



FORESTLAND STEWARDS

WORKING TOGETHER FOR HEALTHY FORESTS

After the Fire

This year California experienced the fires we've been dreading for years. Although summer wildfires are expected, this time there were almost 2000 burning at one time, which stretched fire fighting capacity to the limit. Some areas had no fire crews available for weeks. Fires also occurred in areas that seldom burn, like the redwood region (p. 5). This year was a tough fire season—whether an aberration or harbinger of things to come remains to be seen.

For those directly affected by the fires, there is a steep learning curve. So much to do and so little time to protect the forest resources before fall rains and other threats arrive (p. 7).

The basic steps to fire recovery fall include the following:

- Assess the Damage
- Control Erosion
- Protect the Road System
- Monitor Tree Damage
- Regeneration/Reforestation
- Tax Implications
- Professional Help

This issue provides a quick primer on many of these topics. The articles touch on areas you need to consider and provide links and references to more information (e.g., p. 10).

This issue also contains valuable information for those who were fortunate enough to have escaped this year's fires. Reforestation (p. 2), erosion control (p. 3), road protection (p. 4), and wildlife (p. 12) are topics of interest to any forest landowner.

Don't forget, there are many resources available to you, including technical and some financial assistance. Contact your local NRCS, UC Cooperative Extension, or CAL FIRE office to learn more (p. 10).

Redwood burl already sprouting two months post-burn

Photo: Yana Valachovic

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Forest Recovery: Regeneration or Reforestation

After a devastating forest fire there are two general ways to get your forest up and going again: regeneration or reforestation. The natural way is to let the forest regenerate itself. However, reforestation can speed the process along. Each option has pros and cons—how you proceed depends on your goals for your forest.

The great benefit of natural regeneration is that it is free. Seeds grow into mature trees... eventually. The speed at which this occurs depends on the characteristics of the soil after the fire, proximity and quality of seed-bearing trees, competition from other vegetation, weather and many other conditions. In some cases seedlings may be outcompeted by brush that dominates the site for years, even decades, until the trees grow tall enough to take over.

Reforestation, on the other hand, requires money and effort. While landowners are not required to replant a forest after wildfire, if you want to speed the development of a mature forest this is the way to go.

Successful reforestation takes knowledge and hard work...professional assistance is highly recommended.

Prepare Your Site. Preparing the site may include ripping hydrophobic (p. 9) or compacted soil, removing fire or harvest residue, and controlling weeds. Good site preparation is vital for a successful planting.

Choose Appropriate Tree Species. The species you select depends on your unique site characteristics as well as your goals. Choose species that would naturally grow on the site and that are adapted to survive there. When purchasing seedlings, be sure to get ones that come from the same area and elevation (seed zone maps for Southern CA: http://frap.cdf.ca.gov/webdata/maps/statewide/seedzsou_map.pdf and Northern CA: http://frap.cdf.ca.gov/webdata/maps/statewide/seedznor_map.pdf).

Plant Seedlings. Planting seedlings rather than seeds is recommended in California because seeds have a low success rate due to loss from animal and insect predation. Seedlings are sold as 1-year (containerized) and 2-year (bare root) stock. Proper handling and planting techniques are extremely important. A comprehensive guide to planting can be found at <http://anrcatalog.ucdavis.edu/pdf/8237.pdf>.

Seedling Care. Seedlings need to be protected from a number of threats in their first few years. Drought, sun, weeds, and animals can damage or destroy all your hard work. Monitor seedlings carefully and mitigate any threats that arise.

Weed control. Weeds (unwanted vegetation like grasses and shrubs) should be controlled for the first 2 or 3 years to give seedlings a head start. Otherwise the seedlings may be overrun by competing vegetation and take much longer to achieve dominance.

Technical assistance. Planting a forest is a big investment in time, money, and effort so you want to do it right the first time. Contact your local CAL FIRE, NRCS, or UC Cooperative Extension office for advice and support (p. 10).

Seedlings available from the State nursery

The CAL FIRE nurseries grow bareroot and containerized seedlings for the general public and conservation groups. These trees can only be used for specific types of projects, including reforestation, erosion control, and watershed protection.

For successful planting, it is important that seedlings be from stock from the same seed zone as your property. The nurseries collect cones from zones throughout California, focusing on areas of greatest need, such as Southern California, where there has been major damage from insects and wildfire.

Seedlings are sold by species at 25 or more per bundle. For a better price, contracts for growing seedlings are available for quantities of 5000 seedlings or more. This is a good option when several neighbors can go in together on an order, especially for reforestation of a burn area.

Orders are processed beginning November 1. Seedlings start shipping the first part of December.

For more information and for order forms go to http://www.fire.ca.gov/resource_mgt/resource_mgt_statenurseries.php or contact the nursery staff at cdfnursery@fire.ca.gov or 530-872-6301.

