

BASIC CONCEPTS TO REMEMBER FOR LIVING WITH WILDFIRE IN THE SIERRA NEVADA

- ▲ **Fire is a dynamic element of the Sierra.** Your property has likely burned before and will burn again. The landscape where you live today may seem “natural.” In fact it has changed drastically over the last 150 years as we have attempted to manage fire. In preparing your property for fire, you can help restore it to a more ecologically appropriate state. In doing so, you will learn how to be prepared for wildfire—it is not only possible, it’s smart. While it is rarely practical to completely “fire proof” your property, there are many steps you can take to survive inevitable wildfire. www.fire.ca.gov/education_content/downloads/live_w_fire.pdf



- ▲ **One size does not fit all in terms of homeowner fire safety.** Every place is unique. Work with your local Fire Safe Council,³ fire department, Cooperative Extension Agent,⁴ Registered Professional Forester,⁵ and/or contractors to design the appropriate fire-safe practices⁶ and defensible space⁷ for your property. www.fire.ca.gov/education_100foot.php; www.firesafecouncil.org/homeowner/index.cfm

- ▲ **Your home exists within a larger watershed⁸** in the midst of a much larger landscape. Think about where your property is on the slope.⁹ Are you on top of a ridge, where fire will easily burn toward your home? Is your slope steep or gentle? Fire moves quickly up steeper slopes, which means that you may need to treat a larger area to create your defensible space. What is below and above you? What direction or “aspect¹⁰” does your property face? Generally, south-facing properties are hotter and drier; they can therefore be more susceptible to fire. Are there any natural firebreaks¹¹ around you such as streams, rivers, or rocky outcrops where a fire might die? Do wildlife use or move through your property to get to food, shelter, or water? In what watershed do you live? Do the roads in and out of your property follow ridges or rivers? Look beyond your property lines to understand the ecological perspective of your place. www.audubon.org/bird/at_home/Explore.html

Most Sierra Nevada residents choose to live here because of the natural beauty. What many of us don’t realize is that living within these forests and wildlands¹ carries a responsibility. We need to be good stewards of the land, learning to live in balance with the natural world, of which fire is a significant part.

This document summarizes what you can do to coexist with fire in the Sierra, showing you how to provide a positive balance among fire prevention,² conservation, and wildlife protection.

You’ve chosen to live here, and with your choice comes a stewardship responsibility.

WHERE TO FIND MORE INFORMATION

California Fire Safe Council:
www.firesafecouncil.org/homeowner/index.cfm

CAL FIRE: www.fire.ca.gov/education_homeowner.php

Homeowner’s Wildfire Mitigation Guide:
groups.ucam.org/HWMG/index.cfm

Fire Safe Landscaping: www.edcfiresafe.org/fire_safe_vegetation.htm;
www.plumasfiresafe.org/Documents/PNF_BRD%20Fire%20Resistant%20Plants.pdf

Firewise: firewise.org/resources/homeowner.htm

California Defensible Space Guidelines:
www.bof.fire.ca.gov/pdfs/Copyof4291finalguidelines9_29_06.pdf

YOUR LOCAL FIRE SAFE COUNCIL:



For the complete text of this document, with live internet links, please see: forevergreenforestry.com/SierraConservationCWPP.html

TAKING ACTION PREPARING FOR WILDFIRE IN THE SIERRA NEVADA

A landowner guide for balancing fire safety and conservation values.



“Fire always has been and always will be an ecological force in the Sierra Nevada. Decades of fire suppression have changed this role, allowing stands to thicken and fuels to accumulate, especially in the foothills and lower montane zone, where developments are increasing. We either manage fire and live with fire on our terms or let fire dictate the terms. The choice is ours.”

~ JAN W. VAN WAGTENDONK, Wildfire (2006)

▲ **Fire can behave both predictably and unpredictably.** We can generally predict fire direction and behavior, going with the wind and burning all available fuel.¹² Predicting the exact time and place where fire will burn is less obvious. As fire moves across the landscape it can climb up into your trees. A key fire safety objective is to stop this. Dead leaves and branches on the ground (surface fuels¹³) act as a wick¹⁴ to move fire horizontally across the land. Shrubs, small trees, and live branches (ladder fuels¹⁵) can carry fire vertically into the larger trees. Too much of these surface and ladder fuels can cause the tallest trees to burn up in what is called a “crown fire”—when fire spreads from tree to tree in the forest canopy (or tree tops). Create physical space between vegetation layers (both vertically and horizontally) so a fire cannot climb easily from the ground into the trees or to your home. www.for.gov.bc.ca/protect/suppression/behaviour.htm#Behaviour

