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River Protection and Restoration in California

Senate Committee on Natural Resources and Wildlife

CALIFORNIA LEGISLATURE

SENATE COMMITTEE
ON
NATURAL RESOURCES AND WILDLIFE
SUBCOMMITTEE ON RIVER PROTECTION AND RESTORATION

SENATOR MIKE THOMPSON
CHAIRMAN

RIVER PROTECTION AND RESTORATION IN CALIFORNIA

TRANSCRIPT AND WRITTEN STATEMENTS

MARCH 15, 1994

ROOM 2040, STATE CAPITOL
SACRAMENTO, CALIFORNIA

CALIFORNIA LEGISLATURE

SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE

Senator Mike Thompson, Chairman

RIVER PROTECTION AND RESTORATION IN CALIFORNIA

Transcript and Written Statements

March 15, 1994
Room 2040, State Capitol
Sacramento, California

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SENATE NATURAL RESOURCES AND WILDLIFE COMMITTEE

SUBCOMMITTEE ON RIVER PROTECTION

STATE OF CALIFORNIA

HEARING: RIVER PROTECTION AND RESTORATION

STATE CAPITOL

ROOM 2040

SACRAMENTO, CALIFORNIA

TUESDAY, MARCH 15, 1994

2:07 P.M.

Reported by:

Evelyn J. Mizak
Shorthand Reporter

APPEARANCES

MEMBERS PRESENT

SENATOR MIKE THOMPSON, Chair

SENATOR DON ROGERS

MEMBER ABSENT

SENATOR ART TORRES

STAFF PRESENT

KRIST LANE, Consultant

RUTH COLEMAN, Consultant

ALSO PRESENT

CHARLES WARREN, Executive Officer
State Lands Commission

ROBERT HIGHT, Chief Counsel
State Lands Commission

DIANA JACOBS, Ph.D., Environmental Specialist/Ecologist
State Lands Commission

ELIZABETH PATTERSON, Environmental Specialist/Planner
State Lands Commission

DOUGLAS WHEELER, Secretary
Resources Agency

KENT IMRIE, Immediate Past President
Napa Chamber of Commerce

ZEKE GRADER, Executive Director
Pacific Coast Federation of Fishermen's Associations

PETER GOODWIN, Ph.D., P.E. Technical Director/Principal
Phillip Williams and Associates

JULIE SPEZIA, Executive Director
California Association of Resource Conservation Districts

JOANNA LENNON, Executive Director & Founder
East Bay Conservation Corps

ZAKEE ZAREEF, Member
East Bay Conservation Corps

JUD ELLINWOOD, Executive Director
California Salmonid Restoration Federation

APPEARANCES (Continued)

RICH BETTIS, Property Manager & Fisheries Coordinator
Pacific Lumber Company

LINDA FALASCO, President
Central Valley Rock, Sand and Gravel

WILLIAM DAVIS
North Coast Gravel Operators

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CHAIRMAN THOMPSON: I'd like to call to order the Subcommittee on River Protection and Restoration. I have a statement that I'd like to make.

California's rivers contribute greatly to the wealth of this state. Every resident of the state depends on the resources provided by rivers, whether it be gravel for highways, drinking water, agricultural products, or recreational activities. Because of this dependence, we have strained the carrying capacity of our rivers, leaving them less productive for future generations.

During the next year, we intend to explore the factors that affect our rivers and identify ways that will allow us to continue to find value in this renewable resource without further degrading it. We also will look for opportunities to restore our damaged rivers so that we can leave the next generation with a healthy and productive resource.

This hearing represents our first effort toward improving our level of knowledge about this complex resource. We intend to hold hearings in both Southern and Northern California throughout this next year. Subsequent hearings will focus on local issues and local solutions. Today's hearing will take a much broader statewide perspective.

We'll begin the hearing with a presentation by the State Lands Commission. The Commission has recently released a report entitled, "California's Rivers, A Public Trust Report," which provides an historic account of the use of rivers and

depicts the conditions of rivers today throughout our entire state.

This presentation will be followed by the Resources Agency Secretary, Mr. Doug Wheeler, who will outline current programs in the Agency that relate to river protection and restoration. Following that, we'll hear from two panels that will discuss first the economic benefits of river restoration, and second, community development opportunities associated with river restoration.

We've set aside time at the end of the hearing to hear from any other persons who may wish to speak to us on these important issues. Those wishing to testify should see our Sergeants at Arms to sign up on the sign-up sheet. We will impose a time limit depending upon the number of people who do wish to testify.

Before we begin, I'd like to caution our witnesses to be brief because we do have a full agenda. When you come up, please push the blue button, speak into the microphone, and identify yourself for the record.

I'd like to first ask Mr. Charles Warren, who's the Executive Director of the State Lands Commission, to come up.

MR. WARREN: I'd like to be accompanied by our Chief Counsel, Robert Hight, and then we'll bring up Diana and Elizabeth as they're shown in the agenda.

CHAIRMAN THOMPSON: I'd like to welcome Senator Rogers, one of our Subcommittee Members and Member of the full Committee.

SENATOR ROGERS: Thank you.

MR. WARREN: Good afternoon, Mr. Chairman and Senator Rogers.

My name is Charles Warren, and I'm Executive Officer of the State Lands Commission. I'm accompanied by Robert Hight, who's Chief Counsel for the Commission, and I wanted to introduce him to you.

We want to commend and congratulate you, Mr. Chairman and Senator Rogers, for having established this Subcommittee for the protection and restoration of California's rivers.

If you will permit a personal observation, it is my opinion yours is one of the more noteworthy legislative efforts to more responsibly address the natural resources problems of California in recent decades. We at the State Lands Commission are pleased to join you in this effort.

As you know, Mr. Chairman, a major and significant responsibility of the Commission is the management of the sovereign lands of California, which include all lands which historically underlay the tide and navigable waters of the state. These lands are managed as legally mandated by the provisions of the Public Trust Doctrine.

In order to responsibly meet its duties as trustee for such lands, the Commission recently commenced a major initiative to inventory the status and trends characterizing all such trust lands. Our first effort was directed towards California's famous Delta. Our findings were revealed in a report which we released in 1991. With the issuance of that report, a Senate Subcommittee on Delta Protection was formed and

chaired by Senator Pat Johnston, your colleague. Following hearings by that Subcommittee, legislation which seeks to protect the Delta was introduced and signed into law by Governor Wilson.

Our second effort was directed toward California's rivers, the subject for today. Its findings were reported in 1993, and is the subject of our comments here this afternoon. Copies of the report itself, as well as an executive summary, have been provided you. We are encouraged to understand that the report was one of the considerations which led you to form this Subcommittee.

The report itself consists of five parts: Chapter One discusses the natural configurations of rivers and how they were used over time by native and immigrant populations; Chapter Two discusses the effects and consequences of the historical uses to which the rivers have been put; Chapter Three is a status assessment of the rivers in seven regions of the state; Chapter Four is an exposition of the nature and function of rivers and of their restoration capability; and Chapter Five identifies the several governmental programs and initiatives and private party efforts to protect our rivers.

To present the contents of the report in more graphic terms, Mr. Chairman, Dr. Diana Jacobs, our staff biologist and principal author of the report, has prepared a slide demonstration.

Following Dr. Jacobs, Elizabeth Patterson, our staff Senior Planner and Project Director for the report, will provide you with a summary of current national and regional efforts

underway to protect and restore our rivers. This summary may be useful to you when considering your program options.

Following their presentation, I would appreciate an opportunity for a few closing words.

If I may now bring to the lectern Dr. Jacobs.

