

# Fire-Adapted Communities: The Next Step in Wildfire Preparedness

**KLAMATH COUNTY, OREGON**



# Do You Know What It Takes To Survive Wildfire?

## Fire-Adapted Community:

A community that is located in a fire-prone area and requires little assistance from firefighters during a wildfire. Residents of these communities accept responsibility for living in a high fire-hazard, fire-prone area. They possess the knowledge and skills to:

- Prepare their homes and property to survive wildfire
- Evacuate early, safely, and effectively
- Survive, if trapped by wildfire

## Klamath County at Risk

There is more wildfire in our future. For many areas, it is not a matter of "if" wildfire is going to occur, but "when." Unfortunately, many residents living throughout Klamath County are not prepared to survive wildfire. Neither are their homes. Faced with the growing potential for loss of human life and property due to wildfire, Klamath County's firefighting agencies and Oregon State University's Cooperative Extension have come together to promote the Fire-Adapted Community concept. They believe this is the best opportunity to decrease the wildfire threat.

There are proven steps that homeowners can take to improve personal safety and home survival during wildfire. The purpose of this publication is to promote and teach these steps. Once implemented at the neighborhood level, these recommendations will assist communities in becoming fire adapted.



Photograph from the Keno Community Wildfire Protection Plan, April 2006.

*Fuelbreaks are part of fire-adapted communities. Many fuels reduction projects have been completed in Klamath County. Reducing the surface fuels, eliminating ladder fuels, and thinning forest density significantly reduces the intensity of an approaching wildfire. Homeowners who have participated in projects adjacent to their properties, such as this one near Keno, have significantly increased the probability of their homes surviving a wildfire.*



## Who Wins, Who Loses

Why do some houses survive a wildfire, while others are destroyed? Research findings prove that house survival during wildfire is not random, miraculous, or dumb luck. Rather, it is the features of the house, the characteristics of the adjacent vegetation and other fuels, and routine maintenance that often determine which houses burn and which survive. These types of actions are called "prefire activities." Prefire activities improve the survivability of people and the home. The winners will be the people who implement prefire activities. When everyone in the neighborhood completes their prefire activities, they start becoming a Fire-Adapted Community.

***"In Keno, we have strategically connected individual parcel fuel treatments to create larger areas of reduced fire behavior potential."***

**Chief John Ketchum**

**Keno Fire Protection District**

# The Elements of a Fire-Adapted Community

## Community Protection

Well-designed fuelbreaks and known safe areas protect the community.

## Defensible Space

Proper management of vegetation surrounding the home reduces the wildfire threat.



## Ingress and Egress

Good access and departure helps emergency responders arrive in a timely manner and safely leave when necessary to do so.

## Evacuation

Prepared communities can evacuate safely and effectively.

## Built Environment

Appropriate home construction and maintenance resists ignition.

# Fire is Natural to Klamath County's Environment



Bureau of Land Management

A low-intensity fire

Some Klamath Basin plants, such as Jeffrey pine, ponderosa pine, snowbrush, ceanothus, and greenleaf manzanita require the conditions present after a fire to germinate and grow.



Gene Rogers

Fire has been a natural part of Klamath County's environment for thousands of years. These historic fires were usually frequent, of low intensity, and a major influence on the appearance of Klamath County's historic forests. Beginning in the late 1800s, Klamath County's forests and the occurrence of fire started to change.

Much of Klamath County is considered a "fire-adapted, fire-prone environment." It contains the vegetation, climate, and a summer-time lightning occurrence to support wildfire. Fire is a natural process in Klamath County (especially on the east side), and many of the plants growing here have adaptations to survive and thrive in the presence of frequent fires. In fact, it is unnatural for fire to be absent for very long in many areas of Klamath County.

The map (Figure 1, page 5) shows the Klamath County Mean Fire Return Interval. The historic fire return interval indicates that the majority of forested land area in Klamath County had more frequent and low intensity fires than today.

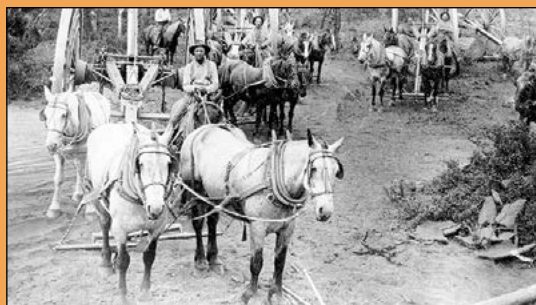
The frequency and intensity of fire influences the type and health of Klamath County's forests. The frequent, low-intensity fires prior to European-American settlement created an open, park-like forest dominated by large ponderosa pine. The low-intensity fires thinned out young trees and shrubs and also reduced the buildup of deep layers of pine needles, leaves, and twigs. The older, thick-barked ponderosa pine and Douglas-fir trees survived this type of fire. As a result, the forest consisted of a variety of age classes of ponderosa pine and some Douglas-fir trees, including large, mature, orange-bark ponderosa pine trees with a sparse understory.

**This is no longer the case for Klamath Basin's forests.**



## Original Forest

Prior to the early 1900s, low-intensity wildfires burned routinely throughout Klamath County and beyond. These fires created an open, patchy forest dominated by large, fire-resistant trees. This image depicts a mature, open eastern Oregon ponderosa pine forest. Experts feel this is a good example of what Klamath Basin's original (prior to European-American settlement) forest looked like.



## Logging Era

The first documented logging occurred when the U.S. Army built a mill at Fort Klamath in 1863. Throughout the 1800s and early 1900s, private mills processed tens of thousands of board feet daily. Logging increased with the first railroad into Klamath Falls in 1909. The photo above shows slip-tongue big wheels of the Modoc Lumber Company hauling logs on the Spring Creek logging unit in 1919 or 1920. Weyerhaeuser Timber built a mill in 1929. By 1941, Weyerhaeuser employed 1,200 and produced 200 million board feet of wood products each year.



## The New Forest

A new forest established in the aftermath of the logging era. But now, fire has been effectively eliminated as a natural influence. Without frequent, low-intensity fires to thin dense stands of trees, the forest becomes overcrowded and stressed, susceptible to insect and disease damage.

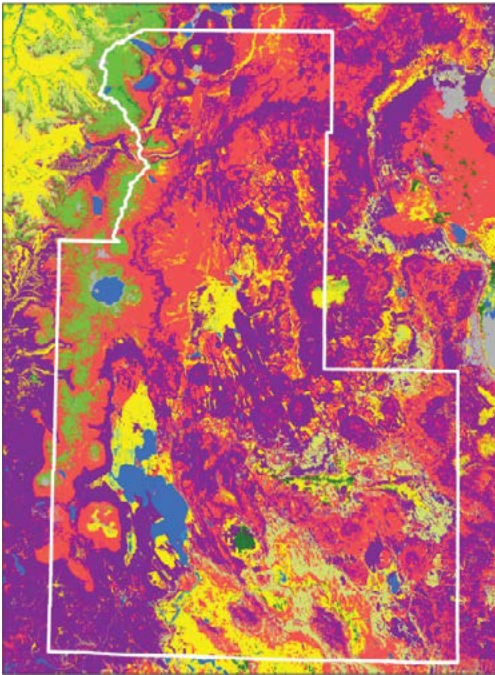
1870

1900

2000

**Klamath's Forest Timeline**

# Klamath's Current Forest and Fire Threat...



- Mean Fire Return Intervals**
- 6-20 Years
  - 21-50 Years
  - 51-100 Years
  - 101-300 Years
  - 301-500 Years
  - 501-1000 Years
  - >1000 Years
  - Other
  - Water

Figure 1. The map shows the Klamath County Mean Fire Return Interval. The historic fire-return interval indicates that the majority of forested land area in Klamath County had more frequent and low-intensity fires than today.

Landfire 2012

Today's forest is much different than the forest that existed prior to 1870. The low-elevation, mixed-conifer forests of Crescent and Chiloquin, where most homes are located, has many times more understory trees today than they did prior to 1870. In addition, there has been a substantial increase in the amount of shrubs present.

The photographs of Keno—Figure 2 (historic) and Figure 3 (current)—are of the same location, but taken 50-plus years apart. Notice that large trees in the 1890s photograph are still present in the more recent photograph. However, there has been a considerable increase in the density of trees and shrubs in the understory. A major cause of the increase in woody plants has been the lack of frequent, low-intensity fires. With European-American settlement, these fires were suppressed.

Under these unnatural conditions, uncontrollable, high-intensity fires are much more likely. The Lone Pine Fire of 1992 and the Old Fort Road Fire of 2006-2007 are recent examples of these types of fires in the Klamath Basin. Furthermore, the forest is less healthy and more susceptible to disease and insects, particularly during drought.



