLUNTEER FIRE COMPANY</p>  <p>266-3601</p>	<p><b>DOWNRIVER</b></p>  <p><b>FIRE COMPANY</b> 623-5231</p>	<p><b>DOUGLAS CITY</b></p>  <p><b>623-1985</b></p>
<p><i>Hawkins Bar</i></p>  <p><i>Volunteer Fire Dept. Inc.</i> 629-3920</p>	<p>HAYFORK VOLUNTEER FIRE DEPT.</p>  <p><b>628-5126</b></p>	<p>VOLUNTEER HYAMPOM FIRE DEPT.</p>  <p>628-4451</p>	<p><b>JUNCTION CITY</b></p>  <p><b>Fire Dept.</b> <b>623-5044</b></p>
<p>KETTENPOM ZENIA VOLUNTEERS</p>  <p>FIRE AND RESCUE (707) 923-7287</p>	<p>Lewiston</p>  <p>Volunteer Fire Department <b>778-3711</b></p>	<p>Platina - Wildwood</p>  <p>Volunteer Fire Department <b>628-4214</b></p>	<p>Post Mountain</p>  <p><b>FIRE DEPT.</b> <b>628-4213</b></p>
<p>SALYER V.F.D.</p>  <p><b>629-2073</b></p>	<p>Southern Trinity Volunteer</p>  <p>Fire Department (707) 574-6090</p>	<p><b>TRINITY CENTER</b></p>  <p><b>Vol. Fire Dept.</b> 266-3379</p>	<p><b>WEAVERVILLE</b></p>  <p>Volunteer Fire Dept. <b>623-6156</b></p>

For more information check out the following websites: <http://www.unce.unr.edu/Fire/default.html>  
<http://www.firesafecouncil.org/>  
<http://www.tcred.net>



# Some Examples of Local Fuels Reduction



# Trinity County RESOURCE CONSERVATION DISTRICT

In cooperation with the Trinity County Fire Safe Council



**TCRCD Office**  
Number One  
Horseshoe Lane  
PO Box 1450  
Weaverville, CA 96093

**Telephone**  
(530) 623-6004  
FAX 623-6006  
E-mail: [tcrcd@snowcrest.net](mailto:tcrcd@snowcrest.net)  
Internet: [www.tcrcd.net](http://www.tcrcd.net)



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Trinity County Resource Conservation District  
P.O. Box 1450  
Weaverville, CA 96093

Tips For

# LIVING WITH WILDFIRE IN TRINITY COUNTY

