

Keeping Your Home and Property Safe from Wildfire



A Defensible Space and Fuel Reduction Guide for Homeowners and Landowners

Max Bennett, Stephen Fitzgerald, Alicia Jones, Kara Baylog

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About Firewise:

The National Fire Protection Association (NFPA) created the Firewise Communities Program in 2002 to address the wildland/urban interface problem. The program encourages local fire safety by training homeowners to take responsibility for protecting their homes from wildfire. The program teaches people how to adapt to living with wildfire and encourages neighbors to work together to prevent losses. We all have a role to play in protecting ourselves and each other from the risk of wildfire.

The NFPA established a recognition program to help communities develop action plans and encourage neighbors to build safer neighborhoods to live. Over 1,400 communities are registered nationally, and over 100 are in Oregon. If you think your community should become a recognized Firewise Community, complete an online request for contact by a local Firewise representative on the Firewise Communities/USA web site, www.firewise.org/usa.



FIREWISE USA™
RESIDENTS REDUCING WILDFIRE RISKS

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About this guide

Have you created a defensible space around your home? Have you reduced flammable vegetation and debris beyond the defensible space (sometimes known as “clearing”)? If so, congratulations! This is an important first step in protecting your home and property from wildfire. But it’s only a first step. As plants grow back and dead woody material accumulates, fuels treatments can lose their effectiveness in only a few years. As a result, **regular maintenance is essential**. In this guide, we provide tips for maintaining defensible space and wildland fuels treatments.

Remember, no matter where you live in Oregon, it’s your responsibility to maintain your defensible space and fuels treatments.



For more information

Before Wildfire Strikes! A Handbook for Homeowners and Communities in Southwest Oregon (EM 9131). Oregon State University Extension Service.

Fire-resistant Plants for Home Landscapes (PNW 590).

Reducing Fire Risk on Your Forest Property (PNW 618). A Pacific Northwest Extension Publication. October 2010.

A Land Manager’s Guide for Creating Fire-Resistant Forests (EM 9087). Oregon State University Extension Service.

Reducing Hazardous Fuels on Woodland Properties: Mechanical Fuels Reduction (EC 1575-E). Oregon State University Extension Service.

Reducing Hazardous Fuels on Woodland Properties: Pruning (EC 1576-E). Oregon State University Extension Service.

Reducing Hazardous Fuels on Woodland Properties: Thinning (EC 1573-E). Oregon State University Extension Service.

Reducing Hazardous Fuels on Woodland Properties: Disposing of Woody Material (EC 1574-E). Oregon State University Extension Service.

Links to these publications can be found at:

<http://extension.oregonstate.edu/sorec/wildfire-publications>

Citizens Fire Academy is an Oregon State University Extension Service program to help homeowners and landowners better prepare for wildfire. <http://extension.oregonstate.edu/sorec/cfa>

Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest. Woodland Fish and Wildlife Group. <http://westernforestry.org/WoodlandFishAndWildlife/wp-content/uploads/2016/09/WildlifeAndFuelsPNW2016Final.pdf>

Create defensible space

Your house and outbuildings are potential fuel in a fire-prone environment. To help your home survive a wildfire, create defensible space between your home and its surroundings by 100 feet or more. Defensible space gives firefighters an opportunity to safely defend your home and other structures from a wildfire while breaking up pathways for fire that can lead to home ignition. Firefighters can't always protect every individual home, so it's your responsibility to take action.



Photo: Stephen Fitzgerald, © Oregon State University

This Oregon property maintains a Lean, Clean, and Green defensible space.

Two important steps in creating defensible space are:

- Landscaping with fire-resistant plants.
- Reducing flammable vegetation and other fuels around the home.

Also, take steps to make the home itself more resistant to fire, such as:

- Screen attic and foundation vents to prevent entry of embers. Also known as firebrands, embers are burning pieces of wood flying through the air.
- Use fire-resistant roofing, decking, and siding.
- Screen undersides of decks to keep out embers.
- Regularly remove leaves and pine needles from gutters.
- Remove brush and grass around outbuildings.

And maintain it!

Defensible space and wildland fuel treatments must be regularly maintained to remain effective. Vegetation grows back! Fresh-cut hardwood trees resprout rapidly after cutting, and shrubs like manzanita, bitterbrush, and poison oak often regrow in cleared areas, along with invasive weeds such as cheatgrass, blackberries, and Scotch broom. All this brush and grass quickly becomes new fuel for a wildfire.

Also, small trees and brush often die, limbs die back, and dead material begins to accumulate on the ground, on roofs, and in gutters. Without on-going attention to regrowth of vegetation and accumulating dead materials, the home protection benefits of defensible space will soon (5 to 10 years) be lost. However, the good news is that most maintenance tasks can be easily accomplished by the average homeowner and don't require a lot of time or money.

Regular maintenance is important



Photo: Eric Knapp, U.S. Forest Service

BEFORE. After fuels reduction treatment, the ground is almost bare.

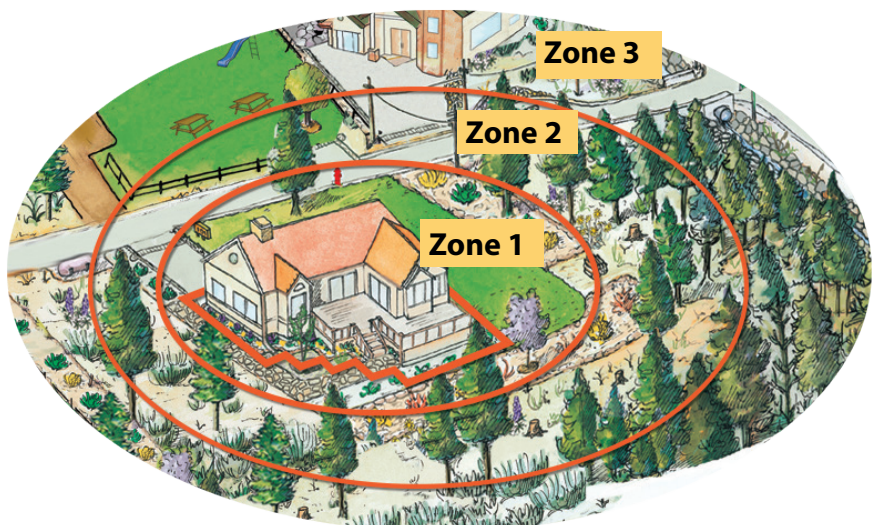


Photo: Eric Knapp, U.S. Forest Service

AFTER. Eight years later, the area has been taken over by trees and brush.

Fuels reduction zones

In the following pages, we talk about fuels reduction zones 1-3. Think of these as concentric circles around your house. Zone 1 extends from the house itself out to 30 feet. Zone 2 extends from 30 feet out to 100 feet (or more on steeper slopes). And Zone 3 is the area beyond Zone 2 that extends out to the property line. How you landscape and maintain the vegetation in these zones will have a big influence on the survival of your home in a wildfire.

