



FORESTLAND STEWARDS

Landowners can aid in coho recovery

Grave declines in coho salmon populations have led to its listing as a threatened species. This listing requires landowners to avoid activities that would cause harm to the salmon or their habitat.

How can landowners help protect and restore salmon populations? A little knowledge of their life history and needs can help.

Coho salmon are anadromous fish, that is, they are born and live in fresh water as juveniles and then migrate to the ocean where they grow for two years. They return to their streams of birth to spawn and die.

Coho salmon face different requirements and threats at each stage of their life cycle. Some threats come from nature—predators, poor ocean conditions, lack of food—while others are from human activities—logging, mining, agriculture, urbanization, etc.

During upstream migration, coho salmon primarily require access. Problems arise if there is insufficient precipitation and runoff to open the sandbars at the mouth of rivers, insufficient flow to enable upstream movement, barriers such as jams, falls and improperly constructed crossings, water that is too cold or hot, low

dissolved oxygen, or high turbidity.

During spawning, the female lays her eggs in the gravel substrate in nests. At this stage, coho need deep, flowing, silt-free water and a stable deposit of clean gravel. They also need cover such as overhanging vegetation, undercut banks, submerged rocks and logs, and floating debris.

Juvenile coho live in their fresh water streams for well over a year, making in-stream conditions important to them. They need cold water, low turbidity, suitable space, shade and structural complexity. They also need plenty of insects for food. Growth and competitive ability are enhanced when there is a lot of cover in and near the stream. This condition has lead biologists to describe good coho salmon habitat as “deep, dark, and dense.”

Timber operations and other land management practices on private timberlands have historically degraded in-stream coho salmon habitat in the following ways:

- increasing sediment loads that reduces productivity of spawning gravel and fills rearing pools,
- removing trees or downed logs that currently (or may in the future) provide large woody debris in-

stream habitat structure,

- reducing shade which protects the water against temperature increase,
- reducing the quality and quantity of overhanging streamside cover that provides hiding cover and food,
- reducing stream flows through water withdrawals during the critical low water periods,
- decreasing bank stability,
- blocking migratory routes through road crossings and debris jams.

Large woody debris has been a central theme of salmon habitat management. It enhances the quality of the habitat in all stream sizes.

Physically, it forms or enhances pools and side channels, moderates sediment discharge, provides cool water pockets, and modifies water quality. Biologically, it may provide cover from predators and excessive water velocity, diminish aggression and provides a foraging substrate for food species. Loss of large woody debris reduces winter survival for all species of salmon.

Approximately 10 mature conifer trees per 100 m (328 ft) of stream are needed to achieve debris loading similar to that in a mature forest stream. There are several options for riparian

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Fire-Safe California

New Alliance committed to pre-fire management

What is needed to build a fire safe California? Identifying the "next steps" was the goal of the first California Fire Partnership Summit held this summer.

The first accomplishment of the Summit was the creation of an "Alliance for a Fire Safe California" made up of leaders from different entities. This Alliance is to serve as a statewide clearinghouse for overcoming institutional barriers and addressing key cross-jurisdictional issues that are characteristic of California's complex wildfire problem.

Showing the depth of commitment to this plan, the high-level Alliance leadership team consists of Richard Wilson, Director, Calif. Dept. of Forestry & Fire Protection; Ronny Coleman, Calif. State Fire Marshal & CDF Chief Deputy Director; Lynn Sprague, US Forest Service Regional Forester; Ed Haste, Bureau of Land Management State Director; P. Michael Freeman, L.A. Co. Fire Chief; and Jerry Davies, Communications Director of the Personal Insurance Federation of Calif.

Summit working groups also pondered major issues and came up with some initial solutions:

■ **What needs to be done to bolster cooperation among multi-agency firefighting resources and prefire activities?**

Identify and include all stakeholders; develop a common mission for the whole project; develop a communication plan document.

■ **How can different state, federal, and local planning and business processes be meshed to minimize overall costs and losses from fire?**

Form groups of key entities responsible for biodiversity and fire safe councils at

the regional and local level to prioritize and identify pilot areas and resources for treatment; establish coordinated planning process across all jurisdictions and share data; identify legislators and stakeholders to champion funding support for prefire management; use California Fire Plan and Fire Safe Council to increase fire consciousness among county planners and to develop private/public partnerships.

■ **How can we ensure that relevant ecological values are addressed before the fires start?**

Synthesize existing information and data on fire ecology and validate in the field; determine acceptable level of ecological and social needs and develop a monitoring system; adequately fund implementation of adaptive measures and fire ecology education.