Protect your Soil and Water

A number of control measures can be taken to lower the soil erosion hazard, and protect your land's productivity and water quality, the first few years after a fire. The goals of these measures are to cover the soil surface and protect it from raindrop impact, improve the soil's ability to absorb water, and reduce the amount and speed of overland water flow.

Initially the soil can be covered with slash (downed branches), mulch, and/or planted or seeded with vegetation (usually a grass that sprouts quickly and has a dense, fibrous root system to bind the soil).

For large areas where covering the soil is not economically feasible or will not occur quickly enough, the first step is to control water running over the soil by erecting barriers that slow and

disperse runoff, reducing its erosive power and allowing it to soak in or settle out sediment before reaching a stream.

Slash. Tree limbs and branches can be spread on the soil to reduce raindrop impact. If branches are cut small enough (slashed) to come in contact with the soil, they will also help disperse overland waterflow and reduce runoff and erosion.

Mulch. Straw can be spread over the soil at 2 tons per acre, or about 100 pounds per 1,000 square feet (an average 74-pound bale covers about 750 square feet). On steep slopes it helps to punch the straw into the soil with a long, narrow-bladed shovel (tranplanting/tile spade). The

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Erosion control and road maintenance practices (arrows indicate water flow). Adapted from Handbook for Forest and Ranch Roads (Mendocino County Resource Conservation District, June 1994) by Recovering From Wildfire, A Guide for California's Landowners.

Watch for invasives

Disturbed soil is a good breeding ground for unwanted invasive species. These plants can change the habitat in ways that are extremely destructive to the natural ecosystem.

- Buy only certified weed-free mulch.
- Learn to identify invasive species in your area.
- Remove invasives immediately—even small populations can expand quickly and become difficult or impossible to eradicate.



Yellow star thistle is a common invasive plant in California.

Jo-Ann Ordano © Cal Academy of Sciences

result should look like the tufts of a toothbrush. It is important that the straw be certified weed-free. Landscape fabrics, or geotextiles, can also be used to control erosion, but are more expensive than straw or natural mulches.

Seeding. Grass seed can sprout quickly and grow roots to hold the soil. Depending on the type and amount of vegetation present before the fire, the intensity of the fire, and the amount of soil disturbance, there may be sufficient grass and herbaceous plant seeds in the soil to germinate and provide cover. If the fire was too hot or the soil disturbance from fire suppression or salvage logging too extensive, native seeds may have been damaged or buried

and you will have to apply seeds. Native plant seed is preferable.

Priority areas for seeding include steeper, more erosive slopes. However, since these slopes are more vulnerable to soil erosion, it is likely that unprotected seeds will wash down the slope during the first rains before they can germinate, especially if the first rains are heavy and the fire intense enough to make the soil water-repellent (see p. 9). It is advisable to cover seed with a mulch or landscape fabric where feasible.

Log Terraces. To slow and disperse runoff, log terraces can be created by felling dead trees along the contour of the land, across the slope. Delimiting these trees will allow them direct contact with the soil.

Waterbars. Waterbars are speed bumps for water made of compacted mounds of soil and rock placed across a road, trail, or firebreak. These mounds divert water to the side onto a nonerosive, stable area of vegetation, rock, or other material, dispersing the water's erosive power.

—adapted from *Recovering From Wildfire*, available at <http://cemendocino.ucdavis.edu/files/56695.pdf>

Roads Need Protection Too

Another component of your forested landscape that may need extra protection after a fire is the road system. The fire most likely destroyed vegetation and forest floor litter that would have intercepted and slowed runoff water. Also, the soil may have developed a water-repellent layer that increases runoff (p. 10). The drainage system of roads in a burned area may not be adequate to handle the increased runoff, debris, and sediment after a fire. Roads and trails can act as conduits for the increased surface flow and may need extra attention to slow water movement.

To protect the road system as well as the downstream water quality, consider taking the following measures. (To insure proper design and installation, work with experienced professionals.)

- To protect the road system:
- Armor culvert inlets or bridge abutments.

- Patrol roads during significant rains to clean out clogged ditches and culverts.

To slow and divert water:

- Construct cross-drains or waterbars for limited-use roads.
- Remove berms on the outside edge of the road's driving surface to allow water to disperse.

To trap sediment and debris:

- Install sediment traps below culverts to prevent sediment from leaving the site.
- Install trash racks at culvert inlets to block woody debris from plugging the culvert.

To increase drainage:

- Enlarge the current ditch system.
- Remove or bypass existing culverts or install larger culverts in special cases.

