California Forest Stewardship Program

FORESTLAND STEWARD

WORKING TOGETHER FOR HEALTHY FORESTS SPRING 2002

Friend and foe: the paradox of fire

" The challenge we face is how to restore some aspects of a more natural fire regime while at the same time minimizing the threat wildfire poses to human and natural resources and values."

–Sierra Nevada Ecosystem Project

It's a hot issue these days. Fire–is it friend or foe? As the summer fire season approaches, it appears to be a foe. We are reminded to create defensible space and to be fire safe. Smokey doesn't want forest fires.

However, that's only part of the story. There are actually multiple issues involved here and the solutions are elusive. At stake is the well-being of our forests and the safety of the people living there.

One issue is that many of our California forests are in an unhealthy condition–one that is ripe for large, catastrophic fires. Due in large part to decades of successful fire suppression, fuels (live and dead plant material) in many of our forests have accumulated to unprecedented levels.

The arrangement of the fuels in the forest is also a problem. They tend to be continuous with fuel ladders–fires are more likely to travel long distances and into the crowns of trees. Environmental conditions such as drought and pollution exacerbate the unhealthy condition.

This house in the forest survived a wildfire.

Another aspect of the fire discussion is the fact that there is an ever-increasing number of people relocating into this forest tinderbox, putting more lives and property at risk. The population in the urban-wildland interface, also known as the I-Zone, increases the difficulty of fighting wildfires and increases the consequences of fires.

But fire is also a friend, a vital and necessary part of the forest ecosystem.

Historically, natural fires swept through forests at relatively frequent intervals. Native Americans used fire as a management tool and increased the frequency even more. Because fuel didn't have time to accumulate, low to moderate intensity fires were the norm.

Fire provides a number of essential ecological functions including:

◆ Some of our native plants are adapted to fire and won't germinate without heat to release the seeds and prepare the ground.

(continued on page 3)

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Pests

Landowners and forest professionals can be part of the effort to monitor California forests for pests by reporting any problems you may find using the Forest Pest Detection report form. Current pests of note include pitch canker, sudden oak death, and bark beetle populations, which are increasing substantially in the south state and possibly the southern Sierra as well.

The detection report serves two purposes. The first is the reporting of pest damage. The forms help to identify and document the type and extent of pest damage occurring throughout the year. Completed forms are forwarded to Forest Pest Management (FPM) offices who compile and summarize reported damage for each pest. The result of these reports and other sources of information is the annual Forest Pest Conditions report. Copies of the report are available from the CDF Sacramento office; electronic versions of the annual report are posted on the Forest Service website at http://www.r5.fs.fed.us/fpm/fhp_doc.htm.

The second purpose of the report is to request the identification of a damaging agent. State or local government personnel, and private individuals can send pest and plant injury samples to the nearest CDF Forest Pest Management office. Instructions for handling and shipping samples are on the back of the form. Contact the FPM office before submitting samples from within the established Zones of Infestation for Sudden Oak Death and Pitch Canker; phone 916-653-9476 for more information. Information on the pitch canker zone can be found at http://frap.cdf.ca.gov/pitch_canker/prevention.html. Information on the Sudden Oak Death zone is located on the SOD website at http://www.suddenoakdeath.org.

The Forest Pest Detection report is part of a cooperative effort to survey and report forest pest damage on an annual basis. The California Forest Pest Council (CFPC) sponsors this effort and annually produces the "Forest Pest Conditions" report. The form is distributed to CFPC members and is generally available from the Forest Service and CDF addresses on the back of the form. Form users would include forestland managers, professional foresters, pest management specialists, biologists, and others interested in the protection of forests from damage caused by biotic and abiotic agents.

The use of the Forest Pest Detection report has become even more important since the discovery of Sudden Oak Death. The potential for the establishment of new exotic pests in California forests makes the report a useful early detection tool for new pest damage.

http://ceres.ca.gov/foreststeward

FORESTLAND STEWARD

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Fire *(continued from page 1)*

◆ Fire cleans up the forest. It removes excess duff, dead wood, overcrowded trees, insect pests, sterilizes the soil of disease organisms, and can help remove some species of exotic weeds.
◆ Fire impacts are patchy, creating a mosaic of habitats which allows a greater diversity of plants and animals to live in the forest.
◆ Fire regulates succession, eliminating climax species that shut out the light, opening up areas to early seral stages. This can encourage wildlife that feed on early successional plants.
◆ Nutrients are released. The chemical composition of the soil and ash is altered by fire.
◆ The chance of high-intensity fires is reduced after the forest is thinned by fire. Low and moderate intensity fires are less damaging to the ecosystem.

So how can we restore the necessary functions of fire while protecting life and structures? There is a lot of work going into answering that question.

The study of fire–fire ecology–is in its early stages. What we do understand is that fire is an extremely complex subject and there's much we don't understand.

Fuels management can mimic some of the functions of fire but not all. Mechanical thinning can decrease the chances of catastrophic fire by removing or modifying some of the fuel load (see page 6 for a discussion of fuel management options). But these methods can't provide all the ecological benefits of fire.