High-intensity fire



Figure 2. A Klamath forest more than 50 years ago



Figure 3. The same forest today, with considerably more understory

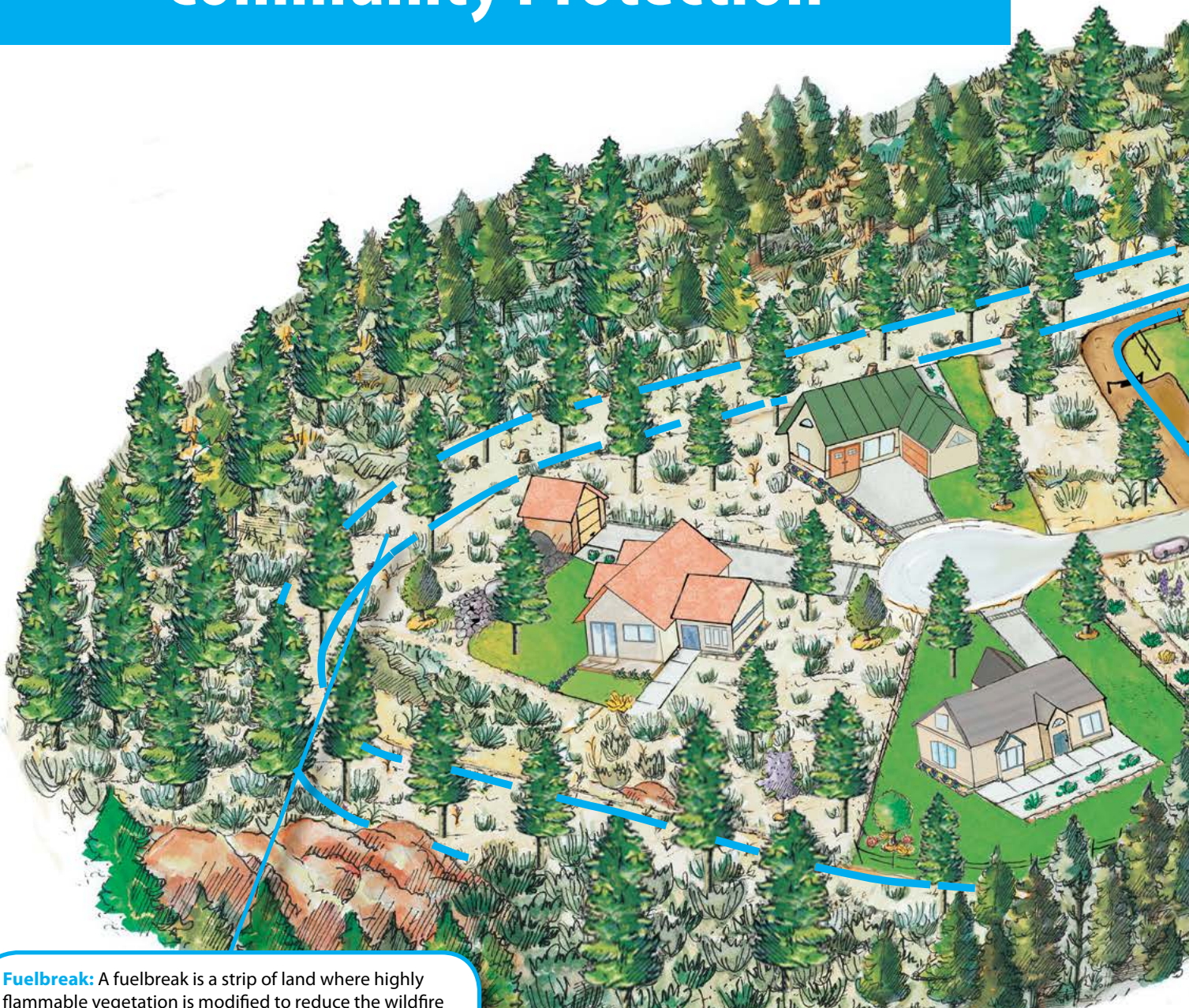
**Unfortunately, given Klamath County's current conditions, homes and lives are at risk.**

## Klamath County Now ...

Dense stands of trees and clumps of shrubs are more likely to be stressed during drought and are often more vulnerable to diseases and insects. Klamath County's current forest is typically thick with trees, brush, and dead vegetation. In many areas, fire has been absent for over a hundred years. As a result, there has been a great buildup of wildfire fuel. Homes have now been added to Klamath County's wildfire fuel mix. The likelihood for uncontrollable, high-intensity wildfire that impacts watersheds, destroys neighborhoods, and takes human life is high in many areas of Klamath County.

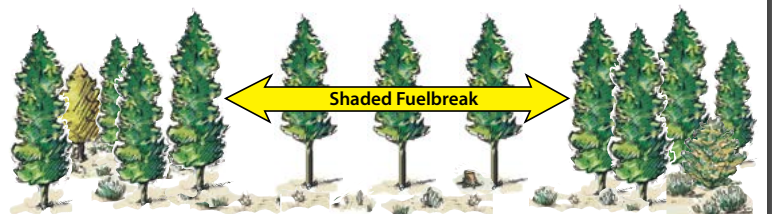


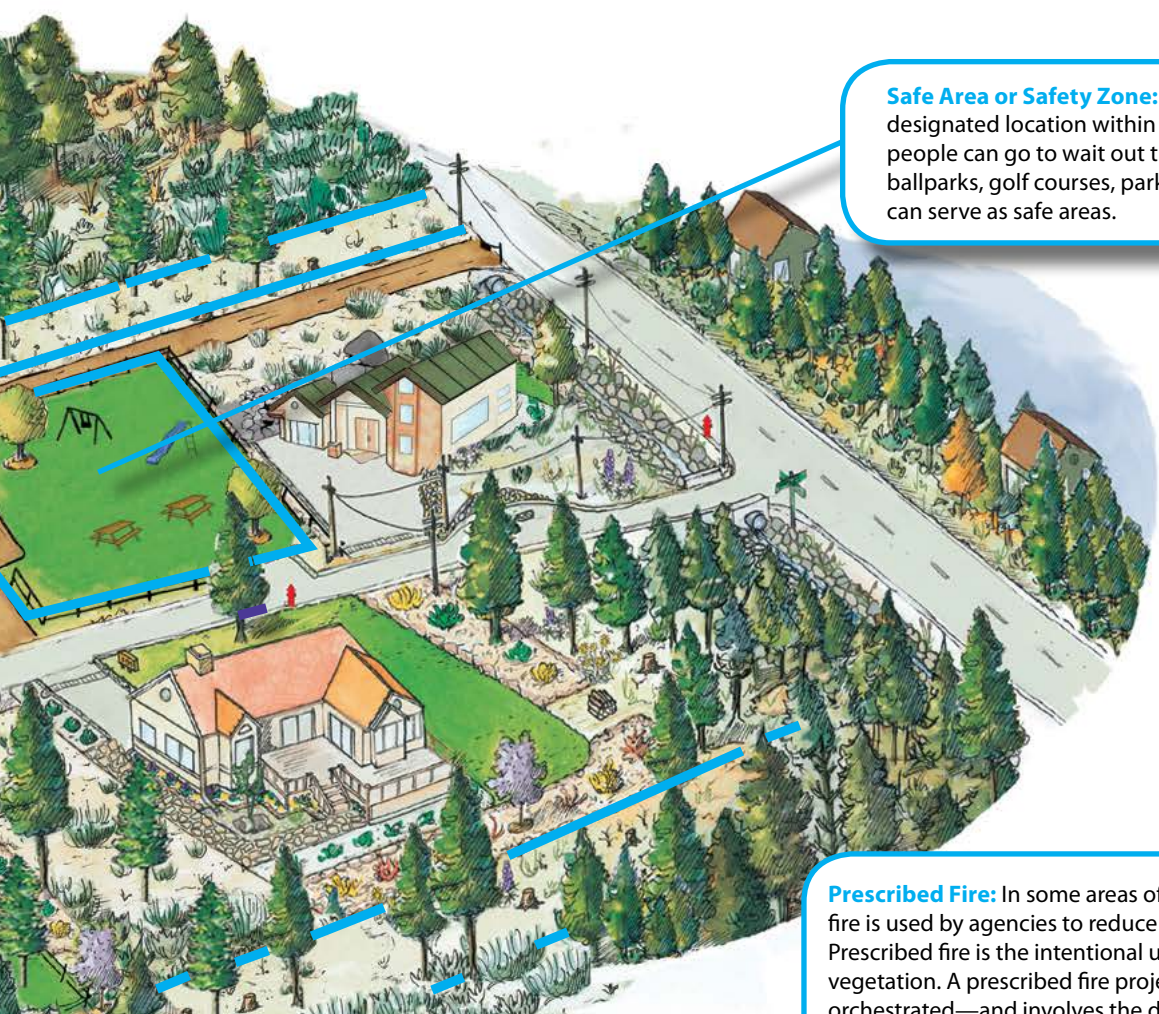
# Community Protection



**Fuelbreak:** A fuelbreak is a strip of land where highly flammable vegetation is modified to reduce the wildfire threat. Fuelbreaks change fire behavior by slowing it down, reducing the length of flames, and preventing the fire from reaching tree canopies. Fuelbreaks can improve the success of fire retardant dropped from the air, provide a safer area for firefighters to operate, and allow for easier creation of firelines (a strip of bare ground established during a wildfire). A **shaded fuelbreak** is created on forested lands when trees are thinned, tree canopies are raised by removing lower branches, and the understory vegetation is managed to reduce the fire threat. Community fuelbreaks are particularly effective when integrated with the defensible space of adjacent homes. They can be manmade or naturally occurring (rock outcrops, rivers, and meadows).

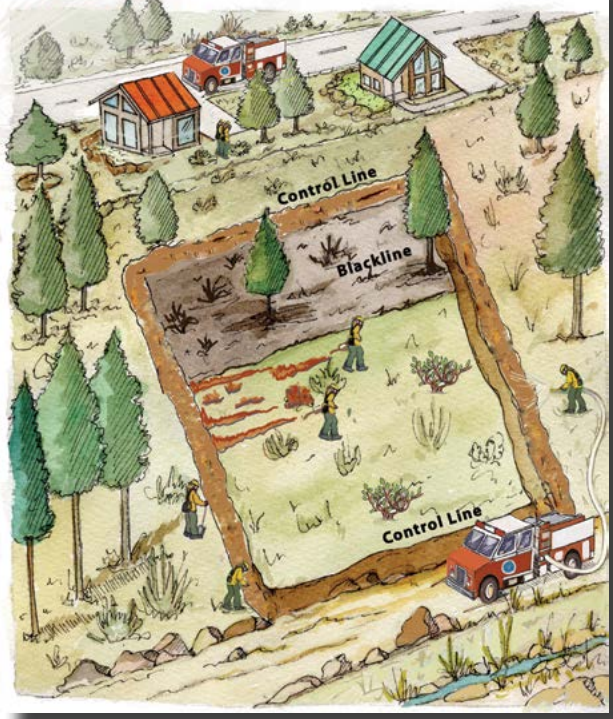
**Shaded Fuelbreak**





**Safe Area or Safety Zone:** A safe area is a designated location within a community where people can go to wait out the wildfire. Often, ballparks, golf courses, parks, and parking lots can serve as safe areas.

**Prescribed Fire**



**Prescribed Fire:** In some areas of Klamath County, prescribed fire is used by agencies to reduce wildfire fuels near homes. Prescribed fire is the intentional use of fire to manage vegetation. A prescribed fire project is well-planned and carefully orchestrated—and involves the disciplines of fire ecology, fire suppression, forestry, and public safety. The important parts of a prescribed fire project are:

- **Training**—Personnel have received extensive training and have been certified in prescribed fire management and implementation.
- **Preburn Activities**—Each winter a multidisciplinary team develops the “Burn Plan” for the upcoming fall burn season. During the summer months, work crews start preparing the burn sites by creating firebreaks, clearing around high-value trees, and thinning dense pockets of brush.
- **Burn Day**—The specific date of a proposed fire cannot be determined very far in advance. A “Go/No-go Checklist” is used to decide if a prescribed fire can be safely and effectively conducted. If the necessary conditions are not optimal, the fire will be postponed until conditions “come into prescription.” The illustration presented at left portrays a typical prescribed fire.
- **Tending the Burn**—Prescribed fires are managed to minimize smoke production and maximize fuel consumption. Personnel closely monitor the site until the project is completed.