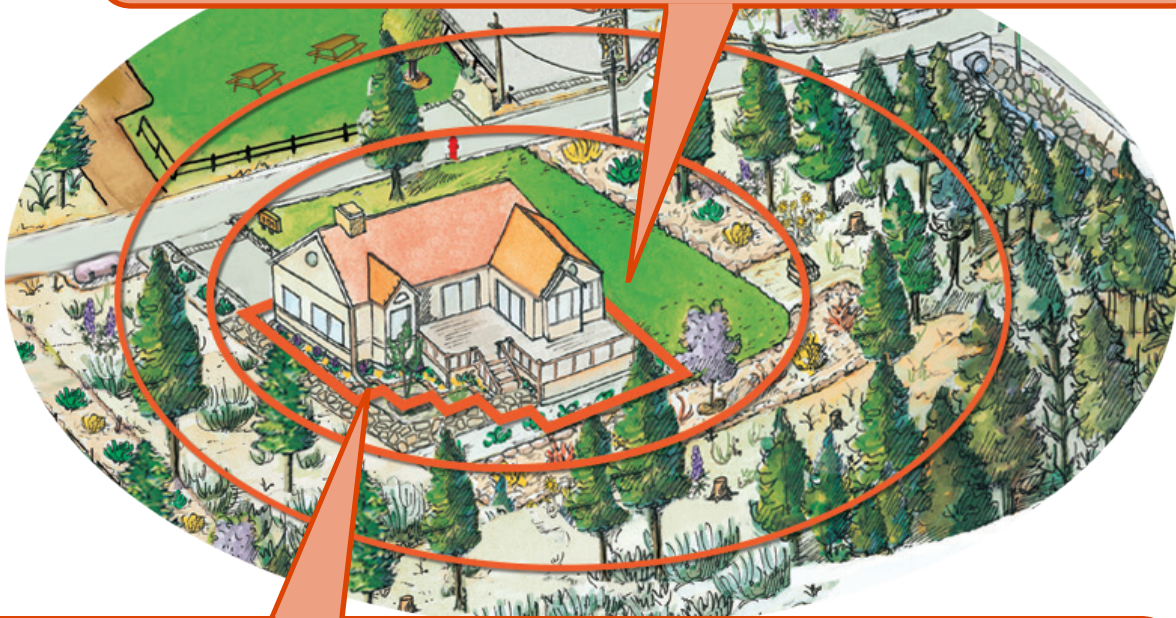


Fuels Reduction: WHERE AND WHAT (Zone 1)

Zone 1. Lean, Clean, and Green area:

The portion of your property at least 30 feet from the home should be Lean, Clean, and Green. Lean means that fire-prone, flammable vegetation is discouraged within 30 feet of the house, and vegetation in general is maintained at a low density. Clean means there is no accumulation of dead vegetation or flammable debris within this area. Green means that plants are kept healthy, green, and sufficiently watered during fire season. For most homeowners, the Lean, Clean, and Green area is the residential landscape. **This zone often has irrigation, contains ornamental plants, and should be maintained annually.**

- ☐ Trim back fire-resistant shrubs.
- ☐ Prune mature trees to at least 10 feet.
- ☐ Remove dead plant material such as leaves, needles, and twigs.
- ☐ Replace flammable plants with fire-resistant plants.
- ☐ Keep grass watered (green) and mowed to 4 inches.



Zone 1A. 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 gravel, rock mulches, or hard surfaces such as brick and pavers. Keep this area free of woodpiles, wood mulches, and flammable shrubs such as juniper. **This area should be maintained annually.**

- ☐ Remove dead plant material that has accumulated such as leaves, needles, and twigs.
- ☐ Keep gutters and roofs cleaned of debris.
- ☐ Make sure any overhanging limbs are trimmed back at least 10 feet or more from the roof.



Noncombustible area.

Fuels Reduction: WHERE AND WHAT (Zones 2 and 3)

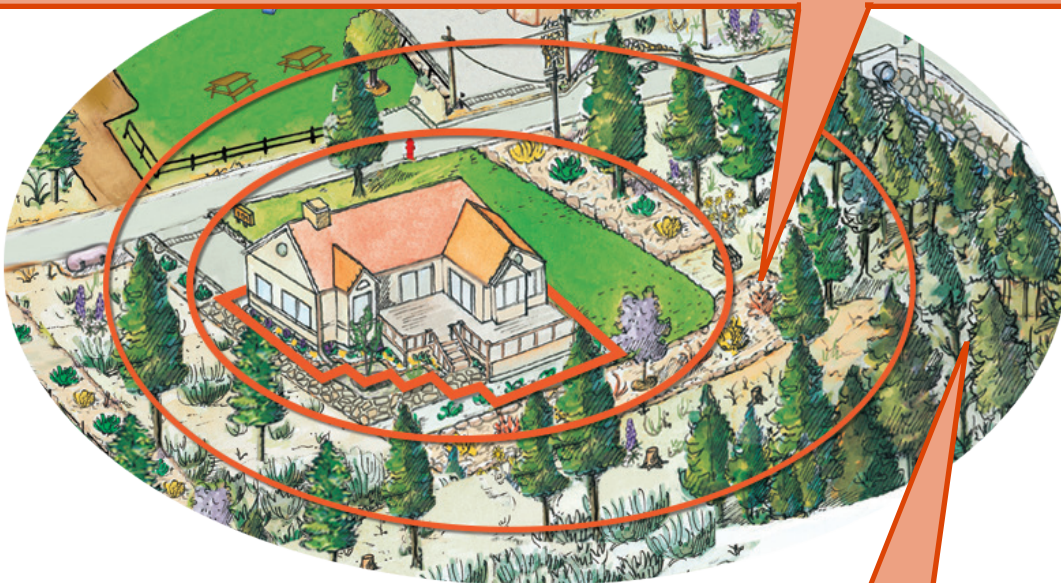
Zone 2. Outer defensible space:

This area extends from the 30 foot “Lean, Clean and Green” area out to at least 100 feet, and up to 200 feet on steeper slopes with thicker vegetation. It usually lies beyond the residential landscape and often consists of naturally occurring plants such as conifer and hardwood trees, brush, weeds, and grass. **Annual maintenance tasks in this zone:**

- ☐ Remove dead fine vegetation, including dead shrubs, fallen branches, thick accumulations of needles and leaves, etc.
- ☐ Before fire season, mow grass to 4 inches or less in height.

Do the following every few years, or on a portion of the area every year, so that the entire area is treated within a 5- to 8-year timespan:

- ☐ Thin out dense patches of trees and shrubs to create separation between them in order to slow the spread of fire. If you want to keep a particular small dense clump or patch of trees and shrubs for a visual screen, clear out 5 to 10 feet around it, creating an island and ensuring that you are breaking up the continuity of fuels.
- ☐ Reduce ladder fuels by removing low tree branches and shrubs growing directly under trees.
- ☐ Remove invasive weeds such as blackberries, cheatgrass, and Scotch broom.



