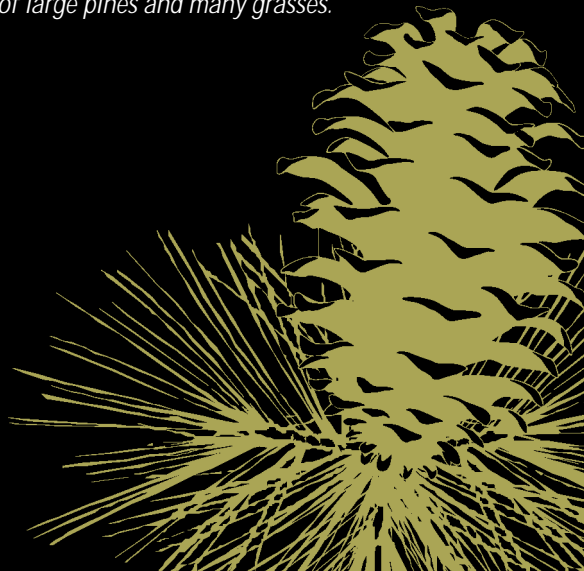


Forest Restoration for Homeowners

A Guide for Residents of Southwestern Ponderosa Pine Forests



Historically, most southwestern ponderosa pine forests were fairly open, with clumps of large pines and many grasses.



If you live among ponderosa pines, you can reduce fire risks to your home and property by carrying out restoration-based landscaping and fire-prevention projects around your house. Use these tips as guides toward restoring ecological health and living safely in the Southwest's beautiful, but fire-prone, ponderosa pine forests.

Fire in the forest

Fire has always been a part of ponderosa pine forests. It provides nutrients to plants and maintains open forest stands. But fire today is unlike what it once was.

Fire has changed because our forests have changed. Previously, low-intensity fires burned ponderosa pine forests every few years, charring the ground but leaving large trees standing. By removing dead needles and thinning young pines, fire stimulated native wildflowers, shrubs, and grasses.

Humans allowed few of these healthy fires to burn in the twentieth century. As a result, forests grew dense with small, highly flammable pines. Those thickets can carry ground fires into tree crowns, creating dangerous and fast-moving fires that can kill large trees, destroy buildings, and threaten lives.

What's restoration?

Forest restoration thins dense stands and uses prescribed fire to protect big, old trees and lower the risk of catastrophic wildfire. By reducing competition for water and nutrients, restoration improves the health of remaining trees, allowing them to better resist drought and bark-beetle attack. It also promotes growth of grasses, wildflowers, and shrubs. That's good for wildlife—and for people.

How to starve a fire

Armies of firefighters can't prevent fire from burning southwestern ponderosa pine forests—but we can help control fire by controlling the fuels it

needs. The key lies in ensuring that fire travels on the ground, where firefighters can combat it, rather than in tree crowns, where they cannot. You can do this by controlling fuels on your property in three different zones.

Around your house

- Replace your roof and siding with fire-resistant materials. Embers from even a distant fire can ignite flammable wood shingles. Consider fire-resistant materials when it's time for construction, repair, or replacement. Ask your city or county building department for more information.
- Remove flammable materials from around your house. Remove pine needles and other flammable materials from your roof and gutters. Ensure that branches don't hang over the roof or grow under eaves. Rake fallen leaves and pine needles away from your home's foundation, creating a 2-foot-wide perimeter down to bare mineral soil. Move firewood and propane tanks well away from the house. Make sure that wood fences, walkways, and decks don't allow fire to spread to your house.
- Have tools and water ready for fire. Maintain an outdoor water supply, with a hose and nozzle that can deliver water to all parts of your home and yard. Store fire-fighting tools (rakes, hoes, axes, shovels) in an accessible place.