# Access

**Address:** The home address should be readily visible from the street. The address sign should be made of reflective, noncombustible material with characters at least 4 inches high.

**Gated Driveways:** Electronically operated driveway gates require key access for local fire departments and districts. They may require a permit and have additional requirements. Contact your local fire agency prior to installing a gated driveway. Rural, wire gates should have multiple locks for access by fire and medical responders and landowners.

**Turnarounds:** Homes located at the end of long driveways or dead-end roads should have turnaround areas suitable for large fire equipment. Turnarounds can be a cul-de-sac with at least a 45-foot radius or a location suitable for a 3-point turn. Contact your local fire agency for specific turnaround requirements.



**Driveway Clearance:** Remove flammable vegetation extending at least 10 feet from both sides of the driveway. Overhead obstructions (overhanging branches and power lines) should be removed or raised to provide at least a 13½-foot vertical clearance.

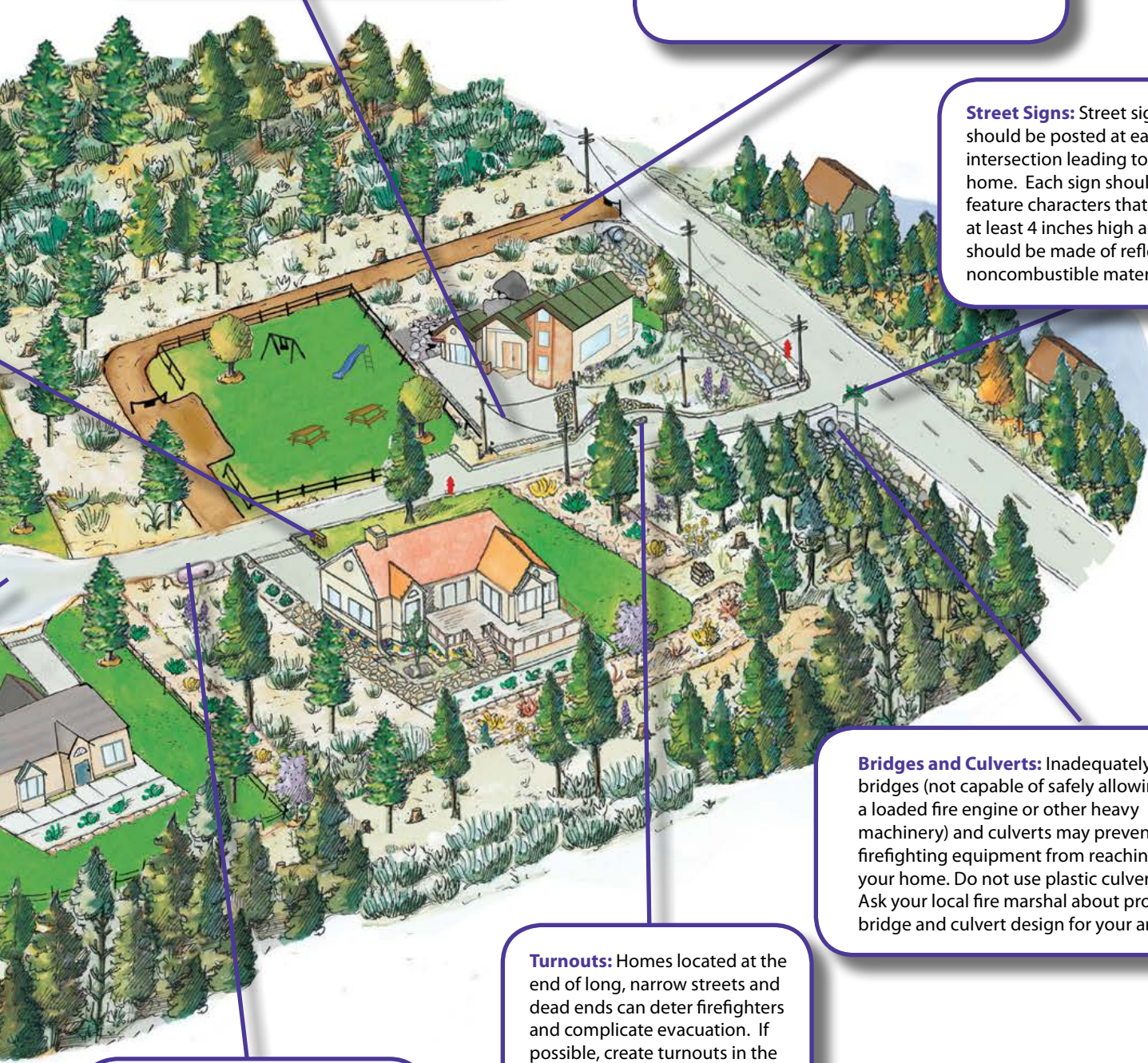
**Secondary Road:** When communities only have one way in and out, evacuation of residents while emergency responders are arriving can result in traffic congestion and potentially dangerous driving conditions. A second access road, even one only used for emergency purposes, can improve traffic flow during a wildfire and provide an alternate escape route.

**Street Signs:** Street signs should be posted at each intersection leading to your home. Each sign should feature characters that are at least 4 inches high and should be made of reflective, noncombustible material.

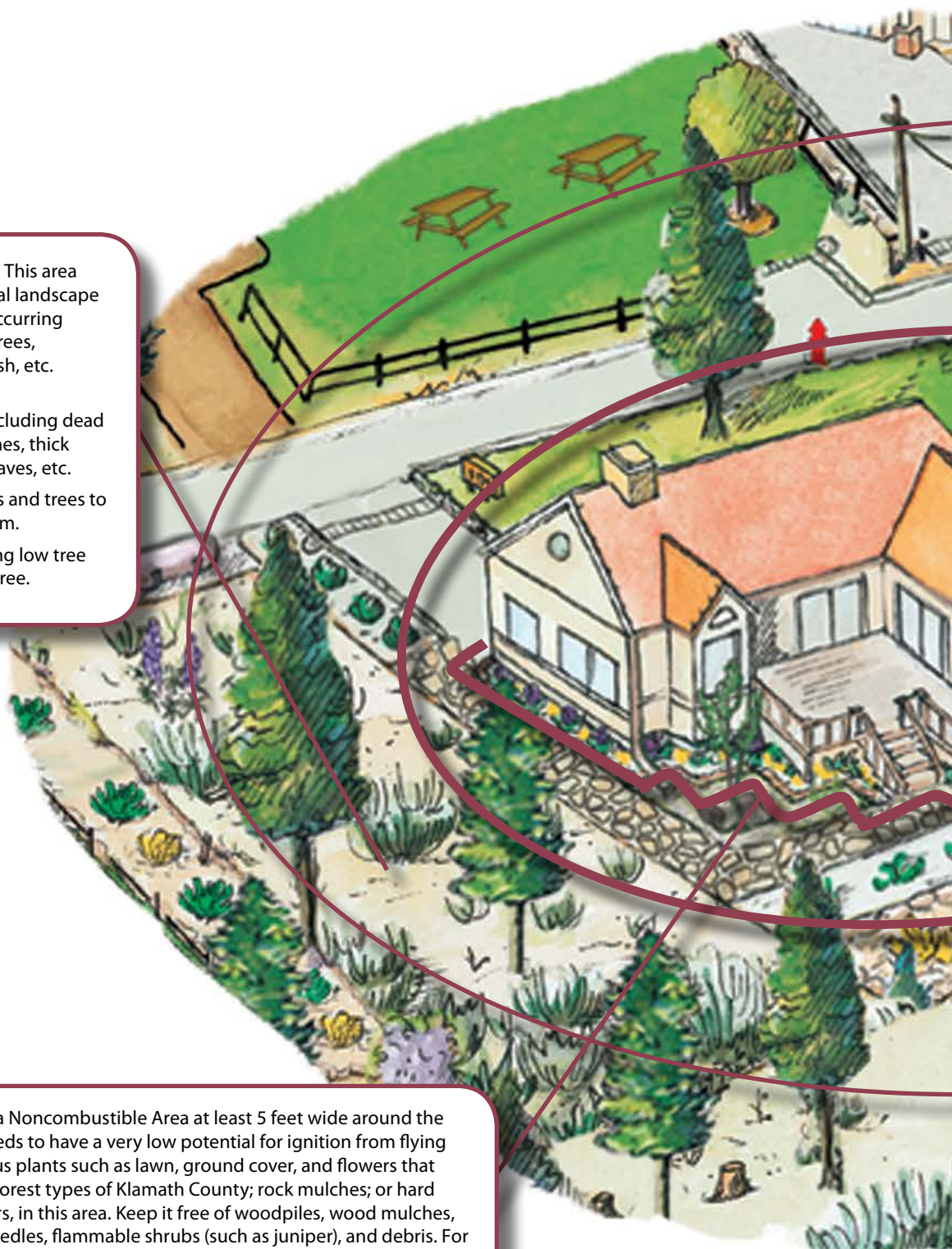
**Bridges and Culverts:** Inadequately built bridges (not capable of safely allowing a loaded fire engine or other heavy machinery) and culverts may prevent firefighting equipment from reaching your home. Do not use plastic culverts. Ask your local fire marshal about proper bridge and culvert design for your area.

**Turnouts:** Homes located at the end of long, narrow streets and dead ends can deter firefighters and complicate evacuation. If possible, create turnouts in the driveway and access roads that will allow two-way traffic.

**Road Width and Grade:** Roads should be at least 20 feet wide and long driveways should be at least 12 feet wide with a steepness grade of less than 12 percent.