▲ **Timing is everything.** There are appropriate times for different actions on your property, much as there are different seasons of work in your garden. Do your defensible space and fuel reduction work well before fire season, to avoid having sparks from equipment start fires in dry vegetation. Avoid ground-disturbing¹⁶ activities in your forest or wildland when the ground is too wet or when birds and animals are nesting. Don't try to do everything at once—think about your fire safety seasonally: plan your activities in the winter and spring; clear after the ground begins to dry (when it's not saturated¹⁷) or when there is snow on the ground; finish treatments by early summer before the vegetation is dry; maintain your defensible space around and inside your home in the fall; and burn your piles after the winter rains begin.



▲ **Your house is likely a fuel source.** Many Sierra homes are located in places where a fire can start and spread into surrounding vegetation. The more you prepare your house and other structures, the less you will have to treat the surrounding vegetation. The biggest improvement you can make is to build or remodel your house to resist the millions of tiny embers¹⁸ created by wildfire ember-attack.¹⁹ When wildfires burn in extreme conditions they send burning firebrands (embers) ahead of them; these firebrands ignite new fires. Using fire-resistant building materials²⁰ and appropriately designed structures will give you the best chance to survive wildfire. Replace wood shake roofs with fire-resistant materials. Don't let your home be part of the problem. firecenter.berkeley.edu/toolkit/homeowners.html; groups.ucanr.org/HWMG/index.cfm; firewise.org/resources/files/wildfr2.pdf If you are building a new home, consider slope, aspect, surrounding fuels, and your potential environmental impacts before deciding where to site it. This may be more important than the view in the long term. Talk to your local planning department and fire marshal to learn about local fire-safe building regulation. osfm.fire.ca.gov/WUIBS.html

▲ **Know your legal obligations.** Learn the legal requirements regarding defensible space and fire-safe building and construction. Discover how to balance these with the ecological needs of your place.

▲ **Firefighters need your help to protect your home.** Make it safe for them and their equipment to get to and from your house. Be sure they can find you with visible road and address signs. Fire-safe landscaping and construction greatly improves firefighters' ability to protect your home. Be a winner! www.livingwithfire.info/beforethefire/accesszone/index.php.

GLOSSARY

¹ Wildlands: An area of land that is uncultivated and relatively free of human interference. Plants and animals exist in a natural state, thus wildlands help to maintain biodiversity and to preserve other natural values.

² Fire Prevention: Actions taken by homeowners and community members to lessen wildfires and their damage caused. Includes education, enforcement, and land management practices.

³ Fire Safe Council: An informal group of public and private individuals and organizations gathered to promote and increase fire safety.

⁴ Extension Agent: An employee from the government or a university who provides information to rural communities about agriculture, land management and/or resource management. In California, the University of California Cooperative Extension (UCCE) provides this service.

⁵ Registered Professional Forester (RPF): A person licensed in California to manage state or private forestlands and advise landowners on management of their forests.

⁶ Fire Safe Practices: Activities such as creating defensible space, firebreaks, access to your home, and fire-resistant landscapes and homes, that make your home and property safer in wildfire situations.

⁷ Defensible Space: An area around a home or structure that has been cleared of flammable materials to act as a barrier between wildfires and property, thereby decreasing the risk of damage or loss. This space is now defined as 100 feet around a structure in California.

⁸ Watershed: All of the land (from ridge to ridge) that drains water runoff into a specific body of water, e.g. drainage areas or basins.

⁹ Slope: A percentage or degree change in elevation over a defined distance that measures the steepness of a landscape.

¹⁰ Aspect: The direction that a slope faces, e.g. north, south, east, west.

¹¹ Firebreak: A strip of land that has been cleared of vegetation to help slow or stop the spread of wildfire, such as a road, trail, or path cleared of vegetation, or natural areas such as streams or rocky outcrops.

¹² Fuel: All burnable materials including but not limited to living or dead vegetation, structures, and chemicals that feed a fire.

¹³ Surface Fuels: Materials on the ground like needles or low-growing shrubs that provide the fuel for fires to spread on the ground; generally all fuels within six feet of the ground.

¹⁴ Wick: A combustible material that allows fire to travel along a confined path to larger fuel sources. An example would be a wooden fence connected to your home.