CHAIRMAN THOMPSON: Yes, please join us.

DR. JACOBS: Good afternoon. My name is Diana Jacobs from the State Lands Commission.

I want to present a brief overview of the findings of our report, discussing briefly and very rapidly, I'm afraid, the major findings, the state of our rivers, which, I'm afraid, is not very good, how we got that way, and some of the tools and techniques there are to restore our rivers.

We are here because we appreciate and value rivers, which is something that humans have done even from the earliest settlement of California by the Native Americans. Later, European settlers also valued and utilized rivers for a variety of purposes: for commerce, places for settlement.

This is the City of Napa on the Napa River.

To be truthful, however, I think that our present culture takes rivers for granted. What we thought was an endless bounty of resources we are finding now is quite finite, and I think this is well illustrated by the Pacific salmon. The populations have catastrophically declined recently, from runs of hundreds of thousands or millions, we're down to thousands. There are a variety of causes for this.

Continuing on with the brief statement about our Pacific salmon, not only are the salmon themselves endangered,

but of course, the fishermen who depend upon them for their livelihood.

There are a variety of causes for the decline of salmon. One of the major problems is thought to be degradation in their habitat. Now, salmon are a migratory species, and with different stages of their life cycle in different parts of the river. And sadly, humans have degraded almost every part of that habitat. Up in the spawning areas, we have filled in with sediment and silt their spawning gravels and dewatered their spawning beds, blocked their historic navigation routes. And downstream further, in the rearing areas, we've completely removed or degraded the riparian habitat, or the stream side forests, that are also important for the aquatic habitat.

Riparian forests are also important for wildlife species. In fact, when you think of riparian forests, you should think tropical rain forests and their productivity and diversity.

This shot was taken just a few miles from here on the Sacramento River.

More kinds and numbers of wildlife are supported by riparian habitat than any other habitat kind in California. Sadly, however, 90-95 percent of this habitat type has been lost in the state since statehood. A number of species dependent upon this habitat are declining as well, including the state listed threatened Swainsons hawk shown here. In fact, we found about 80 different species of wildlife dependent upon rivers are in danger of extinction or, in fact, are already extinct in the state, those including a number of migratory song birds as well.

Even the most remote rivers, from the Oregon boarder, the Lost River, down to the desert rivers -- this is the Almargosa River in the Death Valley -- to the Colorado River, which is surely one of our most degraded ecosystems, these desert rivers are home to unique fauna, including the desert pup fish one here, which is perhaps very emblematic of our California fish fauna as a whole. These are interesting, and unique, and adapted to very harsh environments; however, they can't survive human impacts. In fact, two-thirds of our fish fauna are in danger of extinction, and some, indeed, have already gone extinct.

Well, to explain how we got this way, you have to take a historical perspective, going from the earliest European settlements. One of the earliest impacts was the steamboats, which look very picturesque, but they have voracious appetites for fuel wood. In fact, clearing our forests of hundreds of thousands of acres in the Sacramento/San Joaquin Valleys, and along the Colorado River occurred because -- to fuel this steam ship travel.

Another event that's very important for California history, both for social and economic reasons and literally transforming the land, was the California gold rush. Hydraulic mining washed millions of tons of debris down into valley streams, destroying spawning and other habitats.

Around the turn of the century, cities developing after the gold rush in the coastal areas needed to get a dependable drinking water supply, including San Francisco looking to Hetch-Hetchy and in Los Angeles. This is the Los

Angeles Aqueduct intake in the Owens Valley, and the date on this structure is 1911.

This is the Owens Valley upstream of that intake, and this is the Owens River downstream of the intake. This, of course, resulted in the drying of Owens Lake downstream of this.

I want to turn to some more modern, recent impacts, continuing into the present, from past decades, from the post-War building boom, starting with rural land uses, traditional ones of logging, grazing and mining, and then discussing some urban problems.

Logging is easy to attack. It's easy to find inflammatory pictures, but in truth, it can be quite harmful to the land. It moves -- it removes the vegetative cover and moves a lot of land surfaces. Destructive logging in the '40s and '50s is -- the impacts of that are still being felt today. This is a landslide area shot taken just a few months ago in a watershed that still has not healed from those past logging practices.

More modern techniques can be much more sensitive. This is an example of a cable logging operation, where logs are drawn uphill, diffusing the water runoff, so there's not much erosion occurring on the land surfaces. There's buffer areas to protect streams.

You'll notice, though, there's still a lot of exposed land in the roadways, which is a continuing problem.

Turning to grazing, livestock grazing was very devastating to a lot of western rivers, not just in California, but in other western states. Cows literally can clean up all

the riparian growth along the banks and chisel down the banks along the streams. Luckily, this is rather easy to cure by either fencing or controlling the livestock grazing and rehabilitating the erosion in the watershed with check dams and planting. In fact, measures of this have been occurring in different rivers and streams of the state through cooperative efforts between ranchers and government biologists.

Turning to mining, we don't have gold mining any more, but we, as the Sacramento Bee reported yesterday, we have another kind of mining that has a potential to harm our rivers, and that's in stream aggregates, mining for sand and gravel to build -- to use for concrete and asphalt. This is the San Joaquin River, with old ponds left behind from sand and gravel extraction. Here's the current one in use.

This is the Russian River, which is the focus of a lot of attention right now. The bed of the river, through past gravel mining, has dug itself down about ten or twenty feet as one impact of continued mining of this resource.

Another controversial practice is mining in what they call terraces on flood plains adjacent to the channel. These ponds are some 20-30 feet deeper than the bed of the river, and it's a rather sterile biological environment. Once you dig these pits, they are basically going to stay a lake forever, and it is very difficult to reclaim them to any other purpose.

Some promising techniques that agencies are looking for, and local counties are looking to, to be able to allow mining in the river without harm are barn skimming in certain rivers. This is an example of you taking up a smaller amount of

gravel from an active gravel bar, and in a few years, in not very high water, the river will tend to build this gravel bar back. We're looking seriously at this technique for some rivers that have an overabundance of sediments, such as the Eel River in Northern California.

Turning from rural areas to more intensive uses, irrigated agriculture and development in the flood plain are some of the activities we've done that probably are most changing and altering of our river system. This is the State Capitol at the confluence of the American and the Sacramento River. This entire area is a former flood plain.

I want to focus on the Sacramento River, which is our largest river, and looking at what we do to plume, and structure, and control this river for agriculture and flood control.

This is the site of the dam, the Shasta Dam, before it -- interestingly enough, before it was put in. One of the first impacts this had was, of course, cutting off some historic spawning grounds for the salmon that used to go up into the Pit and the Cloud and upper Sacramento Rivers.

Moving downstream of Shasta and its smaller dam below, Kestwick, the fish actually did learn to spawn, or adapt to spawn, in the waters below this. As water releases from the reservoir, cold water was released and they were able to spawn. However, the continued erosion of the river, which is a natural process of the sediment, has been gradually washing the spawning gravels away. And since none are replenished because of the dams, we're faced now with mining gravel elsewhere and dumping

it in to replace that.

Moving again further downstream to Red Bluff, this is the Red Bluff Diversion Dam, which is a lesser of a migratory problem. There is a fish ladder that still does present some problems. More importantly, it diverts water down into the west side of the San Joaquin Valley for agriculture.

When this water coming off the farms is released some 150 miles downstream, it is laden with silts, and pesticides, and maybe even more importantly is, you can see the difference in color here between the drain water and the river water. This is 80 degrees in temperature sometimes, and when you think that young salmon migrating out do best at 50 or 60 degrees, you can see this is a major problem in the lower river.