# Defensible Space

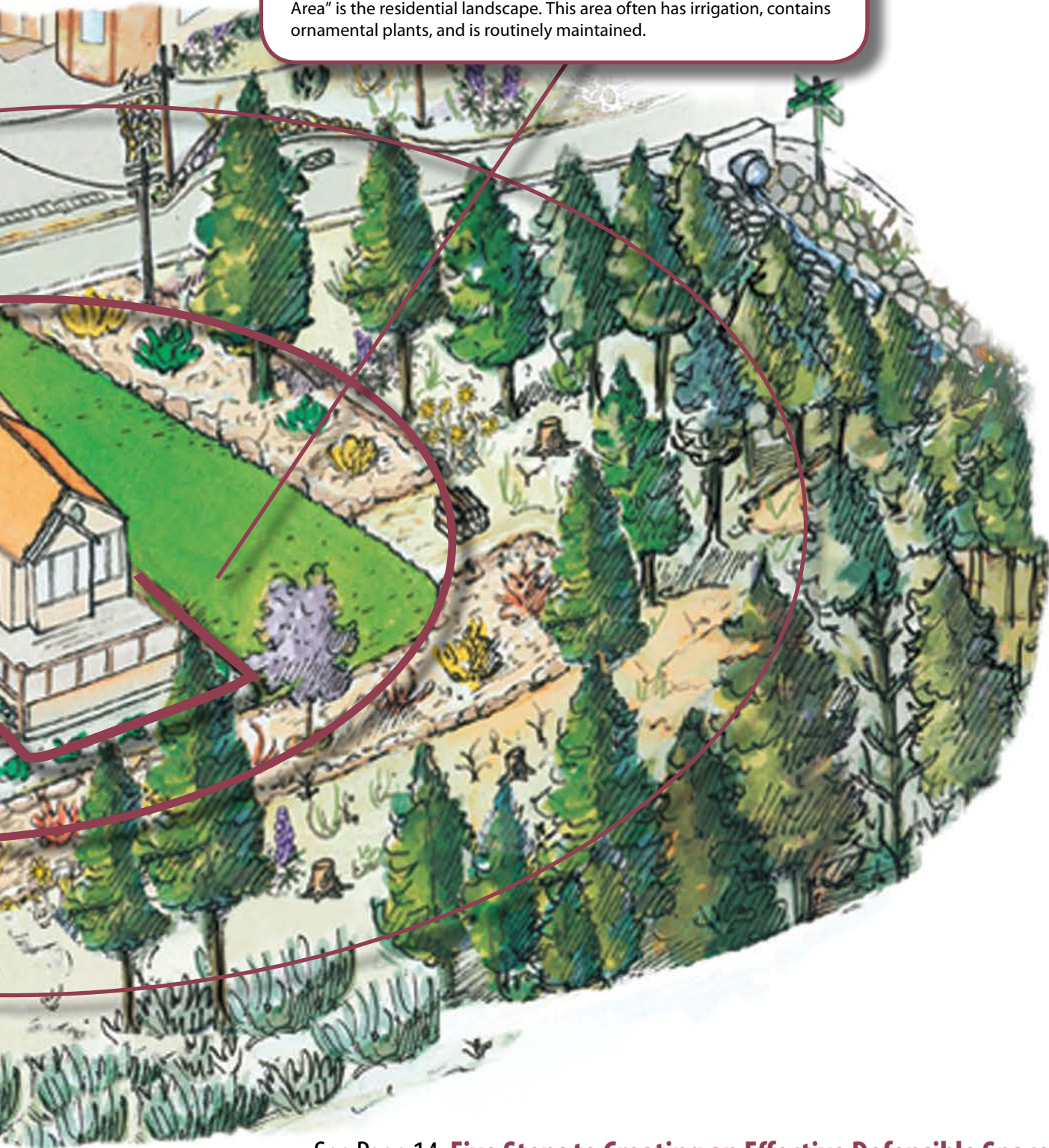


**Wildland Fuel Reduction Area:** This area usually lies beyond the residential landscape and often consists of naturally occurring plants, such as ponderosa pine trees, manzanita, sagebrush, bitterbrush, etc. Within this area:

- Remove all dead vegetation, including dead shrubs, dried grass, fallen branches, thick accumulations of needles and leaves, etc.
- Thin out and prune thick shrubs and trees to create a separation between them.
- Prevent ladder fuels by removing low tree branches and shrubs under the tree.

**Noncombustible Area:** Create a Noncombustible Area at least 5 feet wide around the base of your home. This area needs to have a very low potential for ignition from flying embers. Use irrigated herbaceous plants such as lawn, ground cover, and flowers that are recommended for the drier forest types of Klamath County; rock mulches; or hard surfaces, such as brick and pavers, in this area. Keep it free of woodpiles, wood mulches, dead plants, dried leaves and needles, flammable shrubs (such as juniper), and debris. For more ideas of what to plant, consult PNW 590, *Fire-Resistant Plants for Home Landscapes*, at <https://catalog.extension.oregonstate.edu/pnw590>

**Lean, Clean, and Green Area:** For a distance of at least 30 feet from the home, there should be a Lean, Clean, and Green Area. Lean indicates that only a small amount of flammable vegetation, if any, is present within 30 feet of the house. Clean means there is no accumulation of dead vegetation or flammable debris within the area. Green denotes that plants located within this area are kept healthy, green, and irrigated during fire season. For most homeowners, the "Lean, Clean, and Green Area" is the residential landscape. This area often has irrigation, contains ornamental plants, and is routinely maintained.



See Page 14, **Five Steps to Creating an Effective Defensible Space**

# Built Environment

**Eaves:** Embers can accumulate under open eaves and enter the attic through gaps in construction materials. Covering the underside of the eaves with a soffit, or boxing in the eaves, reduces the ember threat. Enclose eaves with fiber cement board or 5/8-inch-thick, high-grade plywood. If enclosing eaves is not possible, fill gaps under open eaves with caulk.

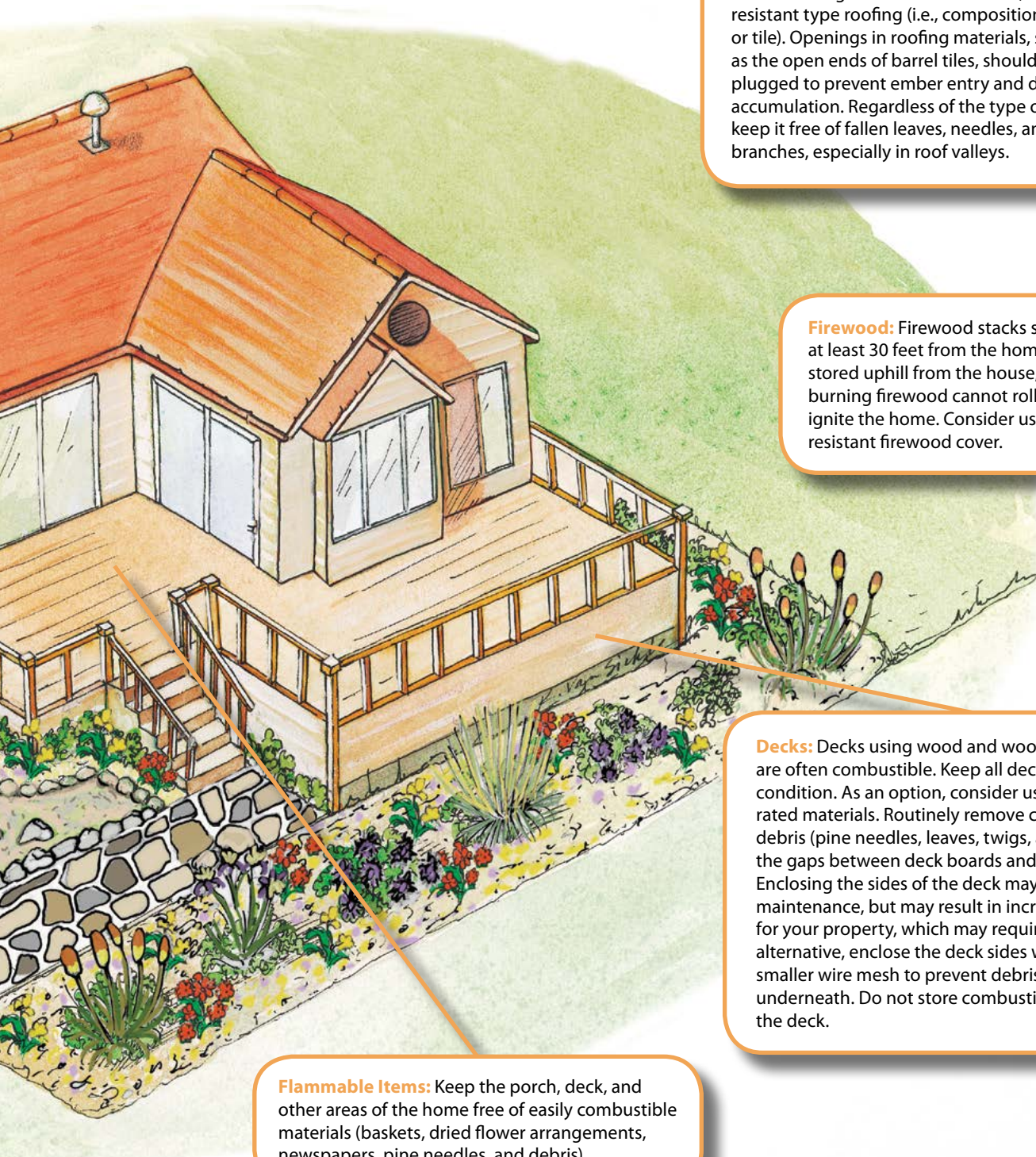
**Chimneys:** Chimney and stovepipe openings should be screened with an approved spark arrestor cap and cleaned out annually.

**Exterior Siding:** Wood products (boards, panels, and shingles) are common siding materials. However, they are combustible and not good choices for fire-prone areas. Noncombustible siding materials (stucco, brick, cement board, and steel) are better choices. Log homes that utilize fire-rated chinking or notched logs are also good choices. If using noncombustible siding materials is not feasible, keep siding in good condition and replace materials in poor condition.

