



Forestland Steward

SUMMER 2010



Balancing wildlife needs with fuels management: a conundrum

Conundrum: A paradoxical, insoluble, or difficult problem; a dilemma.

Foresters and biologists can agree that our California forests are overcrowded, unhealthy, and primed to burn. But they may not always agree on the solutions.

Fuels treatments are one answer. These are prescriptions that usually involve thinning the forest to reduce and separate the contiguous fuels. While fuels treatments can decrease the risk of catastrophic fire, they're not the perfect answer. They don't provide all the ecosystem benefits of fire, and they alter habitat needed by wildlife.

Questions about exactly how, where, when, and what to treat are being hotly debated. New studies are revealing some of the subtleties and complexities of both fire and wildlife needs. These offer hope for solutions to our conundrum.

Attention is now focusing on using strategic silvicultural treatments to accomplish more than fire risk reduction. Treatments may be able to improve forest resilience, restore spatial variability, and protect crucial habitat elements for a range of species, including sensitive species.

Balancing wildlife needs with fire concerns is a huge challenge, one that calls for all the tricks and knowledge, art and science, of both forestry and biology. There are no clear answers and quite a bit of honest disagreement. But the ideas are intriguing and the discussions just beginning.

In this issue you will find considerable information on wildlife needs, as well as an introduction to new directions in fuels management. We promise to provide much food for thought, no absolute answers, and a chance to get in on this exciting conversation.

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Forestland Steward

Forestland Steward is a joint project of the CA Dept of Forestry and Fire Protection (CAL FIRE), Placer County Resource Conservation District, UC Cooperative Extension, and USDA Forest Service to provide information on the stewardship of private forestlands in California.

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The ideas contained in this newsletter are meant as general information and opinion, not management prescription. Consult a Registered Professional Forester or a qualified technical advisor (see page 10) for management advice specific to your needs.



Top 10 wildlife considerations when designing fuels treatments

Lorna Dobrovolny, CA Dept of Fish and Game

- 1 Try to plan your project outside of the breeding season. Most birds and animals have their young in the springtime. Your project could be disruptive to nests, dens, and other young animals trying to get a start in life.
- 2 Retain large snags (standing dead trees) that do not pose a threat to public safety or conflict significantly with management goals for fuel reduction. These habitat characteristics offer important hiding and denning spots. Woodpeckers also use snags for storing food and nesting. The best snags are 24 inches and greater in diameter at breast height (dbh).
- 3 Leave areas for wildlife to escape from predators and travel from one place to another. Not all of your property needs to be cleared of brush, leave certain areas away from human disturbance natural. Remove the brush in stages, with an overall goal to have a variety of shrubs of many ages.
- 4 Design your landscape to include a variety of native trees and shrubs while maintaining a fire-safe forest. It doesn't have to look like the trees were planted in rows to be fire safe. Clumps of trees and shrubs with adequate open areas around them can be fire safe and give wildlife needing that type of environment a place to live. Clumps should be configured in such a way that they don't contribute to ladder fuels. If you plan your landscape with your neighbors, that's even better.
- 5 Consult with a biologist before clearing along streamsides. Many animals and rare plants hide there. This vegetation is important to provide shade to keep streams cool, and also stabilizes banks and provides a filter for erosion. (See page 3 for more about streams.)
- 6 Learn your rare plants and protect them. There are a number of plants in decline in California due primarily to habitat destruction. The Redbud Chapter of the California Native Plant Society would be happy to help you learn how to help native plants thrive. Their website is at <http://www.redbud-cnps.org/>.



Scotch broom is very pretty but invades natural areas and spreads fire. Avoid the temptation to plant these and other invasive plants.

- 7 Do not plant or spread invasive non-native plants. For example, that brush along roadsides with pretty yellow flowers is called scotch broom. It is extremely difficult to control and can cover entire hillsides. Although it is a fire hazard and displaces native plants, you can find it for sale at many local nurseries. Avoid the temptation to plant these and other invasive plants. For more information on invasive plants, see *Invasive Plants of California's Wildlands* at <http://www.cal-ipc.org/ip/management/ipcw/online.php>.
- 8 Check old wood piles for signs of wildlife before lighting. If nests or dens are found, leave the pile alone. If it must be burned, restack it nearby or give the animal a path to escape from the fire.
- 9 Use herbicides according to the label as required by law or seek the advice of a Pest Control Advisor (PCA). A list of currently licensed advisors can be found at <http://www.cdpr.ca.gov/docs/license/currlic.htm>.
- 10 Know the wildlife and plants on your property. You may discover that you have plants or wildlife that have special significance and are a valuable resource to the entire state.

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A few thoughts on managing for wildlife

Managing for wildlife is an art, based on close observation, informed by scientific knowledge, and refined through trial and error (adaptive management). It takes creativity to achieve goals such as fire safety and at the same time provide appropriate wildlife habitat. Below are a few considerations to help guide you in making sound wildlife management decisions.

