Watershed Management Council Newsletter

Winter 1992 Volume 4 No. 3

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Managing Riparian Zones As Ecosystems

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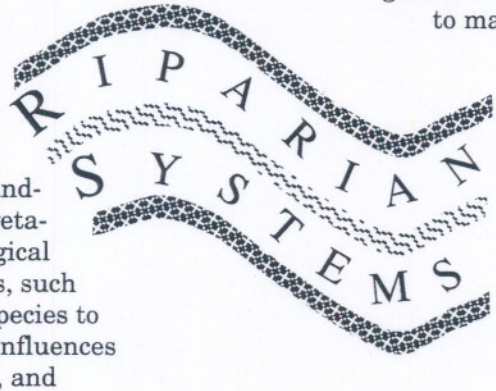
The group of researchers and managers associated with the Andrews Experimental Forest on the Willamette National Forest (collectively referred to as the *Cascade Center for Ecosystem Management)* has been studying the ecology and management of stream and riparian systems for nearly two decades. We have recently published a review of scientific findings (Gregory et al. 1991) and guides for riparian zone management (Gregory and Ashkenas, 1990).

As an outgrowth of interdisciplinary work, we take an ecosystem approach to defining riparian zones, rather than using hydrologic or botanical definitions. Riparian zones are the zone of direct interaction between terrestrial and stream systems. Forest-stream interactions include: shading which regulates light available for aquatic primary production and for warming stream water; fine litter from terrestrial vegetation which is a food resource for aquatic organisms; coarse litter (e.g., fallen logs) that creates habitat structure and affects the ability of the aquatic system to retain dissolved and particulate organic matter; and biogeochemical cycling involving transfers among surface and groundwater systems and terrestrial vegetation. A variety of additional ecological linkages operate in riparian zones, such as the response of some wildlife species to the combined aquatic-terrestrial influences on habitat structure, composition, and microclimate found in riparian zones.



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A Landscape Method for The Management of Riparian and Older Forest Habitats for Wildlife and Fish

Ann Carlson and Diana Craig
USDA Forest Service, Tahoe National Forest

An analysis of management for late-seral-stage (older) forests and riparian areas is underway on the Tahoe National Forest. Wildlife and fish biologists have reviewed related scientific literature and have developed recommendations and desired future conditions for managing older forests and riparian habitats to maintain viable and well-distributed populations of associated fish and wildlife species. These recommendations represent the wildlife and fish desired future conditions for riparian and older forests and will next undergo interdisciplinary review and analysis. The Tahoe National Forest will consider these recommendations and other resource values and develop a proposal for managing older forests and riparian areas. This will lead to an Environmental Impact Statement which will study the biological, physical, social, and economic effects and may lead to an amendment of the Forest Plan.

These recommendations offer a generalized ecosystem framework for establishing management programs for older forests and riparian areas in order to maintain high quality habitat that would support the full assemblage of associated vertebrate species. The framework provides an overview of desired future conditions for landscapes and stands, thus allowing local planning groups to determine specific project-level details and appropriate activities that fit on-site conditions.

The proposed landscape design consists of some large blocks of mature forest and a riparian/older

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WATERSHED MANAGEMENT COUNCIL NEWSLETTER

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MEETING DATES

The WMC Board of Directors meets quarterly. The next meeting will be on February 10, 1992 at 9:30 AM, at PG&E's office in San Ramon. All WMC members are welcome to attend.

MEMBERSHIP

Dues are $25 for 2 years. Please see membership application form in this issue to join.

SUBMISSIONS WELCOME

The WMC Newsletter welcomes all submissions. They may be made either by: USFS DG system (M.Furniss:R05F10A), via the EPA's NPS Electronic Bulletin Board System (301/589-0205 / 8-N-1), by disk (Macintosh or MS-DOS), or by paper copy. Please keep formatting to a minimum. All copyrights remain with the authors. Mail submissions to:

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500 5th Street
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(707) 441-3551 days
FTS 448-3551
or (707) 826-9326 evenings

Deadline for next Issue - **March 15th**

This issue guest edited by Polly Hays

Editor's Note

Polly Hays
USDA Forest Service, San Francisco

" .....of or relating to or living on the bank of a watercourse (as a stream or river) or sometimes a lake..." Webster's gives us a clue that "riparian" is not a precisely defined term. As scientists have been broadening our understanding of riparian systems by stepping back to look at interactions on a landscape scale, regulators have been called on to delineate "wetlands" with precise parameters on a site-specific basis. Depending on who you talk to, "wetlands" may be a subset of "riparian", or "riparian" may be a type of wetland.

You may have been caught in the muddle of riparian definitions, and tried to figure out whose responsibility this field this is anyway. Plant ecology? Wildlife? Fisheries? Hydrology? Sometimes the only clear issue is that riparian systems will continue to be a focus of attention for land managers, regulators, scientists, developers, and the environmental community, even if no one can agree on exactly what they are talking about.

As watershed managers, we must continue to broaden our understanding of both the terrestrial and aquatic components of these ecosystems in order to make sound decisions for protecting and restoring these areas. There are no tried and true answers here, and the more communication between disciplines, the better. The contributions to this issue will introduce you to a variety of approaches to furthering our understanding of riparian systems - and putting that knowledge into use in the field.