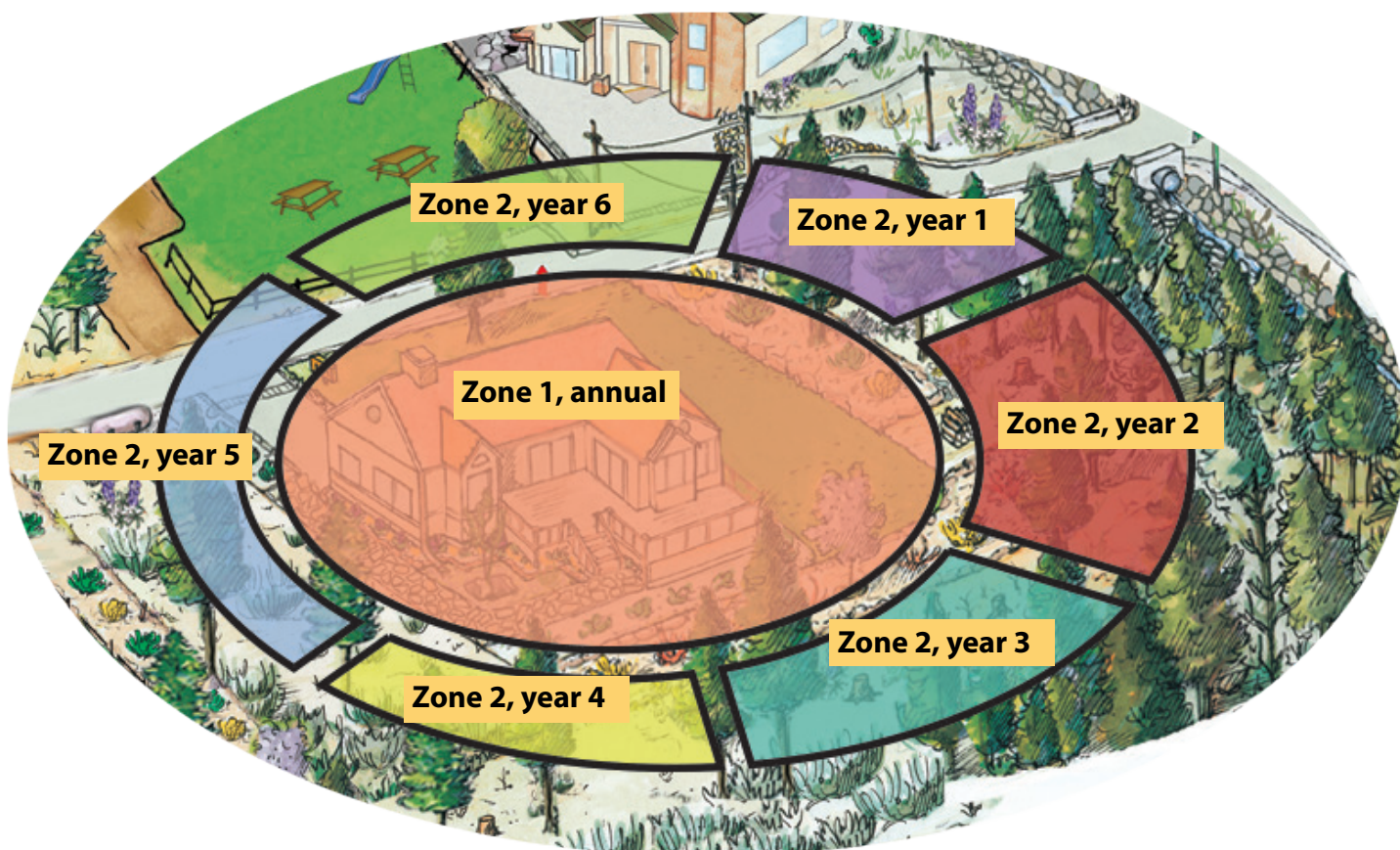
Zone 3. Wildland fuel reduction area:

Some properties extend beyond the home's defensible space. Fuels reduction is appropriate here too, but doesn't need to be as intensive as inside the defensible space area/zone. The overall goal is to break up fuel and vegetation continuity (create spaces between plants so that fire has less chance to sustain itself). **This zone should be maintained every few years, or a portion should be treated every year (see illustration on page 8).**

Thin out dense patches of trees and shrubs to create separation between them. If you want to keep a particular dense clump or patch of trees and shrubs for a visual screen or wildlife habitat, clear out 5 to 10 feet around it to ensure you break up the continuity of fuels.

- ☐ Reduce “ladder fuels” such as smaller trees and brush growing under larger trees, and lower tree limbs.
- ☐ Reduce heavy accumulations of woody material (dead branches and twigs, slash, etc.).
- ☐ It's fine to leave some brush patches, downed logs, and dead trees for habitat and soil benefits.

Fuels Reduction: WHEN



This illustration gives an example of maintenance intervals for the various zones around the house. **In Zone 1**, the noncombustible and Lean, Clean, and Green areas, maintenance is done over the whole area annually. **In Zone 2**, the outer defensible space area, maintenance tasks like thinning and pruning can be done over the whole area every few years, or a portion of the area can be treated each year, as shown in the illustration above. How much is done each year depends on the amount and speed of vegetative regrowth, and the owner's finances and physical capacity. **Zone 3**, the wildland reduction area, can be approached similarly to Zone 2.



Photo: John O'Connor, © Oregon Department of Forestry

When pruning smaller trees, remove only a third of the live branches at one time.



Photo: John O'Connor, © Oregon Department of Forestry

Fall is the best time to prune conifers.

Seasonal guide—winter tasks

Winter is often the best time to thin, prune, trim back vegetation, and dispose of woody material and vegetation. Below are some important winter maintenance tasks for your fuel reduction zones.

Thin out overly dense patches of trees and shrubs, and retain larger, healthier trees. Remove all dead or dying trees and some of the less vigorous or suppressed trees. Thinning increases separation between tree crowns which helps to reduce tree-to-tree spread of fire. Healthy, well-spaced trees are also more fire-resistant and less susceptible to insects and disease.

Remove flammable brush and weeds from your home's defensible space (Zone 2). Understory brush and weeds can act as ladder fuels—vegetation that allows fire to climb from the ground up into the tree canopy. Remove or prune ladder fuels in winter to early spring.

Prune limbs of mature trees up at least 10 feet above the ground. Smaller trees can also be pruned, but remove only a third of the live branches at any one time.

As the tree gets older and taller, it can be pruned again, raising its crown. Fall and winter are the best times to prune conifer trees; hardwoods are best pruned in spring. Be careful not to damage the branch collar.

A properly maintained driveway is essential for providing a safe access and escape route for your home. If firefighters can't see down your driveway, they will not enter.

Check your driveway each winter for encroaching brush or overhanging tree limbs. Strive for at least 13.5 feet of vertical clearance and trim brush back 10 feet or more from the edge of the driveway. Make sure your address signs can be seen so emergency responders can find you!



Photo: John O'Connor, © Oregon Department of Forestry

Understory brush and weeds can act as ladder fuels.



Photo: John O'Connor, © Oregon Department of Forestry

A homeowner prunes with loppers.



Photo: John O'Connor, © Oregon Department of Forestry

Trim brush back 10 feet or more from the edge of your driveway.

Winter Checklist: Mark your progress

Zone 1:

- ☐ Are any tree limbs overhanging or touching your home's roof, deck, porches, or outbuildings? Prune them back at least 10 feet from these structures.
- ☐ Have branches on mature trees lengthened so they droop closer to the ground or into smaller plants? Prune limbs on mature trees so that branches are at least 10 feet above the ground.
- ☐ Have tree branches grown out over the top of your driveway? For safe access and egress, always maintain at least 13.5 feet of vertical clearance across the entire width of your driveway.
- ☐ Are ladder fuels encroaching on the driveway from the sides? Remove small trees, lower limbs of larger trees and brush to maintain at least 10 feet of horizontal clearance from the edge of the driveway.
- ☐ Is your address sign visible? Clear away any vegetation to make your reflective sign clearly visible from all directions both day and night, winter or summer.



Zones 1-2

- ☐ Has previously cut brush grown back into your defensible space? Time to cut it back.
- ☐ Have trees or shrubs grown near phone lines, power lines or electric fences? Check and prune them back annually. Be safe—call your utility company first!
- ☐ Have young trees or shrubs grown into your defensible space since the last time it was cleared? Create separation between trees and shrubs in your defensible space zone, and remove smaller trees and shrubs growing underneath larger trees.

Seasonal guide—spring/early summer tasks

While winter is often the best time to complete “heavy duty” maintenance tasks, there is a lot you can do in spring prior to fire season, and even during fire season.

Clear all flammable debris from the roof, gutters, and around your home. Tree litter (needles, leaves) on or around your home is highly flammable and easily ignited by airborne embers. Mow or weed-whack grass around barns and other outbuildings.

Check your roof and gutters at least twice annually, fall and spring; remove any flammable debris (nearby madrone trees, which lose their leaves in early summer, necessitate removal during summer too). Rake leaves and needles away from your home, decks, and outbuildings. Also, screen the underside of your deck.

During summer, never store flammable materials near your home. Flammable items such as firewood and even patio furniture are easily ignited by airborne burning embers. Move all firewood piles at least 30 feet away from all structures in the spring. During fire season, things like gas grills and patio furniture cushions are especially susceptible to embers and should be stored indoors when not in use.

Remove highly flammable plants such as juniper and replace with attractive, fire-resistant plants. There are a variety of ground covers, flowers, and even trees and shrubs to choose from. Both native species and ornamentals can be used.