■ **What public and private actions are needed to achieve fire safe communities in the urban-wildland interface?**

Improve homeowner education while increasing enforcement of fire safe standards by private insurers and fire agencies; provide technical data for citizens and community-based solutions; insurance rates should be more sensitive to individual property or community-wide fire safe conditions.

■ **What tools and methods are needed to match fire policy goals on the ground with high air quality standards?**

Implement the California Fire Plan approach; lobby for state and federal funding and prorate costs to water users; use prescribed fire to reduce total emission in non-attainment areas; educate stakeholders about the natural and historic role of fire.

A web site is being developed to provide information and educational materials from all partners.

FORESTLAND STEWARD

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Seasonal Stewardship

El Niño expected...prepare for rain

Off the coast of Latin America, a warming pattern is leading scientists to predict the strongest—and potentially most devastating—El Niño in more than half a century.

El Niños bring wild storms to California, typically reaching the coast in late fall or winter. This year, federal forecasters are predicting that it will arrive sooner, perhaps as early as September.

—San Francisco Chronicle, August 1997

You don't need a weatherman's predictions to know that fall is the season to work on erosion control and road maintenance. Before winter, all permanent, seasonal and temporary roads should be inspected and prepared for the coming rains. Winterizing consists of maintenance and erosion control work needed to drain the road surface, to ensure free flowing ditches and drains, and to open all culverts to their maximum capacity.

■ On unsurfaced roads, waterbars may be required at spacings dictated by the road gradient and erodibility of the soil.

■ Trash barriers, culvert inlet basins and pipe inlets should be cleaned of floatable debris and sediment.

■ Ditches that are partially or entirely plugged with soil and debris should be cleaned and heavy concentrations of vegetation which impede ditch flow should be trimmed.

■ Excavate all unstable or potentially unstable fills and sidecast which could fail and be delivered to a watercourse during the coming winter.

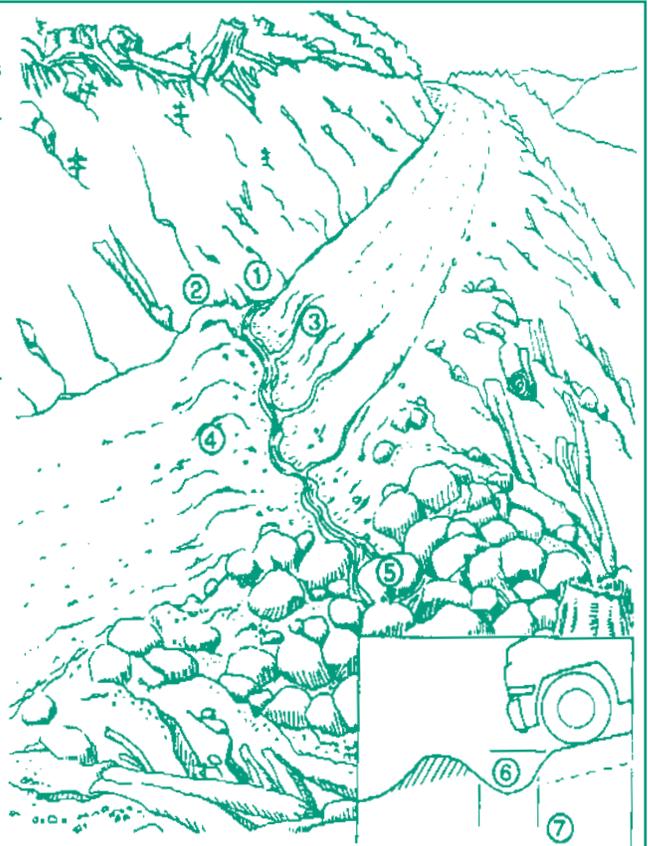
■ Once seasonal and temporary roads have been winterized, they should be gated and closed to "nonessential" traffic.

■ If maintenance activities produce excess material, it should be stored locally or hauled away. Spoil may be feathered over the road, but on permanent roads excess fine material

may produce unwanted muddy conditions after the first rain. Spoil material should be hauled to a stable site safely distant from streams, contoured to disperse runoff and stabilized with mulch and vegetation. Excess spoil should never be sidecast near streams. Berms of excess spoil along the road shoulder should be removed or frequently breached prior to the rainy season.