¹⁵ Ladder Fuels: Materials such as shrubs or small trees connecting the ground to the tree canopy or uppermost vegetation layer. In forests, this allows fire to climb upward into trees.

¹⁶ Ground-Disturbing Activities: Actions that interrupt the natural condition of the ground, such as digging and compaction from heavy equipment.

¹⁷ Saturated: The broad meaning is “full.” Saturated soil refers to the point at which the soil is so full of water that no more water can get into (be absorbed by) the soil, and therefore must run off.

¹⁸ Embers: Small glowing or smoldering pieces of wood or other organic debris, often airborne in a fire.

¹⁹ Ember Attack: Embers blown by the wind during a firestorm that accumulate at intersections between horizontal and vertical members on the outside of your house, igniting debris and combustible materials. Embers can also enter into openings (e.g., attic vents and other wall openings), igniting debris on the inside of your home.

²⁰ Fire-Resistant Building Materials: Materials used in the construction of a house that are resistant to ignition when exposed to radiant heat or flames, e.g. clay tile roofs, metal roofs, and stucco siding.

²¹ Monitor: To watch, keep track of, or check regularly for changes—in this case, to the environment.

²² Adaptive Management: An approach to managing the environment or property that is based on a “learn by doing” technique adjusting to changing conditions over time with new information.

²³ Fire-Resilient Landscape: A natural landscape featuring plants that have adapted to local wildfire conditions, or a domestic outdoor space where appropriate actions have been taken to make it less vulnerable to wildfire and certainly less prone to causing one.

²⁴ Precautionary Principle: A concept that promotes a cautious approach to development and managing the environment when information is uncertain or unreliable. Erring on the side of caution and conservation is encouraged, along with a “Better safe than sorry” attitude.

²⁵ Fuel Treatment: The act of removing burnable materials to lower the risk of fires igniting and to lessen the likelihood of damage to property and communities, e.g. creating a defensible space, developing fuelbreaks, initiating prescribed burns, and thinning vegetation.

²⁶ Resilient, Resiliency: The ability of an ecosystem to return to its balanced state after a disturbance.

²⁷ Invasive Weeds: Undesirable plants that are not native and have been introduced to an area by humans. These plants generally have no natural enemies and are able to spread rapidly throughout the new location, e.g. Himalayan Blackberries, English Ivy, and Scotch Broom.

²⁸ Duff: A layer on the forest floor that is made up of decomposing organic matter such as leaves, needles, and small branches.

²⁹ Regeneration: The renewal of trees or forests by planting seedlings, or the direct seeding by humans, wind, birds, or animals after large disturbances like fire. “Regeneration” also refers to the young trees that were naturally seeded or planted.

³⁰ Untreated: Not altered from a natural or original state; e.g. no fuel reduction or defensible space activities.

³¹ Cover: Any plants or organic matter that holds soil in place, or grows over and creates shade that provides wildlife with an area to reproduce and find protection from predators and weather.

³² Seep: An area where water rises from an underground source to the surface and creates a wet area.

³³ Sediment: Particles of topsoil, sand, and minerals that come from soil erosion or decomposing plants and animals. Wind, water, and ice carry these particles; when the sediment collects in waterways it can destroy fish and wildlife habitat.

³⁴ Snag: A standing dead tree that has usually lost most of its branches. Snags offer essential food and cover for a host of wildlife species.

³⁵ Soil Type: Refers to the different combinations of soil particles and soil composition. Soil can vary greatly within short distances.

³⁶ Disturbance: In terms of soil, various activities that disrupt its normal state, e.g. digging, erosion, compaction by heavy equipment.

³⁷ Compact: To pack closely or tightly together, as in the fragments of soil being compacted from heavy equipment, thereby limiting the ability of oxygen or water to pass freely.

³⁸ Flammable: A quality of a substance that makes it likely to catch fire, be easily ignited, burn quickly, and/or have a fast rate of spreading flames.

³⁹ Erosion: The removal of soil over time by weather, wind and/or water such as rain or water runoff from roads.

⁴⁰ Unstable: Land that is lacking stability, or liable to change with activity, e.g. steep slopes or crumbly soils.

⁴¹ Riparian: A strip of land along the bank of a natural freshwater stream, river, creek, or lake that provides diversity and productivity of plants and animals.

⁴² Access Roads: Roads that allow entrance into and out of a property.

Conservation Principles for Community Wildfire Protection in California's Sierra Nevada

Consider the Conservation Principles below in how you approach your fire safety and defensible space. It's all about balance. You can have an aesthetically pleasing landscape that is fire-safe, supports local plant and animal species, and still provides privacy and plantings.