It's a matter of priority

Some areas—e.g., ridgetops, steep slopes, around homes and communities—need to be treated aggressively because the top priority there is to prevent catastrophic fire. Away from these high priority fire hazard areas landowners can consider treatments that serve other purposes, such as wildlife, forest restoration and resilience, and productivity.

Which species?

Since any habitat type encourages some species and discourages others you will have to make some decisions. Start by making a list of species typically (and historically) found on your property. Of these, which do you want to manage for? What are their needs? Managing for wildlife basically means making sure that all habitat needs are met for all life stages (food, water, cover, space, nesting, resting, etc.). For example, to manage for deer abundance you will need understory growth for food and cover. To maximize the number of different species (biodiversity), you want a mosaic of different habitat types.

What is possible for your forest?

The characteristics of your property—size, location, aspect, climate, vegetation, history, etc.—will determine which wildlife species can realistically be supported there. For species with a

large home range you may need to work with neighbors to create a larger habitat area or wildlife corridors that link suitable habitat.

What features are present on your property?

Forest structure is often more important than species composition. That is, habitat features (e.g., perching branches, soft snags, hollow logs) are critical regardless of the tree species. You will need an adequate supply of the habitat elements required by your species of interest. These may include snags, down logs, acorn-producing oaks, meadows, seeps, riparian areas, aspen groves, etc. If a necessary habitat component is missing you may be able to create it (girdle large trees for snags, put up bird or bat boxes, plant oaks, etc.). Some mix of forest structure is important for all properties, regardless of size.

Streams

Streams provide critical habitat for many animals. Fuel treatments in riparian areas can generally be less aggressive than treatments in upland areas since healthy riparian vegetation often burns less readily. However, when riparian habitat has been altered so that upland vegetation or exotics invade, it may become as susceptible to wildfire as upland areas. Focus treatments at the boundary between upland and riparian vegetation, and implement limited ladder fuels reduction in the riparian zone.

Can you achieve multiple objectives?

You may have to make compromises but it is certainly possible to create habitat for wildlife while also managing for other objectives. Prioritize your various objectives and talk to a biologist and forester for ideas on how to achieve them.

A management or stewardship plan can be a very valuable blueprint to help guide your management activities.



Photo © Pete Cafferata

Under natural conditions, where streams have not experienced changes in streamflow regimes, fires tend to fizzle out when they reach the riparian zone or burn through them in a patchy manner.

NOTE: This issue deals with balancing the needs of wildlife with the need to protect homes, lives, and property. The ideas presented must be considered in light of the landowner's objectives, the size, location, and topography of the property, and past practices. Much of this discussion is appropriate for larger landscapes; small properties, in particular, may find it difficult to comply with mandated fuels reduction requirements while employing all of the wildlife considerations discussed here.

Dr. Lloyd Glenn Ingles © Cal Acad of Sci



Golden-mantled ground squirrels eat seeds, nuts, berries, fungus, and insects, and in turn are food for hawks, bobcats, foxes, and other predators.

Start with the summary

This is just the summary from the GTR-220 (see sidebar at right) and doesn't do justice to the scope of ideas and depth of the strategy presented. It is important to read the entire report to get a better understanding of the context and reasoning behind many of these suggestions. But even these limited bullet points can stimulate thoughtful discussion. And that discussion can help move us toward a long-term strategy to achieve healthier and safer California forest ecosystems that can be sustained far into the future.

New dimensions for Sierran fuel treatments

Sierra Nevada mixed-conifer forests could benefit from a management strategy that goes beyond short-term fuel treatment objectives and incorporates long-term ecological restoration and habitat improvement into forestry practices. This strategy strives to incorporate ecological restoration and wildlife habitat needs and can be implemented using a multiage silvicultural system to meet fuel reduction, ecosystem restoration, and wildlife habitat objectives. Important facets of the strategy include:

- **Mechanical fuels management:** When stands cannot be burned, reducing fuels to moderate fire behavior is still a key priority because wildfire is likely to burn the area eventually. A few of the ecological benefits of fire are achieved with mechanical fuel reduction, but thinning is not an effective substitute for fire in affecting ecosystem processes. Reducing surface fuels is as important as reducing ladder fuels.
- **Limit use of crown separation in fuel treatments:** Sparingly apply canopy bulk density reduction and increased tree crown separation only in key strategic zones. More research is needed, but current models suggest its effects on reducing crown fire spread are limited, and the regular leave-tree spacing does not mimic tree patterns in active-fire-regime forests.
- **The ecological importance of fire:** Prescribed fire can help reduce surface fuels and restore some of the ecological processes with which mixed-conifer forests have evolved.
- **Treatments focused on affecting fire behavior:** Efforts to restore pre-European forest conditions are likely to fail in the face of climate change and also do not provide flexible prescriptions that adapt to different site conditions. Focus treatments on affecting potential fire behavior by manipulating fuel conditions, thereby allowing forests to equilibrate to fire under modern conditions and increasing forest heterogeneity.



Dave Menke/USFWS

Flammulated owls nest in tree cavities made by other birds. Unlike most owl species, they migrate to Central America for the winter.