*This information came from the **Handbook for Forest and Ranch Roads: A Guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads** by William E. Weaver, Danny K. Hagans & Pacific Watershed Associates for the Mendocino County RCD, June 1994. This 190-page handbook is an excellent resource. Order it for \$20 from: Mendocino Co RCD, 405 Orchard Ave, Ukiah, CA 95482; (707) 468-9223.*

Waterbars are constructed on unsurfaced forest roads that will have little or no traffic during the wet winter period. The waterbar should be extended to the cutbank to intercept all ditch flow (1) and extend beyond the shoulder of the road. A berm (2) must block and prevent ditch flow from continuing down the road during flood flows. The excavated waterbar (3) should be skewed 30° to the ditch-line with the excavated material bermed on the downhill grade of the road (4). Water should always be discharged onto the downhill side on a stable slope protected by rip rap or vegetation (5). The cross ditch depth (6) and width (7) must allow vehicle crossover without destroying the function of the drain.



Waterbars (also called waterbreaks) can be used to drain a road surface. These are shallow, abrupt excavated dips or troughs with an adjacent, downslope hump or moulded berm, that are built at an oblique angle across the road. Waterbars are useful only on low standard seasonal or temporary, unsurfaced roads where winter use will not occur, because traffic easily cuts through the soft berm and fills the adjacent dip.

Waterbars are high maintenance drainage structures that are prone to failure if not properly built and maintained. Unauthorized winter traffic is likely to break down waterbars and result in serious road surface erosion and water pollution.



Quincy Library Group pilot plan to begin

After nearly five years of planning and negotiating, the Quincy Library Group (QLG) appears to be on its way toward implementing their proposal for a 5-year pilot program to reduce the risks of catastrophic wildfire and provide timber for industry and consumer needs.

What is so remarkable about this is the process by which representatives of the timber industry, politicians, environmental activists and others from the small communities of the northern Sierra Nevada have been able to put aside their differences and find areas of common concern such as forest health, danger of catastrophic fire, and the need for a strong local economy.

Named after its neutral meeting place, the Quincy Library Group has approached the problems they saw in the surrounding Plumas, Lassen and Tahoe National Forests in a thoughtful, realistic manner. All participants recognized that the economic well-being of their timber-dependent communities was in jeopardy and that the threat of catastrophic fire could destroy all that was important to both the timber industry and those who loved the forests. With this common ground they were able to discuss those areas they could agree on.

QLG members did their homework. The group had the expertise to understand forest science as they explored new and creative solutions to the challenges in their local forests. They produced a map showing the land areas they believed should be open to management and areas to be considered off-base to management activities.

When planning wasn't enough to make the proposal a reality, the group went to Congress. This summer, the House overwhelmingly approved a 5-year pilot plan directing the Forest Service to implement the QLG proposal. The Senate is expected to agree.

The pilot project focuses on reducing the threat of catastrophic wildfire.

To do this, there will be a series of fuel breaks to separate the forests into watersheds of 8–12 thousand acres each. Known as “shaded fuel breaks,” these areas would be approximately quarter-mile wide zones in which the smaller trees would be thinned along ridgetops and major roads. These thinned zones would break up the continuity of fuel beds and fires ladders which would force flames down out of the crowns of the trees so that firefighters would have a chance to control them.

The QLG broadly defined the type of harvest treatment, as well. Harvest by individual tree and group selection of intermediate-size timber will reduce fuel ladders while providing wood to consumers. Larger trees will be left alone.

At the same time, the QLG plan provides stringent protections to sensitive roadless and wilderness areas and riparian habitats. All activities are to be carried out in compliance with all applicable Federal environmental laws.

This is a pilot project and, as such, is attempting solutions that are experimental and may need to be refined as more data comes in. A monitoring program will be done to determine the effectiveness of the project.

The Quincy Library Group has accomplished some remarkable feats, not the least of which is providing a model for cooperative local input into forest issues. Can other communities follow the QLG's approach?

Mike De Lasaux, UC Cooperative Extension Forester for the area, believes it's not that easy. “There's no recipe for this. This was a unique group of people with a unique history.” The main lesson to be learned, he says, is that patience is the key. “You have to go into it knowing it's a long-term proposition.”

The Quincy Library Group is on the web at [http://www.qlg.org](http://www qlg.org).

Main provisions of the 5-year pilot project approved by Congress

- Directs the Secretary of Agriculture to implement the QLG forest management proposal on designated lands in the Plumas, Lassen, and Tahoe National Forests for 5 years
- Excludes all spotted owl habitat in the project area from logging and other activities during the 5-year period
- Calls for construction of fuel breaks on 40,000 to 60,000 acres/year
- Provides for group selection on 0.57% of the project area annually as well as individual tree selection uneven-aged forest management
- Limits the total acreage subject to forest management activities to 70,000 acres annually
- Requires a program of riparian management including wide protection zones and riparian restoration projects
- Prohibits road building and timber harvesting on certain lands considered off-base
- Authorizes the appropriation of funds to carry out the pilot project
- Requires an annual report to Congress on the status of the pilot project
- Requires a scientific assessment of the project to be commenced at the midpoint and submitted to Congress by July 1, 2002



Assistance Update

Funding sources can be found

WITS (California Watershed Information Technical System)

An excellent listing of funding sources can be found at the WITS website at <http://ceres.ca.gov/watershed/funding.html>. Besides information on federal, state and private assistance programs, there is a link to *Grant Writing Tips from Watershed Restoration—A Guide for Citizen Involvement in California*.