Below Red Bluff, the river is in an almost natural state; I'll say almost. We have substantial amounts of riparian habitat, which is this forested area, still left that haven't been cleared, and the river in many places is still moving naturally across its flood plain, with the process of depositing on one bank and eroding on the other, a process that is called meandering.

In fact, meandering of the river turns out to be essential for the riparian habitat. You can see faint lines in the vegetation representing the different life stages of the riparian habitat that is laid down as the river moves across its flood plain. This is essential. Without the river moving, you will not have regeneration of riparian forests.

Further downstream, however, we have controlled the river for flood control purposes. The Sacramento Flood Control

Project was designed to have a scouring, narrow channel, and then bypass overflow areas that are used for agriculture off the river. This was designed, again, to be a scouring system for navigation as well as flood control; however, the scouring has, perhaps, worked too well, and the river continues to erode its bank.

The Army Corps of Engineers' basic solution up until now has been to armor it with rock riprap or revetment which, as you can see, creates a rather sterile environment.

Some places on the Sacramento River, this is just upstream of the Feather River confluence, are virtually barren. It's like boating through a canal.

You can see, in a natural bank, we have a lot of the habitat values essential for the wildlife and fish.

In answer to the many endangered species that are found now along the river and depend upon these river habitats, and increasing pressure from environmental agencies and the community, the Corps of Engineers is trying their darnedest to come up with a way to mitigate for the loss of this stream side habitat. They are trying to allow trees to grow on the levies, but you can still see the barren riprap below.

Another solution just going to be tried this year is to replant in the rock itself, which is something that has really not been tried before. This will take some years to grow and replace the natural habitat values.

Something that the State Lands Commission is working on in the south fork of the Mokelumne is to bury logs at the same time you apply the rocks to try to preserve some of the

habitat values immediately.

In the end, however, most of the important values of the Sacramento River will need to be saved by allowing the river to be a river; allowing it to meander, deposit on one side and erode on the other.

Through the efforts of the Upper Sacramento River Advisory Council, which is nicknamed SB 1086, government agencies, and local land owners, local environmental groups, fishing groups, have been working on a concept for a meander management zone which will allow the river to meander within a certain zone. And it is felt only this way can we truly restore and protect the values of this river.

In areas where the river has already been constrained by levies, we're actually asking the Corps of Engineers to study setting them back to recreate a meander zone.

Looking now at urban rivers, this is the City of Bakersfield. The Kern River flows through this city. We have a set of slightly different problems, and different values, and solutions. We have more of a community amenity as well as flood control. This is a heavily plumbed river, if you will. There's canals running every which way for water supply, and it is placed within levies for flood control.

This river is lucky in a sense, in that the flood control channel is fairly wide, and there's a lot of opportunities for restoring habitat values, which would be important for the use as recreation as well as habitat. In fact, the City of Bakersfield is working on a riparian parkway.

Closer to home, the State Lands Commission is working

with the local cities and counties of the Sacramento River area here near the Capitol to protect the remaining habitat along the river and restore some of the degraded areas to preserve this area for recreation and habitat.

A lot of rivers have friends, and even the L.A. River, as shown here, has a friends organization, surprisingly. We are working to restore this river, which it is. This is the typical engineering solution to flood control -- at least it was in the past -- to place a river or a stream in a concrete channel, or at best, in an earthen channel.

This was going to be the fate of a stream in north Richmond, which runs into San Francisco Bay, called Wildcat Creek. But the citizens objected to this approach, and through the help of many organizations, many agencies, were able to put together a different plan. The State Lands Commission, in fact, was able to purchase this piece of land down near its mouth to allow the stream to maintain its habitat values. This is actually part of the flood control project. Protect this habitat, and we really have a very nice wetland down in the channel, which was planned to be just a barren canal.

I want to end with a positive note in the rural area also. This is the Natal watershed in Northern California. It's so remote, this is nicknamed the Lost Coast. Citizens have been getting together even here to look at their watershed and do restoration. This watershed was logged in the '40s and '50s, and it has one of the highest rainfalls in California, a combination which results in very high sediment yields. You can see by the muddy water. These two shots were the same place, by

the way, at different times of the year.

A lot of efforts have been gone into to preserving -- excuse me, restoring this degraded watershed, focusing on the fish. This is something that loggers, ranchers, environmentalists, everyone could agree on the value of the fish. And in fact, one of the first things they have done is to successfully petition the Fish and Game Commission to make their own protective fishing regulations.

Other projects include preserving some of the remaining old growth forests in the tributaries, and the State Lands Commission's school lands program has been involved with the environmental community on logging companies to preserve logging jobs, and at the same time, preserve old growth in this watershed.

So, this should be regarded as work in progress, but is an example of looking at a watershed from the headwaters to the sea, and what can be done.

That concludes my remarks.

CHAIRMAN THOMPSON: Thank you very much.

Senator Rogers.

SENATOR ROGERS: I noticed the slide there in the Owens Valley of the Owens River, and below the take-off point.

Isn't there efforts being made to rewater that stream?

DR. JACOBS: Yes, there are, with the Department of Fish and Game as a major lead in that; that's right. So even on the Owens River, there's much hope for it.

SENATOR ROGERS: Hopefully, we can turn that around

and go the other way.

DR. JACOBS: Right.

SENATOR ROGERS: Thank you.

CHAIRMAN THOMPSON: My constituent and the author of the report.

MS. PATTERSON: Actually, I was manager of the report, and we had many authors, and Diana was the principal author.

I also have been told that when you follow slides, you should have puppy dogs and children, and I have neither.

Some people fear that the challenge of river restoration may paralyze policy makers. I want to allay those fears by showing what action other states and the Congress of the United States are taking. I will begin where the State Lands Commission began.

When we launched the Rivers Report project in 1992, we were fortunate to have the guidance of the then recently released National Research Council's publication, "Aquatic Restoration." This remarkable book provided a framework from which we could construct our report.

Our ecology specialist, Diana Jacobs, has shown how, in relying on this framework, we approached the rivers as a system, describing functions that are essential for the well-being of aquatic and riparian habitat. She has shown past practices and their consequences and new ways that sustain the river resources. She has shown the potential for restoration.

My testimony is to demonstrate to you the need for coordinated, system-wide river restoration and examples of such

coordination by other state legislatures. The following is a brief overview of these efforts and initiatives by federal, state, local, and nongovernmental organizations.

The distinguished National Research Council is a creature of the Congressional Charter of 1863, mandating the National Academy of Sciences to advise the federal government and provide services to the public, scientific, and engineering communities on scientific and technical matters. The Academy is a private, nonprofit, self-perpetuating society of notable scholars engaged in scientific and engineering research.

Investigating the plight of the rivers, the Council recognized the importance of the emerging science of restoration ecology for aquatic ecosystems. They felt strongly that all too many environmental decisions had been made in a fragmented fashion and on a certain road to tragic failure for repairing and sustaining river systems.

The Council lamented that, from a national perspective, too many environmental decisions, including those involving restoration, biodiversity planning, and habitat conservation plans, are uncoordinated, diverse efforts often unrelated to the river's functions or watershed system. These finds suggested to us that: one, we must educate policy makers about these functions and systems; two, that we must initiate an integrated approach to restoring aquatic ecosystems; three, that we should identify the elements for such an approach; and four, provide you the acid test for your assessment of meaningful restoration and management programs.

As the Council's first lesson on the strategy, the

degradation of rivers is informative and instructive, their second lesson of revealing the expanding flood of restoration efforts that seek to protect and restore rivers is encouraging and promising: efforts to repair a broken river; to protect a river segment; to manage river basins and watersheds; and to conduct old business in new ways.