- **Retention of suitable structures for wildlife nest, den, and rest sites:** Trees providing suitable structure for wildlife include large trees and trees with broken tops, cavities, platforms, and other formations that create structure for nests and dens. These structures typically occur in the oldest trees. Develop and adopt a process for identifying, and protecting, such trees for use by inventory and prescription-marking crews.
- **Stand-level treatments for sensitive wildlife:** Areas of dense forest and relatively high canopy cover are required by California spotted owls, fishers, and other species. Identify and manage areas where, historically, fire would have burned less frequently or at lower severity owing to cooler microclimate and moister soil and fuel conditions for the higher stem and canopy densities that they can support.
- **Large trees and snags:** Given their current deficit in mixed-conifer forest and the time necessary for their renewal, protect most large trees and snags from harvest and inadvertent loss owing to prescribed fire.
- **Landscape-level treatments for prey of sensitive wildlife:** In the absence of better information, habitat for the prey of owls and fishers may best be met by mimicking the variable forest conditions that would be produced by frequent fire. Reductions in stem density and canopy cover would emulate the stand structure produced by local potential fire behavior, varying by a site's slope, aspect, and slope position.



Johnny N. Dell, bugwood.org

Many mammals live in the forest, including these intelligent opportunists.

- **Retain hardwoods and defect trees and promote shrub patches:** Hardwoods (particularly black oak) and defect trees (i.e., those with cavities, broken tops, etc.) are valued wildlife habitat and should be protected whenever possible. Increasing understory light for shrub patch development, can increase habitat for some small mammals and birds.

- **Riparian forest fuel reduction:** Prescribed burning of riparian forest will help reduce fuels in these corridors that are also important wildlife habitat.

- **Spatial dispersion of treatments:** Trees within a stratum (i.e., canopy layers or age cohorts) would often be clumped, but different strata would usually be spatially separated for fuel reasons. Give particular attention to providing horizontal heterogeneity to promote diverse habitat conditions.

- **Spatial variation in forest structure:** “Average” stand conditions were rare in active-fire forests because the interaction of fuels and random fire behavior produced highly heterogeneous forest conditions. Creating “average” stand characteristics replicated hundreds of times over a watershed will not produce a resilient forest, nor one that provides for biodiversity. Managers could strive to produce different forest conditions and use topography as a guide for varying treatments. Within stands, important stand topographic features include concave sinks, cold air drainages, and moist microsites. Landscape topographic features include slope, aspect, and slope position.

- **Stand density and habitat conditions vary by topographic features:** Basic topographic features (i.e., slope, aspect, and slope position) result in fundamental differences in vegetation composition and density producing variable forest conditions across the Sierra landscape. Drainage bottoms, flat slopes, and northeast-facing slopes generally have higher site capacity, and thus treatments retain greater tree densities and basal areas.

- **Tree-species-specific prescriptions:** Hardwoods and pines, which have much lower densities in current forests compared with historical conditions, should rarely be thinned. Thinning



Terry Spivey, USDA Forest Service

California tortoiseshell butterflies lay eggs on Ceanothus plants.

Reptiles have their role in the forest ecosystem.

should be focused on species that have much higher densities than they would under natural fire regimes, for example, firs and incense cedar. Address

pine plantations separately.

- **Silvicultural model and strategy:** Tree diameter distributions in active-fire forests vary but often have nearly equal numbers in all diameter size classes because of periodic episodes of fire induced mortality and subsequent recruitment. Stand treatments that significantly reduce the proportion of small trees and increase the proportion of large trees compared to current stand conditions will improve forest resilience.

- **Treatment of intermediate-size trees:** In most cases, thinning 20- to 30-inch dbh trees will not affect fire severity, and, therefore, other objectives for their removal should be provided.

- **Field implementation of silvicultural strategy:** Modify marking rules to ones based on species and crown strata or size and structure cohorts (a proxy for age cohorts) rather than uniform diameter limits applied to all species.

- **Allocation of growing space:** A large proportion of the growing space would be allocated to the largest tree stratum.

- **Assessment of treatment effects:** Emphasis is on what is left in a treated stand rather than what is removed.

—Summary from *An Ecosystem Management Strategy for Sierran Mixed-conifer Forests* (see sidebar to the right).

An Ecosystem Management Strategy for Sierran Mixed-conifer Forests is a technical study that attempts to move the discussion beyond limited choices between fuels management and wildlife needs. This timely 49-page synthesis of current research is a must-read for forest landowners and managers.

An Ecosystem Management Strategy for Sierran Mixed-conifer Forests. Malcolm North et al. 2009. Gen. Tech. Rep. PSW-GTR-220. USDA Forest Service, PSW Research Station http://www.fs.fed.us/psw/publications/documents/psw_gtr220/psw_gtr220.pdf

Emphasis is on what is left in a treated stand rather than what is removed.

Snags are:

A Place to Live—Many animals, including birds, bats, squirrels, and raccoons, make nests in hollow cavities and crevices in standing dead wood.

A Food Source—By attracting insects, mosses, lichens and fungi, dead wood becomes a gourmet restaurant for wildlife looking for a snack.