New "Blue Book" is out

A newly-updated directory of cost share and assistance programs available to individual California landowners and Indian tribes has been produced and is available from UC Berkeley Cooperative Extension Forestry. It provides current information on program goals,

services available, who to contact, eligibility requirements and projects submitted and funded, for many programs offered by federal/state agencies and private industry. If this directory would be useful to you, please contact Sherry Cooper at 1851 Hartnell Avenue Redding, CA 96002-2217; (916) 224-4902; shcooper@ucdavis.edu. There are a limited number of directories available, so call in your request right away and a free copy will be mailed to you.

EQIP

EQIP (Environmental Quality Incentives Program) is a new, voluntary USDA conservation program that provides technical, financial, and educational assistance primarily in designated priority areas. The priority areas are defined as areas of special environmental sensitivity.

Local conservation districts convene working groups that determine the priority areas and develop proposals. These working groups are made up of representatives from resource conservation districts and other federal, state, and local agencies interested in natural resource conservation.

This year, California received \$4.9 million in EQIP monies. Funded landowners will enter into a five-year contract to install and maintain projects.

The Natural Resource Conservation Service (NRCS) manages EQIP. The next sign-up period for funding is expected to be in September. For more information, contact your local NRCS.

Watershed Protection and Restoration Council

In response to concerns about the threatened status of coho salmon and other anadromous fish in California, the Governor has created the Watershed Protection and Restoration Council. This Council will be responsible for providing oversight of state activities aimed at watershed protection and enhancement.

The Council will be chaired by Douglas Wheeler, Secretary for Resources, and consist of representatives at the highest levels of state government.

A working group, chaired by the Executive Director of the Water Resources Control Board, will develop a work plan and coordinate the activities of the Council.

There will also be a science panel that will advise the Council and advisory committees to include input from other interested parties and the public.

California Community Forests Foundation offers support

The California Community Forests Foundation (CCFF) is a non-profit organization formed to support communities concerned about their forests in both rural and urban areas.

Through grants and partnerships, CCFF helps educate Californians about the importance of forest ecosystems: their ecology, management, and benefits to communities. The Foundation's goals are to help fund:

- programs that provide environmental/conservation education training opportunities
- urban and community forestry research, seminars, and the

dissemination of information about the care and management of community forests

- stewardship programs
- community-based educational and informational programs that promote fire and life safety.

All proposals for educational projects, research, seminars, information sharing activities, scholarships and awards programs are considered.

CCFF raises money through donations, gifts and grants from private and government sources. Your tax-deductible contributions are welcome.

For more information, contact Kay Antunez at (916) 653-7958.



Pine Pitch Canker update

Don Owen

On June 4, 1997 the State Board of Forestry passed a resolution establishing the Coastal Pitch Canker Zone of Infestation. The Board's action was prompted by ongoing concerns about the spread of pitch canker to new areas and impacts of the disease in areas where it currently exists. This is the first time the Board has established a Zone for a tree disease. The Zone encompasses all or parts of 21 counties on or near the coast from Mendocino County to San Diego County. The Zone includes all infested areas as well as adjacent areas that might reasonably be expected to become infested in the near future. The distribution of the disease is discontinuous and thus there are infested as well as uninfested areas within the Zone.

Long distance spread of the disease occurs when materials infected with the pitch canker fungus are transported to uninfested areas. Preventing disease spread is important because once pitch canker becomes established in an area there is no way to stop it from infecting

and killing trees. No cure or preventative exists. While one goal for the Zone is to slow disease spread, neither the Board nor the Department of Forestry and Fire Protection (CDF) has the authority to impose and enforce a quarantine on the movement of infected materials. Slowing disease spread can only be achieved through a cooperative effort among affected governments, businesses, organizations, and individuals. It is the intent of the Department to work with all affected entities to achieve the goals of slowing disease spread and reducing disease impact. Department staff are available to provide training and assistance related to these goals.