The best fuels management method in that respect is prescribed, or controlled, burning in which areas are burned under conditions which allow us to control it. But prescribed burns have their own drawbacks, most notably the danger of the fire escaping and effects on air quality.

Prescribed burns have to be done under very stringent conditions by a qualified crew. Steps are taken to notify any nearby residents who could be affected by the fire and smoke, to monitor weather conditions continually, and to use knowledge of fire and its behavior. Even with all the precautions, prescribed burns occasionally escape. Many forested areas cannot be safely burned because the fuel load is too high. Others are too close to human habitation. Control burns are only possible in limited situations.

It would be nice to have a simple solution to the challenge of fire but there are no easy answers. Fire can be destructive to the environment but it can also be beneficial. It can increase the abundance of native species or favor exotics. It can be good for wildlife or deadly…

So what should you do? You certainly need to protect your immediate home and family: create a defensible space, educate yourself about fire safe issues, and join a Fire Safe Council. It is important to understand that fire is an integral part of the California forest landscape–it won't go away–and there are risks involved in living in the wildlands. You might also want to explore the feasibility of reintroducing fire into your forest.

To learn more, contact your local CDF Unit, FireSafe Council, or the California Forest Stewardship Helpline at 1-800-PET TREE.

Fuel Characteristics

Fuel Load	The amount of vegetation, both live and dead, available for burning in an area (measured in tons per acre).
Moisture Content	The amount of water present in fuels. The moisture content of dead fuels is constantly changing and is influenced by relative humidity and precipitation. Changes in live fuel moisture content are less dynamic. The lower the moisture of a fuel, the greater the fire hazard.
Size and Shape	The size and shape of the fuel directly affects how easy it is to ignite and how fast a fire will spread. Smaller fuels, especially those less than 1/2" in diameter (e.g. pine needles, grass, and twigs) present a greater hazard than larger fuels.
Vertical Arrangement	This is the manner in which fuels occur at different heights (e.g. pine needles on the ground, shrubs, tree branches, etc.). A vertical arrangement of fuels that would enable a surface fire to be carried into the tree canopy presents a hazardous situation. These types of fuels are referred to as "ladder fuels."
Horizontal Continuity	Horizontal continuity describes the distribution of fuels of similar heights. A dense stand of shrubs or a forest of trees with interwoven branches would have a high degree of horizontal continuity. Sparsely vegetated areas with a wide separation between fuels would constitute a low degree of continuity. The higher the degree of horizontal continuity, the greater the wildfire hazard.
Compactness	The amount of air space between fuel particles is its compactness. This is of importance since the amount of air circulation affects moisture content, ease of ignition, and rate of fire spread. Rate of fire spread is slower in compacted fuels (i.e. little air space) than in loosely arranged fuels.
Chemical Content	The chemical makeup of fuels may affect fire behavior. It can either increase or decrease the fires hazard associated with fuels. Typically, vegetation which is oily or resinous is more flammable.

—from The Defensible Space and Healthy Forest Handbook, http://www.ucfpl.ucop.edu/UWI%20Documents/014.PDF

Seasonal Stewardship

How to burn piles properly

Heather Morrison

Burning is one way to get rid of your excess fuel but, because of concerns about fire escape and air quality, you'll have to make a few phone calls first.

The California Air Resources Board (CARB), local air quality districts and California Department of Forestry and Fire Protection (CDF) are the responsible state agencies for prescribed burning of private and state lands. Under Title 17 of the California Code of Regulations (Public Health), the CARB has established a set of regulations that need to be implemented prior to burning.

Before you burn, it is critical to find out if it is an authorized burn day by calling both the local air quality district and CDF. There may be limited hours for burning as well as various burning restrictions within the different air districts. In addition, landowners must contact their local CDF office for a permit, and/or the local air quality district to see if a Smoke Management Plan (SMP) must be submitted.

In order to encourage a hot fire that will readily combust material and reduce smoke, CARB and the local air quality districts have established a set of minimum drying times, which will lower the fuel moisture content.* These drying times are set between the time of cutting and the time of burning.

Drying times are a minimum of six weeks for trees, stumps, and large branches greater than six inches in diameter. For most forest management burning, contact your local air quality district and CDF to determine specified drying time, which may be longer than specified above. To help keep the pile dry during inclement weather, it is helpful to cover it with either a tarp or plastic (be sure to remove it prior to burning).

Pile location is also very important. Don't place piles near structures, near residual trees as heat convection can damage the crown, and do not place them under or near power lines.

When igniting piles, here are a few things to keep in mind. Do not burn when adjacent fuel moisture levels are very low or when you have strong winds; this will decrease your chances of the fire escaping.

Protect your residual stand; do not light the pile if there are strong winds blowing toward it. For large landing piles, ignite the side of the pile adjacent to the residual stand. By doing this you are burning away from your trees.

The best time to burn is just before a rain, when the relative humidity is high. It is good to have some wind, unstable air, but do not burn in high wind conditions. For information on fire weather, go to the National Fire Weather Page at http://www.boi.noaa.gov/firewx.htm.

** These standards may vary by Air Quality District. Please contact your local Air Quality District to determine the appropriate drying times.*

Here are some burn pile management guidelines for landowners:

◆ Arrange the material to be burned so that it will burn with a minimum of smoke. Place material of various sizes in the pile for adequate air flow.