—from *Recovering From Wildfire, A Guide for California's Landowners*

For more information on planning, designing, maintaining and closing wildland roads, see the classic *Handbook for Forest and Ranch Roads*. It can be purchased for \$22 at <http://www.mcrd.org/publications/>

Fire in the Redwoods: Lessons Learned

Yana Valachovic, UC Coop Extension Advisor

In a walk through an old-growth coastal redwood forest you are likely to see evidence of wildfire in the form of fire scars that form into goose pens or other elaborate structures over time. While these structures are common, few of us have had the opportunity to see wildfire in action in coastal redwood forests today, in either younger second-growth forests or old-growth forests.

In 2003, a wildfire started as a result of a lightning strike in a remote area of Humboldt Redwoods State Park near Meyers Flat. This fire was part of a large September lightning storm. While CAL FIRE was able to rapidly extinguish most of the fires started by these lightning strikes, two fires in the region grew into substantial events. When all was said and done, one of them (the Canoe Fire as it was termed) burned approximately 11,000 acres of Humboldt Redwoods State Park and onto adjacent private land (86 percent and 14 percent, respectively by area).

Studying the effects of this fire offers some lessons for forest managers and landowners about how fire is likely to affect their own stands. The lessons are especially relevant to those trying to understand and recover from the 2008 June lightning series in Mendocino County that impacted 60,000 acres.

The Canoe Fire occurred in old-growth redwood and Douglas-fir stands and 50-year-old second-growth stands. Fire had not occurred in this area for over 60 years and a significant amount of fine material had accumulated throughout the region. Even though the fire generally had low flame lengths (6-12 inches), the abundance of fine materials provided ample material for the fire to burn slowly for long time periods.

As a result, we observed significant mortality of Douglas-fir trees across all size classes, whereas mortality in the redwood trees was much less common.

I was surprised to observe that it did not take a hot or intense fire to kill the larger, thick-barked Douglas-fir trees. Redwood mortality was most common in the sapling and pole-sized classes. Larger redwood trees died infrequently, and largely from physical failures of structure, such as burned goose pens or burned roots deep in

the duff. Only once did I see a large old-growth redwood tree die and remain standing. Tree mortality in the area has continued for at least 3 years following the fire, although the majority of the trees died in the first summer after the fire.

Redwood branches that had been badly scorched by the heat of the understory flames (not torched) generally all were able to epicormically sprout and produce new foliage. It is unknown how much effect the fire had on the growth rates of these damaged redwood trees, but I assume that some effect occurred.

Given this information, how might you apply or predict the effect that fire may have on your stand? There are guides for predicting survival for Douglas-fir following fire, but I am not aware of any for redwood. I found the Douglas-fir guides reasonably useful, although Douglas-fir damage and associated mortality appeared to be higher than the guides implied in this situation, probably because of the long burn time of the Canoe Fire.

The key to understanding Douglas-fir survival was found in how hot the fire was around the trees. Was there duff and fine material that fueled a longer, hotter fire that damaged the roots? If the answer was yes, the tree usually died.

Once you have an idea of what to expect, the next question is whether a management or salvage action is warranted. In the Canoe

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Goose pen (basal hollow) in process.

Photos: (above) Stephen Underwood, State Parks; (below) Yana Valachovic

Sprouting redwood canopy in dead Douglas-fir 11 months post-burn.

Photo: State Parks



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Fire, very little soil movement or invasive plant introduction was observed within the burn areas, and thus no intervention was recommended. However, a careful look at the fire lines and roads used to fight the fire is warranted. If you expect a large number of trees to die, then salvaging those trees is an option, if market prices make it worthwhile.

In contrast to Douglas-fir stands, wildfire impacts to redwood stands are much harder to evaluate. In the Canoe Fire example, redwood trees in the pole and pre-commercial size classes were the most vulnerable, while the larger trees seemed unaffected. You can assume that some of the smaller-sized trees

may die and sprout at their bases, and others will re-foliate through redwoods' ability to epicormically sprout from the damaged branches or tree bole. This damage will have some effect on growth rates and potentially on tree form, but the effect may vary widely among trees. Management actions following wildfire should again address fire lines, roads, and other soil movement issues.

The next question is whether the trees should be salvaged or stands regenerated. If I were looking at damaged redwood trees in these smaller size classes, I would probably wait and observe the effect on growth rates over a few years and then decide.



Low flames burned slowly for long periods.

Photo: Stephen Underwood

MFRIG Helping People Help the Land

*Stephen G. Smith, District Conservationist,
Mendocino County NRCS*

This year, for the first time in nearly 40 years, the coastal redwood forests experienced major fires; over 35,000 acres of "unburnable" forests were burned. Mendocino County had over 60,000 acres in over 135 locations set afire by one lightning event.

Unlike the Sierra, fire is relatively uncommon on the coast. Even the fire agencies were not prepared for such an event. Questions immediately started: what were the effects of fire on our soil, water, air, and trees?

As District Conservationist for the Natural Resources Conservation Service (NRCS), I asked our agency partners, clients, and loggers what they knew, they asked others, and help came from many directions.