A Crow's Nest—Higher branches of snags become excellent look-outs from which wildlife (such as raptors) spot potential prey and also where they eat their catch.

A Hiding Place—The nooks and crannies of dead wood are put to good use by squirrels and other wildlife looking to store food.

A Nursery—Decaying logs on the forest floor act as "nurse logs" for new seedlings.

A Soil Refresher—Mosses, lichens and fungi all grow on snags and aid in the return of vital nutrients to the soil through the nitrogen cycle.

—from the National Wildlife Federation, <http://www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife/Gardening-Tips/Attracting-Wildlife-With-Dead-Trees.aspx>

Snags: so much more than dead trees

Richard Harris and Bill Laudensayer

A *snag* is a standing dead tree. Snags provide habitat to innumerable organisms including fungi, insects and other invertebrates, and land animals such as amphibians, reptiles, birds, and mammals.

Logs and limbs from snags are important to the forest floor and streams. As they decay they release nutrients essential to long-term soil productivity. Down logs and limbs also provide habitat for many animals including salamanders and carpenter ants.

There is a misconception that forest health is negatively affected by diseased, dying, and dead trees. On the contrary, their presence is an important component of natural forest ecosystems (although large quantities of these trees in some forests do suggest a decline in forest health). In this article, we suggest a few simple guidelines for managing and recruiting snags.

Why Are Snags Important?

Probably the single most obvious reason for a landowner to be concerned with snags is because they provide habitat for birds. Some birds, such as sapsuckers and woodpeckers, excavate their own nests in snags (primary cavity nesters). Other birds occupy abandoned nests or natural cavities (secondary cavity nesters). These secondary nesting birds comprise up to one third of the breeding birds found in some forests.

Most cavity-nesting birds consume large quantities of insects each year. There is evidence that "biological control" by these birds can help keep populations of potentially damaging insects, such as bark beetles, below epidemic levels. Insect outbreaks often attract cavity nesting birds.

Snags are used in numerous other ways. Woodpeckers and sapsuckers communicate by "drumming" on dead branches. Squirrels and other small mammals use dying and dead trees as foraging sites, to store winter food supplies, and for roosting and denning. Bats use loose bark

and hollow tree trunks for roosting. A myriad of insects use dead trees as overwintering sites; some consume portions of dead trees, contributing to the decomposition process.

The death and eventual falling of trees provide forest openings that encourage regeneration of shrubs, trees, and grasses. This leads to improved habitat for species such as deer and small mammals.

Ecology of Snags

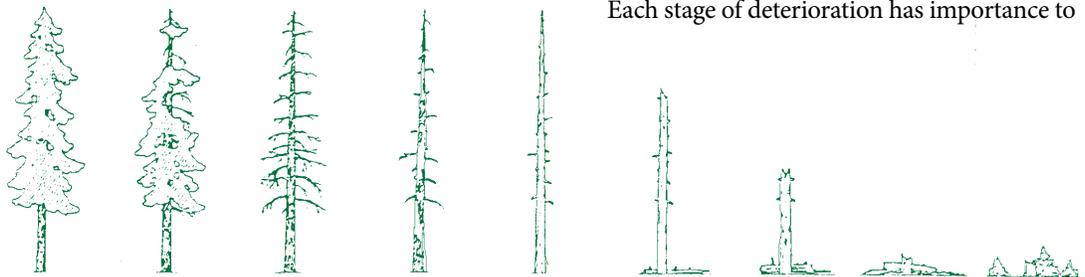
The number of snags in a forest varies. The creation of new snags depends on agents of mortality including insects, disease, and fire. Tree death in the forest is patchy, episodic, and grouped, reflecting the ways in which natural disturbances work.

The rate at which a dead tree deteriorates determines many of its ecological properties. Larger diameter trees persist longer than smaller ones. Decay rates also vary by species. For example, ponderosa pines generally persist longer than white fir of the same diameter. Large diameter snags appear to be more valuable because they stand longer and provide habitat for birds which require large trees to nest. It is the large trees and, consequently, large snags that are becoming more scarce in our forests.

Hard or Soft

Snags may be classified as "hard" or "soft." Hard snags are essentially sound wood while soft snags are in an advanced state of decay. Hardness depends on tree species, the nature of the decay agents, and snag age. Some birds and insects may only excavate in soft snags. Others, including woodpeckers, require hard snags because of the stability they provide for nest cavities. As a snag progresses from hard to soft, pieces begin to fall to the ground. Eventually, the snag is reduced to a decomposed stump and collection of downed, decayed material—in essence, forest floor woody debris.

Each stage of deterioration has importance to



As trees go through their lifecycle from living tree to soil they provide benefits to different wildlife species.

certain wildlife. Early in the process when bark loosens, snags become important roosting sites for bats. Advanced stages of decay are most important for insectivorous birds and small mammals.

The successional stage of the community around the snag also influences the way in which they are used. For example, some birds require snags in open shrub or grass communities. Others avoid snags in the open and will only use those in the closed forest.