This flood has grown from a riffle of local efforts, such as the Russian River management planning, to rapids of state legislation, such as the Massachusetts and Oregon river protection and management mandates, and, if I may continue the metaphors, a federal waterfall known as the River Watershed Protection and Restoration Act of 1994. This second lesson tells us that there are politically acceptable options for answering the need for restoration and preservation of the ecological integrity of rivers.

To illustrate the scope and breadth of river restoration at the local, state, and federal level, I will briefly summarize Chapter Five of our Rivers Report, and briefly describe two state initiatives and the Federal Rivers Act of 1994.

We began Chapter Five with a Paul Bunyan parable quoted from Aldo Leopold, "The Round River," from the 1949 A Sand County Almanac, which I have shortened:

> "We the genus Homo ride the logs that float down the Round River, and by a little judicious 'burling' we have learned to guide their direction and speed. The technique of burling is called economics,

the remembering of old routes is called history, the selection of new one is called statesmanship, the conversation about oncoming riffles and rapids is called politics. Some of the crew aspire to burl not only their own logs, but the whole flotilla as well. This collective bargaining with nature is called planning."

This quote is the summary of the multitude of programs, policies and initiatives that make up the current body of river protection, restoration, and management in California. As you know, the public trust is the artery of this body. In addition to the public trust, there are statutes and laws that proscribe activities that are harmful to rivers except for the public welfare. We note that there are standards of water quality and requirements for fisheries. In all, there are 14 federal agencies with management and regulatory responsibilities. There are 17 state agencies with management and regulatory responsibilities. In addition, there are 58 counties, more than 350 cities, and scores of special districts that may have jurisdiction and whose actions affect rivers.

Acknowledging the sheer number of agencies involved in river management or activities that affect rivers, the Resources Agency has formed a federal and state task force. This River Assessment project is to inventory, evaluate and provide information on a statewide basis in recognition of the need for a comprehensive foundation of information in order to

better conserve the state's rivers.

In the Rivers Report, we also identify 40 nongovernmental organizations which are addressing river restoration, protection and management, including the California Association of Riparian Parkways, CARP, an association of 40 elected officials representing river greenway initiatives in their jurisdictions. The report clearly demonstrates that those who use the river and its resources -- the economist, the historian, the statesmen, and the politician of the parable -- are searching for ways of river management, albeit often uncoordinated, fragmented, and conflicting.

California is not alone in this search. Massachusetts is a state with exciting and innovative local initiatives to reclaim and protect rivers. The Massachusetts River Protection Act, Senate Bill 948, augments their state-sponsored "Adopt a River" program by establishing a setback ranging from 25-150 feet of land buffer for certain types of potentially harmful land use activities adjacent to rivers.

Oregon is a state that has already enacted legislation anticipating and envisioning the Federal River Protection Act of 1994 and serving as a forecast of what states can do. The first step taken were two 1987 statutes. SB 202 provides for the issuance of passes for river access fees for the maintenance, enhancement, or protection of natural and scenic beauty of designated rivers. The second statute, HB 3019, enabled the creation of river management planning process for the Deschutes River.

We have for you today copies of the "Deschutes River Management Plan" and the statutes to which I refer, as well as the Massachusetts bill.

The plan is a collaborative planning process of federal, and state, and local governments, landowners, and others who use river resources, and who agree through this plan to protect and manage the river and its watershed.

The second step is the largest river protection act in the nation's history for the lower 48 states: the 1988 Oregon Omnibus National Wild and Scenic Rivers Act, which protected 40 Oregon rivers, totaling over 1,500 miles, as Wild and Scenic Rivers. Credit for this awesome achievement goes to the Pacific Rivers Council. The Council has received national acclaim for its imaginative river restoration approaches that merge contemporary ecosystem science with sustainable community development. They have played a major role in developing the recommendations of the National Research Council into a national legislative program of which I will describe shortly.

In spite of these noteworthy, numerous, and promising restoration projects at all levels of government and by the private sector, which are not insignificant, there is still lacking national direction. Much more is needed to slow the loss of national aquatic resources and reverse the damage of ecosystem functions and wildlife. A national prescription is needed and must be on par with the current commitments to water quality and endangered species recovery plans. In fact, in many cases the most cost-effective strategy for meeting these legal commitments is the physical restoration of aquatic systems.

Both the National Research Council and the Pacific Rivers Council are urging the federal government to take the lead, to provide a national aquatic ecosystem restoration strategy that enables each state to be innovative, imaginative, and inspired in developing a state legislative program. Guided by these recommendations, Congressman Bill Richardson of New Mexico, Chairman of the House Natural Resources Committee Native American Affairs, may introduce today, March 15th, the River and Watershed Protection and Restoration Act of 1994. The legislation will be considered in the Natural Resources Committee chaired by Congressman George Miller.

The purpose of the Act is to provide a new, unique mechanism to empower local river and watershed conservation advocates to protect and restore aquatic resource values in rivers and watersheds. The bill provides a means for these local conservationists to tailor and integrate local state and federal incentive and regulatory tools for the benefit of rivers and watersheds.

The bill provides local, grassroots conservationists a mechanism that gives state and federal sanction of their own protection and restoration strategies. This sanction is in the form of placing the watershed or river on a National River and Watershed Registry. Placement on the Registry will allow local conservationists to obtain federal funding, technical assistance from federal and state aquatic resource agencies, and protection from activities that are inconsistent with the river or watershed conservation strategy.

In conclusion, we have learned from the National

Research Council and the Pacific Rivers Council that no truly effective, comprehensive river conservation program exits at any level of government. We see the growing knowledge of the general public and elected officials of the severity of the problems and the bankruptcy of existing approaches and policies.

We have learned that, while there are very worthy and respected river restoration programs such as the SB 1086, Upper Sacramento River Riparian Restoration effort, and the Central Valley Stream Restoring project, the scope of river protection and restoration is on such a scale that more is required than new laws for each river mile.

We have seen examples of local and state initiatives that are in need of a coordinated, comprehensive resource management program. And finally, we have seen other state legislatures act with the current level of knowledge of aquatic restoration.

Although more information and development of data is desirable, we must acknowledge that science and resource managers will never know all. To quote Entering the Watershed:

"Rather than allowing the unknown to paralyze us as more systems and species disappear, we must apply the best of what we know today."

Thank you.

CHAIRMAN THOMPSON: Thank you very much.

Senator Rogers.

SENATOR ROGERS: In your reference to the Massachusetts plan, and I don't have the time to read it, but I

see it's in the manual here, how do they resolve the conflict I can see here, to take the extreme, 150-foot setback, and if a private owner owns a fairly large amount of acreage, you're talking about the taking of a fairly substantial amount of land away from this private owner.

How is that resolved? I mean, did the people in Massachusetts, the private landowners, did they willingly acquiesce to this?

MS. PATTERSON: Well, as a matter of fact, Senator Rogers, there was an enormous amount of concern about that, and the resolution of it is that it's a management plan. It's not a taking away of land.

And the management plan does recognize uses. What the plan is asking is that those uses not degrade the river. And to the extent that many of the adjacent landowners to rivers can do that with best management practices and other things that they have noted in the legislation, it will be accomplished.

SENATOR ROGERS: So, it's a management plan; it's not a taking of the land. However, the landowner loses the land either way, even though you call it a management plan. He winds up without the use of his land.

MS. PATTERSON: I suspect -- the uses are restricted, and I suspect some landowners consider it overly restrictive, but many apparently are supportive.