WMC Biennial Conference Slated for November

INTEGRATED WATERSHED MANAGEMENT:
OVERCOMING OBSTACLES

Nov 18-20, 1992
Embassy Suites,
South Lake Tahoe

Mark your calendars and watch your mail for information about this event.

Planning and preparations are well along, but volunteers are still welcome to become involved. If you're interested, please give Ken Roby a call at (916) 284-7126.

Get Organized

Watershed Management Council members will want to take note of two organizations that have a growing presence in the State of California and throughout the West. Watershed Management and Riparian Management are really umbrella terms that encompass a wide variety of interests and disciplines. Your area of expertise may find a home with one of these groups:

Society For Ecological Restoration And SERCAL

The Society for Ecological Restoration (SER) is an international organization with goals to further the art and science of ecological restoration and management, and to facilitate communication among restorationists.

SER hosts an annual conference, and provides members with two publications, *Restoration and Management Notes*, which includes in-depth articles on specific projects and topics, and *SER News*, a quarterly forum for current issues, news, and ideas. The newly formed SERCAL is the first chapter of SER. SERCAL members receive a quarterly newsletter. The chapter will focus on local issues, such as habitat restoration and erosion control around Lake Tahoe, preservation and restoration of southern coastal sage scrub, and the proposal by the Board of Forestry to register biologists. Current projects include a California restoration database, and a restoration training class. For membership or other information contact SER at 1207 Seminole Highway, Madison, WI 53711 (608) 262-9547, or write SERCAL at 1009 J Street, Sacramento, CA 95814.

Western States Riparian Council

The charter meeting of the Western States Riparian Council was held in November, 1991. This council has the goal to: "further proper management of riparian systems by enhancing the ability of state riparian organizations to communicate and work together west-wide." (State riparian organizations refers to the variety of riparian associations, councils, and coalitions that exist.)

Specific objectives include: • To promote the development and dissemination of information about the functions, processes, values, and proper management of riparian systems. • To foster the formation of state riparian associations in the states west of the 100th meridian. • To facilitate communications among member organizations. • To seek understanding and consensus among state organizations on issues and needs regarding riparian systems.

California was among nine western states at this charter meeting, represented by Jim Clawson (UC Davis Extension). Jim, who attended as a member of the California Riparian Improvement Coalition (a group of ranchers and conservationists being brought together by the California Section of the Society for Range Management), brought back the following comments: "In general, this is a council of state councils. Organizational materials are being developed and will be mailed later this year. I would appreciate ideas on : 1) How to identify and communicate with possibly interested organizations in California, and 2) How to effectively participate in this new group without creating another time-robbing activity." For further information, or to provide your ideas, contact Jim Clawson, UC Davis Extension, Department of Agronomy and Range Science, Davis, CA 95616-8515, (916)752-3455.

New State Programs Foster Riparian and Wetland Habitat Conservation

The Wildlife Conservation Board (CA Dept. of Fish and Game) has recently been authorized to establish two new programs: the *Inland Wetlands Conservation Program* (1990) and the *California Riparian Habitat Conservation Program* (1991). The purpose of the Riparian Habitat Conservation Program is to protect, preserve, and restore riparian habitat throughout the state. The Inland Wetlands Conservation Program has a similar goal to protect, preserve, and restore wetland habitat, but it is authorized to implement projects specifically in the Central Valley of California. The Inland Wetland Program is currently funded and operational, and the Riparian Program is scheduled to be funded in fiscal year 1992-93.

These programs also provide the WCB with new authority that will enable the Board to adopt and implement creative options for the acquisition, restoration, and enhancement of riparian and wetland habitat. Specifically, the Board may now apply for and accept Federal grants, and receive gifts, donations and other forms of financial support from public and private sources for the purposes of the new programs. It may also award grants and loans to public agencies and nonprofit organizations for the purposes of the program.

For further information, contact the Wildlife Conservation Board, 1416 Ninth Street, Sacramento, CA 95814

Guest Editors Wanted

Good ideas have a way of coming at the right time. Polly Hays of the USDA Forest Service Regional Office told me she could drum up contributions for our "Riparian Systems" issue. "Why not be the guest editor for the next issue, says I?"

"Why not?" says Polly. "You're it," says I; and a new tradition is born — I hope.

Do you have a special subject on which you would like to host an issue of our newsletter? Just give me a call and we'll set it up.

It's simple. All you do is arrange for the contributions, maybe make one or two of your own, edit the lot, and send it all to me. I'll do the layout and the production, and Clay Brandow will handle the mailing. You can even prescribe important features of the layout if you like, such as article placement and use of graphics, but that's optional. One issue, all yours.

Editing our newsletter is a very rewarding experience and can open doors you didn't even know were there. Don't wait, the slots won't last long. Call me at (707) 441-3551 FTS 448-3551 and we'll discuss it further.

-Mike Furniss, regular editor

A Landscape Method...
(Continued from Page 1)

forest network. The goal for the large blocks is to conserve viable sub-populations of wildlife that are associated with the interior zones of older forest habitats. The recommended riparian/older forest network provides a continuously connected system of older forest centered on watercourses and has three components: 1) riparian zone; 2) older forest zone; and 3) connectors.

The riparian zone includes the stream channel, floodplain, and upland areas that directly influence the stream environment. The objectives for the riparian zone are to provide a high quality stream environment and those key attributes that are important for fish and wildlife. The two key riparian attributes identified in the literature review are: 1) the composition and arrangement of riparian and adjacent upland forest canopy and understory vegetation; and 2) uninterrupted surface and subsurface water flows. When the following components are maintained in a natural condition, high quality stream environments can be maintained over time: 1) stream temperature; 2) arrangement and recruitment of large woody debris; 3) sediment conditions; and 4) watershed connectivity and fish passage.