Snag Management Guidelines

Ecological stewardship should include preservation and recruitment of snags for the benefit of wildlife and long-term soil productivity. Landowners must weigh many factors when managing for snags, including fire hazard, hazards posed to developed areas from falling trees, and trade-offs of productive forestland for benefits other than timber production.

There is little reason to remove soft snags from a forest provided they are not posing safety or fire hazards. Soft snags have no commercial value. Hard snags will gradually turn into soft snags so if adequate hard snags are provided, and most soft snags retained, requirements for all snag-dependent species should be met.

In general, it is most beneficial to provide a wide range of snag species and size classes. Both coniferous and hardwood snags are useful to wildlife. For example, large black oak snags are extensively used by cavity-nesting birds and small mammals. Of the conifers, ponderosa pine may be preferable to white fir. Deciduous trees such as aspen, cottonwood, and willow are heavily used where available.

Snags should be well-distributed because of the territorial requirements of cavity-nesting birds. Clumping of snags in small patches has been shown to benefit some species, especially pileated woodpeckers. When selecting specific trees, suitable nest trees are indicated by signs of heart rot at the heights and diameters required by the target animal. Signs of heart rot include:

- conks, either small or large
- broken branch stubs with signs of rot
- wounds or scars resulting from fire, lightning or mechanical damage
- existing woodpecker holes or cavities
- dead areas on living trees

It is wise to consider the position of a snag in the landscape and in relation to other trees. Snags in the lower parts of slopes surrounded by other trees are at less risk from windthrow than isolated snags on ridgetops..



Dr. Lloyd Glenn Ingles © California Academy of Sciences

White-headed woodpecker

It is not advisable to give general prescriptions for the number and size of snags without considering the characteristics of the stand, including stocking levels and tree species composition and requirements of target wildlife species.

Snag guidelines for particular wildlife are available (contact UC Cooperative Extension). For example, in a ponderosa pine forest, a minimum of 14 snags/100 acres with a minimum size equal to or greater than 20 inches dbh probably provides sufficient nesting habitat for pileated woodpeckers assuming large diameter live trees are present and food supplies are adequate.

Large snags can often be substituted for smaller ones to meet habitat requirements but the reverse is not true. Caution against overly general prescriptions will prevent situations in which either too many or too few snags are provided in a specific forest type on a property.

Bottom Line

Large trees are increasingly scarce in California's forests. Without management to preserve and recruit large trees that eventually become snags, important wildlife may disappear from our forests. A landowner may find it useful to work with neighbors in trying to preserve and recruit large diameter snags so that no one person shoulders too much of a burden. Even one large snag over an area of several acres can provide significant benefits.

—a *Forestland Steward* classic from Winter 1998



Chris Schnepf, University of Idaho

Soft snag

Balance habitat with safety

The same features that make snags an asset for wildlife may be a liability for people. Protect snags when possible but remove any that pose a hazard—those that can fall (from any direction) onto a structure, access road or trail, powerline, or anywhere that people hang out.

Reduce the possibility of a snag serving as a fuel ladder to spread fire into the canopy by removing low hanging and dead branches from the lower portions of the tree. However, be cautious. Snags can fall or catch fire from a spark from a mechanical saw.

Protect snags from fire by removing fine litter and woody undergrowth at their base.

—adapted from *Creating and Maintaining Wildlife, Insect, and Fish Habitat Structures in Dead Wood*
http://www.fs.fed.us/psw/publications/documents/psw_gtr181/067_Brown.pdf

Strategies to enhance habitat for birds



Dave Menke / USFWS

A vigorous understory is important for concealing nests and supporting invertebrates that birds, including the willow flycatcher, prey upon.



James C. Leupold/USFWS

Several species, including the Sierra Nevada subspecies of fox sparrow, are dependent on shrub habitat. Shrub fields are a source of fruit, nectar, and seeds used by shrub nesting birds, as well as adjacent forest nesting species.



Dr. Lloyd Glenn Ingles © California Academy of Sciences

Western tanagers prefer open coniferous forest habitat.

Mixed-Conifer Hardwood Habitat

- 1. Reduce conifer cover to enhance hardwoods.** This is the most important action you can do to avoid further reduction of hardwood habitat.
- 2. Manage for cavities.** 30% of landbirds in this habitat nest in cavities. Both snags and decay in living hardwoods are critical sources of cavities.
- 3. Manage for structural diversity.** Bird diversity in mixed-conifer hardwood habitat increases with more under- and middle-story foliage.
- 4. Manage for dense and diverse understory.** Many bird species here forage or conceal their nests in the understory and on the ground.
- 5. Manage with fire.** Fire is a critical part of the natural cycle that maintains hardwoods, snags, and understory plants.

Aspen Bird Habitat

- 1. Restore riparian aspen communities.** Healthy aspen habitat is the most species-rich habitat in the Sierra.
- 2. Promote aspen regeneration and expansion.** This is the single most important management consideration to avoid further loss and degradation of this vital habitat.
- 3. Manage for multiple age and cover classes.** The smallest size classes of aspen are important predictors of avian richness.
- 4. Manage for dense and diverse understory.** Understory aspen and riparian shrubs are important for numerous bird species.
- 5. Limit grazing and over-browsing.** Grazing can significantly reduce aspen regeneration, understory foliage, and the structural diversity important for many bird species.