SENATOR ROGERS: One other thing.

You mentioned in your comments about a fee being charged. I didn't understand who charges the fee and who pays

it?

MS. PATTERSON: Right.

In Oregon, there is -- they have an ordinance that charges a river access fee. I guess you have to get a pass, sort of like a pass to a state park or a pass to a national park. And that fee goes into a fund, and that's the fund that -- it actually funds a number of things, and you'll see it in the ordinance. But the most telling thing it funds is the ability to do some management planning.

SENATOR ROGERS: Suppose I'm a fisherman. I have a fishing license, but then, in order to get to the river, do I have to pay a fee to get to the river to fish?

MS. PATTERSON: Yes, and it is coordinated through the Oregon process.

CHAIRMAN THOMPSON: But you don't have to wear it on your fishing vest as you do your California fishing license.

SENATOR ROGERS: You're right. You don't have to expose it.

CHAIRMAN THOMPSON: Not yet.

SENATOR ROGERS: That'll be next.

Okay, thank you very much.

MS. PATTERSON: You're very welcome.

CHAIRMAN THOMPSON: Thank you.

Charles.

MR. WARREN: Mr. Chairman, Senator Rogers, I submit it is clear that river protection should be a priority subject for legislative consideration.

An echo of the findings of our report, which has just

been described to you, can be found in last month's report by the Technical Advisory Committee's progress report prepared for the California Rivers Assessment, which has been partially described for you.

In the Technical Advisory Committee's report, they state:

> "California's widely diverse rivers are among the state's most valuable resources, providing habitat for fish and wildlife, recreational and cultural opportunities for landowners, and water for agriculture, commerce and drinking. California's rivers are also among its most damaged ecosystems. Demands on rivers and their flood plains for hydroelectric power, flood control, crops, and grazing land, sand and gravel mining, and water for cities, industry and agriculture have resulted in enormous changes to the state's waterways.
>
> "Ongoing threats to rivers' resource values include: watershed land use practices, flood plain development, pollution, over-harvesting of fisheries, and proliferation of non-native fish and plant species."

With that, we recognize, as Senator Rogers' question suggests, that the task before you will not be an easy one,

because until now, the destruction of our rivers has been treated as a tolerable cost of doing business.

However, we are now beginning to recognize and appreciate the considerable value of a river and the unacceptability of its destruction. Fortunately, such recognition comes at a time when there are alternatives to historically destructive activities.

It is my view, Mr. Chairman, that too many of such historical destructive activities have been committed or accepted by our existing statutory and regulatory mechanisms.

So, as a first step, the Subcommittee might consider the enactment of a "do no harm" statute which would apply to all state agencies whose jurisdictional responsibilities involve activities which affect rivers. Such a statute would direct all such agencies to review and revise their regulatory provisions as necessary to avoid river destructive practices. This "do no harm" legislation should require such agencies to report back to the Legislature, describing their compliance in no more than two years.

Concurrently, the Subcommittee might consider or should consider a more comprehensive and proactive river and watershed restoration program. In your hearings and deliberations, there are a few suggestions of a general nature we would recommend that you consider.

First, rivers and their uses are unique in respects which suggest that management plans for their protection and restoration should also be unique. Accordingly, any state program should reflect and provide for a regional and watershed

approach to river protection and restoration.

Second, your program should recognize and provide for the fact that some uses of land are destructive to rivers. Consequently, local government which has land-use regulating authority should be fully involved in helping accomplish legislatively declared goals and objectives of river protection and restoration.

Third, your program should recognize the several notable state projects which have as their subject a better understanding of the role and needs of rivers. I have in mind the California Rivers Assessment program mentioned earlier, which will provide invaluable data on an ongoing basis to those engaged in river management planning and restoration. I have in mind also the multi-agency collaborative effort to repair the Upper Sacramento River, and Fish and Game's recent recommendations for restoring Central Valley streams.

There are a number of other significant projects, all of which are set forth and described in our report. The Subcommittee might consider how best such efforts could be integrated and coordinated in a more comprehensive statewide program in furtherance of legislatively declared goals and objectives.

Fourth, your program should provide for professional and scientific guidance in the development and implementation of river protection and restoration. As we know now, natural systems are complex, interrelated, and many times the victim of the law of unintended consequences.

To conclude, Mr. Chairman and Senators, we wish you

well as you undertake the task before you. We offer any help and assistance within our means, and we join with all Californians in anticipation of the success of your efforts.

We thank you very much.

CHAIRMAN THOMPSON: Thank you.

Senator Rogers, do you have any questions?

SENATOR ROGERS: I guess just one.

In your proposal of "do no harm" to the river, you know, we're hearing more and more about a need, when we prepare an environmental impact report, that we need to also prepare an economic impact report.

I'm just wondering, had you considered the "do no harm" to the economy of whoever's affected by proposed legislation? Shouldn't that possibly be part of the consideration also?

CHAIRMAN THOMPSON: I would guess that the State Lands Commission would not only welcome but urge that economic assessment, from what I've seen. And we, this Natural Resources Committee, had a hearing up in Blairsden early this year on timber issues, up in Senator Leslie's district, and we took a very interesting tour of a river restoration project.

It's interesting, as we become better able to quantify both the costs and the benefits associated with not only the restoration projects, but the degradation becomes a slam-dunk as far as what we should be doing. In fact, up in Blairsden, or rather it was really outside of Quincy, the siltation was causing such a problem for the hydro dam down river that it was up into the tens of millions of dollars to

remove that problem. So, looking at that cost benefit analysis, it was real easy to understand that the over grazing in the area was a problem. They needed to move those cattle back away from the river.

I think that's the beauty of the course that we've charted, is that we're going to get right down to the ground level and bring the locals in, and let them identify both the problems and the solutions, and work together with them, understanding the economic impact of these problems.

We'll hear, I know, from one of the panels from the Napa area, the fact that the Napa River is a tremendous economic asset to the area, but not being used to its full potential.

SENATOR ROGERS: I appreciate that, but also I think there should be some attention given to the economic impact that occurs to the landowner, to the persons who are affected, who have to give up, say, part of their land for the setback, or whatever else may be required of them. I think that should be -- I think to be fair, I think that should be a consideration in any proposed legislation.

MR. WARREN: And I certainly agree with you, Senator Rogers. I think my "do no harm" suggestion contemplates that.

What I meant by that was to suggest that we are now aware that there are new methodologies, technologies, and practices which can be employed that were not known in recent years, even in recent years, which are now possible which would be less destructive of rivers than our historical practices. So, that was my point.

We're not telling -- I don't think it's wise to

suggest to agencies that they limit their activities to doing no harm, but in line with their other mission, that they try to achieve their mission in a way which is less destructive to the river than present practices.

That's all that I suggested by that, and I have in mind -- you might be amused by a reminance [sic] -- that is, when I was in the Legislature, for two years in a row I carried legislation to provide for an economic impact report. Needless to say, I was not successful, but I am of a mind, Senator, to yours on the point.

SENATOR ROGERS: Maybe we need you back in the Legislature, and you'd have better luck now.

MR. WARREN: Thank you very much, Mr. Chairman and Senator Rogers.

CHAIRMAN THOMPSON: Thank you all.

Next we'll hear from Secretary Wheeler.

SECRETARY WHEELER: Thank you, Senator. Good afternoon, Senators, Members of the Committee.

Briefly, to summarize some of the current activities undertaken by the state, and particularly by the Resources Agency, which address the issues that have been described for you just previously by the State Lands Commission, first let me say that we've brought descriptions both of our "California Habitat" or "Riparian Habitat Preservation Program", and of the "California Rivers Assessment," two of the three programs that I'd like to describe to you briefly.