Keep grass and weeds mowed to less than 4 inches in height. Dry grass and weeds are very hot, flashy fuels that ignite easily and spread quickly. Flames can be three times



Photo: John O'Connor, © Oregon Department of Forestry

Tree litter and pine needles are easily ignitable and should be removed.

the height of the grass. Mow or weed-whack vegetation near barns and other outbuildings, around vehicles, RVs, fences, along roadways, and under power lines.

Avoid grass fires by mowing *before* fire season when grasses are still green. Mowing in the spring will also reduce the chance of weeds maturing and spreading viable seed. During fire season, restrict mowing to early morning hours. However, mowing may be prohibited entirely under extreme conditions; check with your local fire district for current restrictions.



Photo: Shannon L. VanDeventer, © Oregon Department of Forestry

Around your home, plant fire-resistant vegetation.



Photo: John O'Connor, © Oregon Department of Forestry

Mow or weed-whack dry grass and weeds that ignite easily.



Photo: John O'Connor, © Oregon Department of Forestry

Keep firewood stored at least 30 feet from your home and structures.

Spring Checklist: Mark your progress

- ☐ Have leaves or pine needles accumulated on your roof, in gutters, on or under decks, or on the ground right next to your home? Time to get out the ladder, leaf blower, or rake!
- ☐ Have you moved firewood piles left over from winter at least 30 feet from your home? Cover them if possible.
- ☐ Have you replaced flammable groundcover near your home with fire-resistant landscaping?
- ☐ Have grasses and weeds grown up tall over the spring? Keep them mowed to 4 inches or less.
- ☐ Have weeds or grass grown up around electrical fences? Clear all flammable material away from the fence to prevent a ground fire from igniting.
- ☐ Is your line tester functioning on your electric fence? Help avoid a grass fire by inspecting the tester and all fence connections often for shorts in the line.
- ☐ Are flammable household items such as patio furniture pads, door mats, and mops sitting out on your deck or elsewhere near the home? Cover or move these items inside when your home is unattended or if a wildfire is near.
- ☐ Will you be prepared if a fire comes? Make sure you have a family emergency preparedness plan and emergency evacuation kit. Discuss home evacuation plans and routes with all family members. Include pets and livestock in the plan. Practice the plan with all family members.

Fuel reduction and wildlife habitat—what's the balance?

Many landowners have other objectives for their land beyond reducing the fuel hazard, such as aesthetics or maintaining or creating wildlife habitat. These two objectives can be compatible with fuel hazard reduction, but some compromises may need to be made. Wildlife utilize herbaceous grasses and forbs, shrubs, logs, trees, and snags for food, cover, and nesting. Several species of birds utilize shrubs for nesting and cover, yet many native shrubs are also fire-prone (manzanita, bitterbrush, sagebrush, etc.). The key is to reduce the fuel ladders and fuel continuity enough to reduce the risk, but still keep some untreated cover areas (in between) for wildlife habitat. You must decide how much risk you are willing to accept and balance accordingly.



Photo: Stephen Fitzgerald

Leave some snags in Zone 3 and beyond.

Zone 1 (0 to 30 feet)—

This zone should have the highest priority for fuel reduction and creating defensible space. In this zone, you can provide or create food and water sources for wildlife. Wildlife considerations may include use of fire-resistant plants as food sources and providing water features.

Zone 2 (30 to 100 feet)—

Leave a limited amount of shrub cover in patches but avoid leaving patches under trees as you don't want to create ladder fuels.



Photo: Max Bennett, © Oregon State University

Here is an example of fuel reduction that maintains aesthetics and wildlife habitat.



Photo: Marty Main

On this property, cover patches have been left but there are no shrubs under the remaining trees.

A few downed logs can be left, but there shouldn't be any snags in this zone. Plant or retain hardwoods that provide food sources, like oak, cherry, and others that are also fire-resistant. Leave deciduous shrubs for food and cover that have a higher moisture content, such as oceanspray.

Zone 3 (100+ feet)—Leave some shrub patches and downed logs. Snags also may be left, but be aware that if they ignite, they could create a hazard by spewing embers across your property. If you own several to tens of acres or more, you can leave a few snags per acre without greatly increasing the fire risk.

For more information:

Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest. Woodland Fish and Wildlife Group. <http://westernforestry.org/WoodlandFishAndWildlife/wp-content/uploads/2016/09/WildlifeAndFuelsPNW2016Final.pdf>



Photo: Stephen Fitzgerald, © Oregon State University

Snags are valuable habitat but be aware that they can ignite and spew embers that create new spot fires.

Fuels reduction and visual screening

For many landowners, fuel reduction can visually improve the appearance of the forest. However, sometimes this means that there is an unwanted, direct line of sight to neighboring homes or roads. If you want to maintain a visual screen or barrier to block a particular view and maintain aesthetics and privacy, you can easily incorporate visual screening into your existing fuel-reduction management strategy.

- Promote trees of various sizes and species to provide complexity in your visual screen.
- Include individual scattered small trees, patches of small trees, as well as patches of denser vegetation.
- To promote fire-resistance, separate the denser patches and clumps so there are not large contiguous areas of heavy fuels.
- Rather than leaving or planting one homogenous row of trees, create depth by staggering the spacing of several rows of trees to increase the effectiveness of your visual screen.



Photo: Max Bennett, © Oregon State University

This landscape is both fire-resistant and attractive. The dense patch of vegetation in the background was left to screen a driveway. Because it is separated from other trees and shrubs, it does not pose a significant fire hazard.

Tools and techniques for fuels maintenance

Preventative management

Most plants grow fastest in full sun. Fuels reduction treatments help reduce the regrowth of young vegetation by decreasing the density of trees and removing ladder fuels. It is important to retain a canopy, however, so unwanted vegetation will grow slower and/or be shaded out.

Weed germination can be reduced by covering bare ground with organic materials such as leaves, wood chips, or bark, but use these materials sparingly within 30 feet of the home, and not at all in the non-combustible area within 5 feet of the home. Weed infestations can also be reduced by removing weeds *before* or *at* time of flower to prevent seed dispersal.

When removing invasive weeds such as cheatgrass or Himalayan blackberry, it's important to replace the weeds with something else, perhaps a fire-resistant native grass or shrub. Otherwise the site may simply be reinvaded by the same or a different group of weeds.

Pruning/limbing

Removing the lower limbs of trees reduces fuel ladders that can carry flames from the ground into the tree canopy. Mature trees can be pruned up to 10 feet or so; younger or smaller trees can also be limbed up, leaving upper two thirds of the tree with a live green crown.

Pruning and cleaning out shrubs also reduces the fuel load. Remove dead twigs, leaves, and other woody material to maintain a shrub that is Lean, Clean, and Green. Shrubs

such as manzanita can be very flammable if in a decadent state, but can be relatively fire-resistant when regularly maintained by pruning.

Cutting

Cutting back vegetation removes excess fuels or a fuel pathway that would allow flame or embers to reach your home. Cut back woody vegetation to stump or ground level with loppers, chainsaws, or brushcutters. Most brush species sprout back vigorously after cutting due to a well-established root system and will need to be recut. Herbicides can be applied to freshly cut stumps to prevent resprouting. Work safely and wear protective equipment when using a chainsaw.

Removal

Remove above-ground fuels and the root system so the plant doesn't resprout. Remove small weeds with a spade or similar digging tool. A weed-pulling tool or grubbing hoe may be needed for bigger plants such as shrubs. Extensive root system removal may result in bare areas, setting the stage for reinvansion of weeds, so cover bare soil with organic matter or quickly plant and establish desirable native vegetation.

Disposal

Fuels-reduction projects can generate a lot of material. Small logs generated from thinning can be used for firewood, fencing, and other projects. Smaller woody material can be composted, hauled away, piled and burned, or chipped. Many wildfires start from escaped burn piles, so safe burning practices are important.



Photo: John O'Connor, © Oregon Department of Forestry
Madrone sprouts emerge from an old stump.



Photo: Douglas Forest Protection Association, used with permission
A crew removes and chips brush along a forest road.