Forestry professionals throughout the state can help slow the spread of pitch canker by learning to recognize symptoms of the disease and taking appropriate action when the disease is encountered. The pitch canker fungus can be transported on pruning tools, logs, Christmas trees, seedlings, wood and bark chips, cones, seeds, and wood waste. Monterey and Bishop pines have been heavily impacted by the disease,

but we also know that most pine species and even Douglas-fir are susceptible.

Here are some things you can do:

- Know when you are in an infested area.
- Do not transport infected or contaminated material to areas that are free of the disease.
- When cutting or pruning a diseased tree, clean tools with a disinfectant before using them on uninfested trees.
- If you are outside of the Zone of Infestation, contact CDF or the County Agricultural Commissioner's office to report trees you suspect might have pitch canker.
- Make sure that others are aware of these guidelines.

For further information or to request assistance contact: Dave Adams (916-758-0306/david_adams@fire.ca.gov); Don Owen (916-224-2494/don_owen@fire.ca.gov); Steve Jones (916-653-9450/stephen_jones@fire.ca.gov).

A color brochure is available in quantity upon request. Additional information is available on the pitch canker website at http://frap.cdf.ca.gov/pitch_canker.

Coho Salmon *(continued from front page)*

management to provide large woody debris to streams: leave an undisturbed buffer strip of unmanaged timber along the stream channel, leave a predetermined fraction of trees to be naturally recruited to the channel, manage a streamside zone on a double rotation basis, or use silviculture to maintain an even delivery rate of large woody debris with a mix of tree species.

Sediment is another issue with timber harvest and associated activities. Increased fine sediments are a problem for salmon due to their negative effects on spawning, hiding cover, and insect abundance. Too much coarse sediment is a concern because it fills pools, destabilizes stream beds, and reduces water depth leading to warmer water.

Roads and drainage systems are often the cause of increased sedimentation.

Streamside vegetation is essential in many ways. It is a source of fine organic debris such as leaves, twigs and branches, as well as insects that fall into the water. Root systems stabilize the banks and reduce sediment input. Root systems also support undercut banks that are an important source of cover for salmon. Vegetation provides shade and controls heating in the summer and cooling in the winter.

Many conservation measures could be used to avoid significant modification or degradation of coho salmon habitat. In order to develop an adequate conservation package, it is necessary to identify the stream

conditions that may be affected by planned operations and choose the measures which specifically reduce the risk of stream habitat degradation.

If coho are absent from potential watercourses, conservation measures should be incorporated to allow salmon to recolonize recovered habitat.

For more information about coho recovery, contact the Stewardship Helpline at 1-800-PET-TREE.

*—much of the information in this article comes from a document entitled **Coho Salmon (*Oncorhynchus kisutch*): Considerations for Timber Harvests Under The California Forest Practice Rules** by the Calif. Department of Forestry & Fire Protection.*



Pine Pitch Canker Zone of Infestation



Out on a Limb with the Extension Forester

Monitoring restoration effectiveness: a case study

Richard Harris

There is a critical need for information on the relative effectiveness of measures taken to restore or rehabilitate wetland habitats and associated watersheds.

In California alone, millions of dollars are spent every year for implementing restoration projects. Unlike many other environmental programs, restoration funding is increasing not decreasing. A recent California ballot initiative (Proposition 204, 1996) allocated over \$60 million to restoration of watersheds and streams tributary to the San Francisco Bay-Sacramento River delta. On federal lands in California, restoration is focused on "forest health" initiatives aimed at reducing risks of catastrophic wildfire. These major public programs are in addition to the numerous restoration efforts undertaken by local agencies and private companies.

In the rush to implement restoration, few dollars have been expended on evaluating the effectiveness of restoration projects in achieving specified objectives. In fact, many restoration projects have been undertaken without clearly defined objectives or provisions for long-term monitoring. If done at all, monitoring is typically limited to the implementation (i.e., construction) phase.

In California, restoration is often undertaken under the direction of local watershed organizations and Resource Conservation Districts. Working with stakeholder groups is therefore part of the restoration planning framework.

In the Feather River watershed of northeastern California there has been an extremely active restoration program for the past ten years. The Feather River Coordinated Resource Management group (CRM), a consortium of 20 local, state, and

federal agencies and private landowners, has implemented many different stream and riparian restoration projects since 1985. Some of these involve rather extensive modifications of stream channels; others involve changing land use practices (exclusion or management of grazing) or simple revegetation.

The stated goal of the CRM is: "to maintain in perpetuity the stability, vitality, and diversity of the Feather River watershed and its communities." In general, the CRM's restoration

In the rush to implement restoration, few dollars have been spent evaluating the effectiveness of restoration projects in achieving specified objectives.

projects have been undertaken in an opportunistic manner, responsive to cooperative landowners and availability of funding. Monitoring has generally been short-term and limited.