And also to concur in the remarks that you just heard form the State Lands Commission about its report, and about the

importance of protecting this incredibly important ecosystem. In fact, it's appropriate, I think, that Mr. Warren quoted from the report of our technical advisory committee about the fact that rivers and riparian habitat are among the most valuable resources in the State of California. They provide habitat for fish and wildlife, as he said, recreational opportunities, water for commerce, agriculture and the public.

I am pleased that we follow the report. Pleased also to be able to tell you that in anticipation of a report like this, or of the public's concern, back in 1991, when the Governor announced his Resourceful California Program, we included a component which addresses both the need to assess riparian habitat and the status of California's rivers. And so, I will talk to you very briefly about three things, all of them ongoing programs, addressing the needs that have been identified by that report: number one, the California Rivers Assessment; number two, the California Riparian Habitat Conservation program; and probably the most senior of these in terms of length of origin or date of origin, the California Wild and Scenic Rivers system.

Starting with the Assessment, I am pleased to say that we have under way a really quite productive partnership between the state government and the federal government in assessing the rivers of California for the purposes of establishing priorities for their protection, and for the development of river conservation strategies.

I mentioned that it is a partnership. We are represented at the state level principally by the Wildlife

Conservation Board. I'm pleased that joining me in the room today is the project director, Scott Clemons of WCB. And thanks to the National Parks Services' Rivers, Trails, and Conservation Assistance Program, we have a federal partner. Those activities of the two principal co-sponsors are coordinated with the Executive Council on Biological Diversity, CERES, which is our new electronic data base for all of California's resources, and through CERES, the Sierra Nevada ecosystem project in that bioregion, and the National Biological Survey.

The initial focus of this Rivers Assessment is two-fold -- first, on riparian habitat and values; second, on aquatic resources -- and it is proceeding in two phases. The first phase is what we call the professional judgment phase. We are asking experts across the state to collect information about the condition of riparian and aquatic resources in each of the state's watersheds for a minimum of 160 rivers, which is an important distinction, I think, from the more general view taken by the State Lands Commission report.

First data available will commence to flow in April. We expect to be completed with that first phase by early June. that is an overview of those 160 rivers, a list of which we will be happy to provide.

In the second phase of the assessment --

CHAIRMAN THOMPSON: So this should be June instead of August?

SECRETARY WHEELER: Correct. I'm sorry, April through June, correct.

In the second phase, which we call the aggregated information model, we'll take a more detailed examination of rivers in at least each of the state's ten bioregions. And in fact, for that purpose we've identified 13 different rivers. And in each of those, there'll be at least one.

That data gathering will begin as well in April and should be completed by July a year from now, July of 1995.

I have just quickly the list of those demonstration basins. They're the Eel, the Sacramento, the Deer Creek, Cosumnes, Mokelumne, Carmel, Owens, Sespy Creek, Santa Clara, Santa Margarita, and the White Water River.

I have also the chart, which is not going to be easy to see, unfortunately, but which is demonstrative of the geographic breadth of that phase, but also of the new tools that have been utilized. This is a geographic information system that defines the watershed, the river itself, within each of the state's principal bioregions.

It's this kind of resource availability, as Charles has already suggested, which makes the job a lot easier than it would have been had we undertaken it just a few years ago.

SENATOR ROGERS: Excuse me just a minute.

SECRETARY WHEELER: Yes, sir.

SENATOR ROGERS: Doug, we have a lot of Deer Creeks in California. Which Deer Creek basin are you referring to there?

SECRETARY WHEELER: The Deer Creek basin here is the one, I believe, under the Wild and Scenic Rivers study as well.

SENATOR ROGERS: Where is it located?

FROM THE AUDIENCE: Northern California, upper Sacramento River watershed area.

SECRETARY WHEELER: Why don't I show you this map.

SENATOR ROGERS: Thank you.

SECRETARY WHEELER: But this is the tool that helps us in the pursuit of that assessment which, I said, has two phases. We expect to come out of this assessment in both of its phases two important products. First of all, a process which we are in the course of developing which will allow us to continue to collect data, to evaluate that data, and to exchange data among the variety of state, federal agencies, local interests involved. And second, the elaboration of this computer data base, which will give us for the first time a complete assemblage of that data, easily accessible to decision makers across the state.

The second of the three programs that I wanted to describe to you relative to these --

CHAIRMAN THOMPSON: I'm sorry. You may have covered this; I was distracted for a minute.

How was it that you chose these rivers?

SECRETARY WHEELER: Those were chosen because they represent at least one each in the ten state bioregions. So, there are a total of 13; these are the so-called demonstration basins in which we'll conduct exhaustive research into the condition of the river. And they're intended to be representative of river marine types, habitat types, geographic distribution --

CHAIRMAN THOMPSON: Any consideration given to the

shape that these rivers are in?

SECRETARY WHEELER: Correct, so that they'd be representative of some that are more pristine than others, obviously.

CHAIRMAN THOMPSON: And some that are less pristine.

SECRETARY WHEELER: And some that are less.

And in fact, the advisory committee, which consists of more than 80 members, developed criteria for the selection of these and for the other 160 in the professional judgment phase. We'd be happy to share those criteria with you.

The second program is one even more advanced than the Rivers Assessment, and that is the California Riparian Habitat Conservation program, Senator, which resulted from the enactment of SB 906 and the Governor's approval of that law back in 1991. It, too, is managed principally by the Wildlife Conservation Board, and it has focused on this need to protect, conserve and better manage the dwindling riparian habitats of the state. So far that program has funded several projects, including a river corridor enhancement study for the Cohilla River, a riparian habitat enhancement project on the Sacramento River, and several acquisitions, including the recently approved purchase of the first phase of Rank Island in the San Joaquin River.

It's that program which is also responsible for the habitat inventory, the riparian habitat inventory, which is, in turn, a part of the California Rivers Assessment.

Finally, let me address briefly the California Wild and Scenic Rivers system. You know that this is the state legislation which corresponds to the federal Wild and Scenic

Rivers Act. It, too, classifies rivers according to their recreational and their natural values, either wild, scenic or recreational, and then prohibits uses which are inconsistent with those values, except on certification by the Secretary for Resources that those values would not be degraded.

We add rivers to that list as they are proposed for further study, and in fact, it's one of the purposes of the assessment, to identify rivers which might be further studied for inclusion in that system.

Currently, pursuant to AB 653, a 1993 law, we are studying Mill Creek and Deer Creek, Senator, for addition to the Wild and Scenic Rivers system. Pursuant to the terms of that legislation, those reports would be submitted to the Governor and the Legislature by January 1 of '95.

I mention these three programs just to give you some idea of, first of all, our understanding of the importance of the resource, and second, the fact that there is ongoing effort to address the needs that have been identified in the State Lands Report.

That is not to say that we have in place the perfect system for the management of these resources, but it is certainly among the most progressive in the country, and it does provide us with the tools that we need to deal with a lot of these issues on a watershed basis.

As has already been identified, SB 1086 is an important collaboration on the upper Sacramento River. We all know about the success of the American River Parkway as a result of essentially local initiative. We're working now on the San

Joaquin Parkway as well.

As the needs arise, we have found abundant tools by which to address those needs.

Thanks.

CHAIRMAN THOMPSON: You're not suggesting that we should acquiesce from our charge?

SECRETARY WHEELER: Well, I'm not sure what your charge is at this point. I understand that you're embarking upon a fact finding process. The question is, what conclusions we come to.