We formed the informal Mendocino Fire Recovery Information Group (MFRIG) to help landowners protect, conserve, and restore lands damaged by the Mendocino lightning fires. MFRIG currently includes NRCS, UC

Cooperative Extension, Mendocino County Fire Safe Council, Inland/Coastal Mendocino Cooperative Weed Management Area, CAL FIRE, Mendocino Redwood Company, and citizens of Greenfield Ranch.

Due to the diverse landscape, people, and situations, we could not include all the information needed for recovery work in a mass mailing. Instead, MFRIG compiled technical information, scheduled workshops, and found expertise that landowners could use to help them make decisions on what they may need to do to protect resources.

We created a website that covered all aspects of fire recovery and community protection... nearly 500 pages of information! We also directed landowners to technical assistance and financial help. See http://cemendocino.ucdavis.edu/UC_FIRE_LINKS/.

Our timeline is short—the winter rains can and will cause severe damage. We have been as proactive as we can in accordance with the NRCS mission: *Helping People Help the Land*.

We formed the informal Mendocino Fire Recovery Information Group (MFRIG) to help landowners protect, conserve, and restore lands damaged by the Mendocino lightning fires.

Post Fire Restoration DOs And DON'Ts

DOs:

DO...When planning your property restoration, gather as much information as possible from CAL FIRE, Natural Resources Conservation Service (NRCS), UC Cooperative Extension (UCCE); your local fire officials, Fire Safe Council, Cooperative Weed Management Area; fire restoration consultants, professional foresters, range managers, and plant experts regarding reducing fire hazard and making your property fire safe.

DO...Before starting any large-scale landscape, slope, or soil restoration effort on areas damaged by wildfire, consult with NRCS and UCCE, private registered professional foresters (RPFs), certified range managers (CRM), and/or land restoration consultants.

DO...Evaluate and map out locations of existing subsurface drains, culverts, crossings, irrigation and utility facilities, etc. on your property. Determine if these are still operable and the degree of damage, if any. Note: Many underground plastic culverts and irrigation lines may have melted or been destroyed in the fire or by the fire fighting effort.

DO...Install sediment control measures prior to the rainy season, such as straw wattles, mulch, plantings, slash, sediment traps, and/or other properly designed and located sediment control measures, if necessary and as directed by NRCS, a Certified Professional in Erosion and Sediment Control (CPESC) specialist, or an RPF or CRM experienced in erosion control. Note: Sediment control measures will help prevent eroded and displaced soil from entering streams, roadside ditches, and waterways; maintain road systems; and help protect water quality and water supplies. Consult with licensed foresters, rangeland managers, landscape contractors, or other licensed contractors with erosion and sediment control experience for design and installation assistance. If straw mulch is used it should be rice straw or weed-free.

DO...Coordinate restoration efforts with neighbors and/or road and homeowner associations.

DO...Replant damaged landscapes with drought tolerant, fire retardant native plants with re-sprouting ability. Use planting stock and/or collected or purchased seed native to the area and from a locally collected source. On forested lands conifer seedlings should be ordered in advance from forest nurseries that have collected seed from this seed zone (p. 2).

DO...Obtain any necessary permits before cutting down trees, performing major land grading activity, building retaining walls, constructing a permanent sediment or erosion control structure in a watercourse, or doing any work in a riparian area, wetland, streamcourse, or other natural area. Note: Permits and/or consultations may be needed from CA Dept of Fish and Game, U.S. Fish & Wildlife Service, CA Regional Water Quality Control Board, U.S. Army Corp of Engineers, and NOAA/National Marine Fisheries Service.

DO...Monitor and maintain fire and fuel breaks created by fire fighters on your property. Waterbars/breaks should be provided and maintained on these fire control measures so that runoff water does not concentrate and cause erosion. Consult with CAL FIRE regarding maintenance assistance for fire and fuel breaks constructed by fire fighters on your property.

DO...Monitor and maintain all existing and planned erosion, sediment, and drainage control measures—including vegetative treatments—before, during, and after all future rainfall events. The first year is critical for success. Correct deficiencies as soon as possible. Note: One of the main reasons that recommended treatment practices fail following installation is the lack of long-term maintenance by the landowner or responsible party.

DO...Hire and/or consult with licensed foresters and contractors—preferably ones certified and experienced in soil erosion and sediment control and/or native landscape restoration—for design and installation assistance on vegetative and/or structural measures needed to restore slopes, soils, proper drainage conditions, landscape, and the native plant community.

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DO...Hire and/or consult with licensed foresters and contractors—preferably ones certified and experienced in soil erosion and sediment control and/or native landscape restoration.



DO...Install sediment control measures prior to the rainy season.

*Photo: USDA Forest Service/
Lake Tahoe Basin Management
Unit*

DON'T...Do what your neighbor is doing. Every situation is unique.