**Windows and Skylights:** Windows are one of the weakest parts of a home and usually break before the structure ignites. This allows burning embers and heat to enter the home, which may lead to internal ignition. Single-pane windows and large windows are particularly vulnerable. In high fire-hazard areas, install windows that are at least double-glazed and that utilize tempered glass for the exterior pane. The type of window frame (wood, aluminum, or vinyl) is not as critical. However, vinyl frames should have metal reinforcements. Closable, solid exterior shutters can provide additional window protection. Keep skylights free of pine needles, leaves, and other debris, and remove overhanging branches. When skylights are placed on steep-pitched roofs facing large amounts of nearby fuels (i.e., a mature pine tree or another house), consider using flat ones constructed of double-pane glass, instead of domed.

**Vents:** Attic, eave, and foundation vents are potential entry points for embers driven by wind. All vent openings should be covered with 1/8-inch or smaller wire mesh. Consult a design professional to ensure that adequate ventilation is maintained while ensuring protection from embers. Another option is to install ember-resistant vents. Do not permanently cover vents, as they play a critical role in preventing wood rot.

**Rain Gutters:** Rain gutters trap flying embers. Always keep rain gutters free of leaves, needles, and debris. Check and clean them several times during fire season. In some instances, rain gutters can be removed as long as roof runoff water can be carried away without damaging the house exterior or foundation, or without causing erosion. Gutter removal may also affect erosion control.



**Roof:** Homes with wood-shake or shingle roofs are much more likely to be destroyed during a wildfire than are homes with fire-resistant roofs. Consider replacing wood-shake or shingle roofs with a Class-A, fire-resistant type roofing (i.e., composition, metal, or tile). Openings in roofing materials, such as the open ends of barrel tiles, should be plugged to prevent ember entry and debris accumulation. Regardless of the type of roof, keep it free of fallen leaves, needles, and branches, especially in roof valleys.

**Firewood:** Firewood stacks should be located at least 30 feet from the home. If the stacks are stored uphill from the house, make sure that burning firewood cannot roll downhill and ignite the home. Consider using an ember-resistant firewood cover.

**Decks:** Decks using wood and wood-plastic materials are often combustible. Keep all deck materials in good condition. As an option, consider using fire-resistant materials. Routinely remove combustible debris (pine needles, leaves, twigs, and weeds) from the gaps between deck boards and under the deck. Enclosing the sides of the deck may reduce this type of maintenance, but may result in increased land coverage for your property, which may require a permit. As an alternative, enclose the deck sides with 1/4-inch or smaller wire mesh to prevent debris from accumulating underneath. Do not store combustible materials under the deck.

**Flammable Items:** Keep the porch, deck, and other areas of the home free of easily combustible materials (baskets, dried flower arrangements, newspapers, pine needles, and debris).

Property owners...**new construction must use approved, fire-resistant materials. For more information, contact your local fire agency.**

# Five Steps to Creating an Effective Defensible Space

The term defensible space refers to the area between a house and an oncoming wildfire where the vegetation has been managed to reduce the wildfire threat and allow firefighters to safely defend the house. In the event that firefighters are not available, defensible space also improves the likelihood of a home surviving without assistance. Fortunately for Klamath County homeowners, there are a variety of resources available to assist you in creating defensible space. Local fire districts and departments will conduct free defensible-space inspections. Advice on integrating defensible space practices with Oregon State Best Management Practices (BMPs) and other landscape management topics can be provided by the Oregon Department of Forestry conservation districts and the Oregon State University Klamath Basin Research & Extension Center (KBREC) in conjunction with fire professionals. See pages 17 and 23 for contact information.



John Coburn

Through proper planning, an effective defensible space can be attractive and control soil erosion.



## Step One

The size of the defensible space is usually expressed as a distance extending outward from the house in all directions. The recommended distance is not the same for every home. It varies depending on the dominant vegetation surrounding the home and the steepness of slope. Use the Recommended Defensible Space Distance table to determine the right space for your home.

Once the recommended distance for defensible space is known, mark it by tying strips of cloth or flagging to shrubs. This becomes the Defensible Space Zone.

If the Defensible Space Zone exceeds your property boundaries, seek permission from adjacent landowners before doing work on their property. It is important to note that the effectiveness of the Defensible Space Zone improves when entire neighborhoods implement defensible space practices.

RECOMMENDED DEFENSIBLE SPACE DISTANCE			
	<i>Flat To Gently Sloping</i> 0-20%	<i>Moderately Steep</i> 21-40%	<i>Very Steep</i> +40%
<i>Grass</i> Dry grass and weeds	100 feet	100 feet	100 feet
<i>Shrubs and Woodland</i> Sagebrush, manzanita and mountain mahogany	100 feet	200 feet	200 feet
<i>Forest Trees</i> Fir and pine. If there's a substantial shrub understory, use the values stated above.	100 feet	100 feet	200 feet



## Step Two

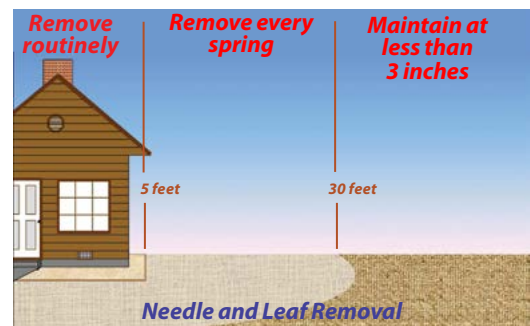
Within the recommended Defensible Space Zone, remove:

- Dead and dying trees
- Dead native and ornamental shrubs
- Dead branches
- Dried grass, weeds and flower.
- Exposed branches from fallen trees that are embedded in the ground and located

more than 30 feet from the house. The embedded tree can be left in place.

Regarding fallen needles and leaves:

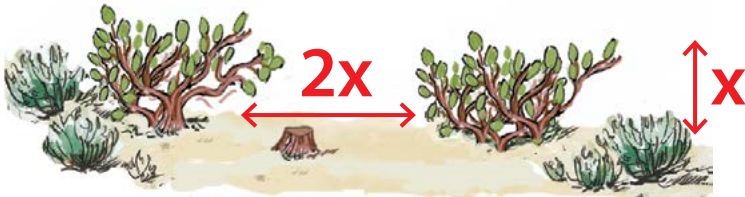
- Within 5 feet of the house, remove all routinely throughout fire season
- From 5 feet to 30 feet of the house, remove every spring. Needles and leaves that fall after the spring season removal period can accumulate on the ground as long as they do not create a fire hazard.
- More than 30 feet from the house—do not allow fallen needles and leaves to exceed a depth of 3 inches.





## Step Three

Within the Defensible Space Zone, native trees and shrubs (lodgepole pine, white fir, snowbrush ceanothus, manzanita, bitterbrush, sagebrush, rabbitbrush) should not occur in dense stands. Dense stands of trees and shrubs pose a significant wildfire threat. Thin dense tree and shrub stands and clumps to create more space between them.

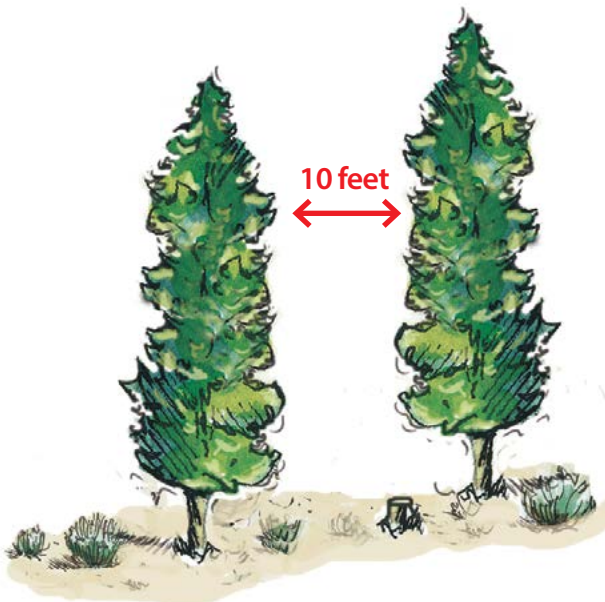


### *Sagebrush, Rabbitbrush, Bitterbrush, and Other Shrubs*

On flat to gently sloping terrain more than 30 feet from the house, individual shrubs or small clumps of shrubs within the Defensible Space Zone should be separated from one another by at least twice the height of the average shrub. For homes located on steeper slopes, the separation distance should be greater. For example, if the typical shrub height is 2 feet, then there should be a separation between shrub branches of at least 4 feet. For homes located on steeper slopes, the separation distance should be greater. Remove shrubs or prune to reduce their height or diameter or both. See Step Five for shrub management recommendations within 30 feet of the house.

### *Forest Trees*

On flat to gently sloping terrain more than 30 feet from the house, individual trees or small groups of several trees should be thinned to provide an average separation between canopies of at least 10 feet. For homes located on steeper slopes, the separation distance should be greater.



**Within 30 feet of the house**, the canopies of individual or small groups of several trees should be separated by 10 feet to 30 feet. A continuous tree canopy maintained as previously described is also an option for this area. Contact your local fire professionals (see Page 23) to have your trees evaluated and marked for removal.

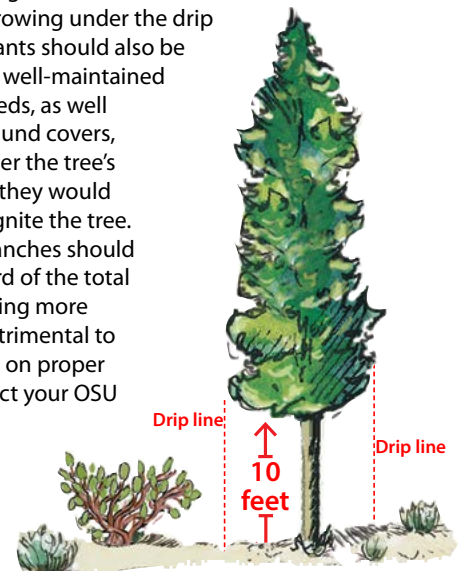


## Step Four



Vegetation that can carry a fire from low-growing plants to taller plants is called ladder fuel. In areas where trees have been thinned as per Step Three, lower tree branches should be removed to a height of at least 10 feet.

Shrubs and trees growing under the drip line of overstory plants should also be removed. Irrigated, well-maintained lawns and flower beds, as well as low-growing ground covers, can be present under the tree's drip line as long as they would not allow a fire to ignite the tree. Removal of tree branches should not exceed one third of the total tree height. Removing more than this can be detrimental to tree health. For tips on proper tree pruning, contact your OSU KBREC Extension office.