I would like very much to suggest that while your effort proceeds, so too will ours, and that we stay in touch about our findings so that we can draw the right conclusions from the best available data.

CHAIRMAN THOMPSON: Our plan is to do just that, and as I mentioned in the opening statement, to hold hearings throughout this year, probably come forward with some sort of legislative package next year, but the major emphasis is to include participation at the local level.

So, I'm not sure if you're doing a lot of that.

SECRETARY WHEELER: Critically important. In fact, I've just come from, this week, a meeting in -- or late last week -- a meeting in Redding where we, on behalf of the State Executive Council on Biodiveristy, invited all of the watershed groups that work in the Klamath Province of the Northwest Coast, to hear from them about what they were doing, and to hear from them about the ways in which the state and federal agencies can respond to their needs.

So, I agree completely with that emphasis.

I also agree with the importance of a watershed or a systemic approach to this problem. I think it would be a mistake to proceed with yet another fragmented approach, yet another bill that protects one feature of the ecosystem in isolation from all the others, because what is successful and, I think, commendable about the effort of the watershed groups is the fact that they're dealing with entire watersheds within those bioregions.

CHAIRMAN THOMPSON: Along those lines, let me ask you just very briefly, the process whereby you go about evaluating and eventually placing on Wild and Scenic status a river?

SECRETARY WHEELER: We do that pursuant to legislation which directs us to do it, and the terms of that legislation --

CHAIRMAN THOMPSON: Names the rivers?

SECRETARY WHEELER: Correct, as study rivers.

I mentioned the two, the Mill and the Deer, that we are now looking at.

And typically, the legislation also includes the charge that we look at aquatic resources, and habitat, fish and wildlife, and adjoining land uses. It then requires that we make a determination as to which of the subcategories is the most applicable, and then we make a recommendation back to the Governor and then to the Legislature for its enactment.

CHAIRMAN THOMPSON: So, that would take subsequent legislation?

SECRETARY WHEELER: Correct.

CHAIRMAN THOMPSON: So on the Deer and the Mill Creek bill, that was the Sher bill of last year.

SECRETARY WHEELER: Correct.

CHAIRMAN THOMPSON: That only directs --

SECRETARY WHEELER: Authorizes the study.

CHAIRMAN THOMPSON: Authorizes or directs?

SECRETARY WHEELER: Directs.

CHAIRMAN THOMPSON: So it directs you to complete the study, and based upon your findings, we'll determine whether or not we can place some sort of status on that river.

SECRETARY WHEELER: For addition to the system, correct.

And in the case of those two, it's due to you by January 1 of '95.

CHAIRMAN THOMPSON: So, the process in itself is somewhat flawed, because just to determine whether or not we look at a river is subject to the entire political process.

SECRETARY WHEELER: Except that we've anticipated that need with the Rivers Assessment. We're not going to wait for direction, one river or creek at a time. We've undertaken a statewide assessment of the rivers and their condition such that we can make a recommendation to you about all of them.

CHAIRMAN THOMPSON: You're doing this separate and apart from the Sher Legislation?

SECRETARY WHEELER: Correct.

CHAIRMAN THOMPSON: That was battered by the political process because, if you'll recall, that started life as a three-river assessment. Antelope Creek was included in

that also, but Mr. Sher, for some reason, acquiesced and removed Antelope Creek.

As he explained it to me, it was to ensure signature on the bill.

SECRETARY WHEELER: I don't -- I was not part of those discussions.

As I say, the assessment that we described to you this afternoon predates that discussion. It's far more comprehensive. Indeed, it's more comprehensive that the study you just heard reported by the State Lands Commission.

CHAIRMAN THOMPSON: So eventually, we won't need to do individual pieces of legislation.

SECRETARY WHEELER: That's the theory.

CHAIRMAN THOMPSON: We'll know exactly --

SECRETARY WHEELER: Not only should we have data as of the time of the study, we will have a mechanism by which to keep tabs on those rivers as circumstances change.

SENATOR ROGERS: I guess just a comment, and, I guess, a concern, and maybe you can address my concern.

First we have the assessment, and then the study, and then it seems like almost inevitably there comes a recommendation that that be placed in the Wild and Scenic River category.

Should I be concerned that all five of these are going to wind up as being recommended to be Wild and Scenic Rivers?

I have nothing against that if it's justified, but some of my constituents are concerned that, perhaps, that's

almost a foregone conclusion; that once you start this process, that it winds up over here, Wild and Scenic, and there's nothing that can stop it.

SECRETARY WHEELER: We don't embark upon the study with that presumption. And in fact, it may be, of those 160, some are already protected in one way or another.

I want to emphasize that there is awful lot going on around the state, a lot of it at the grassroots, to protect and manage these resources, number one.

Number two, that's a decision which ultimately the Legislature is going to have to make based on the best available information we can develop. The purpose of this project is to develop and maintain an adequate data base so that we do make decisions based on the best available information.

SENATOR ROGERS: Of course, your recommendation carries a lot of weight, as you know, with Members of the Legislature.

SECRETARY WHEELER: I hadn't noticed.

SENATOR ROGERS: I have.

SECRETARY WHEELER: We are making no recommendations. This is a study of the condition of those rivers, and their likely prospects.

If there are recommendations to be made, they'll follow the process, I assume, that has resulted in these other additions to the Wild and Scenic Rivers system.

SENATOR ROGERS: We can only hope that we run out of metaphors before we get to that point.

SECRETARY WHEELER: You'll notice that I didn't use

any. I'm not quite as creative on that point.

SENATOR ROGERS: Thank you.

CHAIRMAN THOMPSON: So when you're talking about his tremendous clout, is he the one responsible for us wearing our fishing licenses on the outside?

[Laughter.]

SENATOR ROGERS: No, no.

SECRETARY WHEELER: The program has been enormously successful in attaining its desired objective, which is to increase revenue.

CHAIRMAN THOMPSON: To raise money.

SECRETARY WHEELER: And they are badly needed.

CHAIRMAN THOMPSON: Believe me, having already lost my fishing license --

SECRETARY WHEELER: You'll have to buy another one.

CHAIRMAN THOMPSON: -- I can attest to that, exactly.

SENATOR ROGERS: For a fee, you can get another one.

CHAIRMAN THOMPSON: Thank you very much.

SECRETARY WHEELER: Thank you.

CHAIRMAN THOMPSON: We'll have the first panel, Economic Benefits of River Protection and Restoration: Kent Imrie from the Napa Chamber of Commerce; Zeke Grader, Executive Director of the Pacific Coast Federation of Fishermen's Association; and Peter Goodwin, from Phillip Williams and Associates.

MR. IMRIE: I think I'm first.

I want to thank Senator Thompson and the Senate Committee on Natural Resources and Wildlife for inviting me here

today to talk about a subject that's close to my heart, river restoration, because I am a fly fisherman, and also revitalization of downtowns, which we are actively embarking on in downtown Napa.

I do applaud the Committee for focusing on California's rivers and realizing their economic potential, particularly in my home town of Napa. Our family business, an insurance agency, has been operating in Napa for four generations. When the agency started in Napa, the river was clearly the center of activity for the entire area. It served as the major transportation system for commerce coming out of the Napa, eastern Sonoma and Solano Counties. That was in the 1890s, when "going to the City" for many citizens from Fairfield, Vacaville and Sonoma meant going to Napa.

The Napa River remains today one of the only three navigable rivers in California. But what is happening today in Napa, and what role is the River playing in that?

Senator Thompson mentioned earlier that the River is being under utilized, and I think that's clearly the case. But many things are happening, and the question is, is Napa on its way to being the San Antonio of California; San Antonio being clearly an example of a successful downtown revitalization built around a river, in their case more of an estuary. We consider ours to be truly a river.