The older forest zone includes, but also extends beyond, the upland area in the riparian zone. Depending on the size of the stream, the objective for this zone is to provide travelways and year-long or seasonal habitat for associated species. Headwater areas would be managed primarily to provide critical habitat for small mammals and amphibians. As stream size increases downstream, an increasingly larger old forest zone (up to 1650 feet) would be managed to provide sufficient habitat for travel and year-long or seasonal use for larger species.

Connectors are included in the network to link older forest habitats into a completely connected system and are intended to provide travelways for wildlife. Connectors are arranged over ridges so that older forest habitat in each planning watershed is linked with habitat in adjacent watersheds.

Where the objective is to provide high quality older forest habitat (the large blocks, the older forest zone, and the connectors), management should concentrate on providing key older forest habitat components over time. The key components identified are: 1) large-diameter overstory trees; 2) large-diameter snags; 3) large-diameter logs; and 4) vertical diversity (multi-layer canopies).

The recommended program for managing older forest and riparian habitats outlines above is viewed as a set of working hypotheses that integrate current science into a comprehensive proposal for forest management. Analytical tools, such as GIS are recommended for evaluating the effectiveness and impacts of the proposed program. These recommendations should be adapted to accommodate evaluations and any new scientific information, as it becomes available. Summary documents of the literature review are available.

Ann and Diana can be reached at (916) 265-4531.

Correction

In our last issue, Volume 4, No. 2, your regular editor goofed and left out a critical part of the data table in Robert Thomas' article on "Monitoring and Sampling". Above the table headings of "Mean Sample Estimate" and "True Estimate" should have been "Variances (in thousands)". If you were not confused by the data table, you probably did not read the article carefully and missed some important concepts that are critical to valid monitoring. Read it again.

Here is the corrected table:

		Variances (in thousands)		
Scheme	Mean est. load	Mean Sample est	"True" estimate	Sample size
1	4,262	905	125	21
2	11,465	14,450	1,882	21
3	11,162	6,646	856	42
4	3,043	2,674	2,868	21
5	3,045	1,303	1,246	42
6	3,069	1,670	1,555	21
7	3,077	703	693	21

AIH Meeting Scheduled for October

Interdisciplinary Approaches In Hydrology and Hydrogeology

October 17-22
Portland, Oregon
For information, contact:
AIH, 3416 University Avenue S.E.,
Minneapolis, MN, 55414-3328
(612) 379-1030

Managing Riparian Zones As Ecosystems

(continued from Page 1)

This functional definition and view of riparian zones provides a basis for making management decisions and stream networks within the context of full drainage basins. Although there are compelling reasons to plan at the basin scale, examples of how to do so are scarce. The conceptual framework developed from ecosystem and basin geomorphology perspectives provide a useful foundation.