From July, 1996 to June, 1997 University of California Cooperative Extension worked with the Feather River CRM to develop a long-term restoration effectiveness monitoring program. This included the selection of a "demonstration" watershed where monitoring would occur. Our past work with the CRM had led us to conclude that its overall monitoring goal was to assess the effectiveness of both riparian and upland restoration practices.

Some typical CRM riparian restoration activities include installation of check dams, stream channel realignment, streambank stabilization and revegetation. Upland activities include

road rehabilitation and forest thinning. The basic question would be: "are these practices effective in achieving their intended purposes?"

The CRM nominated a 29-member Technical Advisory Committee (TAC) to work with us which included representatives from most member agencies, local county supervisors, private landowners and restoration project workers. We also established a scientific review panel comprised of representatives of the University of California and University of Nevada, the USDA Forest Service and the California Department of Forestry and Fire Protection.

We met with the TAC twice to develop goals. The group eventually consented to the following two-part goal statement for the monitoring program:

- Evaluate effectiveness of restoration in reducing erosion and sedimentation, while considering effects on water quantity and flow timing, wildlife, fisheries and forage at the project, reach, and small and large watershed scales, and

- Provide opportunities for education, training and technology transfer pertinent to monitoring.

During the course of developing this goal statement several issues arose. The question of the appropriate scale for monitoring became especially important and one on which we consulted extensively with our scientific review panel. If the aim was to monitor the effectiveness of restoration in reducing erosion and sedimentation while considering effects on other values such as wildlife, fish, etc. then the literature and our scientific panel suggested that there are different possibilities at different scales. At the large watershed scale (>10,000 acres), it would be possible to conduct trend monitoring of water quantity, water quality (sediment



yield, sedimentation rates in reservoirs) and land cover changes. We are not aware of any documented cases of restoration effectiveness monitoring at the large watershed scale. The possibilities for restoration effectiveness monitoring are speculative at that scale.

The literature and our peer review panel suggested that effectiveness monitoring would be feasible at the small watershed scale (<1000 acres) at which most studies of watershed effects from land use treatments have been conducted. Possibilities include paired experiments in similar basins to evaluate watershed-level restoration effects on stormflow sediment, stream temperature, channel pattern, bank stability, mass wasting and wildlife, fish, and invertebrate populations.

Some project effectiveness monitoring and research has been done at the stream reach scale (1-10 km) as well, consisting of paired experiments in geomorphically-similar reaches. Reach-level monitoring would not necessarily discern watershed-level responses. At the project site scale (1-5 acres), monitoring would focus on implementation (i.e., was the project done as planned?), longevity (did the project survive?) and site-specific effectiveness (was a site-specific problem solved?). This type of monitoring is already being done but tends to be short-duration (1-3 years).

After much deliberation of a location for the monitoring program, the TAC selected the Last Chance Creek watershed in eastern Plumas County as the demonstration watershed. Work is proceeding on finding funding for an initial assessment of sub-basins within the watershed that may be suitable for paired-basin effectiveness monitoring. Funding has been obtained for establishing some reference monitoring sites.

The process we used with the Feather River CRM is outlined to the right. Interested readers should contact me (rrharris@nature.berkeley.edu) for further information.

Process for Planning and Implementing a Watershed Monitoring Program

Step 1: Problem Formulation/Project Initiation:

Procure start-up funding
Establish peer and local interest panels
Preliminary data gathering
Literature search
Time frame: 3 months

Step 2: Establish Project Goal(s):

Define project area
Develop overall goal statement
Peer review
Time frame: 1 month

Step 3: Define Monitoring Scales and Issues/Objectives at each Scale:

Peer review
Time Frame: 2 months

Step 4: Develop Conceptual Model for Watershed Processes:

Prepare flow/process diagram for watershed
Develop sub-models indicating relationships between issues/activities and processes/results
Identify key monitoring variables for each scale/issue
Peer review
Time frame: 1 month

Step 5: Assemble Data Base and Determine Selection Criteria for Candidate Basins:

Delineate candidate basins
Procure data for candidate basins
Create data management system
Develop and prioritize criteria for basin selection
Time Frame: 3 months

Step 6: Data Analysis and Evaluation for Basin Selection:

Develop statistical profiles for each basin based on criteria
Time Frame: 3 months

Step 7: Select Demonstration Basin:

It is assumed here that a 10-20,000 acre basin will be selected which is representative of processes at larger scales and wherein monitoring at other finer scales can be performed.
Present results of Step 6 to local panel
Conduct selection process
Peer review
Time Frame: 1 month