◆ Except for large trees (diameter of six or more inches), ignite only the amount that can reasonably be expected to completely burn within the following 24 hours.

◆ Ignite outdoor fires only with ignition devices approved by the local air quality district and CDF.

◆ Ignite material to be burned as rapidly as practical within applicable fire control restrictions.

◆ Curtail, mitigate, or extinguish burning when smoke is drifting into a nearby populated area or creating a public nuisance.

◆ Don't burn material unless it is free of tires, rubbish, tar paper and construction debris; is reasonably free of dirt, soil, and moisture; and is loosely stacked in such a manner as to promote drying and ensure combustion with a minimum of smoke.

◆ Some air districts and/or counties may limit the amount of needles and leaves within a pile, as well as burning hours throughout the day.

FAQs about defensible space

What is defensible space?

Defensible space is the area between a house and an oncoming wildfire where the vegetation has been modified to reduce the wildfire threat and to provide an opportunity for firefighters to effectively defend the house. Sometimes a defensible space is simply the homeowner's maintained backyard.

What is the relationship between vegetation and wildfire threat?

Many people do not view the plants growing on their property as a threat. But in terms of wildfire, the vegetation adjacent to their homes can have considerable influence upon the survivability of their houses. All vegetation, including plants native to the area as well as ornamental plants, is potential wildfire fuel. If vegetation is properly modified and maintained, a wildfire can be slowed, the length of flames shortened, and the amount of heat reduced, all of which assist firefighters defend the home against an oncoming wildfire.

The fire department is supposed to protect my house, so why bother with defensible space?

Some individuals incorrectly assume that a fire engine will be parked in their driveway and firefighters will be actively defending their homes if a wildfire approaches. During a major wildfire, it is unlikely there will be enough firefighting resources available to defend every home. In these instances, firefighters will likely select homes they can most safely and effectively protect. Even with adequate resources, some wildfires may be so intense that there may be little firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. This can be accomplished by reducing the amount of flammable vegetation surrounding a home. Consequently, the most important person in protecting a house from wildfire is not a firefighter, but the property owner. And it's the action taken by the owner ***before*** the wildfire occurs (such as proper landscaping) that is most critical.

Recommended defensible space by slope/vegetation type

	0–20% slope flat to gently sloping	21–40% slope moderately steep	40%+ slope very steep
grass	30ft	100ft	100ft
shrubs	100ft	200ft	200ft
trees	30ft	100ft	200ft

Does defensible space require a lot of bare ground in my landscape?

No. Unfortunately, many people have this misconception. While bare ground is certainly effective in reducing the wildfire threat, it is unnecessary and unacceptable due to appearance, soil erosion, and other reasons. Many homes have attractive, well-vegetated landscapes that also serve as effective defensible space.

Does creating a defensible space require any special skills or equipment?

No. For the most part, creating a defensible space employs routine gardening and landscape maintenance practices such as pruning, mowing, weeding, plant removal, appropriate plant selection, and irrigation. Equipment needed includes common tools like a chain saw, pruning saw, pruning shears, toppers, weed-eater, shovel, and a rake. A chipper, compost bin, or a large rented trash dumpster may be useful in disposing of unwanted plant material.

How big is an effective defensible space?

Defensible space size is not the same for everyone, but varies by slope and type of wildland vegetation growing near the house.

Does defensible space make a difference?

Yes. Investigations of homes threatened by wildfire indicate that houses with an effective defensible space are much more likely to survive a wildfire. Furthermore, homes with both an effective defensible space and a nonflammable roof (composition shingles, tile, metal, etc.) are many times more likely to survive a wildfire than those without defensible space and flammable roofs (wood shakes or shingles). These conditions give firefighters the opportunity to effectively and safely defend the home.

Does having a defensible space guarantee my house will survive a wildfire?

No. Under extreme conditions, almost any house can burn. But having a defensible space will significantly improve the odds of your home surviving a wildfire.

Why doesn't everyone living in a high wildfire hazard area create a defensible space?

The specific reasons for not creating a defensible space are varied. Some individuals believe "it won't happen to me." Others think the costs (time, money, effort, loss of privacy, etc.) outweigh the benefits. Some fail to implement defensible space practices simply because of lack of knowledge or misconceptions.

–from *Living With Fire: A Guide for the Homeowner* *(see page 10)*

Tools

Numerous options for fuels management

So you've decided you need to reduce the fuels on your property–how should you go about it?

A good place to start is to talk to the experts: your local Natural Resource Conservation Service (NRCS) office, Resource Conservation District (RCD), University of California Cooperative Extension forestry specialist, or CDF Forestry Assistance Specialist. These people can help you make decisions about the best treatment(s) for your property. In addition, they are knowledgeable about cost-share programs that may be available to help finance your work.

In many cases, you will want to come up with a larger strategy for the work you are doing–a conservation or management plan. That can help determine the best approach to reach your personal objectives for your land.

Reducing the fuel load on your property can be accomplished in numerous ways. Each of these has financial costs and environmental consequences associated with it.