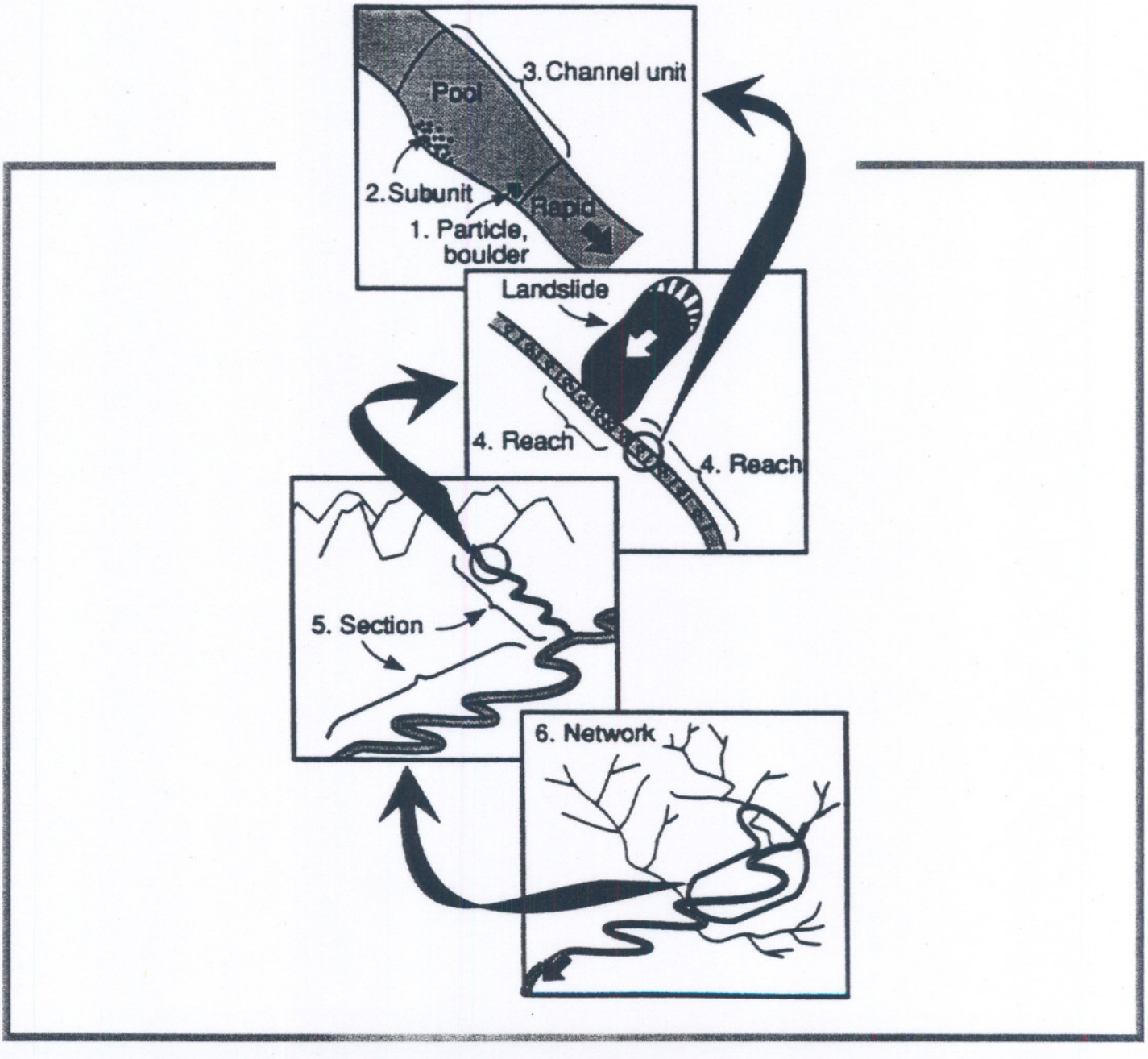
References

Gregory, S.V., L. Ashkenas. 1990. Riparian Management Guide. Willamette National Forest, Eugene, OR. 120 p. (a condensed field guide is also available)

Gregory, S.V., F.J. Swanson, W.A. McKee, K.W. Cummins. 1991. An ecosystem perspective of riparian zones. BioScience. 41(8):540-550.

Lamberti, G.A., S.V. Gregory, L.R. Ashkenas, R.C. Wildman, K.M.S. Moore. 1991. Stream ecosystem recovery following a catastrophic debris flow. Can. Jour. Fisheries and Aquatic Sciences. 48(2):196-208.

Fred Swanson, (503) 750-7355 Art McKee, (503) 750-7350, Stan Gregory, (503) 737-1951



Riparian Classification: An Important Tool for Understanding and Managing Riparian Systems

Sydney Smith
USDA Forest Service, Modoc National Forest

Riparian classification is a process for grouping and describing riparian communities with similar floristics, environmental characteristics, and management potentials. In the US Forest Service, teams with expertise in plant taxonomy and ecology, soils, water relationships, stream and watershed function, and geology and landforms conduct riparian classification work. Riparian classification results in a written guide to riparian plant communities, including keys, descriptions, photos, and management characteristics.

In the Pacific Southwest Region, both riparian and transitional sites are classified. These include streambanks, active channel shelves, floodplains, overflow channels, as well as the sub-surface irrigated meadow and terrace sites that lie between the wettest areas and the true uplands.

Riparian classification begins by sampling within stratified areas of similar vegetation, soils, stream type, geology, and landform. These data are analyzed, enabling the ecologist to classify the sites into similar groupings. Because disturbed, early seral ecosystems are common in riparian areas, both existing and potential plant communities are typically described.

The information on community types and seral pathways provided by riparian classification enables resource managers to be very specific when developing management prescriptions for other resources (e.g., livestock, timber, fisheries) within a riparian system. The following examples illustrate the application of riparian classification to management decisions for riparian systems:

Example 1: A management plan is being developed for a site with the following existing conditions: a 2 percent gradient, cobble fragment, perennial stream channel with 35 percent hardwood cover. Riparian classification identifies a site potential for 85 percent hardwood cover in this stream type and land form. The land managers want a mix of site characteristics that provide streambank protection and shading, thermal cover, livestock forage, and species diversity. Classification aids in the identification of the optimal seral stage—one with 60% hardwood cover—that provides a better mix of desired characteristics than that which occurs in the existing or the potential plant community. Managers can now prescribe specific management to develop and maintain the desired plant community.

Example 2: A restoration plan is being developed for a downcut meadow channel with a high width-to-depth ratio. Vegetation is an array of grazing-disclimax communities such as mountain silver sagebrush, Kentucky bluegrass, forbs, and Douglas sedge. Water temperatures and sediment levels are high, and the stream has no pools. Riparian classification identifies this site as disturbed and early seral. Short-term potential (10-20 years) exists for development of willow, Nebraska sedge, and bulrush communities. Longer-term potential (50-100 years) is for formation of a narrow, deep, perennial, meandering sedge-dominated channel with undercut banks, low stream temperatures, and beaked and wooly sedge communities. The classification identifies seral pathways and key management species, as well as specific actions to speed up succession, including grazing management, species-specific vegetation plantings, and appropriateness of instream structures. In this example, managers use the classification to select specific short-term and long-term actions that will advance the site towards desired condition—in this case, site potential.

Riparian classifications have been published for National Forest areas of Eastern Oregon, Nevada, Utah, and Idaho. Classification efforts are currently underway in the Pacific Southwest Region on the Inyo, Modoc, Lassen, Six Rivers, and Plumas National Forests.

For more information, contact Terry Hicks, Ecologist, Inyo National Forest (619-873-5841), or Sydney Smith, Ecologist, Modoc National Forest (916-233-5811).