Step 8: Conduct Issue-Related Watershed Analysis for Selected Basin:

Procure funding
Determine environmental/ecological conditions relative to important issues.
Time Frame: 6 months

Step 9: Present Results of Watershed Analysis:

Local panel review
Peer review
Time Frame: 1 month

Step 10: Design Monitoring Plan(s) for Selected Basin:

Develop specific methodologies for monitoring at relevant scales to address key questions and issues. The overall plan will be prepared and will guide monitoring at other scales.
Local panel review
Peer review
Time Frame: 3 months

Step 11: Pilot Monitoring Program:

Procure funding
Test monitoring protocols
Revise monitoring plan(s) as necessary
Local panel review
Peer review
Time Frame: 6 months

Step 12: Implement Long Term Monitoring:

Procure funding
Time Frame: multiple years



Resources

Publications to help forest landowners

Managing Your Redwood forest: An Owner's Manual for the Nineties by Peter C. Passof is a 104-page UC Cooperative Extension publication with discussions on sustainable forestry, regulations, silviculture, maintaining biodiversity, preparing a forest management plan, economics, and other areas of interest to forest landowners including case studies and sources of assistance. Copies are available from the Integrated Hardwood Range Management Program, 160 Mulford Hall, University of California, Berkeley, CA 94720. Cost is \$10 which includes tax, postage and handling. Make checks payable to UC Regents.

Forest Pruning and Wood Quality of Western North American Conifers is a complete and up-to-date authority on pruning. The 403-page book includes information on market opportunities, the biology of pruning, "how-to" information, and New Zealand's experience with intensive pruning. Available for \$37.50 from University of Washington, Institute of Forest Resources, Box 352100, Seattle, WA 98195 or call (206) 685-7650.

Terminology for Forest Landowners by Donald Hanley, David Baumgartner and Leila Charbonneau is an excellent, 37-page booklet available for only \$3.00

ppd. It explains over 400 commonly used forestry terms, all alphabetized and clearly defined. Make checks payable to: Cooperative Extension Publications, P.O. Box 645912, Washington State University, Pullman, WA 99164-5912.

More resources on the web

The Fire and Resource Assessment Program (FRAP) has a new website. This website describes the work of FRAP and, in particular, highlights the work FRAP is doing to fulfill its mandate to assess California's forest and rangeland resources.

<http://frap.cdf.ca.gov>

The Pitch Canker website is now online.

http://frap.cdf.ca.gov/pitch_canker

The Firewise home page is designed for anyone who lives and/or vacations in areas susceptible to wildfire. The page features a Firewise Landscaping Checklist, questions answered by fire protection experts, and how to obtain more detailed information.

<http://www.firewise.org>

To find UC Cooperative Extension resources, the UC Division of Agriculture and Natural Resources (DANR) directory is available online:

<http://danr.ucop.edu/danrdir/>

California Biodiversity News—all issues can be found at:

<http://www.ceres.ca.gov/biodiversity>

Water and Wildland Expertise in the University of California System

<http://www.nceas.ucsb.edu/exp>

Technical Assistance Resources

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

California Department of Forestry and Fire Protection
Forestry Assistance Program

Jim Geiger (916) 653-8286

California Association of Resource Conservation Districts

Thomas Wehri (916) 447-7237

California Resources Agency

California Environmental Resources Evaluation System (CERES)

Deanne DiPietro (916) 653-8614

Coastal Conservancy

Neal Fishman/Carol Arnold (510) 286-4181

Farm Service Agency

Larry Plumb (916) 498-5300

Natural Resources Conservation Service

Jerry Reiox (916) 757-8256

..... (209) 946-6229

California Department of Fish and Game

Terry Mansfield (916) 653-1921

U.C. Cooperative Extension Forestry

John LeBlanc (510) 642-6678

USDA Forest Service

Sandra Stone (415) 705-2587

California Stewardship Helpline (800) 738-TREE



Calendar

October 1–2, 1997

Ecology of Forest-Zone Hardwoods & Management for Wildlife & Wood Products

Auburn, CA
Sherry Cooper 916-224-4902
<shcooper@ucdavis.edu>

October 2–4, 1997

Family Forest Management Conference

Eureka, CA
Forest Landowners of California
Dan Weldon 916-972-0273
<dweldon@forestlandowners.org>

October 6 & 7, 1997

One-day Archaeology Courses

Burney, CA
California Licensed Foresters Assn.; \$100
Hazel Jackson 209-293-7323, fax 209-293-7544 <clfa@volcano.net>