Your management decisions should be site-specific. Characteristics such as slope, vegetation type, fuel load, and fuel configuration all need to be factored into the decisionmaking. Some fuel reduction methods are more appropriate for properties of a certain size. You will want to consider all the alternatives and choose those that are best for your needs.

Prescribed burning. The use of prescribed, or control, burns can be effective in clearing brush, removing exotic species, enhancing wildlife habitat, and restoring the many functions that fire brings to the environment. Control burns can also be relatively economical.

On the other hand, fire has to be

used with great caution. Prescribed burning can only be done safely when all the conditions are right–weather, fuel load, topography, etc. There is always the danger of a fire burning out of control and the liability involved is more than any small landowner would want to contemplate.

CDF has a Vegetation Management Program (VMP) in which they implement prescribed burns and cover the liability for landowners. Call your local CDF Unit for information.

Pile burning. This is a labor-intensive approach in which material is cleared by hand or mechanical method, then the cut material is placed in piles and burned. While burning can return nutrients to the soil be aware that a very hot fire can create a condition in which the soil becomes impenetrable to water (hydrophobic) for many years.

Grazing. This may be a "natural" way to keep fuels down but even grazing can have its down sides. Grazing animals–usually goats, horses, or cows–can be indiscriminate eaters. They will eat the plants you want to retain as well as those you're happy to get rid of. Goats can graze steep slopes but if left to their own devices may denude the site and cause erosion. Horses do not eat shrubby material but can keep the grass down. Cattle need to be managed as they will eat or trample just about any plant.

Herbicides. These are chemicals that kill plants or inhibit their germination. These need to be used with great caution and in accordance with the label. Plants respond differently; in some cases herbicides can favor native plants, in others exotic weeds.

Heavy Equipment. Mechanical treatments include a great variety of activities such as mowing, disking, grading, use of an anchor chain, mastication, and similar types of clearing. Some of these techniques can be very damaging to the environment so use with care.

Disking is quick and economical, however it can disturb the topsoil and encourage weeds to grow. Mowing works best on flat areas. Masticators grind the fuel into mulch rather than removing it from the site (see page 7). Bulldozers and other types of machines can fell trees to be chipped or crush chaparral.

Recycling and Utilization. These methods use the material removed rather than disposing of it.

Multi-cutting is a recycling method in which shrubby material is chopped into smaller pieces by hand and left on site to act as a mulch. This method works well on steep hillsides. It also provides improved wildlife habitat.

Chipping is often used along roadsides where the chips are used as a cover. A tub grinder is another method of grinding material to a particular size.

Meet the masticator

Mastication is one way to reduce fire hazard and brush, at the same time enhancing the soil.

A masticator is a piece of heavy machinery consisting of a backhoe-type vehicle with an articulating arm. On the end of the arm is a device that chops or flails woody vegetation. The machines come in various sizes for different needs and land characteristics.

The masticator turns woody material into a mulch that remains on the ground, protecting the soil as well as adding nutrients. The mulch also inhibits the return of shrubs that need bare soil to germinate, for example, greenleaf manzanita.

Masticators can be used in many types of terrain and can operate on slopes of up to 35%. They are often used to reduce vegetation along access roads and along driveways.

Timing of the work is important to soil protection. Mastication should be done when the ground is dry, generally in late spring or early summer–April, May, and June. Avoid when fire danger is high as the machinery can make sparks in the field. Best timing varies depending on the climate and humidity.

You might consider using a masticator if you have several acres to be worked. According to Cliff Heitz, District Conservationist with NRCS, the cost becomes economically feasible at about 10 acres. "Mastication initially appears to be costly but in the long term it's the least expensive method."

As always, it's important to consider and minimize any negative environmental impacts. The masticator leaves more of a footprint on the soil than hand methods. However, with a skilled operator, damage to the soil can be minimized as the masticator chips the material in front and drives over the chips. In addition, be clear about what you want left in place; once it's gone it's too late. You may want to leave patches of brush for wildlife or privacy screening.

How do you find out if mastication is a good fit for your needs? Contact your local NRCS office for advice. They will work with you to develop a conservation plan that will address your objectives be they wildlife habitat improvement, reforestation, thinning, or pruning. Many counties, especially in the foothills, provide some cost-share funding for this work.

How to select a tree service

The International Society of Arboriculture has listed tips for selecting a tree service or arborist. These tips can save money and help avoid hiring the wrong company. Read these carefully before hiring.

Check in the phone directory, usually under Trees, Tree Service, or Tree Care Service. Although anyone can list themselves in the yellow pages, a listing at least indicates some degree of permanence.

Beware of door-knockers. Most reputable companies have all the work they need without going door-to-door.

Never be rushed into bargains such as "if you sign an agreement today, I can take ten percent off the price." Never pay in advance. Ask for certificates of insurance, including proof of liability for personal and property damage, and worker's compensation. Then phone the insurance company to make certain the policy is current.

Ask for local references from other jobs the company has performed. Take a look at these and, if possible, talk with the former clients. Experience, education and a good reputation are signs of a qualified arborist.