Low-Order Stream Channel Mapping
A new component of Coordinated Resource Inventory

Michael J. Furniss and Sam A. Flanagan
USDA Forest Service, Six Rivers National Forest

Low-order stream channels in northern California forested watersheds are a special management problem. They are numerous, high gradient with steep sideslopes, difficult and dangerous to traverse, and constitute the most sensitive lands in all watersheds. Hillslopes adjacent to most low-order streams are typically steep, deliver eroded materials directly to channels, and have landslide-prone "valley inner gorge" morphology (Figures 1 and 2).

Knowing the extent and characteristics of the low-order streams in a planning watershed is critically important information — but is difficult to obtain and therefore usually missing. When such information *is* gathered, it has commonly been localized (e.g., the channel directly below a cut unit or at a road crossing), and a watershed-wide picture cannot be drawn.

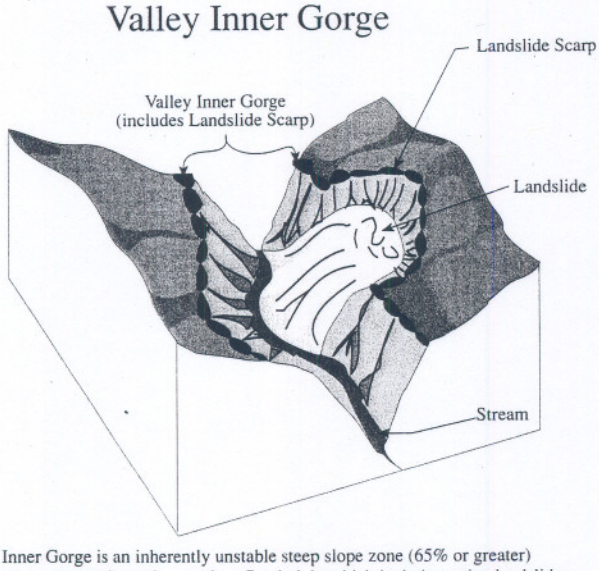


Figure 1

Valley Inner Gorge is an inherently unstable steep slope zone (65% or greater) adjacent to a stream channel or modern flood plain which includes active landslides along the margins. Upper margin is the first break in slope ascending from the channel.

As an part of our Coordinated Resource Inventory (CRI) — which includes the mapping of soils, geology, and vegetation, all at once — we are trying to develop practical techniques for mapping and describing all stream channels in a survey area. The large streams are easy — they are not extensive and are often described in fish habitat surveys. The small streams are the big challenge.

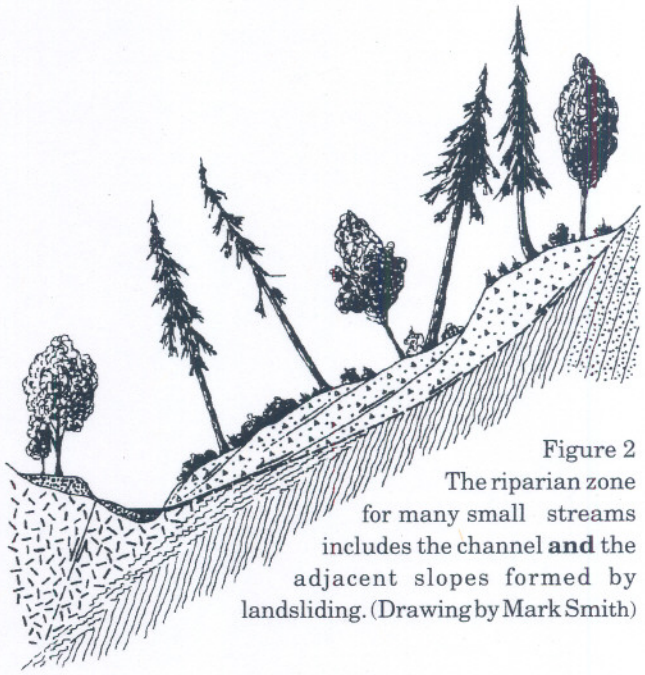


Figure 2
The riparian zone for many small streams includes the channel **and** the adjacent slopes formed by landsliding. (Drawing by Mark Smith)

We had two primary questions:

"What techniques for stream channel and stream-side slope mapping can produce a useful picture of the most sensitive lands in a planning watershed?"

"What does it take, in time and money, to complete a useful inventory of ***all*** *stream channels and stream-side slopes in the steep, dissected forested watersheds common in northern California?"*

We assembled an interdisciplinary group and brainstormed what characteristics we were interested in. We then pared the list down to what seemed to be a practical minimum set of characteristics to measure. We then set out to survey all the streams in a 15,000-acre survey area, in the Bluff Creek watershed near Orleans California, which is tributary to the Klamath River. Streams were defined as: *"any channel or declivity showing evidence of annual scour or deposition".*

The survey technique divides the stream into short, successive sections based on geomorphic and riparian characteristics. Thus each section contains relatively consistent features. Mappable features within each section are:

- Stream gradient
- Flow (P,I,E)
- Inner gorges (length and slope)
- Channel bankfull width
- Valley bottom width
- Riparian vegetation (width and species comp.)
- Woody debris volume, by size class
- Channel bearing

A new section was begun when a "significant" change occurred in one or more of the above parameters. Of particular interest were the points of abrupt change along the stream channel. Such changes typically were associated with hillslope failures, tributaries, or sharp bends. For example, a recent landslide had altered inner gorge morphology and riparian zone width. What constituted a significant change, on which to break the section, was the principal focus during the first several field trials. At first, delineation of sections was based on observer subjectivity. This encouraged valuable discussions among the crew as we considered whether a "change" had occurred. Our goal was to balance efficiency with mapping resolution. After several weeks of trial and error, the following characteristics were chosen to represent mappable changes (i.e., a new section was begun):

- Inner gorges, valley bottom width, stream gradient, and bankfull width — a 50% change in either the width, length, or slope
- Riparian — a 100% change in width of the riparian vegetation zone
- Bearing — a 25° change
- Mouth of tributaries
- Change in flow (i.e., perennial to intrmtnt.)