October 8–10, 1997

Full Three-day Archaeology Course

Redding, CA
California Licensed Foresters Assn.; \$300
Hazel Jackson 209-293-7323, fax 209-293-7544 <clfa@volcano.net>

October 10–12, 1997

California Exotic Pest Plant Council Symposium '97; \$75

Concord, CA
Sally Davis 714-888-8541; e-mail:
<sallydavis@aol.com>

October 17–18, 1997

Watershed Management Council's Annual Field Tour

Redding, CA
Sherry Cooper 916-224-4902
<shcooper@ucdavis.edu>

October 21–24, 1997

Second International Oak Conference

San Marino, CA
Amy Larson, 510-763-0282

October 21–24, 1997

Restoration as Process through Philosophy, Ecology, and Community

San Luis Obispo, CA

Society for Ecological Restoration Annual Meeting

Edith Read 714-751-7373,
<eread@psomas.com>

October 21–24, 1997

Watershed Stewardship Planning Workshop

San Francisco, CA
UC Berkeley Extension; \$895
510-643-7143, fax 510-643-8290 <http://www.unex.berkeley.edu:4243/em>

October 22–23, 1997

Yours, Mine & Ours—It's All in the Family

Sparks, Nevada
California-Nevada-Hawaii Forest Fire Council 916-275-9758, fax 916-275-4818
<beerock@aol.com>

October 22–24, 1997

Watershed Management Council Field Conference

Santa Ana & Margarita Rivers
Contact: Sari Sommerstrom 916-467-5783; 818-893-9696

October 28–29, 1997

Forest Seedling Nutrition from the Nursery to the Field

Corvallis, OR
Oregon State University
OSU Conference Office 541-737-2329

November 5–7, 1997

Facilitating & Mediating Effective Environmental Agreements; \$795

Berkeley, CA
510-649-8008

November 9–11, 1997

Local Leadership: The Key to Total Resource Management

CARCD Annual Conference
Tenaya Lodge, Yosemite
916-447-7237
\$190 before 10/10; \$210 thereafter

November 12–13, 1997

Pest Mgmt. in Plantation Forestry: Getting Back To Our Roots

Sacramento, CA
California Forest Pest Council
Susan Frankel 415-705-2651
Nancy Rappaport </S=N.Rappaport/OU1=s27a@mhs-fswa.attmail.com>

November 13, 1997

The CalFED Alternative: Technical Input & Policy

San Francisco, CA
UC Berkeley Extension; \$295
510-643-7143

November 14, 1997

Silviculture Workshop

Sacramento, CA
California Licensed Foresters Assn.
Hazel Jackson 209-293-7323, fax 209-293-7544 <clfa@volcano.net>; \$95-\$125

November 16–20, 1997

Bridging the Global Environment: Technology, Communication, And Education.

Soc. of Env. Toxicology & Chemistry
Annual Meeting <http://www.setac.org>
San Francisco, CA
Rod Parrish 904-469-1500, fax 904-469-9778, <rparrish@setac.org>

November 17–20, 1997

Fire in California Ecosystems: Integrating Ecology, Prevention & Management

San Diego, CA
UC Extension
Sandra Cooper 916-757-8948; Neil Sugihara 916-364-2854

November 21, 1997 9 a.m.

California Forest Products Commission

Sacramento, CA
916-568-1141, fax 916-568-1144
<www.calforests.org>

December 3–5, 1997

Wildlife Restoration: Techniques for Habitat Analysis & Animal Monitoring

Sacramento, CA
510-465-4962

December 4–5, 1997

Constructed Wetlands for Water Quality Management

San Francisco, CA
UC Berkeley Extension; \$295
510-643-7143

For more information, call the number given or the Stewardship Helpline, 1-800-738-TREE. To submit an event or to receive this calendar by e-mail, contact shcooper@ucdavis.edu

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UC Cooperative Extension Advisors

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 ment, wetlands, watersheds, fisheries

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 Specialty: Resource economics; forestry
 hardwood rangelands; silviculture,
 Forest Management Program

How can the *Forestland Steward* newsletter help you?

I'd like to see more information on _____

My suggestion is _____

Add me to the mailing list / change my address:

Name _____

Address _____

City, Zip _____ Phone _____

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

Stewardship Helpline: your one-stop information source

Spinkled throughout the pages of this newsletter are constant references to the Stewardship Helpline at 1-800-738-8733, or 1-800-PET TREE to its friends.

This number is worth remembering. It's your connection to all the experts and answers a landowner might need.

Staffed by Wendy Wickizer for the Society of American Foresters, the Helpline will save you time and energy when you have questions about any of the topics covered in this newsletter.