Determine if the arborist is a member of organizations such as the American Forestry Association, American Society of Consulting Arborists, International Society of Consulting Arborists, International Society of Arboriculture, or the National Arborist Association. Membership does not guarantee quality, but lack of membership casts doubt on the person's professionalism.

Have more than one arborist look at the job and provide estimates.

Making an agreement

The terms of an agreement are usually made verbally. To prevent misunderstanding and be assured of the work agreed upon, get a written agreement. Most companies have their own form. Listed below are several key items that a written agreement or contract should include:

- ◆ Dates the work will begin and end.
- ◆ Exactly what work will be done. For example, prune all dead, dying, diseased and weak branches one and one-half inches or greater in diameter.
- ◆ Specify what cleanup will be done and when.
- ◆ The total dollar amount you will be charged.

–from *The Defensible Space and Healthy Forest Handbook.*

Cleanup Grant

Farm and Ranch Cleanup Grant Program

If illegal dumping is a problem on your property, the California Integrated Waste Management Board has a program that may help.

Grants of up to $10,000 per project ($50,000 per city/county) are available to fund clean-up activities. Funds may be used for waste removal and disposal, drainage control and grading improvement, slope and foundation stabilization, excavation, recycling, site security, and public education. Waterways flowing through private land are also eligible for cleanup.

To be eligible, the cleanup site must be located on a parcel zoned or approved for agicultural use (including silviculture, viticulture, horticulture, etc. activities) and the illegal dumping must be a nuisance or threat to public health and safety or to the environment. In addition, the owner must not be responsible for the dumping.

The Board may not award more than $10,000 per site but applications for the Cleanup Grant may consist of more than one site. The definition of a site is flexible and may consist of several piles along a roadside with various property owners or two noncontiguous piles on one larger parcel. Owners are not limited to one site.

The funding is provided to the city or county in which the site is located, so property owners must coordinate with a local government agency to get the funds. Possible applicants include local health agencies, public works departments, and enforcement agencies.

The Board's Grant Manager is committed to assisting applicants. The most time consuming elements of managing the grant will be (1) preparing a board of supervisors agenda item to obtain the resolution allowing the agency to enter into a grant agreement, (2) receiving a cost estimate, and (3) coordinating with the party conducting the cleanup activities.

Applications for the Farm and Ranch Solid Waste Cleanup Program are accepted on a continual basis. In order to rank and score applicants, Board staff will review applications on a quarterly basis.

For more information as well as applications and the review schedule, check the website at http://ciwmb.ca.gov/LEACentral/GrantsLoans/farmranch/default.htm. You can also ontact the Grant Manager Wes Mindermann at (916) 341-6314 or wminderm@ciwmb.ca.gov.

Use Your Appliances Wisely

Cut back on unnecessary energy use to keep your hard earned money in your pocket. Here are some suggestions you can do, at absolutely no cost to you.

Put your computer and monitor to sleep. Most computers come with the power management features turned off. On computers using Windows 98/ME/2000 open your power management software and set it so your computer goes to sleep if you're away from your machine for 5 to 15 minutes. Those who use Macintosh computers look for the setting in your Control Panels called "Energy Saver" and set it accordingly. When you're done using your computer, turn it off; do not leave it in sleep mode overnight as it is still drawing a small amount of power.

Plug "leaking energy" in electronics. Many new TVs, VCRs, chargers, computer peripherals and other electronics use electricity even when they are switched "off." Although these "standby losses" are only a few watts each, they add up to over 50 watts in a typical home that is consumed all the time. If possible, unplug electronic devices and chargers that have a block-shaped transformer on the plug when they are not in use. For computer scanners, printers and other devices that are plugged into a power strip, simply switch off the power strip after shutting down your computer. The best way to minimize these losses of electricity is to purchase Energy Star® products.

Eliminate wasted energy. Turn off lights in unoccupied rooms. Turn off kitchen and bath-ventilating fans after they've done their job. Keep your fireplace damper closed unless a fire is burning to prevent up to 8% of your furnace-heated air from going up the chimney.

Check out www.flexyourpower.ca.gov **for more information and ways to save money!**

Books

Look to the past to understand the present

Fire in Sierra Nevada Forests: A Photographic Interpretation of Ecological Change Since 1849
By George E. Gruell
ISBN: 0-87842-446-6. $20, Mountain Press Publishing Co.; 238 pages

Fire in Sierra Nevada Forests is one of the first books I have seen that does more than just explain how our Sierra Nevada forests have changed in the past century; it *shows* us, through a comparison of past and present photo pairs. These pairs represent many areas throughout the Sierra Range, including lower elevation oak woodlands up to the red fir belt and over into the eastside forests. It includes photos of historic gold rush towns like Downieville, Coloma, and La Porte.

The author has painstakingly located the original vantage points of almost all photos. After browsing through the over 80 photo pairs, it was obvious that many of these vantage points were impossible to reach due to heavy vegetation or other obstructions such as roads. In those cases, the conjugate photo was taken at an angle which clearly shows the change in vegetation over time.