Meadows

- 1. Get to know your meadows.** Inventory and rank habitat value using key indicator species.
- 2. Make wildlife management the primary objective in the best bird meadows.** With their crucial ecological value and loss/degradation, the few remaining high quality meadows should be managed exclusively for wildlife.
- 3. Restore degraded meadows.** Restoration activities include raising water tables with check dams and removing grazing.
- 4. Manage for dense patches of willow/alder.** Dense patches of these shrubs are the single most important habitat feature for meadow-dependent birds.
- 5. Manage for tall lush herbaceous vegetation.** A vigorous understory helps conceal nests and support invertebrate prey for birds.

Riparian Habitat

- 1. Plant native riparian plants in a mosaic.** Planting a variety of natives in clusters provides different habitats for different species.
- 2. Keep dead trees.** These are important habitat elements that offer food and safety for birds. Try to leave at least one dead tree per acre.
- 3. Eliminate, reduce, or closely manage grazing,** especially in spring and during breeding season.
- 4. Maintain and restore riparian understory.** Keep native plants that grow under trees.
- 5. Remove non-native plants,** which can overtake natives and provide poorer bird habitat.

Shrub Habitat

- 1. Value shrubs as important wildlife habitat.** All activities that may impact shrub habitat should consider the ecological value to wildlife.
- 2. Manage group selects and post-fire for shrubs.** Timber harvest or fires that reduce canopy in areas greater than 5 acres can provide high quality habitat for shrub-dependent birds. Herbicide, mastication, and conifer release treatments that inhibit natural shrub regeneration reduce important habitat.
- 3. Prioritize mixed shrub habitats over monotypic stands.** Mixed species shrub fields support greater diversity and densities of shrub-nesting birds than manzanita-dominated sites.
- 4. Increase use of prescribed fire.** Fire helps regenerate aging shrubs, reduce surface fuels that inhibit shrub recruitment, and thin encroaching conifers.

Oak Woodland

- 1. Plant acorns and oak seedlings.** Plant a diversity of oak species native to your area to benefit a diversity of birds.
- 2. Do not cut down large, old oak trees.** Trimming oaks by removing large branches is better than removing whole trees.
- 3. Keep dead oaks.** These are important habitat elements and offer food and safety to birds. Try to leave at least one dead tree per acre.
- 4. Protect young oaks, especially from grazing animals,** with plastic tubing or fencing.
- 5. Maintain and restore oak understory.** Keep native plants and shrubs that grow under oaks. Remove non-natives.
- 6. Do not water native oaks.** Our oaks receive no summer water in their natural environment.

— from the Northern Sierra Forest Songbird Communities Study <http://www.prbo.org/cms/103>

Species Spotlight

All eyes on the fisher: managing for a sensitive species

Some species are rare or declining for a variety of reasons. They may have naturally low numbers, very specialized habitat requirements, or needs that directly conflict with those of humans. These species sometimes need special management intervention to prevent further loss or extinction.

The fisher (*Martes pennanti*) may be one of these species. With a small and possibly decreasing population, it is currently the subject of numerous studies. The State recently decided not to list the species, but it is still under review for Federal listing.

What makes fishers so sensitive and what can be done to protect them? These are questions the studies hope to answer. Understanding the current status of the species and determining fishers' needs, behavior, and the factors that limit their survival are the first steps toward a solution.

Status

Fishers are cat-sized members of the weasel family found only in North America. They are dark in color, with males significantly larger than females. Omnivores, they feed on just about anything: birds, mammals (rodents, porcupines), reptiles, insects, carrion, and vegetation.

The fisher population in California was sharply reduced in the early 1900s due to intensive trapping and habitat alteration, largely from historical timber practices. At one time fishers were found across forested areas of California in the northern Coast Range, Klamath Mountains, southern Cascades, and western slope of the Sierra Nevada. Today they are restricted to two widely separated areas, with a small population in the southern Sierra Nevada and a larger one in the northwest more than 250 miles away.

Needs

Many life history characteristics contribute to the fisher's vulnerability. They require forested habitats with old growth characteristics, have a large home range, give birth to only 2–3 offspring per year, and do not travel across large expanses of open habitat, like areas that have been extensively logged or burned. However, fishers will use less desirable habitat when there are large patches of trees available to provide cover.

Old growth characteristics include numerous large diameter trees and snags, moderate to



Gerrald and Buff Corsi © California Academy of Sciences

dense canopy cover, and understory vegetation. Decadent structures (snags, cavities, deformed branches, fallen trees and limbs, etc.) and limbs close to the ground are critical. Large lateral limbs, pockets of decay, horizontal branch arrays, and cavities they need are found mostly in large trees.

Fishers seldom revisit the same resting spot so there must be a large number of appropriate spots available. Resting, nesting, and cover occur in cavities in tree trunks or hollow logs, snags, and on mistletoe platforms (witch's brooms).