Mechanical

Mechanized equipment such as tractor-mounted brush hogs, brush mulchers, and other large equipment mow or masticate (chop up into small fragments) unwanted vegetation. This does not remove fuel from the site but rearranges it on the ground so it can decompose quickly.

Chemical

Herbicides control brush and weeds and can be combined with other treatments, such as cutting. Herbicides can control invasive species. Small amounts provide effective control. Follow label directions. Apply herbicides with a backpack or hand-held sprayer. Dead plants should be removed.

Grazing

Cattle, sheep, and goat grazing reduce fuel loads. Cattle keep down grass and other herbaceous vegetation, and goats and sheep browse woody plants. Goats and sheep eat the leaves and green twigs or stems. They can keep down the brush, but may require temporary fencing, water, and predator control.

Prescribed burning

Prescribed underburning involves using low-intensity fire to remove vegetation and woody debris close to the ground. Liability and escape potential make this a very risky strategy on private lands, particularly around homes.



Photo: Max Bennett, © Oregon State University

A brush mulcher is used to clear underbrush.



Photo: John O'Connor, © Oregon Department of Forestry

Goats will browse woody vegetation like blackberry (above) and poison oak.

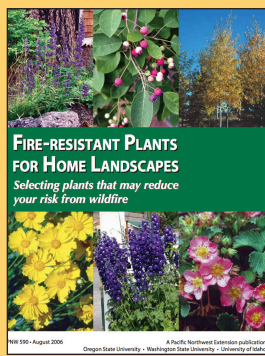
Plant selection and maintenance

Controlling brush and weeds is an important part of your defensible space and wildland fuels-reduction maintenance program. Native shrubs like manzanita, bitterbrush, and sagebrush are fire-prone and burn hot. Invasive weeds such as Scotch broom and blackberry are also very flammable. Young sprouts grow quickly from the stumps of cut hardwood trees such as madrone and oaks. While large, mature hardwoods are usually resistant to fire, sprouts can quickly become new ladder fuels. This part of the publication provides tips for managing common brush and weed species to reduce the risk of fire to your home and property.

In Zone 1: Landscape with fire-resistant plants and remove flammable plants

Fire-resistant plants are not easily ignited by an ember or flame. They tend to have moist and supple leaves, don't accumulate much dead or dry material within the plant, and have low sap or resin content. Many native plants as well as many commonly planted ornamentals are relatively fire-resistant. In contrast, highly flammable plants tend to accumulate fine, dry or dead material within the plant, may have loose or papery bark, and often have contain volatile waxes, terpenes, or oils in their leaves, twigs and stems.

For more information about fire-resistant plants, see [Fire-resistant Plants for Home Landscapes](#) (PNW 590).



Examples of flammable plants include:

- **Western juniper and ornamental juniper shrubs**
- **Cypress** (Leyland, Italian, etc.)
- **Scotch broom, gorse, and blackberry** (non-native invasive shrubs)
- **Many manzanita and ceanothus species** (native shrubs)
- **Bitterbrush and sagebrush** (native shrub species)
- **Cheat grass, false brome, and European beach grass** (non-native grasses)



Photo: Valerie C. Elder, © Oregon State University

Beach grass is highly flammable and should be cut back near a home.



Photo: John O'Connor, © Oregon Department of Forestry

Some types of brush can be highly flammable.



Photo: Brian Ballou, © Oregon Department of Forestry

Juniper bushes can harbor embers and burn very intensely.

Within the Lean, Clean, and Green area

Highly flammable plants such as juniper should be removed when they are within 30 feet of your home, and from a greater distance on steeper slopes. Fire-resistant plants can be located in this 30-foot zone, but these plants should be sufficiently watered and trimmed back, with all dead material (leaves, needles, or twigs) routinely removed. Create at least 10 feet of separation between the canopies of individual and small patches of fire-resistant trees and shrubs located within this zone. Planting ornamental hardwood trees (aspen, maples, etc.) within this zone can help protect homes from wildfire by blocking radiant heat directed at the home.

Zones 2 and 3: Within the outer defensible space and wildland fuel reduction zone

In this zone, remove invasive plants such as Scotch broom whenever possible. Thin out dense patches of brush and trees or clear around small dense patches. Prune and dispose of dead, dry material on fire-prone shrubs such as manzanita, sagebrush, and bitterbrush. Within the defensible space (up to 100 to 200 feet outward from the home, depending on slope and vegetation), strive for about 10 feet of separation between individual tree canopies or small clumps of trees. Remember that this will be more than 10 feet between tree trunks! Individual shrubs or clumps of shrubs should be separated from other shrubs by at least 2 to 3 times the height of the shrub.



Photos: Max Bennett, © Oregon State University

The vegetation on the left is dense and a fire danger, but the same type of vegetation on the right has been thinned.



Photo: Stephen Fitzgerald, © Oregon State University

Spacing between shrubs should be two times their height (shrubs with an "X" should be removed).

Plant management guides

While all plants can burn under the right conditions, the following pages contain information about how to manage plant species that can be especially problematic in fire-prone areas. Poison oak is also covered. While not a serious fuels issue, poison oak is a common annoyance in woody areas surrounding the home and can affect your ability to work around your property.

Grasses

Grasses allow fire to spread quickly. *Cheatgrass* is a problematic, non-native species in central and eastern Oregon. *European beach grass* is a flammable, non-native species on the Oregon Coast. *False brome* is an invasive species in some forests in the Willamette Valley.

Shrubs

Most native shrub species are relatively low in flammability because they tend to have moist and supple leaves, don't accumulate much dead or dry material within the plant, and have low sap or resin content. However, some species, such as *sagebrush*, *manzanita* and *bitterbrush* can pose more of a fire hazard. Native shrubs, especially more flammable species, are not recommended for the 30-foot Lean, Clean, and Green zone (Zone 1) surrounding the homesite.

Invasive species such as *Scotch broom* and *Himalayan blackberry* introduced to Oregon thrive and spread rapidly. Many of these plants highly flammable and pose ecological problems when they out-compete native vegetation. Eradicate invasive plants or substantially reduce them whenever possible.

Hardwood trees

Most hardwood tree species have thin bark and are more easily top-killed by fire than conifers. Hardwood trees sprout back quickly after fire or cutting. Because of their high foliage moisture content and other characteristics, hardwoods are generally less flammable than conifers. Larger, mature hardwood trees are relatively fire resistant and usually well-suited for both defensible space and wildland fuels-reduction areas. *Oaks* in particular have thicker bark and are less likely to be killed by light surface fires than madrone and other hardwood species. However, small hardwood seedlings or saplings, or hardwood trees that have been cut and have resprouted, can serve as ladder fuels. Young sprouts can be cut back to stump level. Sometimes it's better not to cut the tree to avoid the need for sprout maintenance.

Conifer trees

Conifer foliage tends to be more flammable than hardwoods but some conifer trees can be fire-resistant when limbed up to an adequate height. The bark of some conifer species, especially ponderosa pine, is thick, insulating the cambium layer and allowing the tree to survive surface flames. Other conifer species such as the true firs and cedars have thinner bark, more flammable foliage, and are more

Plants of concern for home fire protection



easily killed. The bigger and older the tree, the thicker the bark and the greater the fire-resistance. As a result, mature trees of many conifer species can survive low-intensity fires. Unlike hardwoods, conifers do not resprout after being cut or killed by fire (with a couple of exceptions).

Low-growing conifers, such as ornamental juniper, Leyland cypress, and western juniper, have very flammable foliage and are poor choices for Zone 1. Most other conifers can be used in Zones 2 and 3 provided they have good vigor, are adequately spaced, and are pruned to eliminate low-hanging branches.

When selecting a tree (conifer or hardwood) for zone 1, consider its mature size to ensure an adequate distance from the home and foundation.