This book clearly shows how fire (and a lack of) is only one of several factors that have affected the Sierras. Land use practices such as grazing, mining, urbanization (generally in the form of roads) and logging have also contributed to the difference between the pairs. I believe however, that these photos more than anything indicate that our forests are, first, not static and always growing and secondly, that despite the fact many practices were done with little to no regard for the environment (as compared to the present), that our forests are resilient and do grow back (i.e. 100 years ago, reforestation was not mandatory).

I would recommend this book to anyone who has an interest in Sierra history and/or ecology.

–Heather Morrison

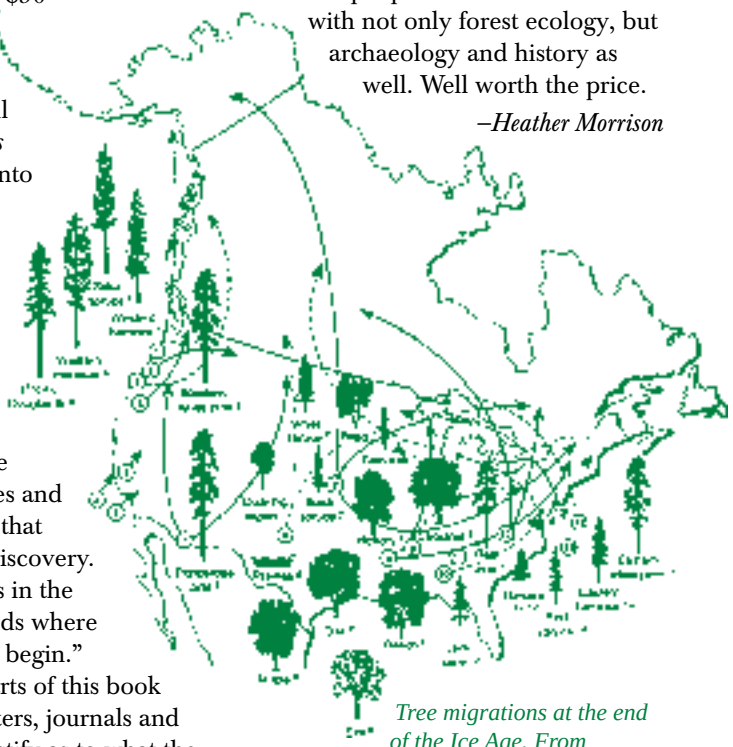
America's Ancient Forests: From the Ice Age to the Age of Discovery
By Thomas M. Bonnicksen
ISBN: 0-471-13622-0. $90
John Wiley & Sons, Inc.; 594 pages

What a wonderful book! *America's Ancient Forests* delves into the distant past, when forests were developing and migrating throughout the continent 20,000 plus years ago up until the 19th century. It includes much information on ice age forests, ancient peoples and fauna, and the forests that existed at the age of discovery. As the author suggests in the preface, "this book ends where most books on forests begin."

One of the best parts of this book is the collection of letters, journals and other quotes which testify as to what the landscape looked like and which describe the various land management practices, such as native American use of fire for a myriad of reasons. These notes are much like George Gruell's photo book, bringing the reader back into a time where cameras did not exist.

I strongly recommend this book to those people that are fascinated with not only forest ecology, but archaeology and history as well. Well worth the price.

–Heather Morrison



Tree migrations at the end of the Ice Age. From America's Ancient Forests.

Rare plants of Northern California

Illustrated Field Guide to Selected Rare Plants of Northern California. *ANR Publication 3395. 2001. 370 pages, 297 color photos, 149 drawings, glossary, 150 maps.*

Photos, line drawings, and descriptions of 149 rare plants (California Native Plant Society List 1 plants) in California's northern 10 counties. Each plant is described by: scientific name, alternate scientific name, common name(s), global distribution, USGS quadrangle where plant has been found, habitat description, key plant features, flowering time, diagnostic features. Handy 5.5" x 8.5" spiral bound book. $36 plus tax and shipping. 1-800-994-8849 or http://anrcatalog.ucdavis.edu.

Resources

I-Zone research from the FPL

The I-Zone is that area where the wildlands and homes come together. Problems arise because fire is a natural and necessary process in the California wildlands, but threatens life and property when it occurs near where people dwell. With increasing numbers of people moving into the I-Zone, it is important to find ways to deal with and minimize the effects of the inevitable fires.

Researchers are working on this problem in numerous ways including learning to understand fire behavior, modifying the environment to discourage catastrophic fires, working to increase forest health, finding ways to utilize excess biomass, and doing research on practical matters such as finding building materials that withstand fire.

The University of California Forest Products Laboratory (FPL) is a prime player in this field. If you want to get up-to-date information on how to best build homes to survive in the wildland-urban interface, go to the FPL at http://www.ucfpl.ucop.edu/. There you will find results of their tests on decks, roofs, walls, and windows. You will also find studies on woody biomass utilization, defensible space landscaping, and a homeowners' survival guide. There are also fact sheets.

In addition, the site contains a comprehensive, 246-page manual, ***Introduction to the I-Zone*** at http://www.ucfpl.ucop.edu/I-Zone/IZone2001.pdf. This volume contains general information about issues in the I-Zone. There is extensive coverage of history, the California Fire Plan, laws, fire ecology, effects of fire, fuel management, and even community programs. Check it out.