While fishers in California choose late successional forest structures for resting and denning, they may select younger age forest characteristics for foraging. Foraging habitats include the understory of old growth forests, as well as openings and patches with understory vegetation and prey species nearby to high canopy cover stands.

Management Implications

Almost 40 percent of fisher lands are in private ownership so maintaining or increasing their populations will require cooperation from both private and public landowners.

New data about fishers and their life history should give us insights and tools to provide the elements they need while meeting human management objectives. Stay tuned as more information becomes available.

Learn about current fisher studies and issues from California Department of Fish & Game <http://www.dfg.ca.gov/news/issues/fisher/> and Sierra Nevada Adaptive Management Project (SNAMP) <http://snamp.cnr.berkeley.edu/teams/fisher>.



Little Orphan Annie

This year the SNAMP Fisher Team rescued 5 orphaned fisher kits. You can follow their progress and exploits at the Fisher Kit Blog at <http://ucanr.org/blogs/Fisher/>.

You are invited

to a **SNAMP Fisher Integration Team Meeting** on Thursday, July 22, from 10:00 am–4:00 pm 550 E. Shaw Blvd., Fresno <http://snamp.cnr.berkeley.edu/events>

Resources **Some easy ways to enhance wildlife habitat**



Photo © Ron Wolf

Red-breasted sapsuckers nest in cavities in dead trees or branches.

- Plant native oaks or other mast-producing trees or shrubs. These benefit numerous animals—over 300 wildlife species use oaks either directly or indirectly.
 - Leave snags in place or create new ones. Snags in various stages of decay are necessary habitat for a great number of species in the forest.
 - Thin or control-burn patches of the forest to create browse for deer or other herbivores (if compatible with landowner objectives).
 - Leave downed wood, such as logs, to decay in place on the forest floor.
 - Leave or augment large woody debris in streams.
 - Plant native grasses and forbs.
 - Remove exotic and particularly invasive pest plants. (<http://www.cal-ipc.org>, California Invasive Plant Council).
 - Add artificial shelters, such as nesting boxes for birds or bat boxes, especially when snags or other appropriate cover are limiting. Artificial shelters should be considered a supplement rather than a substitute for habitat restoration.
- Plant native wildflowers to attract butterflies and other insects (see the *Sunset Western Garden Book* for lists of plants).
- Use pesticides and herbicides only when absolutely necessary; they may harm nontarget species. Use the least toxic, most specific method of control.
- Create brush or rock piles when this type of cover is limiting.
- Provide water with guzzlers or other structures.
- Leave riparian vegetation and corridors to ensure adequate cover for animals using water sources.
- Increase the variety of vegetation types. This not only increases the diversity of food and cover, it also introduces redundancy into the ecosystem. Thus, if one species of plant does poorly, wildlife may be able to use another.

—from *Forest Stewardship Series 8: Forest Wildlife, a publication created by UC Cooperative Extension to help forest landowners understand forest wildlife relationships and function, habitat structures and elements, and how to maintain or enhance them. Download a free copy at <http://anrcatalog.ucdavis.edu/Forestry/8238.aspx>.*

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 (Redding) 530-528-5108
Jill Butler (Santa Rosa) 707-576-2935
Ed Crans (Placer/Yuba/Nevada)
530-889-0111 x128
Brook Darley (Tehama/Glenn) 530-528-5199
Mary Huggins (S. Lake Tahoe) 530-541-1989
Patrick McDaniel (El Dorado) 530-647-5288
Dale Meese (Plumas) 530-283-1792
Jonathan Pangburn (San Benito/Monterey)
831-333-2600
Alan Peters (San Luis Obispo) 805-543-4244
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

Tina Bartlett
916-653-9834; tbartlett@dfg.ca.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

Susie Kocher, Natural Resources Advisor
530-542-2571; sdkocher@ucdavis.edu

Gary Nakamura, Natural Resources Advisor
530-224-4902; nakamura@berkeley.edu

Rick Standiford, Forest Management Specialist
510-643-5428; standifo@berkeley.edu

Bill Stewart, Cooperative Extension Specialist
510-643-3130; billstewart@berkeley.edu

Yana Valachovic, Humboldt-Del Norte counties
707-445-7351; yvala@ucdavis.edu

USDA Forest Service

Janice Gauthier
707-562-8875; jgauthier@fs.fed.us

Calendar

July 21-August 11 (see article at right)

Balancing Wildlife Needs and Fire Hazard Reduction in the Central Sierra Nevada

Sponsors: Society for American Foresters, El Dorado Co and Georgetown RCD, UC Cooperative Extension El Dorado County, CA Dept of Fish and Game, US Fish and Wildlife Service, NorCal Society of American Foresters

Location: El Dorado RCD, 100 Forni Rd, Placerville

Fee: \$15, covers refreshments and handouts

Registration: <http://ucanr.org/forestregistration> or call Nancy Starr 530-621-5503; limited to the first 50 people who register

July 22

Fisher Integration Team Meeting 2010

Location: Inyo Room at UC Merced Center, 550 E. Shaw Blvd., Fresno

Time: 10 am-4 pm

Website: <http://snamp.cnr.berkeley.edu/events/>

Note: The goal of this meeting is to share what the team has learned through their fisher research over the last year. There will be time for discussion and questions through out the day as well as at the end.