DON'Ts:

DON'T...Be too quick to remove fire damaged vegetation, including trees that were not completely burned. Many of the damaged and scorched native plants will re-sprout and come back, including severely burned redwoods and oak trees. Note: Consider pruning first before removing the entire plant. Consult with professional foresters and NRCS for advice.

DON'T...Place loose debris, prunings, or discarded fire-damaged vegetation in gullies, drainage swales, or watercourses, over stream banks, etc. in an attempt to protect bare soil without first consulting with erosion control specialists. Piles of brush will prevent plants from re-establishing and may dislodge if in contact with concentrated runoff or stream flows, causing other problems. Note: Removed brush can sometimes be used as mulch if chipped or spread (or crushed) thinly over the critical soil areas.

DON'T...Plant out-of-county erosion control seed mixes or other non-local seed mix. Many mixes are designed for rangeland applications and contain non-native grasses and legumes not intended for forest or fire-damaged soil/slope restoration. Based on your long-term goals, don't plant inappropriate mixes, non-native invasive plants, or re-seeding grasses. Note: If white ash is present resident seed from pre-existing native plants may no longer exist. White ash is an indicator that the fire burned very hot and any resident seed bank in the soil was likely destroyed. Re-seed these areas in native grasses and/or replant with native plants.

DON'T...Use materials such as broken asphalt or concrete, inorganic debris, or other objects as emergency or permanent erosion control measures, especially if these materials can come in contact with runoff water, natural drainages, and streamcourses. Note: In some cases, rock and broken concrete can be used as velocity dissipaters at the outlets of road culverts or other drains to protect the soil from erosion and washout, provided these dissipaters are designed by an appropriate professional.

DON'T...Cover fire-damaged slopes with plastic sheeting to prevent slope failure and protect bare or disturbed soil from rainfall. Plastic

sheeting will increase runoff and the likelihood of erosion, retain moisture in the ground increasing the possibility of slope saturation and instability, and kill root systems of native plants trying to re-establish naturally. Plastic sheeting is almost always the wrong thing to do. Note: Depending on site conditions, alternatives include the use of hydromulch, a proper application of rice straw, or an erosion control blanket if recommended by a CPESC or geo-technical consultant.

DON'T...Control and concentrate future property drainage and runoff without a proper drainage control design that considers drainage facility sizing, location, and dispersal method. Whenever possible, keep surface runoff in a natural "sheet" flow and incorporate practices such as vegetative cover to slow runoff and improve the water infiltration capacity of the soil. Note: Consult with a professional forester or NRCS for general planning information on controlling drainage around your home and property before proceeding with drainage repairs and improvements following fire damage. For design and installation assistance contact a landscape contractor or certified specialist experienced in erosion and drainage control.

DON'T...Use straw bales in whole bale form as water diversion and detention devices or for sediment control in burn areas. Contrary to popular belief these devices require a great deal of maintenance and are not appropriate for most situations. Their design, location, and installation should only be done by a qualified contractor or forester certified in erosion and sediment control. Straw wattles and loose straw that is simply spread over bare and disturbed soil is much more effective than keeping it in bale form. Note: Only rice or weed-free straw should be used to prevent non-native grasses and weeds, which may be contained in straw bales, from colonizing treatment areas.

DON'T...Disturb the hydrophobic soil layer that forms on some soils following fire on slopes susceptible to landsliding. Hydrophobicity is a natural phenomenon that actually makes the soil water repellent, which reduces infiltration and the capacity of the soil to hold water. The hydrophobic layer is normally found within 6 inches of the surface. In some areas it may be advisable to break up this layer to aid in plant establishment and water infiltration, lessening the impacts of runoff and erosion.



DON'T...Use straw bales in whole bale form. Straw wattles and loose straw that is simply spread over bare and disturbed soil is much more effective than keeping it in bale form.

*Photo: USDA Forest Service/
Lake Tahoe Basin Management
Unit*

The Real Dirt on Hydrophobic Soils

Hydrophobic is a fancy word that simply means water-averse. Hydrophobic soils repel water rather than absorbing it. This can have important implications for your forestland and the larger watershed.

Healthy soil is vital to a forest; it determines what can grow there. Trees and plants get their nutrients and water from the soil so if soil characteristics change it can have a major effect on your forest.

Hydrophobic soils are created when intense heat from forest fires creates a waxy coating around soil particles. While not visibly different, this soil has unique characteristics that change the soil properties.

To check for hydrophobicity, scrape away the ash layer to expose the mineral soil. Place a drop of water on dry soil and wait 1 minute. If the water beads, the soil layer is hydrophobic.

Commonly, the upper few inches of soil are not hydrophobic so you may need to scrape away a layer 1/2 to 1 inch thick and repeat the test. Once a water repellent layer is found,

continue to scrape additional layers and repeat the drop test until a non-hydrophobic layer is found. This will help you determine the thickness of the hydrophobic layer.