Using these values, the mean section length for first- and second-order streams was 90 feet. Mean section length increased to 125 feet for third-order channels. Section length varied between 7 and 465 feet, with the longest sections found in the largest channels. Sections less than 25 feet typically were bedrock cascades.

No map is prepared in the field, but aerial photos are carefully referenced and control points are noted in the data. A schematic map can be prepared from the data (Figure 3). Automated map generation from a spreadsheet of the data is under development.

Data analysis and integration with geology, soils, and vegetation information, and application of GIS is underway. Many of the channels mapped are difficult or impossible to discern on aerial photos. Therefore, the technique can provide detailed information concerning stream protection and sensitive areas that is otherwise unobtainable. As a first-cut, we believe that this technique is practical, but needs to be refined to reduce the amount and/or resolution of data taken to increase production and decrease costs.

Schematic Stream Channel Map

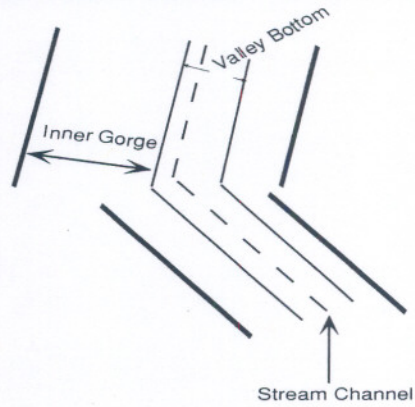


Figure 3. This type of map can be drafted from the data. Each channel section has a bearing, length, and set of attributes. The inner gorge width and valley bottom width are shown here. Other data, such as riparian vegetation width and bankfull width might be best displayed at a larger scale.

Production

A crew of two very fit earth scientists was able to map 2600 feet of channel length per day, equivalent to a 100-acre watershed. Production was somewhat proportional to the size of the streams. Overall costs were about $2.40/acre in this terrain where drainage density is especially high. This figure might be surprisingly high, but the need for and utility of the information is also high.

The authors welcome all questions and comments.

You can contact Sam and Mike at (707) 441-3551
FTS 448-3551

New publication

"Livestock Grazing on Western Riparian Areas"

Produced for the USEPA by the Northwest Resource Information Center,Inc., Eagle, Idaho,Ed Chaney, Wayne Elmore, and William S. Platts, Ph.D., Authors, July 1990. 45 pp.

This new publication provides an informative introduction to livestock grazing in Western riparian areas. Riparian areas are lands adjacent to streams, and rivers where vegetation is strongly influenced by the presence of water. The publication discusses and illustrates the errors and mistakes of historical, destructive grazing practices and sets the stage for the restoration and proper management of such areas.

Orders for the publication should be directed to:

Conchita Donaldson, Soil Conservation Service, Room 0054, US Department of Agriculture, P.O. Box2890, Washington, DC 20013
(from EPA News-Notes #7)

Is Restoration of Riparian Systems a Viable Mitigation Tool?

Stephen A. Laymon
Kern River Research Center, Weldon

Mitigation for riparian habitat lost during development projects is an issue of increasing importance. In the last 10 years, four major conferences have been held regarding structure and function of riparian systems in California and the last two highlighted restoration. Despite this interest, surprisingly little is known about the factors that determine success of an individual restoration site or even how success might be defined.

The first step in defining the success of a restoration-mitigation site lies in developing a firm understanding of the goals of the project. Examples of project goals are: (1) creation of habitat for a certain endangered species (e.g. yellow-billed cuckoo or Bell's vireo); or (2) creation of forest of a certain type (e.g. open-canopy mature valley oak woodland or closed-canopy mature cottonwood-willow riparian forest).

In the first example, an understanding of the habitat requirements of the target species is needed. For most animals in riparian systems, habitat requirements are poorly known. In tests of California Department of Fish and Game's Wildlife-Habitat Relationship Models in riparian habitat along the South Fork Kern and Sacramento rivers, I have found a poor fit between the model's predictions and the actual breeding birds. Therefore, detailed research on habitat requirements of target species will likely be needed prior to the start of the project.

In both the first and second example, a site must be chosen that can support the target plant community. For example, low terrace sites will not support oaks due to frequent inundation and a high terrace site will not support willows because the depth to ground water is too great. Sites with high salinity or extreme pH values may not sustain the necessary plant species.