Lower tree branches should be removed to a height of at least 10 feet, but leave at least a 60 percent canopy crown.



## Step Five

There are two goals for the Lean, Clean, and Green Area. The first goal is to eliminate easily ignitable fuels, or kindling, near the house. This will help prevent embers from starting a fire in your yard. The second goal is to keep fire intensity low if it does ignite near the house. By proper management of the fuels near the house, a fire would not be able to generate enough heat to ignite the home.

For most homeowners, the Lean, Clean and Green Area is also the residential landscape. This area often has irrigation, is planted with ornamental vegetation, and is regularly maintained. The landscape should be arranged so that vegetation would not allow a fire to travel and spread rapidly across the area.

## Lean, Clean and Green Tips

Within the Lean, Clean, and Green Area:

- Remove dead shrubs and trees; dried grass, flowers, and weeds; dead branches; and firewood.
- Remove fallen needles and leaves every spring.
- Wood and bark mulches can be used, but not in a widespread manner. If used, these areas should be separated by ignition-resistant materials, such as irrigated lawn, clover, flowers, or noncombustible materials such as gravel and rock.
- Native shrubs should be substantially reduced. Individual specimens or small groups can be retained as long as they are kept healthy and vigorous, and pruned to reduce height and amount. Leave the root systems in place, when removing shrubs. Low-growing, native shrubs, such as pinemat manzanita and bearberry, can be retained.
- Use low-growing (less than 18 inches tall), irrigated, actively growing herbaceous plants that are recommended for Klamath County, such as ordinary lawn grass, clover, flowers, some ground covers, and succulents. Plant materials that are dried and cured out for the season should be removed.
- Ornamental, deciduous trees and shrubs can be used as landscape specimens or in small groups. They should be irrigated, kept healthy and vigorous, and free of dead leaves and wood. Deciduous trees should be placed so that their mature canopy can be easily maintained at a distance of at least 10 feet from other trees and the house. Shorter deciduous shrubs are preferred.
- Ornamental evergreen shrubs and trees, such as juniper, mugo pine, Austrian pine, and others should not be used in this area. For more information, consult PNW 590, *Fire-Resistant Plants for Home Landscapes* at <https://catalog.extension.oregonstate.edu/pnw590>.
- Clear all flammable vegetation from within 10 feet of any propane tanks.
- Remove tree limbs that are within 10 feet of the chimney, house, deck, or roof. Remove limbs that are encroaching on power lines.
- Create a noncombustible area at least 5 feet wide around the perimeter of the house and around any combustible attachments (decks).

## Noncombustible Area Tips

The area immediately adjacent to a house is of critical importance to house survival during a wildfire. It should consist of noncombustible landscape materials and ignition-resistant, low-volume plants. Within this area:

- Remove dead shrubs and trees; dried grass, flowers and weeds; dead branches; and firewood.
- Remove fallen needles and leaves.
- Do not use wood and bark mulches.
- Do not use wood landscape timbers or boards.
- Remove flammable shrubs and trees. This includes native plants (sagebrush, bitterbrush, manzanita, snowbrush, ceanothus, rabbitbrush and live oak) and ornamental plants (juniper, mugo pine, arborvitae, scotch broom, and large exotic grasses). Leave the root systems in place when removing shrubs.
- Noncombustible landscape materials, such as gravel, rock, and brick are acceptable.
- Use low-growing (less than 18 inches tall), irrigated, herbaceous plants that are recommended for Klamath County, such as lawn, clover, flowers, some ground covers, and succulents.
- Use low-growing (less than 18 inches tall), irrigated, deciduous shrubs as individual specimens or in small groups. Prune these shrubs to remove branches in contact with the ground and sides of the house.
- Do not plant shrubs under first-story windows, under soffit vents, in front of foundation vents, or in corners.
- Trellises used in this area should be made of noncombustible materials.

## Maintenance

Maintaining a defensible space is an ongoing activity. Plants grow back, and flammable vegetation needs to be routinely removed and disposed of properly. Before each fire season, re-evaluate your property using the previous five steps and implement the necessary defensible space recommendations.



Photo courtesy of University of Nevada Cooperative Extension

### Little Green Gas Cans

Firefighters often refer to ornamental junipers as little green gas cans. During a wildfire involving homes, embers can smolder undetected under ornamental junipers. The junipers can then ignite and burn intensely after firefighters have left the area. Planting ornamental junipers next to your house is never a good idea. Keep these little green gas cans at least 30 feet from the house or replace them with low-growing, deciduous shrubs, herbaceous flowers, rock mulches, and hard surfaces.



## Fire Managers Promote Defensible Space

Defensible space is supported by Klamath County's environmental goals and its ordinances. A healthy forest and a fire-resistant forest go hand in hand. A few defensible space recommendations may call for consultation or a permit from local fire-management agencies, Oregon Department of Forestry (ODF) districts, or your local Extension office to reduce other potential impacts to the ecosystem.

**Managing Trees:** Cutting of live trees with trunks greater than 14 inches in diameter requires a permit from your local fire agency.

**Plant Selection:** Plants being used in areas other than borders, entryways, flower beds, and similar locations need to be selected from the OSU Extension Recommended Plant List, which includes information on the fire resistance of different plants. For this plant list, as well as a list of accent plants suitable for Klamath County conditions, consult PNW 590, *Fire-Resistant Plants for Home Landscapes* at <https://catalog.extension.oregonstate.edu/pnw590>

**Noncombustible Area:** In the 5-foot Noncombustible Area around structures: using gravel, rock, pervious concrete, pervious pavers, or appropriate vegetation will be beneficial.

**Enclosing Decks:** Enclosing the underside of a deck may increase the amount of land coverage on a property.

**Sensitive Areas:** If the Defensible Space Zone includes sensitive areas, including lakeshores, a beach, stream environment zones, scenic resource areas, and conservation or recreation areas, additional considerations may apply. Adequate defensible space can still be achieved with professional advice.

**For more information,** contact ODF at: 3200 Delap Road, Klamath Falls, OR 97601 541-883-5681.

*“Klamath County fire districts and agencies need to work with the public to ensure fire defensible space around homes and property. This work will greatly increase the capacity of our limited firefighting resources.”*

*Dennis Lee,*

*ODF Protection Forester and*

*President of Klamath County Fire Defense Board*

## Working With Your Neighbors

When the area needed to create an effective defensible space exceeds your property boundaries, you'll need to contact the adjacent property owner to discuss opportunities to work cooperatively. In Klamath County, your neighbor could be a government agency. An important first step is to check with your local fire department or fire district before proceeding. Contact information for some of the common government landowners in Klamath County neighborhoods is presented below.

Oregon Department of Forestry	541-883-5681
OSU Extension (KBREC)	541-883-7131
U.S. Forest Service (Chemult)	541-365-7001
U.S. Forest Service (Chiloquin)	541-783-4001
U.S. Forest Service (Klamath)	541-883-6714

If you are interested in getting other homeowners in your neighborhood organized to reduce wildfire hazards, contact your local fire district or department.

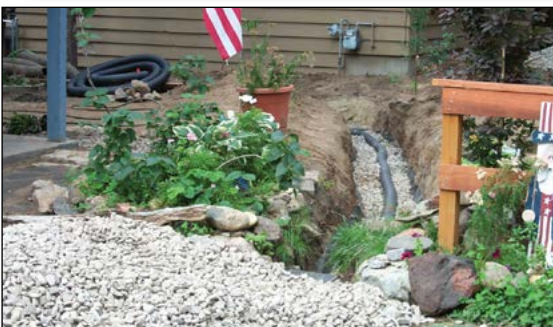


Photo from the NTC Photo Archives  
*The area within 5 feet of your house is important to both water quality and defensible space concerns. When constructing, refer to the Klamath County Roads Department for erosion-control measures (such as the installation of an infiltration trench shown at left) or city planning department where appropriate. Contact your local fire professional, ODF district or OSU Extension office for advice on defensible space.*

## Conservation Landscaping Concepts

When creating defensible space, be aware of Klamath Lake, river, and stream water-quality concerns. If misapplied, defensible space practices could encourage accelerated erosion, a major contributor to the declining clarity of moving water. Consider using the following conservation landscaping concepts when creating defensible space:

- Do not remove all vegetation from the Defensible Space Zone.
- Low-fire-hazard vegetation is the preferred alternative to incorporate the objectives of both Best Management Practices (BMPs) and defensible space.
- Do not dig out plant roots. Leave them in place.
- When breaking up dense brush fields on steep slopes, leave islands of lean and green shrubs staggered horizontally across the slope.
- Implement BMPs on your property. BMPs are measures that help slow water runoff and control soil erosion. For a free BMP inspection of your property, contact the ODF district in Klamath Falls at 541-883-5681.
- For educational materials and programs about defensible space, erosion control, and general landscape management, call KBREC at 541-883-7131.

# Evacuation

## Preparation

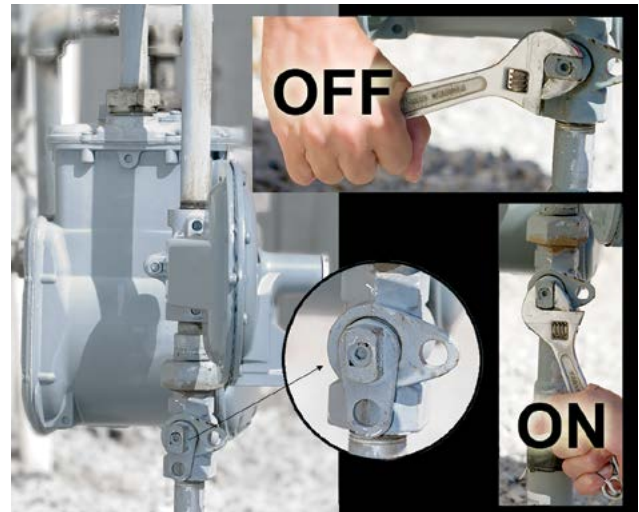
A key component of the Fire-Adapted Communities concept is residents who know how to safely and effectively evacuate. Successful community evacuation requires preparation. The following checklists provide recommendations concerning proper evacuation preparation.