Water repellency can be detrimental in several ways. Less water in the soil means less water available for plant growth. Reduced infiltration can result in damaging runoff into stream channels, erosion and topsoil loss, and increased sediment.

A number of factors influence water infiltration, including amount of vegetative cover, woody material, soil texture, surface rocks, slope of the land, and extent and thickness of the hydrophobic layer. Taken together, these factors will determine the likelihood of increased runoff, overland flow, erosion, and sedimentation.

Plant roots, soil microorganisms, and soil fauna eventually break down a hydrophobic layer, but thicker layers may persist for more than a year.

—*from Soil Quality Resource Concerns: Hydrophobicity*
<http://cemendocino.ucdavis.edu/files/56626.pdf>

Treatments

- Place fallen logs across a slope to slow runoff and intercept sediment.
- On level or gentle slopes, rake or hoe the upper few inches of soil to break up the hydrophobic layer and allow water to penetrate.
- Scatter straw mulch to protect the soil from erosion. Anchor the straw in place.
- Control erosion and reduce runoff by seeding, straw bale check dams, and silt fences.

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DON'T...Disturb potentially unstable slopes, especially those in fault areas and/or with signs of previous movement or known historic instability. Disturbances such as grading, cutting, removing trees and root wads, or other deep excavations will increase the likelihood of future slope failure. Note: If these slope alterations are absolutely necessary, then consult with a registered geologist or geo-technical expert before slope disturbance/restoration activity.

DON'T...Do what your neighbor is doing. Every situation is unique. Your property may be different in many regards including soil type, slopes, drainage conditions, type and condition of plant cover, degree of fire damage, etc. Get expert advice and a site damage assessment, including treatment recommendations, from NRCS before proceeding with your property restoration efforts. Note: Practices such as sandbags, plastic, straw bale basins, check dams, etc. are all temporary and require a great deal of maintenance. Furthermore, they are not appropriate for every situation and can actually make problems worse or create new ones.

DON'T...Wait until the last minute to plan, design, and install erosion, sediment, or drainage control practices that may be necessary to safeguard your home and property before next winter. Note: The nature and extent of your restoration effort will depend on the degree of damage, time needed to get a site assessment, acquiring an appropriate plan and design, securing any necessary permits, lining up a contractor, and doing the work. In many cases, consider doing NOTHING. This may be the best solution on some properties. Doing nothing will allow nature and time to heal soil and vegetation damage naturally, especially in wildland and other natural areas. In fact, tampering with natural processes may very well delay natural recovery and re-establishment of pre-existing native cover.

—*abridged and adapted from an information sheet developed by Rich Casale, District Conservationist/CPESC #3, USDA Natural Resources Conservation Service, Santa Cruz Co, 2008. <http://cemendocino.ucdavis.edu/files/56624.pdf>*

Doing NOTHING may be the best solution on some properties. This will allow nature and time to heal soil and vegetation damage naturally. In fact, tampering with natural processes may very well delay natural recovery and re-establishment of pre-existing native cover.

Resources

This website is so extensive it is valuable even for those who have not been hit by wildfire. http://cemendocino.ucdavis.edu/UC_FIRE_LINKS/

Get all your fire recovery info in one place

The Mendocino Fire Recovery Information Group (MFRIG) has created a remarkable website at http://cemendocino.ucdavis.edu/UC_FIRE_LINKS/ to help people find the information they need as they deal with the diverse challenges that occur after fire. Some of the material is specifically for Mendocino County, but most is applicable to a wider audience.

This website is so extensive it is valuable even for those who have not been hit by wildfire. The articles and links to information about fire-safe homes and communities, fuels management, forest health, reforestation, invasive plants, and many other topics are great resources for any forestland owner.

The site consists of four main sections:

- **Defensible Space and Fire Safe Home**—this is the “before fire” section. It includes fire safety topics such as defensible space, home landscaping, wildfire risk assessment, developing a water supply, large animal rescue, plus a section on community protection.

- **Natural Resource Issues and Concerns**—after the fire. This includes articles about restoration, erosion control, slope stability, etc.



- **Forest and Fuel Management**—more on recovery from fire including guidelines for fuel breaks, assessing beetle attacks, invasive plants, and a fire resistant plant list.
- **Fire Restoration Practices and Support Services**—listings of where you can go for help. This section has lists of registered professional foresters (RPFs), certified rangeland managers, contractors, loggers, erosion control specialists, erosion control materials and seed, and native nurseries. There is information on financial assistance, potential permits required, tax relief, Board of Equalization relief, and where to go for technical help.

Technical Assistance

Many agencies are available to provide technical assistance, referrals, information, education, land management plan assistance, and advice.