For information on vegetation and weed management:

Pacific Northwest Weed Management handbook
<http://pnwhandbooks.org/weed/>

UC Davis Pest Management
www.ipm.ucdavis.edu/PMG/menu.homegarden.html

Herbicide use for vegetation management

Some homeowners and landowners may wish to use herbicides to control Scotch broom, Himalayan blackberry, oak, madrone, manzanita, poison oak, and other vegetation commonly found in fire-prone areas in southwestern Oregon. For general guidelines and information about safe application methods, see the *PNW Weed Management Handbook* referenced above. **Information and links can also be found at** <http://extension.oregonstate.edu/sorec/forestryvegetation>.

Invasive Weeds

Scotch broom (*Cytisus scoparius*) Gorse (*Ulex europaeus*)

Plant Identification and quick facts:

- Scotch broom can grow up to 10 feet tall, gorse even taller.
- Both have yellow flowers and produce abundant seed pods. Seeds remain viable in the soil for many years.
- Gorse has spines, Scotch broom does not. Most gorse is found along the southern Oregon coast, while Scotch broom grows inland and is more widely distributed.
- Oils and resins make them very flammable. Gorse contributed to the catastrophic 1936 Bandon fire.
- Invasive species not native to the U.S.
- **Fuel reduction objective:** Eliminate when possible.



Photo: Max Bennett, © Oregon State University

Scotch broom flowers.

Recommended tools:

Weed pulling tool

Various brand names such as the “Uprooter”, “Pullerbear” and “Extratigator.” Use the tool to grip the stem and pull down to remove the plant, including the root mass.

Spade or Pulaski

Dig out plant including the root mass when soils are moist.

Backpack sprayer

Used for applying herbicides. Consult your local Extension office or pesticide applicator professional for further information on chemical treatments.



Photo: Max Bennett, © Oregon State University

Mature Scotch broom plants.



Photos: Steve Wickham, © Used with permission

A forester uses a weed puller to uproot a mature Scotch broom weed.

Best management practices: Scotch broom and gorse

Preventative management

Prevent Scotch broom and gorse infestations. Don't disturb the ground where these species pose a threat. If ground is disturbed, quickly revegetate disturbed areas with fast-growing native vegetation. Shading out gorse and Scotch broom with native trees and shrubs can aid in long-term preventative management. Scotch broom seedlings should be pulled before seeds have developed. Clean mechanical equipment of seed before using on other sites.

Hand treatment

Effective for small areas and when the plants are small. Individual large plants can be removed using a weed-pulling tool. Young plants may be pulled by hand or removed by shovel. Failure to remove the root system will encourage resprouting. Pulling may disturb the soil, encouraging seed germination and requiring later retreatment. When possible, begin hand treatments prior to seeding. If seeds have already been produced, wrap seed pods tightly in plastic bags to reduce seed spread during removal. Young plants will generally resprout when cut with hand tools such as loppers. Older plants with a base stem diameter of 2 inches or more and no longer green may be killed if cut in late summer. It is very difficult to hand pull gorse plants due to their spines.

Mechanical

Mowing or cutting generally results in resprouting. Some older or less vigorous plants may be killed, but new seedlings will germinate, requiring retreatment. Multiple mowings or mastication treatments may reduce plant reserves, the seed bank, and the overall density of plants.

Chemical

Potential treatments include foliar, cut stump, and basal applications with triclopyr or glyphosate. Dead plants are fuel and should be removed after the herbicide has taken effect. New seedlings may germinate from seed stored in the soil, requiring retreatment.

Prescribed burning

Not recommended. Dangerous. Both species are very flammable due to the oils and resins in the bark and leaves.

Grazing

Goats can graze small gorse seedlings or sprouts if foliage is tender. On mature shrubs, goats will graze only branch tips. Continual grazing in an area reduces the number of plants and seed production, but eradication requires combining grazing with mechanical and/or chemical control measures. Grazing is not recommended for Scotch broom as it is toxic to livestock in large quantities.

Invasive Weeds

Himalayan blackberry (*Rubus armeniacus*)

Plant identification and quick facts:

- 5 leaflets per leaf; canes have thorns; are ribbed and square in cross-section.
- Thickets often reach 6 feet or more in height; brambles (canes) can grow 3 feet or more in length in one season.
- Spreads via underground burls, runners, and tip-rooting from canes; quickly occupies disturbed areas.
- Less vigorous in shade; can't survive in deep shade.
- Flammable due in part to accumulation of dead material in thickets; burns well in winter.
- **Fuel reduction objective:** Eliminate when possible.



Photo: Max Bennett © Oregon State University

Blackberry leaves.

Recommended tools:

Spade/grub hoe

Dig out plant and the root mass when soils are moist.

Brush hog

Not effective as a stand alone treatment but can be used with other treatments such as goats or herbicides.

Backpack sprayer

Used for applying herbicides. Consult your local Extension office or pesticide applicator professional for further information on chemical treatments.



Photo: John O'Connor, © Oregon Department of Forestry

Blackberry encroaches on a deck, creating a major fire hazard.

Best management practices: blackberry

Preventative management

Himalayan blackberry quickly occupies cleared or disturbed areas. Don't delay in planting or seeding such sites with fast-growing native vegetation. Heavy shade reduces the vigor of existing plants and prevents new plants from establishing.

Hand treatment

Effective for small patches. A spade, Pulaski, grub hoe, or similar tool can be used to uproot blackberry plants. The more of the root system that is removed, the less resprouting there will be. This is hard work. Grubbing blackberry plants will disturb the soil, encouraging germination of other weeds, so it's easy to replace one weed problem with another. To minimize this, maintain organic matter on the soil surface to reduce weed germination (as long as it doesn't pose a fuel hazard) and/or replace with fast-growing native vegetation.

Mechanical

Not effective as a stand-alone treatment. Cutting and mowing blackberry usually will not eliminate the plants because they resprout vigorously from their well-established root system. If they are cut down to ground level frequently (several times a season) over several years, they may be significantly reduced. Mowing produces a heavy mulch which can help suppress other weeds.

Chemical

Effective when done correctly and combined with mowing. Glyphosate and triclopyr are suitable herbicides. Late-summer-to-fall treatments give best results, depending on the product. Dead plants are fuel and should be removed.

Prescribed burning

Not recommended. Blackberry resprouts vigorously after fire.

Grazing

Partially effective. Goats will eat blackberry leaves and green canes, and limited amounts of dry woody material. They are most effective at suppressing resprouting blackberry that has been cut or mowed. Over time, they can reduce and even eliminate patches of blackberry. Goats require supervision and maintenance. They will also eat desirable native vegetation.

Native Shrubs

Manzanita (*Arctostaphylos* spp.)

Plant identification and quick facts:

- Oregon hosts several species: whiteleaf (*Arctostaphylos viscida*) in southwest Oregon. Greenleaf is common in southwest and central Oregon.
- Can grow up to 10 feet tall, average 3 to 5 feet.
- Drought tolerant; prefers open areas and full sun.
- Branches regularly die off.
- Some species resprout after cutting; whiteleaf does not. Produces lots of seed which remain viable in the soil for many years.
- ▶ **Fuel reduction objective:** Within the defensible space, keep individual plants trimmed back, with no dead material, and separate plants. Within the wildland fuels-reduction zone, break up contiguous brush fields and retain manzanita patches for wildlife.



Photo: Stephen Fitzgerald © Oregon State University

Greenleaf manzanita in bloom.

Recommended tools:

Chainsaw or brushcutter

Cut low to the ground to reduce stem hazards.

Shovel/grub hoe

Dig out plant and root mass when soils are moist.

Brush mower/mulcher

Grinds or shreds into small pieces, suitable for wildland areas.



Photo: Stephen Fitzgerald, © Oregon State University

Greenleaf manzanita.



Whiteleaf manzanita.

Photo: John O'Connor, © Oregon Department of Forestry

Best management practices: manzanita

Preventative management

Manzanita does not grow well in the deep shade. As a result, planting or maintaining trees to shade an area is an effective long-term strategy to reduce establishment of new manzanita plants.