### Elements of Family Emergency Planning and Preparation

- Meet with household members. Explain dangers to children and work as a team to prepare your family for emergencies.
- Discuss what to do about power outages and personal injuries.
- Post emergency phone numbers near phones.
- Learn how to turn off the water, gas (see inset) and electricity at your home.
- Select a safe, agreed-upon meeting point. During an emergency, you may become separated from family members.
- Choose an out-of-town contact because it is often easier to make a long-distance phone call than a local call from a disaster area. Everyone must know the contact's phone number.
- Complete a family communications plan. Your plan should include contact information for family members, work and school.
- Teach children how to make long-distance phone calls.
- Complete an inventory of home contents and photograph/videotape the house and landscape. Place files in your to-go bag (see page 19). A second copy of these files should be stored in a location away from your community.
- Identify escape routes and safe places (safety zones). In a fire or other emergency, you may need to evacuate very quickly. Be sure everyone in your family knows the best escape routes out of your home and where safe places are in your home for each type of disaster. Draw an escape plan with your family, highlighting two routes out of each room.
- Prepare an "EVACUATED" sign and, if you have an emergency water source (pool, pond or hot tub), a "WATER SOURCE HERE" sign. Select sites to post the signs where they will be clearly visible from the street.



*Families should designate a safe meeting place and emergency contact person.*



Washoe County, NV

#### How to Shut Off the Gas Supply

Attach a wrench to the gas meter with a wire so it is readily accessible in the event of an emergency. Use the wrench to turn the valve until it is perpendicular to the pipe. Be aware that once your gas is turned off, all your pilot lights will need to be relit when turning the gas back on. It is advisable to contact your gas provider at that time.

### Contact Information for Your Local Utility Company:

Klamath Water and Power Agency	541-850-2503
North Coast Electric	541-884-4171
Klamath Falls Utilities Department	541-883-5366
Avista	800-227-9187
Pacific Power	888-221-7070
MidState Electric	541-536-2126

## To-go Bag and Disaster Supplies Kit

Prepare for at least three days, but preferably seven days. The best time to assemble a to-go bag and disaster supplies kit is well before you need them. Most of these items are already in your home, and stocking up on emergency supplies right now can add to your family's safety and comfort during and after a disaster.

### Essentials for a Disaster Supplies Kit

If you anticipate an extended evacuation at an emergency shelter or your family is returning to a home without functioning electricity and water, these items will prove to be helpful:

- ❑ 1 gallon of water per person, per day, stored in unbreakable containers and labeled with the storage date. Replace every six months.
- ❑ Supply of nonperishable packaged or canned foods with a hand-operated can opener
- ❑ Antibacterial hand wipes or gel
- ❑ First-aid kit, including a first-aid book
- ❑ At least one blanket or sleeping bag per person
- ❑ ABC-type fire extinguisher
- ❑ Special items for infants, elderly, or disabled family members
- ❑ Large plastic trash bags, tarps, and rain ponchos
- ❑ A large trash can
- ❑ Bar soap, liquid detergent, and household bleach
- ❑ Rubber gloves and duct tape



Prepare a pet to-go bag and place pet carriers in an easily accessible location.

### Preparing Pets and Livestock for Evacuation

Plan to take your animals with you and never turn them loose. Animals may not be allowed inside human emergency shelters. Contact Klamath Falls Pet Emergency Services ( 541-882-9005) for advice on animal evacuation.

- ❑ Make sure dogs and cats wear properly fitted collars with identification, vaccination, microchip, and license tags.
- ❑ Your pet evacuation plan should include routes, transportation needs, and host sites. Share this plan with trusted neighbors in your absence.
- ❑ Exchange veterinary information with neighbors and file a permission slip with the veterinarian authorizing emergency care for your animals if you cannot be located.
- ❑ Make sure all vehicles, trailers, and pet carriers needed for evacuation are serviced and ready to be used.
- ❑ Assemble a pet to-go bag with a supply of food (for two to three days), nonspill food and water bowls, cat litter and box, and a restraint (chain, leash, or harness). Additional items to include are newspaper, paper towels, plastic bags, permanent marker, bleach/disinfectant solution, and water buckets.

## Essentials for a To-go Bag

The to-go bag should be easily accessible and filled with items needed to help you quickly and safely evacuate your home. When a wildfire is approaching, you may only have enough time to retrieve this bag. Be sure it contains:

- ❑ Clothing and personal toiletries
- ❑ Inventory of home contents and photographs/videotapes of the house and landscapes. Contact your insurance agent for an inventory checklist
- ❑ Flashlights, portable radio that tunes to an emergency radio station, and extra batteries. Change batteries annually.
- ❑ Extra set of car and house keys
- ❑ Extra pair of eyeglasses
- ❑ Contact information for family, friends, and physicians
- ❑ Copy of this publication

### How to Address the Special Needs of Vulnerable Populations During an Evacuation

During a disaster, it is essential that individuals with special needs (including the elderly and people with medical problems and people with certain disabilities) receive proper care.

- If the family member is dependent upon medications or equipment, or has special dietary needs, plan to bring those items with you. Documentation about insurance and medical conditions (including a list of current drugs taken) should also accompany the person.
- Transportation available to the general public during an emergency evacuation may not be suitable for family members with special needs. Planning ahead for special and required transportation needs is best.
- Many special-needs populations are easily upset and stressed by sudden and frightening changes. Your plans should ensure that a caregiver or trusted family member is able to stay with them at all times during an evacuation.



Plan ahead to provide suitable transportation for people with special needs.



When wildfire strikes, families need to have an emergency plan.

Photo courtesy of John Pickett

## **You Have Prepared Your Family for an Emergency Evacuation When You Have:**

- ❑ Made a Family Emergency Plan
- ❑ Registered with your local emergency notification system if this service is available in your area
- ❑ Registered with your phone-tree caretaker, if a phone tree has been established in your community
- ❑ Attended an evacuation drill and practiced two of the recommended evacuation routes out of the community
- ❑ Arranged for transportation out of the affected area if you do not drive
- ❑ Familiarized yourself and your family with the location of local evacuation centers
- ❑ Designated a safe meeting place and contact person for you and your family members
- ❑ Assembled a family to-go bag, a disaster supplies kit, and a pet to-go bag
- ❑ Inventoried home contents, videotaped/photographed property, and placed photos and videos in the to-go bag
- ❑ Reviewed the animal/livestock evacuation recommendations and assembled supplies needed for the animals' care in a pet to-go bag
- ❑ Reviewed the supplemental fire-preparedness information available at <http://www.kcrsg.org/>
- ❑ Prepared "EVACUATED" and "WATER SOURCE HERE" signage

## **Notification**

No single method of communication is fail-safe during an emergency, so regional public safety officials use a combination of five methods to keep the public informed during an emergency.

- Local government public information officers can prepare and distribute media releases for broadcast by local media outlets.
- Emergency managers can initiate the Emergency Alert System, which interrupts local radio and television broadcasts with important information.
- Public safety officials can directly broadcast messages over government cable channels.
- First responders and credentialed volunteers can go door-to-door to alert citizens.
- If applicable, the local emergency notification system can be used to automatically call affected residents.

There is no guarantee that every citizen will be contacted, but these five methods allow regional officials to quickly notify large sections of the local population. As another option, consider establishing an emergency phone tree in your neighborhood in conjunction with your local fire department or fire district.



Oregon Department of Forestry

Wildfires can start at any time during the day or night. Stay informed.

### **Emergency Notification System**

Several counties employ emergency notification systems capable of providing a prepared message during an emergency by calling telephones and sending emails and text messages to a particular area. However, you may not receive the message if the electricity fails, if you are not at home when an emergency occurs, or if your contact information is not included in the notification system database.

These emergency-communication systems may allow you to enter multiple forms of contact information (unlisted home number, cell phone, work phone, and email address) into the database. Check with your county's emergency management department, local fire department or fire district or sheriff's department to see if your county employs an emergency-notification system and how you can register for alerts.

**In an Emergency, Tune to Your Local Radio Station for Updates.**

## Time to Leave

During a wildfire, it will likely be dark, smoky, windy, dry, and hot. There may be burning embers being blown about, no power, no phone service, and poor water pressure. Remember, there is nothing you own worth your life! Please evacuate immediately when asked by fire or law enforcement officials. If you are concerned, don't wait to be asked to leave. Drive slowly, turn on your vehicle headlights, and stay as far to the right side of the road as possible.

### ***If You Have to Evacuate and There's Time***

#### **Wear and carry:**

- Long pants, a long-sleeved shirt or jacket made of cotton or wool, a hat and boots
- Gloves, a handkerchief and goggles to cover your face, and water to drink
- Flashlight and portable radio from your to-go bag (see page 19) tuned to a local radio station

#### **Family members should:**

- Evacuate early, especially if not essential to preparing the house for wildfire
- Follow practiced evacuation routes to the designated safe meeting place
- Relay plans to the designated contact person

#### **For your animals:**

- Evacuate them if possible
- Contact your county's animal services department for assistance
- Bring current pet photos (make sure distinguishing markings are visible), health records and paperwork (especially vaccination information) stored in waterproof bags, and medications and dosage instructions
- Secure pets in their own carrier or cage
- Place your pet to-go bag in the car (see page 19)

#### **For your vehicle:**

- If you can, lift your garage door manually, disconnect the electric garage door opener, and place the vehicle in the garage pointing out. Leave the garage door unlocked and closed. If you cannot lift your garage door manually, park the vehicle in the driveway facing out
- Leave keys in the ignition
- Roll up the windows
- Keep the fuel tank full during fire season

#### **Place in your vehicle:**

- To-go bag (see page 19)
- Disaster supplies kit (see page 19)
- Important documents (bank, IRS, trust, investment, insurance policies, birth certificates, marriage certificates, death certificates, medical and immunization records, wills, contracts, titles and deeds)
- Credit and ATM cards and extra cash
- Medications
- Driver's license, passport and Social Security cards
- Laptop, charger, and backup of desktop computer files
- Address book
- Cell phone and charger
- Family photo albums and videos



Photo courtesy of John Ketchum

*During a wildfire, the dark and smoky conditions can make evacuation difficult. Be prepared!*

- Family heirlooms
- Toys, books and games for entertainment

#### **Inside your home and out buildings:**

- Close all interior doors.
- Leave a light on in each room.
- Remove combustible curtains and other materials from around windows.
- Close windows, skylights, and exterior doors (house, garage, shop, and barn).
- Close fire-resistant drapes, shutters, and blinds.
- Turn off all pilot lights.
- Move overstuffed furniture (couches and easy chairs) to the center of the room.
- Close fireplace damper.
- Turn off air conditioning.
- Place an *EVACUATED* sign in the front window.