California Stewardship Helpline
1-800-738-TREE; ncsaf@mcn.org

California Dept of Forestry & Fire Protection
Forest Landowner Assistance Programs
Jeffrey Calvert
916-653-8286; jeff.calvert@fire.ca.gov

Forestry Assistance Specialists
Guy Anderson (Mariposa/Madera/Merced) 209-966-3622 x218
Jan Bray (Amador) 530-647-5212
Herb Bunt (Red Bluff) 530-528-5108
Jill Butler (Santa Rosa) 707-576-2935
Ed Crans (Placer/Yuba/Nevada) 530-889-0111 x128
Brook Darley (Tehama/Glenn) 530-538-5199
Mary Huggins (S. Lake Tahoe) 530-541-1989
Patrick McDaniel (El Dorado) 530-647-5288
Dale Meese (Plumas) 530-283-1792
Alan Peters (Calav/Tuol) 209-754-2709
Jim Robbins (Fortuna) 707-726-1258
Tom Sandelin (Fresno/King) 559-243-4136

California Association of RCDs
916-447-7237; staff@carcd.org

California Dept of Fish & Game
Scott A. Flint
916-653-9719; sflint@dfg.ca.gov

Natural Resources Conservation Service
Jerry Reioux
530-792-5655; jerry.reioux@ca.usda.gov

U.C. Cooperative Extension Advisors/Specialists
Mike DeLasaux, Plumas-Sierra counties
530-283-6125; mjdelasaux@ucdavis.edu
Greg Giusti, Mendocino-Lake counties
707-463-4495; gagiusti@ucdavis.edu
Gary Nakamura
530-224-4902; nakamura@nature.berkeley.edu
Bill Stewart
510-643-3130; stewart@nature.berkeley.edu
Yana Valachovic, Humboldt-Del Norte counties
707-445-7351; yvala@ucdavis.edu

USDA Forest Service
Jim Geiger
530-752-6834; jgeiger@fs.fed.us

Calendar

November 4-6, 2008

California Board of Forestry Meeting

Location: Sacramento, CA

Contact: 916 653-8007

Info: http://www.bof.fire.ca.gov/board/board_current_docs.aspx

November 13, 2008

Oaks in Urban Landscapes

Location: Paso Robles, CA

Contact: Sherry Cooper, slcooper@nature.berkeley.edu, 530-224-4902

Info: <http://danr.ucop.edu/ihrmp/>

November 18, 2008

Carbon Workshop

Location: Redding, CA

Sponsor: Pacific Forest Trust

Contact: 541.754.6868

Info: <http://www.pacificforest.org/>

December 2-4, 2008

California Board of Forestry Meeting

Location: Sacramento, CA

Contact: 916 653-8007

Info: http://www.bof.fire.ca.gov/board/board_current_docs.aspx

December 3, 2008

Oak Regeneration

Location: Santa Margarita, CA

Contact: Sherry Cooper, slcooper@nature.berkeley.edu, 530-224-4902

Info: <http://danr.ucop.edu/ihrmp/>

January 20-22, 2009

Forest Vegetation Management Conference: Integrated Pest Management in W. Forests

Location: Holiday Inn, Redding, CA

Contact: Dave Gallagher (daveg@totalforestry.net) or Danielle Lindler (jrc@gotsky.com)

Cost: \$110 (\$135 if postmarked after 12/29/08) includes lunch on the 1-21-09

January 30-31, 2009 (tentative dates)

Forest Futures II: Maintaining Healthy and Productive Working Forests on the Northcoast

Location: Humboldt County, CA

Contact: Yana Valachovic, 707-445-7351, yvala@ucdavis.edu

For more information on events call the number provided or the Forest Stewardship Helpline, 1-800-738-TREE or check <http://groups.ucanr.org/Forest/>

Forest Stewardship Series FREE for the downloading!

The Forest Stewardship Series is a 24-part FREE online publication that offers California forestland owners a comprehensive source of information about the management and enjoyment of their lands. The information contained in the series will help you define and implement strategies for achieving your personal goals as a landowner. Download the complete series or individual sections at <http://anrcatalog.ucdavis.edu/Forestry/8323.aspx>.

The Sections:

- Forest Stewardship Series 1: Introduction to Forest Stewardship and Glossary of Terms
- Forest Stewardship Series 2: A Forest Stewardship Framework
- Forest Stewardship Series 3: Forest Ecology
- Forest Stewardship Series 4: Forest History
- Forest Stewardship Series 5: Tree Growth and Competition
- Forest Stewardship Series 6: Forest Vegetation Management
- Forest Stewardship Series 7: Forest Regeneration
- Forest Stewardship Series 8: Forest Wildlife
- Forest Stewardship Series 9: Forest Streams
- Forest Stewardship Series 10: Riparian Vegetation
- Forest Stewardship Series 11: Forest Water Quality
- Forest Stewardship Series 12: Fish and Fish Habitat
- Forest Stewardship Series 13: Threatened and Endangered Plants
- Forest Stewardship Series 14: Exotic Pest Plants
- Forest Stewardship Series 15: Wildfire and Fuel Management
- Forest Stewardship Series 16: Forest Pests and Diseases
- Forest Stewardship Series 17: Forest Roads
- Forest Stewardship Series 18: Stewardship Objectives and Planning
- Forest Stewardship Series 19: Laws and Regulations Affecting Forests: Timber Harvesting
- Forest Stewardship Series 20: Laws and Regulations: Activities Other Than Timber Harvesting
- Forest Stewardship Series 21: Economic Considerations in Forest Stewardship
- Forest Stewardship Series 22: Forest Taxation, Estate Planning, and Conservation Easements
- Forest Stewardship Series 23: Technical and Financial Assistance
- Forest Stewardship Series 24: Professional Assistance