Within 100 feet of your house

- Create a defensible zone around buildings. Ensure that fire cannot spread within 100 feet of your house or other buildings. In this zone, mow dry grasses and weeds; prune branches of taller trees to a height of between 6 to 10 feet; remove dead limbs, fallen leaves, and other dry fuels; keep plants watered; and maintain open space between tree crowns.
- Clear pine needles, leaves, and branches. Dispose of heavy accumulations of pine needles, fallen leaves, and other flammable materials.
- Allow good access. Maintain a wide, uncluttered driveway with sufficient vertical and horizontal clearance to allow fire engines to enter and to turn around. Post your house number so that it is visible from the street.



Careful prescribed fires can reduce fuel accumulations and wildfire risk.

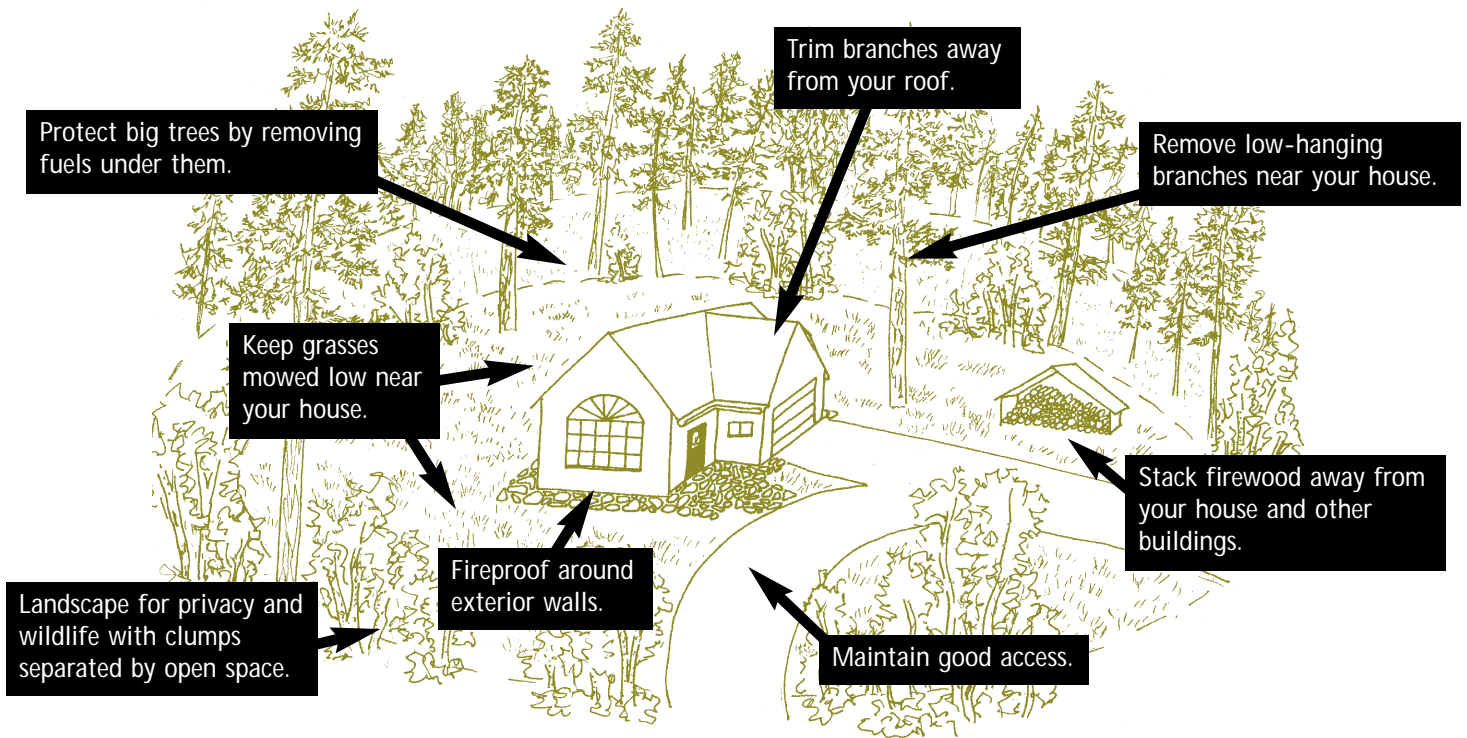
Beyond 100 feet from your house

- Remove "ladder fuels" to reduce crown fire danger. At distances over 100 feet from the house, you can lower the danger of crown fire without losing the forest's natural qualities. Do so by removing small trees and dead, dangling branches that could carry fire from the ground into the tree canopy. Be sure to remove thinned materials promptly.
- Protect big, old trees. Large pines provide important wildlife habitat, increase property values, and look great. The same actions that can protect your house will help to protect old trees: rake pine needles and woody debris at least 2 feet away from their trunks, and trim nearby small trees and shrubs that could carry fire into their crowns.
- Think clumps. You can leave some clumps of dense trees and shrubs standing for visual screening or for wildlife habitat, as long as they're separated from your house and from one another by defensible open space—and placed so they can't carry fire into the crowns of large trees.
- Think openings. Openings with grasses and other low vegetation are important for many wildlife species, and can help stop a fire.
- Think wildlife habitat. Living trees with dead branches are particularly important for birds such as woodpeckers and bluebirds; so are scattered patches of denser vegetation.
- Clear out piles of downed logs and branches. Remove heavy accumulations of downed brush and logs. If you or firefighters burn piles to get rid of this material, make sure they are far enough from remaining trees to avoid scorching living crowns.
- Consider prescribed burning. Prescribed fires can help reduce dangerous fuel accumulations and stimulate grass and wildflower growth. Check with your fire department—some conduct prescribed burns on private land.

Landscaping ideas

You can help increase fire resistance—and provide good wildlife habitat—through smart landscaping. Fire-safe landscaping can include varied wildlife habitats and low-water-use plants that conserve precious water supplies.