Hand treatment

Effective, but retreatment may be required. Dead branches can be removed with handsaws, loppers or chainsaws. To remove small plants, use a shovel or grub hoe in moist soils. This is labor intensive. A brushcutter will efficiently mow down many small plants. For larger plants, use a chainsaw to cut to a low stump. Whiteleaf manzanita does not sprout back; however, many other manzanita species do. While hand treatments are effective at removing and killing plants, new manzanita plants regenerate rapidly from seed stored in the soil. An area cleared of manzanita can be reoccupied by young plants in a few years.

Mechanical

Effective, but retreatment may be required. A variety of machinery, including walk-behind mowers, brush mulchers mounted on skid-steers, and excavator-mounted slashbusters will masticate manzanita and thin out dense brushfields. This equipment is suited to large projects but not defensible space treatments.

Chemical

Triclopyr and 2,4-D can be effective. Dead plants are fuels and should be removed after the herbicide has taken effect. New seedlings may germinate from seed stored in soil, requiring retreatment.

Prescribed burning

Not recommended. For reasons described above, this method is not well suited to most private parcels. Burning kills mature plants, but young plants germinate readily in recently burned areas.

Grazing

Partially effective. Cattle and sheep are not recommended. Goats can be used to suppress manzanita and other woody brush. They are more inclined to browse younger sprouts than older plants; therefore, they are most effective on resprouts or young plants that grow back following an initial hand or mechanical treatment.

Native Shrubs

Poison oak (*Toxicodendron diversilobum*)

Plant Identification and quick facts:

- Grows as a vine and in shrub form; may reach 6 feet or more in height; commonly 1 to 3 feet tall.
- Compound leaves with three leaflets ("leaves of three, let it be").
- Spreads via underground stems; resprouts after cutting.
- Contrary to popular opinion, is not considered an invasive species.
- Not a significant fuels or fire concern, but is a major annoyance for many landowners.



Photo: Max Bennett, © Oregon State University

Poison oak leaves and flowers.

Recommended tools:

Goats

Will browse poison oak plants.

Shovel/grub hoe

Dig out plant including the root mass when soils are moist.

Backpack sprayer

Used for applying herbicides. Consult your local Extension office or pesticide applicator professional for further information on chemical treatments.



Photo: Max Bennett, © Oregon State University

Poison oak leaves climbing up the side of a tree.

Best management practices: poison oak

Preventative management

Found all over low elevations in western Oregon and difficult to prevent. Growth and regeneration are reduced in heavy shade.

Hand treatment

Effective for small patches. A spade, Pulaski, grub hoe, or similar tool can be used to uproot poison oak plants, but the root system is extensive. Use caution, as the roots and stems also contain the oil that produces the allergic reaction in most people.

Mechanical

Not effective. Cutting and mowing poison oak will not eliminate the plants because they resprout vigorously from their well-established root system. If they are cut down to ground level frequently (several times a season) over several years, they may be depleted.

Chemical

Very effective when done correctly. Often combined with mowing. Suitable herbicides include glyphosate and triclopyr applied during mid to late summer. Dead plants are fuel and should be removed after the herbicide has taken effect.

Prescribed burning

Not recommended. Poison oak resprouts vigorously after fire. Avoid placing poison oak in burn piles; smoke can be very harmful if inhaled.

Grazing

Partially effective. Goats will eat poison oak leaves and green stems. They are most effective with resprouting poison oak that has been cut or mowed. Over time, they can reduce and even eliminate patches of poison oak. Goats require supervision and maintenance. They will also eat desirable native vegetation.

Native Shrubs

Ceanothus (includes blueblossom, snowbrush, deerbrush, and buckbrush)

Plant Identification and quick facts:

- In Oregon, Ceanothus is found in both the eastern and western areas of the state. Blue blossom (*Ceanothus thyrsiflorus*) is the most familiar in the western reaches, while Snowbrush (*Ceanothus velutinus*) is most familiar to the east.
- Ceanothus is an evergreen shrub. Flowers are small, showy en masse, and the color ranges from white through many shades of blue to deep violet.
- Most plants in the Ceanothus genus have the ability to fix nitrogen via a symbiotic association with root-inhibiting microbes (actinomycetes).



Photo: Stephen Fitzgerald, © Oregon State University

Snowbrush ceanothus.

- Twigs and leaves contain flammable waxes, oils, and terpenes, making the plant very flammable.
- Some species will stump sprout after fire, and seeds lying dormant in the soil will germinate with fire.

► **Fuel reduction objective:** Within the defensible space, keep individual plants trimmed back, with no dead material, and separate plants. Within the wildland fuels reduction zone, break up contiguous brushfields, and retain some ceanothus patches for wildlife.

Recommended tools:

Goats and sheep

Will browse foliage of certain Ceanothus species.

Shovel/grub hoe

Dig out plant including the root mass when soils are moist.

Backpack sprayer

Used for applying herbicides. Consult your local Extension office or pesticide applicator professional for further information on chemical treatments.



Wedgeleaf ceanothus.

Photo: John O'Connor, © Oregon Department of Forestry

Best management practices: ceanothus

Preventative management

Found in both western and eastern Oregon. Seeds lay dormant in the soil and can germinate hundreds of years later after fire. Most species prefer full sun and do not like heavy shade, so planting taller shrubs and trees to shade Ceanothus out may prove effective.

Hand treatment

Effective. A spade, Pulaski, grub hoe, or similar tool can be used to uproot Ceanothus plants, but the root system is extensive.

Mechanical

Not effective. Cutting and mowing of Ceanothus usually will not eliminate the plants because they resprout vigorously from their well-established root system.

Chemical

Very effective when done correctly. Suitable herbicides include glyphosate and triclopyr. Timing is important. Dead plants are fuel and should be removed after the herbicide has taken effect.

Prescribed burning

Not recommended. Ceanothus resprouts after fire, and seeds lay dormant in the soil and germinate with fire.

Grazing

Partially effective, sheep and goats will eat Ceanothus leaves and green stems. Livestock requires supervision and maintenance. They will also eat desirable native vegetation.

Native Shrubs

Bitterbrush (*Purshia tridentata*) Big sagebrush (*Artemisia tridentata*)

Plant Identification and quick facts:

Bitterbrush:

- 2- to 8-foot-tall shrub with many upright stems. Bark is gray. Leaves are alternate ½- to 1-inch long that are green on top, white hairs underneath. The leaves are three-lobed. Flowers are a pale yellow (five petals) and fragrant. Shrub grows in central and eastern Oregon shrublands and with ponderosa pine, lodgepole pine and western juniper.
- Bitterbrush provides important browse for mule deer.
- Bitterbrush is very flammable.
- **Fuel reduction objective:** Remove most bitterbrush plant immediately around the home or outbuildings (Zone 1 and 2). In Zone 3, remove shrubs under trees to reduce ladder fuels. In more open areas remove shrubs keeping some uncut clumps (for wildlife) to break up fuel continuity.



Photo: Stephen Fitzgerald © Oregon State University

Bitterbrush.

Sagebrush:

- 5-foot-tall shrub with silvery hairy leaves that are narrow, wedge-shaped and three-lobed at the tip. Leaves are aromatic. Flowers are inconspicuous.
- Big sagebrush has three varieties: basin, mountain, and Wyoming. Grows in deep soils in central and eastern Oregon shrublands and within ponderosa pine and lodgepole pine forests.
- Sagebrush is flammable.
- **Fuel reduction objective:** Remove most sagebrush plants immediately around the home or outbuildings (Zone 1 and 2). In Zone 3, remove shrubs under trees to reduce ladder fuels. In more open areas, remove shrubs keeping some uncut clumps (for wildlife) to break up fuel continuity.

Recommended tools:

Shovel/grub hoe:

Dig out shrub including the main root ball.

Backpack Sprayer:

Used for applying herbicides. Consult your local Extension office or pesticide applicator professional for further information on chemical treatments.

Brushcutter, chainsaw or heavy-duty mower:

Can be used to cut shrubs down.