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Wildlife

Wildfires and wildlife

Are wildfires destructive to California's wildlife?

California has experienced an overwhelming number of fires this year. Although necessary for healthy wildlife habitats, fire can be devastating to individual animals.

Wildfire impacts to wildlife range from positive to negative. In California many plant communities (e.g., conifer forests, oak woodlands, chaparral shrublands, native grasslands) are adapted to fire. Fire is an integral part of the ecosystems animals inhabit. Although numerous fires have burned over the past few months, many natural areas remain unburned. Wildlife continue to use these, as well as areas adjacent to burned areas. The habitat mosaics created by fires benefit many different species.

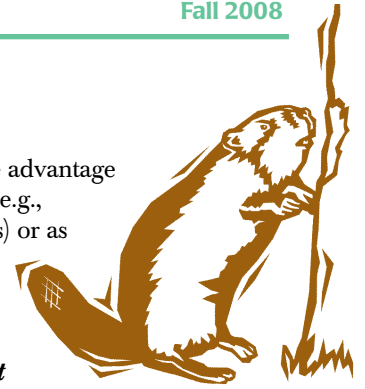
Wildlife are most impacted when fires occur too frequently or burn rapidly. The smoke, heat, and flames of fast-moving fire fronts are more likely to kill animals than slower-moving fires.

How does wildlife react to wildfire?

Wildlife have two basic reactions to wildfire: flee or take shelter. Faster, more mobile animals, like song birds and larger mammals, take flight. Smaller and less mobile animals often take shelter in burrows, tree cavities, rock outcrops, and near bodies of water.

Some species will soon return to an area once the fire front has moved past. Attracted by cues

from the fire, they take advantage of dying trees as food (e.g., some species of beetles) or as predators (e.g., birds that consume the insects).



How do wildfires affect wildlife?

Impacts to wildlife are generally determined by the characteristics of the fire: season, frequency, extent, complexity, duration, and intensity/severity. The impacts can be direct or, more likely, indirect. In many cases it is the indirect effects that most impact wildlife.

Season (when the fire occurs). E.g., spring and early summer fires will impact young wildlife.

Frequency (time between fires, also called fire return interval). E.g., frequent fires can disrupt or eliminate essential habitat, preventing animals from re-colonizing burned areas.

Extent (size of a fire). Larger fires affect more habitat, which can be positive or negative. A small fire may effect necessary changes that are good for wildlife. Large fires will burn up shelter and food in the short-term, but may provide long-term benefits.

Complexity (pattern and differences in burning). A fire is not uniform in temperature, movement, or duration. A complex fire creates a mosaic of effects—including completely unburned areas—which creates diverse wildlife habitat as the area recovers. The resulting habitats allow many types of wildlife to take advantage of a burned area.

Duration (rate that fire burns across the landscape). E.g., low moving, moderate fires may impact wildlife that shelter underground, because the slow pace allows heat to penetrate the soil while intense rapidly moving fire may have less of an effect on these species.

Intensity/severity (intensity=energy released by fire; severity=magnitude of effect). More intense fires release more energy, which can result in more damage (i.e., greater severity) to plant species. Wildlife habitat will suffer and animals will be indirectly impacted.

Will wildlife return?

After a fire, wildlife may be temporarily displaced from their previous habitats. This displacement may be short-lived, just until surviving plants regrow and seeds sprout. But displacement can be longer, requiring some years before the right habitat exists for a particular species.

– <http://www.dfg.ca.gov/news/issues/fire/>

Suggestion:

Monitor wildlife activity in and around a burn area over time to discover unexpected patterns and changes.

- woodpeckers are attracted to new nesting cavities and increased insect activity
- ground-feeding birds find uncovered and opened seeds
- new vegetative growth provides fresh browse for deer
- raptors have open and accessible hunting grounds
- some rodents prefer open areas

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- To save on printing costs and paper, we encourage you to get the internet version of Forestland Steward. Check here for an email copy of each issue instead of a hard copy.

Send to CAL FIRE, Forestry Assistance, P.O. Box 944246, Sacramento, CA 94244-2460.
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