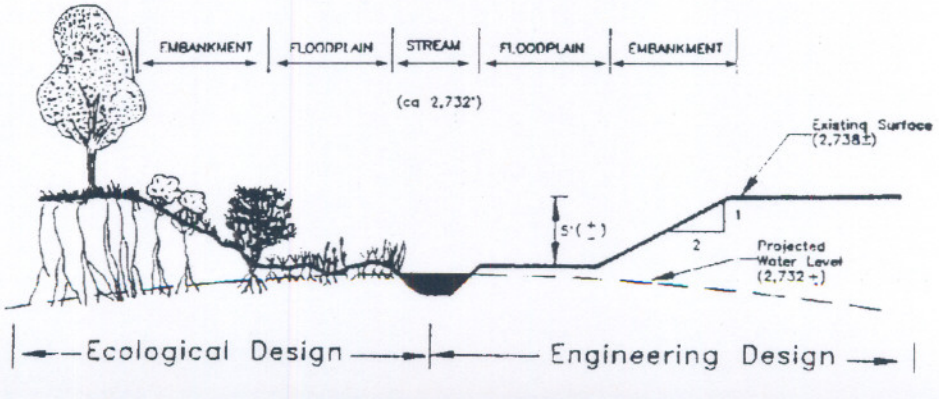
On the Kern River, yellow-billed cuckoos are nesting in five year old natural regeneration sites, but have not yet nested on restoration sites of the same age. Natural, low terrace willow-cottonwood riparian forest regenerates after flooding and densities of young trees are much greater than on restoration sites. Much thinning takes place on natural reforestation sites as the forest matures.

In the short term there are great differences between natural and planted sites, but we know now we will still not understand the critical factors affecting the outcome of restoration sites.

Resources to conduct restoration are scarce, the mission is critical, and we cannot afford to repeat our failures. To avoid repeated failures, we must have the integrity to report failures, as well as our successes. This is difficult for all of us, but may be most difficult for consultants when the next contract depends on the success of the last. Reporting of failures is vital for two reasons: (1) often much more can be learned from them since we are more likely to ascertain the factors that caused sites to fail than to succeed; and (2) we don't want others to make the same mistakes. A free flow of information is vital to learn what we need to know to succeed. There is no room for proprietary information in this field.

It is too soon to know if mitigation through restoration is a viable tool. It has been pointed out that restoration projects for their own sake often succeed, but when they are done for mitigation they often fail. This is an interesting observation and a study of the reasons behind this would take us a long way towards where we need to be in our understanding of restoration.

Steve can be reached at (619) 378-3345.



From Jensen & Platts 1990

Restoration of Riparian Habitat on the Kern River Preserve

Ronald L. Tiller and Reed Tollefson

TNC, Kern River Preserve

Since 1986, The Nature Conservancy has been involved in the restoration of the Great Valley cottonwood forest along the South Fork of the Kern River. The goals of the project are to supplement existing riparian habitat and to develop techniques for successful restoration of the native riparian system. Restoration of this community should provide additional habitat for a wide assemblage of riparian-dependent wildlife including the state endangered Yellow-billed Cuckoo *(Coccyzus americanus)* and Willow Flycatcher *(Empidonax traillii extimus)*, and up to 40 other species of special concern.

The research focus of the restoration effort is to determine how site characteristics such as soil texture, electrical conductivity (EC), pH and depth to the water table affect the survival and growth of Fremont cottonwood *(Populus fremontii)*, red willow *(Salix laevigata)*, and mule fat *(Baccaris glutinose)*. These factors are known to have profound effects on plant survival and growth, but specific tolerances are not well documented for these species.

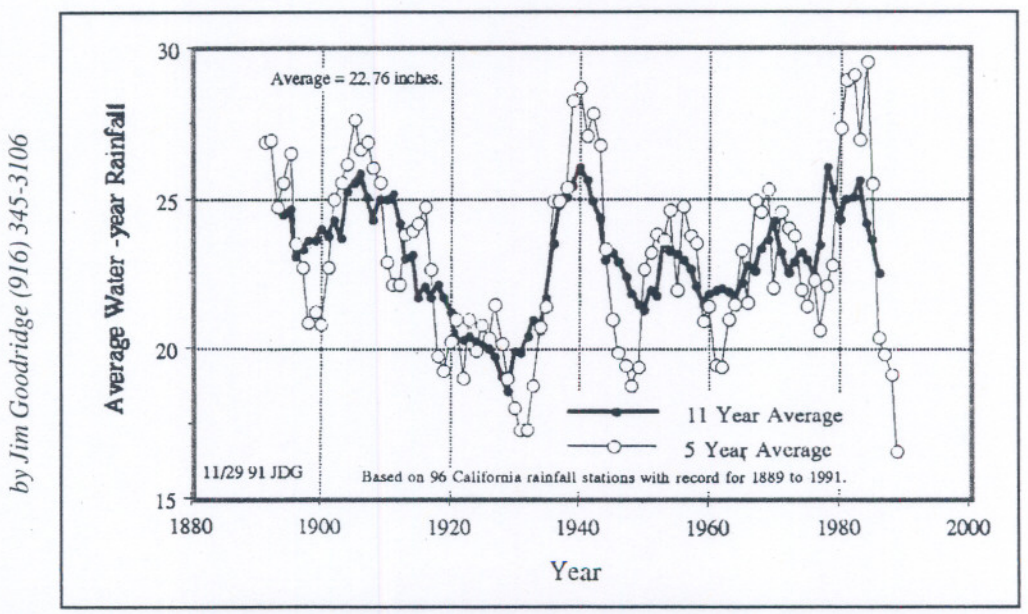
In order to determine or refine thresholds for these species, soil and water samples are taken from 8-10% of the planting holes arranged in a stratified sampling grid. On a 50-acre site, this amounts to 400-500 sample holes, or nearly one sample per 1/10th of an acre. This sampling density is necessary to adequately represent the highly variable site conditions found in the South Fork floodplain and to develop statistically valid sample sizes.