Photo: Stephen Fitzgerald, © Oregon State University

A home surrounded by rabbitbrush and sagebrush.

Best management practices: bitterbrush and big sagebrush

Preventative management

Remove shrubs as they germinate and are small.

Hand treatment

Hand grubbing with a hazel hoe is effective. A brushcutter works well reducing these shrubs near buildings. Bitterbrush will need to be recut in a few years.

Mechanical

For large areas in Zones 3 and 4, a 4-wheel-drive tractor with a mower or brush-hog will reduce these shrubs. The area may need to be retreated in 5 to 8 years.

Chemical

To control sagebrush, 2,4-D works well when applied in the spring and won't harm grasses. Glyphosate can be used to control bitterbrush. Timing and application procedure are very important for good control. Remove dead plants.

Prescribed burning

Prescribed burning is effective. Use fire in Zone 3 only. Be aware of risks and liability associated with using fire on private land. Contact the Oregon Department of Forestry for more information on prescribed burning.

Grazing

Grazing is not effective or practical.

Hardwood resprouts

Madrone (*Arbutus*)

Oak (*Quercus*)

Maple (*Acer*)

Tanoak (*Notholithocarpus*)

Myrtle (*Umbellularia*) and others

Plant Identification and quick facts:

- Madrone is evergreen, but sheds older leaves in early summer.
- Madrone has thin bark, resulting in trees being easily top-killed by fire. It resprouts vigorously.
- California black oak and Oregon white oak dominant in southwest Oregon forests; both black and white oaks are deciduous hardwood trees.
- Bigleaf maple is common throughout western Oregon. It favors moist, well-drained soils.



Photo: Alicia Jones, © Oregon State University

Tanoak reprints.

- **Fuel reduction objective:** Promote and maintain large, single stemmed trees. Thin out dense patches of small trees. Cut back resprouts.

Recommended tools:

Loppers

Use loppers to cut close to the stump on sprouts.

Brush cutter

Can be used to remove multiple young resprouts. Older resprouts may be more difficult to remove.

Chainsaw

Can be used to cut re-sprouts or thin out dense patches of small trees.



Photo: Stephen Fitzgerald, © Oregon State University

Madrone reprints.

Best management practices: hardwood

Preventative management

Heavy shade will suppress the growth of oak trees, especially mature trees. Surrounding conifers often shade oaks out, eventually overtopping and killing them. Young oak sprouts are more shade tolerant. To prevent sprouting, leave trees uncut.

Hand treatment

Effective short term control, but retreatment will be required. Loppers and handsaws may be used to remove re-sprouts. With effort, handsaws may be used to remove dead or dense limbs. Brush cutters are effective at removing small clusters of sprouts and loppers for spot treatments. To discourage additional re-sprouts, consider removing all but 1 to 2 dominant sprouts. The dominant sprouts will more easily develop into mature, more fire resistant trees. Chainsaws may be used to fell larger madrone and oak trees, but may result in resprout growth that adds ladder fuels to your property.

Mechanical

Not effective. Mechanized equipment is ineffective at removing whole trees and are inefficient at removing young resprouts.

Chemical

Effective when done correctly. Hack and squirt, where one or more cuts are made in the tree and a small quantity of concentrated herbicide is applied, is effective at killing standing trees. Cut stump treatments can reduce or eliminate re-sprouting. Dead plants are fuel and should be removed after the herbicide has taken effect.

Prescribed burning

Not recommended. Technically feasible but logistically difficult. Prescribed fire is effective at killing resprouts with low rates of mortality for large, mature trees, especially thicker-barked oaks. This is usually only an option for large or public landowners.

Grazing

Partially effective. Cattle or sheep are not recommended. Goats may browse oak and madrone stump sprouts, reducing growth. Repeated browsing, like repeated cuttings, may be able to kill the root system.

Invasive grasses

European Beach Grass (*Ammophila arenaria*)
Cheatgrass (*Bromus tenctorum*)
Slender False brome (*Brachypodium sylvaticum*)

Plant identification and quick facts:

European Beach Grass

- European beach grass is an invasive species that forms a dense cover that thrives on sandy dunes, reducing cover of native vegetation. It spreads almost exclusively by vertical and horizontal rhizomes, and can be washed by ocean currents to spread to new sites.
- European beach grass stems are clumped, stiff, and upright, with thick and waxy leaves that are 12 to 44 inches long with rolled edges and pointed, sharp tips. The outer surface of the leaves are smooth and light green, while the inner surface has ridges and is covered with a whitish coating. European beach grass leaves are narrower, stiffer, and lighter in color than the native beach grass, *Leymus mollis*.



Photo: Stephen Fitzgerald, © Oregon State University

European beach grass.

Cheatgrass

- Cheatgrass is an invasive annual grass 5-16 inches tall that invades disturbed sites, such as roadsides, heavily grazed areas, or areas subject to disturbance mechanical equipment and wildfire. Seeds germinate in the fall and early winter. The grass grows quickly in the spring and produce seed by early summer. Cheatgrass cures (dries out) by mid- to late June, and turns purplish to reddish-brown, and creates a dry fuel bed that is easily ignited and carries fire.

- Stems are round in cross section with sheaths that are closed. Leaves are approximately ¼ inch wide and hairy. Spikelets (seed head) are grouped in a loose open clump, often drooping to one side like a shepherd's crook. Seeds often get stuck in animal fur and in dogs' ears. Seeds are easily spread by mechanical equipment, vehicles, animals, and on footwear.



Photo: Chris Evans, © University of Illinois, Bugwood.org

Cheatgrass.

False brome

- A perennial bunchgrass growing in clumps 20-28 inches tall. It has broad, yellow-green leaves with hairs along the edges. Spikelets are not stalked and have a noticeable droop.
- Found in disturbed areas, particularly along roads. It can grow in deep shade but prefers open areas with full sunlight.

Recommended tools:

Shovel/grub hoe:

Dig out plant including the root mass.

Backpack sprayer

Used for applying herbicides. Consult your local extension office or pesticide applicator professional for further information on chemical treatments.

Weed-whacker

Can be used to remove the tops of grass plants in an area.

Best management practices: grasses

Preventative management

European beach grass, cheatgrass and false brome

- Don't use fill material from areas known or suspected to have European beach grass, cheatgrass or false brome plants or seed.
- When using equipment in areas with these grasses, power-wash equipment before and after to prevent spreading it to uninfested areas when the equipment is moved.

Hand treatment

European beach grass

- Effective when done intensely. Successful manual control through weekly to monthly digging from early spring through fall has proven successful in some sites. "Sifting" the sand with rakes to remove rhizome fragments at a depth of 19.5 to 39 inches following digging increases success of digging. Yearly follow up digging may be required.

Cheatgrass:

- Use a weed-whacker to cut down plants in spring *before* they produce seed may reduce cheatgrass spread in small areas. Repeat treatments will be necessary.
- Hand-pulling may be effective in the spring in very small areas.

False brome

- In small areas use a weed-whacker to cut down plants as seed stalks are forming to prevent seed formation and dispersal. Repeat treatments will be necessary.

Mechanical

European beach grass

- Moderately effective. When removed with heavy machinery at a depth of 3.3 feet, moderate resprouting occurs the following spring.

Cheatgrass and false brome

- Not effective.

Chemical

European beach grass

- Very effective when done correctly. The most suitable herbicide is glyphosate with a surfactant applied during active growth.

Cheatgrass and false brome

- Very effective when done correctly. There are many suitable herbicides that can be used to control these species in the late spring and early summer. Consult with your local Extension agent for herbicide recommendations.

Prescribed burning

Prescribed burning is not an effective control for European beach grass, false brome or cheatgrass. Burning often increases cheatgrass.

Grazing

Grazing is not effective for controlling European beach grass and false brome.

Cheatgrass may be reduced with intense grazing (high animal numbers, short duration) early in the spring to reduce the production of seed.

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