- Mow grasses and wildflowers low around shrubs, trees, and buildings. This can interrupt a fire's fuel ladder.
- Plants nearest your home should be widely-spaced and low-growing. Consider low, native ground covers—see page 4 for ideas.
- Keep plants immediately around your house well-watered and well-maintained. Regular watering, and removal of dead leaves and branches, can help reduce fire danger.
- Don't plant in large masses that can intensify fire. Use small, irregular clusters of plants. If you plant trees or shrubs for privacy, place them in "islands" at a distance from buildings or large trees.
- Use decorative rock, gravel, and stepping stones for landscaping and paths. They can break up ground fuels.
- Use mulch to conserve water and inhibit weed growth. Rock mulch, cinders, or gravel can maintain soil moisture without increasing fire danger.
- Use native plants that tolerate local conditions. For a list of native, fire-resistant plants, consult your local Cooperative County Extension office, botanic garden, planning department, or garden club.



- Choose fire-resistant plants. Many native southwestern plants resist fire. Some have succulent leaves that store moisture and don't burn readily.
- Use deciduous plants for privacy and wildlife habitat. Many deciduous trees have low resin content, are less flammable than evergreens, and attract birds and mammals. Native shrubs can also provide visual screening and wildlife food and cover.
- Leave extra space on slopes. Fire travels more quickly up slopes than on flat ground, so make sure tall, woody plants or groupings on slopes are spaced widely. Well-maintained native perennial ground covers can control erosion without significant fuel increases.
- Create rock piles rather than brush piles. Try providing cover for wildlife with rocks rather than with piled dead brush.
- Control invasive species. Such nonnative plants as Dalmatian toadflax, cheatgrass, and spotted knapweed threaten natural forest diversity. Some of these species readily carry fire. Prevent their spread by mulching, maintaining native plants, and avoiding unnecessary soil disturbance. If they appear, hand-weeding and selective herbicide use can control them.

Living with smoke

Fire is here to stay in southwestern ponderosa pine forests. To help prevent wildfires from reaching private property, land managers often treat surrounding forests with thinning and prescribed burning to reduce fuel loads.

Prescribed fire produces smoke—but much less than an uncontrollable, dangerous wildfire does. The choice is simple: if we refuse to tolerate occasional light smoke from controlled, prescribed fires, we will probably experience heavy smoke from unpredictable and dangerous wildfires at some time.