#### **Outside your home and out buildings:**

- Place combustible patio furniture and accessories inside or toss them away from the house.
- Remove barbecue propane tanks and place them away from the house where they can safely vent.
- Shut off propane at the tank or natural gas at the meter (see Page 15).
- Close or cover foundation, attic, and eave vents with precut plywood covers or several layers of aluminum foil.
- Cover windows with plywood panels at least 1/2-inch thick.
- Prop a noncombustible ladder against the house.
- Connect garden hoses to faucets and attach nozzles set on spray.
- Remove excelsior pads from swamp coolers and toss them away from the house.
- Leave doors and gates unlocked.
- Turn on outside lights.
- Fill trash cans and buckets with water and place where firefighters can find them.
- If you have an emergency water source, post WATER SOURCE HERE sign in the predetermined spot clearly visible from the street. Register with officials when you arrive at a shelter.



Photo by Hollie Adams

*Simpson Fire (2008), north of Klamath Falls threatened numerous rural homes and many were evacuated.*

### ***If You Cannot Leave***

- If you are unable to evacuate, stay in your home during the fire. It will be much hotter and more dangerous on the outside.
- Call 911 for assistance.
- Turn on all exterior lights.
- Stay away from windows and move to an interior room or hallway.
- Do not attempt to leave until after the fire has passed and you can safely leave.
- Check for small fires inside the house and extinguish them.
- Drink plenty of water.
- Make sure you can exit the house if it catches fire.
- Fill sinks and tubs with water.
- Place wet rags under doors and other openings to prevent entry of embers and smoke.
- Once the fire front has passed, check your flowerbeds, roof, rain gutters, attic, and crawl space for fires or burning embers and extinguish them.

### ***Evacuation Terms***

**Exclusion Zone**—An area established by the commander in charge of the disaster scene into which entry is temporarily forbidden due to extreme danger. Only official responder vehicles are allowed entry until the situation is deemed safe again.

**Voluntary Evacuation**—Voluntary evacuation is used when an area will most likely be impacted and residents are willing and able to leave before the situation worsens. This is helpful for residents with medical issues, pet owners, and others who need more time to evacuate.

### ***If You Cannot Evacuate Your Animals***

- Bring small animals indoors. Do not leave pets tethered outdoors.
- Leave only dry food in nonspill containers. Do not leave treats or vitamins.
- Depending on your pet’s needs, leave water in bathtubs, sinks, or nonspill containers.
- Do not confine mixed species of pets, such as cats, dogs, hamsters, and birds in the same room, even if they normally get along.
- Move livestock and horses to a safe area, such as a recently grazed or mown pasture, riding arena, or irrigated pasture. Never release them onto streets and roads. Provide enough feed and water for at least 48 hours.
- If there are livestock on pastures or rangelands, notify OSU Extension (541-883-7131) in order to coordinate needed evacuations.
- Notify your county’s Emergency Animal Services about animals you could not evacuate.

**Evacuation Advisory**—An advisory is issued when there is reason to believe the emergency will escalate and require mandatory evacuations. It provides residents time to prepare for evacuation.

**Mandatory Evacuation**—When the situation is severe and lives may be in danger, the governor has the authority to order mandatory evacuations. Should this occur, you must leave the area immediately. Follow any instructions you receive from law enforcement officers or fire officials.

**In an Emergency Dial 9-1-1**

**Keno Rural Fire Protection District**

14800 Puckett Road, Keno, OR 97627  
541-883-3062  
www.kenofire.com

**Bly Rural Fire Protection District**

60800 Hwy. 140 East  
Bly, OR 97622  
541-353-2317

**Bonanza Rural Fire Protection District**

2849 Market St., Bonanza, OR 97623  
541-545-6400

**Central Cascades Fire and EMS**

20400 Crescent Lake Hwy.  
Crescent Lake, OR 97733  
541-433-2800

**Chemult Rural Fire Protection District**

109800 Hwy. 97 N.  
Chemult, OR 97731  
541-365-2255

**Chiloquin Agency Lake Fire District**

127 S. First Ave. Chiloquin OR 97624  
541-783-3860  
www.chiloquinfire.com

**Crescent Rural Fire Protection District**

136727 Main St., Crescent, OR 97733  
541-433-2466

**Kingsley Field Fire Department**

216 Gentile St.  
Klamath Falls, OR 97603  
541-885-6382

**Klamath Fire District # 1**

143 N Broad St., Klamath Falls, OR 97601  
541-885-2056  
www.kcfd1.com

**Klamath County Fire District # 3**

22546 Arrow Head Lane  
Sprague River, OR 97639  
501-533-2141

**Klamath County Fire District # 4**

4041 Balsam Dr., Klamath Falls, OR 97601  
541-884-1670

**Klamath County Fire District # 5**

9139 Bly Mountain Cutoff Road  
Bonanza, OR  
541-545-6658

**Malin Rural Fire Protection District**

2304 3rd St. and Highway 50  
Malin, OR 97632  
541-723-5470

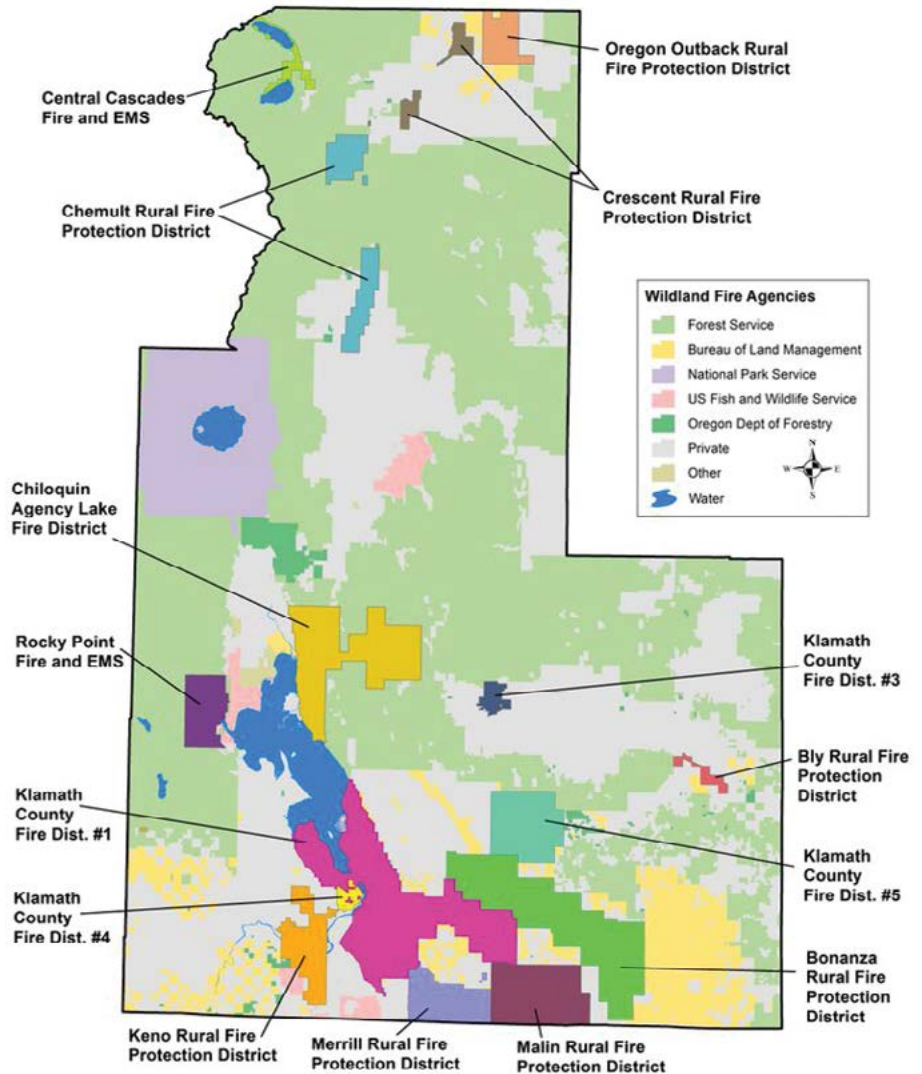
**Merrill Rural Fire Protection District**

216 Main St.  
Merrill, OR 97633  
541-798-5508

**Oregon Outback Rural Fire Protection District**

13099 Sun Forest Dr.  
LaPine, OR 97739-9498  
541-536-2594

**Klamath County Fire Departments and Wildland Fire Agencies**



**Rocky Point Fire and EMS**

25600 Rocky Point Road  
Klamath Falls, OR 97601  
541-356-2205  
www.rockypointfireandems.com

**Oregon Department of Forestry**

Klamath-Lake District  
3200 Delap Road  
Klamath Falls, OR 97601  
541-883-5681

**U.S. Forest Service**

**Fremont-Winema National Forest:**

**Chemult Ranger District**  
100500 US-97, Chemult, OR 97731  
541-365-7001

**Chiloquin Ranger District**

38500 Highway 97 N, Chiloquin, OR 97624  
541-783-4001

**Klamath Ranger District**

2819 Dahlia Street, Klamath Falls, OR 97601  
541-883-6714

**Bureau of Land Management**

**Klamath Resource Area**

2795 Anderson Ave., Bldg. 25.  
Klamath Falls, OR 97603  
541-883-6916

**Walker Range Fire Patrol Associates**

135393 US-97  
Crescent, OR 97733  
541-433-2451

**Crater Lake National Park**

P.O. Box 7  
Crater Lake, Oregon 97604  
541-594-3000

**U.S. Fish and Wildlife Service**

1936 California Ave.  
Klamath Falls, OR 97601  
541-885-8481

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Cover photograph of the 2008 Royce Butte Fire at Crescent Lake Junction.

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- Keno Fire Protection District
- Oregon State University Extension/Klamath Basin Research and Extension Center
- Wildland Fire Technologies
- Northwest Fire Science Consortium
- Klamath County Emergency Management
- Oregon Department of Forestry - Klamath Unit

For more information visit: [www.kcrsg.org](http://www.kcrsg.org) and <http://oregonstate.edu/dept/kbrec/>



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