For homeowners

Living With Fire: A Guide for the Homeowner. This booklet uses easy-to-follow discussions, graphics, and tables to give homeowners information they need to minimize the threat of fire to their property. The 12-page booklet covers the fire environment, fire behavior, defensible space, landscape design, defensible home considerations, and what to do if wildfire threatens. This publication was produced by the University of Nevada Cooperative Extension and The Sierra Front Wildfire Cooperators primarily for eastern California and western Nevada but much of the information is applicable throughout the California wildlands. It is available in pdf format at http://www.kolotv.com/graphics/Living_with_Fire.pdf or check out the Living with Fire website at http://www.extension.unr.edu/FIRE/FrontPage.html. it is also available from the CA Forest Stewardship Helpline, 1-800-738-TREE.

Technical Assistance Resources

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 Department of Forestry & Fire Protection
Forest Landowner Assistance Programs
Jeffrey Calvert
(916) 653-8286
jeffrey_calvert@fire.ca.gov

Forestry Assistance Specialists
Jill Butler (Santa Rosa)
(707) 576-2935
jill_butler@fire.ca.gov

Rich Eliot (Fortuna)
(707) 946-1960
rich_eliot@fire.ca.gov

Tess Albin-Smith (Fort Bragg)
(707) 961-1531
tess_albin-smith@fire.ca.gov

Adam Wyman (Red Bluff)
(530) 528-5116
adam_wyman@fire.ca.gov

Chris Anthony (Camino)
(530) 644-2345 x292
chris_anthony@fire.ca.gov

vacant (Fresno)
(559) 243-4108

Glenn Barley (Riverside)
(909) 320-6120
glenn_barley@fire.ca.gov

California Association of RCDs
Thomas Wehri
(916) 447-7237
staff@carcd.org

California Dept of Fish & Game
Marty Berbach
(916) 327-8839
mberbach@dfg.ca.gov

California Resources Agency:
California Environmental Resources Evaluation System (CERES)
Deanne DiPietro
(916) 653-8614
deanne@ceres.ca.gov

Farm Service Agency
Larry Plumb
(530) 792-5520

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

U.C. Cooperative Extension Forestry
Richard Harris
(510) 642-2360
rrharris@nature.berkeley.edu

Gary Nakamura
(530) 224-4902
gmnakamura@ucdavis.edu

USDA Forest Service
Sandra Stone
(707) 562-8918
sstone01@fs.fed.us

Calendar

April 23

New Dynamism of Voluntary Land Conservation, Henry J. Vaux Lecture
Berkeley, CA
UC Berkeley, Haas Pavilion Club Room
Larry Ruth ergo@nature.berkeley.edu

April 23–24

Assessing Proper Functioning Condition (PFC) for Local Watersheds
Redding, CA
Turtle Bay Museums
Daria Hoyer 530-241-4001
daria@salixaec.com
$35; http://www.or.blm.gov/nrst/

April 23–24

Managing Species Mixtures in Coastal Forests to Mitigate Swiss Needle Cast
Tillamook, OR
Oregon State University
Conference Coordinator 541-737-2329
outreach@for.orst.edu; $275

April 25–27

Forest Landowners of California Annual Meeting: Forest Health/Fuels Management/Defensible Space
Redding, CA
Dan Weldon 916-972-0273
dweldon@forestlandowners.org; $75-$145

April 26

Maintaining Ranch Roads
San Geronimo, CA
UC Cooperative Extension
David Lewis 707-565-2621
djllewis@ucdavis.eud; Sherry Cooper 530-224-4902 shcooper@ucdavis.edu
$16; includes lunch

April 27

Streams in Motion: A Citizen's Workshop on Channel Dynamics, Sedimentation and Erosion
Elk Grove, CA
EPA and the RWQCB
Kate Kirsh 916-782-1011
kate@foothill.com
Free–limited to 20; Bring a sack lunch

April 30

Getting Your Message Out Workshop
Redding, CA
USFS, CARCD, W. Shasta RCD, & more
Hal Voege 916-991-1800
halvoege@ix.netcom.com
$15 inc. lunch; Limited to 30 people

May 2–3

Managing Young Conifer Forests for Timber and Amenities–Cascades
Corvallis, OR
Oregon State University
Conference Coordinator 541-737-2329
outreach@for.orst.edu; $275

May 7–9

Board of Forestry– Joint F&GC Mtg
Fresno, CA
Board of Forestry
Donna Stadler 916-653-8007
http://www.fire.ca.gov

May 10

Maintaining Forest & Ranch Roads
Redding, CA
UC Cooperative Extension
Sherry Cooper 530-224-4902
shcooper@ucdavis.edu
$10; Bring sack lunch; field visits

May 14–15

Oak Mortality Task Force Meeting
Santa Rosa, CA
Katie AFacino, 916 651-9182,
katharine_facino@fire.ca.gov

May 16–18

Intermountain SAF's Annual Meeting–Wildland/Urban Interface: Fire and Community Forestry
Reno, NV
Skip Ritter skip_ritter@nv.blm.gov
$10-$50; Registration due May 1

May 16–17

Local Gov't Strategies for Protecting and Restoring Aquatic Habitat, Water Resources & Salmon Fisheries
San Francisco, CA
FishNet 4C, Fishery Network of Cent. Ca. Coastal Cos., NMFS, DF&G
707-536-0020; FishNet.marin.org; $30-$75

May 21–22

Thinning Alternatives to Promote Diversity in Young Plantations
Blue River, OR
Oregon State University
Conference Coordinator 541-737-2329
outreach@for.orst.edu; $275

June 4–6

Board of Forestry Meeting
Redding, CA
Donna Stadler 916-653-8007
http://www.fire.ca.gov

Looking for past articles?