1. REMEMBER THE VEGETATION (NATIVE TREES AND OTHER PLANTS)

a. Discover and monitor your forest and vegetation's dynamic changes.

Plan for the future. Because you are the conservation steward of your land, your work will be ongoing. Watch the wild areas on your property and learn from them as they grow and change with your stewardship. Think both in the short term (what will happen this year) and the long term (what will happen over time). Document those changes as the years go by; keep notes and records. Learn how to monitor²¹ the ecological changes on your property and use that information for adaptive management.²² Living with wildfire means taking the responsibility to manage, adapt, and guide the vegetation around our homes. www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Planning/Evaluating_Land.htm

b. Act conservatively.

We are manually recreating a more fire-resilient landscape.²³ In doing this, we need to apply the general concepts of the precautionary principle²⁴ while implementing fuel treatments:²⁵ you can always remove more trees and vegetation at a later time, but you cannot immediately replace what you have cut. What you leave is ultimately most important. Use careful planning and consideration to ensure that what you leave standing is healthy and resilient.²⁶ www.mindfully.org/Precaution/Precautionary-Principle-Common-Sense.htm

c. Protect native species that share your home.

Look at the native vegetation around your property—or ask a local plant or forestry specialist for help—to see what different plants share your home. There may be plants that are rare. If so, protect them by providing defensible space (while keeping in mind their needs, such as shade). Find out if those plants exist in other areas within your watershed and how they are being managed there. Watch for invasive weeds.²⁷ Follow vegetation treatments with invasive weed removal. Minimize the introduction of exotic plant species near your home, especially those that can spread into adjacent wildland areas. Invasive species can change your fire hazard very quickly and be difficult to manage.

Avoid unnecessarily introducing water into your landscape, as water will generally help non-native plants out-compete native plants. www.cal-ipc.org, www.ipm.ucdavis.edu/PMG/weeds_common.html

d. Keep the oldest and biggest trees.

Generally, most of the oldest trees in the forest are no longer present. If you have old or very large trees, create defensible space



e. Conserve rare and endangered species.

One of the bonuses—and responsibilities—of living in the Sierra is living with the many rare and endangered species with which you share habitat. Learn about them by talking to your local Cooperative Extension Agent or a wildlife biologist. Plan your fuel reduction actions around the needs of these species. Often by a fairly minor refinement of your activities, such as timing, technique, or extent, you can protect species while realizing your fuel reduction goals. www.dfg.ca.gov/hcpb/species/t_e_spp/tespp.shtml

3. REMEMBER THE SOIL

a. Maintain the life in your soil.

There is as much or more activity below the ground on your property as there is above the ground. Keep this in mind in terms of what you do above ground. Talk to your Cooperative Extension Agent or local gardeners to find out what soil types³⁵ are on your property, some can tolerate much more disturbance³⁶ than others. Minimize activities that could compact,³⁷ flood, or poison your soil. The health of your land is directly dependent on the health of your soil. As such, the soil is one of your most valuable assets. managingwholes.com/new-topsoil.htm

b. Ensure that your soil cover is fire safe.

Replace cover that burns easily (such as dry or dead vegetation) with cover that is less flammable³⁸ (e.g. gravel or fleshy green plants). Ensure that if and when a fire comes through, it is not so hot that it kills your soil life. Rather, it should move through without a lot of fuel to consume in its path. For example, a very light layer of pine needles can help with soil erosion (see below), but too much can be a fuel problem.

c. Minimize erosion.

Protect your soil by keeping it covered. Cover helps to prevent erosion³⁹—especially on ground

If you have old or very large trees, create defensible space around them so they will survive wildfire. This may include raking away thick duff²⁸ at their base. These trees often have thick, fire-resistant bark; they have evolved with fire. Think about their protection in terms of building a fire in your woodstove; a big log won't start burning without a lot of smaller kindling (e.g. small trees, shrubs, branches, etc.). In your forest, make sure that the smaller kindling isn't around the bottom of your big trees; generally the trees will make it through a wildfire on their own. Sometimes you'll need to remove smaller trees that touch the crown of the tallest trees. Don't remove all of them, small trees are the next generation of large trees. Keep enough regeneration²⁹ for the future forest (possibly in small patches), while still providing space between the trees you keep standing. Your biggest trees also break up the wind as it's moving through, which can slow down fire spread. www.eri.nau.edu/cms/content/view/544/740/

2. REMEMBER THE WILDLIFE

a. Provide local wildlife a place to live.