August 3-5

Board of Forestry Meeting

Location: Resources Building, Sacramento

Website: <http://www.bof.fire.ca.gov/>

September 7-9

Board of Forestry Meeting

Location: Resources Building, Sacramento

Website: <http://www.bof.fire.ca.gov/>

September 30

Balancing Wildlife Needs and Fire Hazard Treatment

Location: UC Forestry Camp, Meadow Valley

Contact: Mike De Lasaux (mjdelasaux@ucdavis.edu) for more information.

October 21, 2010

SNAMP Annual Meeting

Location: TBA (Davis or Sacramento)

Website: <http://snamp.cnr.berkeley.edu/events/>

Note: The goal of the annual meeting is to promote shared understanding of the current status of SNAMP and its findings thus far and to allow for public interaction and involvement.

October 26

Woody Biomass Workshop

Location: Yreka, CA

Website: <http://groups.ucanr.org/WoodyBiomass/Workshops/>

Note: Workshops raise awareness of woody biomass utilization issues and options in the local area.

Balancing Wildlife Needs and Fire Hazard Reduction in the Central Sierra Nevada

Foresters, wildlife biologists, and specialists will discuss ways to reduce fuel loads while maintaining and potentially enhancing habitat for wildlife. Includes four evening sessions plus an optional field trip.

Wednesday, Jul 21—Introduction and objectives of forest management to enhance forest health and reduce fire hazard; Regulations affecting fuels management projects

Wednesday, Jul 28—Wildlife habitat with emphasis on conifer forests

Wednesday, Aug 4—Plant identification and sensitive plants

Wednesday, Aug 13—Incorporating wildlife and sensitive plant considerations into prescriptions and Community Wildfire Protection Plans

Friday, Aug 13—Morning field trip to observe management approaches

Location: 100 Forni Rd, Placerville

Fee: \$15, covers refreshments and handouts

Register: <http://ucanr.org/forestregistration> or 530-621-5503; limited to the first 50 people

Get the version with live links

You can receive the e-version of this newsletter about a month earlier than the printed copy...plus, it has live links to all the web resources. Get an early peek at *Forestland Steward* by signing up for the electronic version (yes, you can still get the hard copy). Simply send a note to llitman@pacbell.net and specify whether you want to receive the e-version *instead of* or *in addition to* the paper version.

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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.

Fill out this box and send it to CAL FIRE, Forestry Assistance, P.O. Box 944246, Sacramento, CA 94244-2460. Fax: (916) 653-8957; email: jeff.calvert@fire.ca.gov
 For address changes, please send this box or contact Jeff Calvert via e-mail, standard mail, or fax...be sure to reference Forestland Steward newsletter.

Document your forest with a nature journal

Animal Signs

tree holes

bird nests

feathers

howl pellets

gnawed bark

tree scratches

nipped twig ends

hair

mud slides

holes

diggings

seed caches

scat

sounds

“...certain days glow like a sifting of golden maple leaves in an old lane in October, moments uncovered as I turn a page spotted with gun oil: a Hunter’s Moon viewed through bare branches after a day’s shooting; a feathered form laid in my hand and setter eyes that seemed to say, “George, did I do it right?” Mention of a sun disappearing behind a purple ridge as I climbed that last hill to the station wagon with an empty game pocket, bonetired but immeasurably happy. For as long as I have these pages, many of them yellowed and beginning to smell of time, my setters will range the fall and winter woods. And, for just as long, I’ll be there.”

—George Bird Evans, in *The Pleasures of a Shooting Diary*

If you don’t keep a nature diary or journal you may be missing out on a fun activity for you or your whole family, as well as valuable information about your forest. A journal can be anything you want it to be: a daily diary, an occasional notation, a species list, a scientific record... It can be organized or casual, poetic or practical, and it can evolve over time.

Your journal will sharpen your powers of observation and inform your management activities. You will learn what habitat is necessary to various species and identify the important

habitat elements (e.g., an acorn granary tree, travel corridors, nesting times, etc.) to protect. It can remind you of happy days in the woods and then become a historical record valued by future generations or subsequent property owners.

By keeping track of what species are seen, when, and in what numbers, you will notice if common species become rare or unusual species appear. It can help you notice changes happening in your forest before they become serious problems.

Your nature journal can be a family project that involves children and grandchildren and helps stimulate their appreciation and knowledge of the forest ecosystem. You may want to plan occasional “nature days” where you walk the same path noting all wildlife signs: tracks, hair, scat, sightings, nests, etc. You can even set up a remote camera triggered by movement to take pictures during the night or at times you aren’t present.

Supplement your journal with a small library of field books so you can learn to identify the plants and animals you see.

A nature journal should include—at minimum—the date, location, weather, species seen, and notes. Feel free to include your thoughts and feelings. And be sure to note things you expected to see but didn’t.