We archive all issues and articles at http://ceres.ca.gov/foreststeward. There you will find full issues in pdf format or individual articles by subject (go to the section For Landowners).

June 16–22

Forestry Institute for Teachers
Shasta County, CA
N. Ca. SAF, UC Coop. Ext., Shasta Co. Office of Educ., CDF Proj. Learning Tree & othersHeather Morrison 1-800-738-8733 info@forestryinstitute.org
Weeklong workshop for teachers. No charge. Applications postmarked by March 15 receive priority
http://www.forestryinstitute.org.

June 19–21

Feather River Coordinated Resource Management Group
Crescent Mills, CA
Leslie Mink 530-283-3739
leslie@plumascounty.org
No fees; 6/19: Steering Committee Meeting. 6/20 & 21: Eastside Sierra tour include restoration projects

July 9–11

Board of Forestry
Marin County, CA
Board of Forestry
Donna Stadler 916-653-8007
http://www.fire.ca.gov

July 14–20

Forestry Institute for Teachers *(see above)*
Humboldt County, CA

July 28–August 3

Forestry Institute for Teachers *(see above)*
Plumas County, CA

For more information on these events call the number given or the Forest Stewardship Helpline, 1-800-738-TREE. To submit an event, contact Sherry Cooper, 530-224-4902; shcooper@ucdavis.edu.

Comprehensive calendar, updated monthly online at http://ceres.ca.gov/foreststeward

Species Spotlight

A brief look at coho

Coho illustration courtesy Calif. Dept. Fish & Game

Coho salmon have a fascinating, complex life cycle. They emerge from eggs in freshwater streams where they spend their first year before migrating to the ocean. After a year or two in the ocean they return to the parent stream to spawn and die. Fish that go from freshwater to the ocean and back are called anadromous.

The complexity of the anadromous life cycle adds to the coho's vulnerability. Spawning is done in gravel; too much sediment there can destroy good spawning habitat. Emergent baby fish require shallow, quiet areas, and pools or side channels in which to grow. Young coho need cool water, adequate cover, and sufficient food to survive. There are completely different habitat requirements in the ocean and therefore different threats, including fluctuating ocean temperatures and fishing pressure. Then the migration back to freshwater is fraught with dangers from dams, culverts, and other impassable structures. Drought, flooding, mudslides, and other natural disasters can also impact the fish at any point in its life cycle.

Coho has experienced a rapid decline in numbers and range in the last few decades. Historically, coho were found in 582 California streams from the Smith River in the north to the Big Sur River on the central coast. Of these streams, an estimated 19–50% have lost their coho runs with the decline worse in the southernmost parts of the range. It is estimated that coho numbers in California are presently less than 6% of their abundance in the 1940s, with at least a 70% decline since the 1960s.

The decline of the coho is attributed to a number of factors, both human and natural. Among these is road and dam construction; timber harvesting, grazing and mining activities; urbanization; and overfishing. In addition, drought and other environmental conditions have played a role.

Coho is one of five species of salmon found in California. Salmonids are further differentiated into groups of genetically similar populations called *evolutionarily significant units,* or ESUs.

The National Marine Fisheries Service (NMFS) is the responsible federal agency for anadromous fish. NMFS has determined that three ESUs–the Central California, Southern Oregon/Northern California Coasts, and Oregon Coast–are threatened species, that is, they are likely to become endangered (in danger of extinction) in the foreseeable future.

Landowners can do much to improve habitat for coho salmon and help recover the species. Large woody debris and boulders in streams can improve conditions by providing escape cover, shade, and organic nutrients. Stream canopy is vital to maintain suitable water temperatures. Good road construction and maintenance are also extremely important (consider attending a roads workshop on April 26 or May 10–see calendar).

For more information on what you can do, go to the articles "Landowners can help in coho recovery" at http://ceres.ca.gov/foreststeward/html/coho.html and "How can you help the fish?" http://ceres.ca.gov/foreststeward/html/fishhelp.html

More info

For more information on the biology or the status of coho salmon, go to the following:

National Marine Fisheries Service: Pacific Salmon and the ESA
http://www.nwr.noaa.gov/1salmon/salmesa/

For the Sake of the Salmon
http://www.4sos.org/

Calif. Dept. of Fish & Game—Coho Salmon
http://www.dfg.ca.gov/hcpb/species/jsp/more_info.jsp?specy=fish&idNum=57

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Send to CDF, Forestry Assistance, P.O. Box 944246, Sacramento, CA 94244-2460. Phone: (916) 653-8286; Fax: (916) 653-8957; email: jeffrey_calvert@fire.ca.gov