Become familiar with the animals that share your property. Talk to local wildlife experts and/or bird watchers. Learn what wildlife need in terms of shelter, food, water, and reproduction. Your property is their home too. Balance your land management activities with their needs, leaving some areas untreated³⁰ for the birds and wildlife. Protect these as you would your home by creating defensible space (while still considering their needs for cover³¹). If you watch quietly you may see animals using those areas. www.fs.fed.us/psw/rsl/projects/wild/verner/psw_37.html; cetuolumne.ucdavis.edu/newsletterfiles/Master_Gardener_Articles_20044858.doc

b. Provide access to food and water.

Protect and retain trees with nests and cavities, or where obvious wildlife feeding or nesting is occurring. Leave some plants that have berries or other wildlife food. Be especially carefully and leave cover around streams, seeps,³² or other wet areas to keep them cool and wet; this helps wildlife who use those places to move about. Ensure all natural water supplies are clean by keeping any poisons and sediment³³ away from any water that could drain into them. www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Backyard/Backyard_Intro.htm

c. Protect future generations of wildlife.

Find out when local species are nesting and/or breeding and avoid working in and around your wildlands during those times. Learn what kind of habitat local species might use and be sure to protect those areas. www.paws.org/about/emailnetwork/archive/wildagain/wild_2004_06_02.html; www.audubon.org/bird/at_home/SafeMisc.html

d. Value the standing dead trees.

Standing dead trees—or snags³⁴—are especially important for wildlife, providing both shelter and food to many birds and other animals. However, they can also be a wildfire hazard if they are near enough to fall on your home or fall and block an evacuation route during a fire. Balance the needs of wildlife with your need for fire safety. Think about your home within the landscape; if you've got snags in the area, you don't need them next to the house. Find the most appropriate actions for your unique place. www.nwf.org/backyard/snags.cfm



Protect your soil by keeping it covered. Cover helps to prevent erosion³⁹—especially on ground that is not flat—keeping the soil in place. Don't let soil move across your property, particularly not into streams or other natural water sources. Keep ground-disturbing activities away from unstable⁴⁰ and riparian⁴¹ areas. Pay special attention on steep slopes. The steeper the slope, the faster the soil can move downhill if its disturbed, and the faster a fire can climb uphill under the right (or wrong!) conditions. www.uri.edu/ce/healthylandscapes/tips/6.html

d. Protect your soil after a fire.

Soil can be most fragile after a wildfire, especially if winter rains soon follow. If you have experienced fire on your property, get cover onto your soil as soon as you can to prevent erosion. Your soil is alive, help it grow. www.ext.colostate.edu/PUBS/NATRES/06308.html; www.cnr.uidaho.edu/afterforest/AftertheBurnFINAL.pdf

4. REMEMBER THE PEOPLE

a. Plan your actions with your neighbors.

Talk to your neighbors. Find out what they are doing on their land. Find ways to cooperate in your land management actions. Your defensible space will likely impact your neighbor's chances of surviving a wildfire and vice-versa. Talk about what to do in an emergency and how to most safely evacuate. Find out if there is a Fire Safe Council (FSC) in your community, and if so, get involved. Help make your community a Firewise community. Coordinated work amongst neighbors will have a greater impact on your individual fire safety. www.fire.ca.gov/about_content/downloads/Evacuation2006.pdf

b. Find experienced workers and treat them well.

Workers with chainsaws in hand are the actual decision-makers as to what stays or goes in your forest. If your objective is to reduce fuels while still maintaining ecological integrity and diversity on a site, your workers must have the knowledge and experience to help you achieve this. Involve the workforce in the design, planning, and monitoring of projects. Talk to your local FSC or neighbors; check references to find reputable contractors. Pay workers well (and bring them cookies!) to achieve better ecological outcomes on the ground. Happy, respected people do the best work.

c. Work with your local fire department.

Talk to your local firefighters. Find out what they need to safely get to your house and back out. Make sure that your access roads⁴² are safe; maintain your fuel treatments along all roads, both for firefighter safety in protecting your home and your evacuation safety. Let firefighters know where you live and what's on your property; invite them out to see it. Have street and address signs visible so out-of-town firefighters can find you if there is a big fire. Make sure you have a water supply they can find and use. Know where and how to turn off any fuel sources such as natural gas or propane. www.projecttabs.org/pdf/firedepartment.doc