Smoke will sometimes be carried long distances by wind, or into drainages in the cool of evening. Areas far from the fire can become smoky. Forest managers work to minimize smoke impacts, and typically give advance warning of prescribed burns. Contact the agency conducting burns if you have concerns about smoke; many have plans for warning and temporarily moving people who are sensitive to smoke.

Where to go for help

- Ask your local fire department or Cooperative County Extension office. Some fire departments will help in marking trees before thinning; some also assist with thinning and prescribed burning on private land. They can refer you to contractors who thin trees and clear brush.
- Find extension information online (see below). Extension services have compiled many publications on rural home fire safety, fire-resistant landscaping, invasive species, and related topics.
- Check out Firewise information. See www.firewise.org for more information about home fire protection.

Extension information online

Arizona: www.ag.arizona.edu/extension/firewise

Colorado: www.colostate.edu/Depts/CSFS/homefire.html

New Mexico: www.emnrd.state.nm.us/forestry/20Communities/Handbook_TOC.htm

Utah: www.extension.usu.edu/publica/natrp2.htm

- Work with your homeowners' association. Planning for subdivision fire protection can help protect all the homes within it.
- Learn how to landscape for wildlife. For tips, see www.nwf.org/backyardwildlifehabitat.
- Plant natives. See *Native Plants for High-Elevation Gardens* (Fulcrum Press, 2003) or *Beyond the Ponderosa: Successful Landscape Trees for Higher Elevations in the Southwest* (Flagstaff Community Tree Board, 1998) for landscaping ideas; check with a botanic garden or native plant society; or see www.hort.usu.edu/natives/nurseries/Alpha.html for a list of native plant nurseries in your area.

- Get to know your local weeds. Visit www.weedcenter.org or www.usgs.nau.edu/SWEPIC for guides to identification and control of noxious plants.
- Contact your state forest service. State foresters can provide advice, and sometimes can arrange cost-sharing plans for private landowners interested in thinning forest land through the National Fire Plan; see www.stateforesters.org for a directory.
- Contact the Ecological Restoration Institute for information about forest ecology and restoration. Visit our website at www.eri.nau.edu, or call us at 928-523-7182.

Native Plants for Landscaping

Trees

Gambel oak (*Quercus gambelii*)
 Quaking aspen (*Populus tremuloides*)
 New Mexico locust (*Robinia neomexicana*)
 Box elder (*Acer negundo*)
 Rocky Mountain maple (*Acer glabrum*)

Shrubs

Buffaloberry (*Shepherdia* spp.)
 Snowberries (*Symphoricarpos* spp.)
 Utah serviceberry (*Amelanchier utahensis*)
 Wild roses (*Rosa* spp.)
 Three-leaf sumac (*Rhus trilobata*)
 Golden currant (*Ribes aureum*)
 Fendler's buckbrush (*Ceanothus fendleri*)

Grasses

Blue grama (*Bouteloua gracilis*)
 Arizona fescue (*Festuca arizonica*)
 Indian ricegrass (*Achnatherum hymenoides*)
 Western wheatgrass (*Pascopyrum smithii*)
 Mountain muhly (*Muhlenbergia montana*)
 Muttongrass (*Poa fendleriana*)
 Prairie junegrass (*Koeleria macrantha*)
 Little bluestem (*Schizachyrium scoparium*)

Wildflowers

Common yarrow (*Achillea millefolium*)
 Silvery lupine (*Lupinus argenteus*)
 Blue flax (*Linum perenne*)
 Penstemons or beardtongues (*Penstemon* spp.)

Coneflowers (*Echinacea*, *Ratibida*, and *Rudbeckia* spp.)

Ground Covers

Creeping barberry (*Mahonia repens*)
 Cinquefoil (*Potentilla* spp.)
 Kinnikinnick (*Arctostaphylos uva-ursi*)
 Prairie smoke (*Geum triflorum*)
 Alum root (*Heuchera* spp.)
 Pussytoes (*Antennaria* spp.)



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