Planting holes are augered to the water table and soil samples are taken at depths of 6 inches, 2 and 4 feet. Soil texture, electrical conductivity and pH are determined from these samples. Groundwater depth, and the EC and pH of the groundwater are also taken. These data are compared with species thresholds gathered from the literature and past trials on the preserve and is used to develop a site map and planting design. Where information is unknown or unavailable for a species (i.e., mule fat), assumptions are made regarding its tolerance. Cottonwood, willow and mule fat saplings are then randomly assigned to the sample holes and their survival and growth are tracked throughout the growing season.

Long-term monitoring of these trees and shrubs will provide important information that will aid in the accurate determination of tolerances for these species to the measured site factors. Adjustments will then be made to future planting designs that will improve the success of future restoration efforts at the preserve. Knowledge gained from monitoring at the Kern River Preserve will have application to similar riparian systems in the southwest and should ultimately lead to more and better habitats for riparian-dependent wildlife.

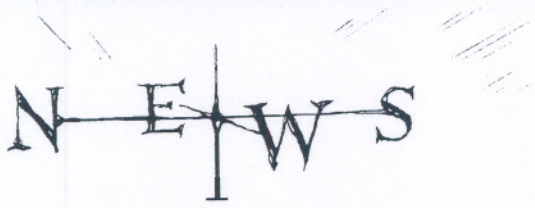
You may contact Ron and Reed at (916) 378-2531

It's all how you look at it



by Jim Goodridge (916) 345-3106

With a 5-year view point, California has a water supply emergency; but the decade has been near normal



Name Stream & Tributaries

Scott Franklin wants to let everyone know that he has retired from active duty with the Los Angeles County Fire Department. He is, however, continuing in the "business", so to speak, by working as a consultant. Scott does point out, however, that "(t)here are those that maintain that consulting can never be termed 'gainful employment'". At any rate, Scott's consulting colleagues include **Dick Montague**, recently retired from the USDA Forest Service, and **George Roby**. Dick and Scott are working on various projects, including a management plan for Camp Pendleton USMC, the City of Newport Beach, and projects in Malibu and the Bay Area. Scott's business phone number is (805) 254-2376.

Moving North, **Karen Hoffman** of the USDA Forest Service did just that. Karen is now the Forest Hydrologist on the Lewis & Clark National Forest, headquartered in Great Falls, Montana. This is quite a change from her previous job as hydrologist on the Lake Tahoe Basin Management Unit, headquartered in South Lake Tahoe, CA. Karen's former boss, LTBMU Watershed Staff Officer **Al Todd**, says that Karen ran an excellent water quality monitoring program in the Lake Tahoe watershed and is an exceptionally good hydrologist, particularly in the field of water quality monitoring.

North again, **Judy McHugh**, hydrologist/geomorphologist par excelánce, is leaving her colleagues at the Six Rivers National Forest for a promotion to District Hydrologist on the Fernan District of the Idahoe-Panhandle NF. The northern Rockies have been calling Judy back for years, and she is on her way home. Forest Hydrologist Mike Furniss says, "Judy is the finest hydrologist the Six Rivers has ever had, and we've had quite a few."

Our 1991 field trip to the Mokelumne River watershed, entitled "Mixed Ownership Planning" was a great success. The rain held off until we got back to Jackson, CA. Speaking of the hazard of "rain on a parade", despite the active mixed ownership Mokelumne watershed protocol (featured at the field trip), on January 3, 1992, the East Bay Municipal Utilities District (EBMUD) sued the State of California (Department of Forestry and Fire Protection) over the state's regulation of logging on the private land in the Mokelumne watershed. Members of the Mokelumne protocol —including EBMUD, CDF, Georgia Pacific, USDA-Forest Service, local county planing agencies, and others — will continue to solve problems face-to-face. The effects of the lawsuit on this process is unknown, but as one wag put it: "What's a lawsuit among friends?"

Looking to 1992, don't forget to mark your new calendar for the Watershed Management Council's conference "Integrated Watershed Management: Overcoming Obstacles" in South Lake Tahoe,CA. November 18, 19 & 20, 1992. It promises to be a truly watershed event.

The California Department of Forestry and Fire Protection (CDF) is in the process of putting out some watershed-related contracts for bid, including a contract to inventory small community domestic water sources, a contract to delineate planning watersheds in the wildlands (*Calwater*), and contract to delineate highly erosive watersheds in California. WMC has several consultant members who might be interested.

Many of you received a request to renew your membership to WMC for 1992 & 1993. If you have not already done so, please take a moment now to correct your mailing label (if necessary), write a check, and mail both to the Watershed Management Council, c/o Neil Berg, USFS, PSW Station, P.O. Box 245, Berkeley, CA 94701. Thanks.

And remember, if you've reached a watershed in your career or have an interesting tidbit of watershed news, let your colleagues know about it. Drop a line to Name Stream & Tributaries, c/o **Clay Brandow**, 1528 Brown Drive, Davis, CA 95616, or just call me at (916) 739-3167.

Riparian Systems Issue

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