Also, I hope to answer the question: is the Napa River a pivotal element towards revitalizing historical downtown? I think the answer will clearly be yes.

Just yesterday, the Napa Chamber of Commerce, of

which I am now past President, thankfully, sponsored --

CHAIRMAN THOMPSON: Immediate past President.

MR. IMRIE: Immediate past President, thank you -- sponsored a panel discussion of our own in Napa regarding downtown revitalization. In this case, the meeting was held after much community discussion regarding the latest retail business loss in downtown, that being Merrill's Drugs, a Napa institution for decades. Merrill's abruptly closed its doors last month.

Also last fall, Woolworth's, which had been operating for decades in Napa, also called it quits, and J.C. Penny's and others have also joined the long list.

Ironically for the panelists and the 90 business leaders that were in attendance at this meeting, there wasn't much of a panic over this. The fact is that downtown Napa is going through a metamorphosis that is tied to tourism, which is strongly linked to Napa's history and the Napa River.

Tourism holds the most economic potential for downtown, which is not to say that we are turning the town over to outsiders. Locals will be part of the excitement as we reach our true potential as a destination for the Wine Valley traveler, business conference planner, or pleasure boat owner. But with the town center not being an easy off-easy on location, we cannot hope to tap a significant number of the 4.5 million visitors to the Valley each year without the natural attraction of the River, the old town atmosphere of Napa, and the quality developments that are ready to become reality along the River. The Visitors Bureau in downtown Napa welcomed 200,000 visitors

last year. That number could be easily doubled or even tripled with the potential of downtown.

Even more importantly, these guests would be induced to stay over night because of the natural beauty of the River, history, and the following list of man-made attractions.

I am going to sound like a past President of the Chamber here, but we are very proud to state that we have either in planning, on the drawing board, definitely coming to a fruition: number one, a center for wine, food and the arts, known as the Cultural Center in Napa, and that, for those of you maybe following it in the newspapers is the Robert Mondavi project; the Napa Valley Expo, or as we old Napans refer to it, the fairgrounds, is part of that plan; the Hat Building, which is an old brick building that's going to become probably a center for restaurants and foods along the River; the Napa Valley Opera House has been on the drawing board and is going through phases of reconstruction; the Napa Valley Wine Train has its Napa station in the Ox Bow, where this Cultural Center will exist.

There's an outlet center coming to the western perimeter of downtown. A Jarvis Conservatory is in the planning; it's talking over an old winery location in downtown Napa that will be a school for musicians from around the world. We have a mural program, and it's in the grassroots stage that hopes to put historical muraling on some of the older buildings around the downtown area. And then we have a very active Napa Valley Landmarks organization that looks at historical buildings and tries to preserve those, and is currently working on one of

the old bank buildings to turn it into a center for nonprofit organizations.

There are also several new and resurrected, I'll say, eating establishments spread throughout the downtown.

All of these things hope to return Napa really to its heritage, which is a renewed focus on the Napa River. Not since the 1930s has the community turned its attention to the River, and I'd also like to add that all of those projects that are in the works are, quote, "river friendly", unquote. That is, they don't -- they will not have a major negative impact on the River.

Of course, a lot of it hinges, and a lot of the future developments that we can't even identify at this point, will depend upon a flood control project being implemented, which is well on track in Napa. More private development will come as portions of the flood plain become available for additional development. And that will also certainly be something that'll maximize the potential for downtown.

The City's role in all this, I'm going to get to the Community Resources Department, who is in the audience today, but we also have an Economic Development Coordinator in Napa now that's looking at the big picture, helping to keep the vision for downtown, to explore public-private partnerships, and to help find ways to finance improvements to the infrastructure which are still needed.

We're well aware of the fact that San Antonio's success was made possible because of private investment and development along their estuary. In San Antonio, it could be

said it was David Strauss who had the vision.

In Napa, we believe it will be Robert Mondavi, but it will take the City, in a coordination effort, to make that happen, to make it happen for all corners of the downtown.

I think it is time that I talk a little bit about the recreational benefits of the River, and as I mentioned, in the audience we have Heather Stanton, who's our Community Resources Department Director. She's been involved over several years now with the River. And many of the pictures that we have here on posters were her department's project. And also, I've left brochures regarding the Napa River trail, which is already well into the works, and should mention the National Parks Service helped out in developing the brochure and helping us with the trail project.

We really do have a vision for the recreational opportunities of the River, and many of the amenities are in place already, as I mentioned, one being the Veterans Park, which is centrally located, and Napa really has become the center of town. It used to be the Clock Tower, City Hall. Now it has moved towards the River, which is an indication right there of the attention being turned back to the River. It's where all the festivals and major events in Napa occur.

We have a four-street dock now, which is adjacent to that park, which is a mooring facility for pleasure boats that come up the River from the Bay. We already do have stretches of finished trail along the River trial that were financed through private and public cooperation by developers along the River.

The expansion of the recreational uses of and public

access of the Napa River is a perfect example of two visions merging: a vision of hiking, biking, boating, and even horseback riding to experience the Napa River through the downtown and beyond, combined with a vision to have the River serve as a draw for the day and overnight visitors that have come to share in those experiences.

Public access to the River is a win-win for the City of Napa, and the community realizes this. Restoration and preservation of the River goes hand in hand with the attraction the River holds for both the local citizens that can literally make the River part of their neighborhood, and the many visitors for which a clean and safe River, meandering through historic downtown, has almost a magnetic effect. All would not be possible without River restoration and protection.

The Cultural Center, proposed museums, the Napa Valley landmarks, and the Opera House, along with the restored Victorians downtown, and of course the Napa River, add an educational component to the lure of downtown Napa.

So much is in place. The community has said over and over: we want no more studies, no more plans; let's just do it. Well, we are doing it, but it will take a shared vision along with additional public and private support to finally announce to the world that the Napa River front has been reborn.

I want to thank you for your attention. That concludes my remarks, and I'll answer any questions you might have about Napa.

SENATOR ROGERS: What's the difference in the rainfall in the Napa Valley versus San Antonio? How many inches

of rain do they have in each place? Does anybody know?

MR. IMRIE: We've been below average, but our average is at 23-24 inches, I believe, a year. I've got to believe it's a lot less than that in San Antonio.

SENATOR ROGERS: Less than that?

MR. IMRIE: Oh, absolutely.

What's your point, Senator?

SENATOR ROGERS: I was just wondering, because a lot of the problem we have of keeping healthy rivers in this state is having adequate rainfall and adequate snow pack. That's a big problem.

Of course, you don't have that problem up here in Northern California as much as we do in the southern two-thirds of the state.

So, that was the reason for that question.

MR. IMRIE: We're not really fed by snowfall either.

SENATOR ROGERS: I know you're not. You're in a very unique position.

Thank you.

CHAIRMAN THOMPSON: The Senate Ag. Committee today passed the Joint Powers Agreement bill --

MR. IMRIE: Fantastic.

CHAIRMAN THOMPSON: -- for the Robert Mondavi Center for Food, Wine and the Arts.

MR. IMRIE: We will report back, thank you.

CHAIRMAN THOMPSON: Zeke.

MR. GRADER: Thank you, Senator Thompson and Senator Rogers.

My name is Zeke Grader, and I'm the Executive Director for the Pacific Coast Federation of Fishermen's Associations.

Among others through our member organizations, we represent the majority of the state's organized commercial salmon fishermen.

I really want to thank the Subcommittee for holding this hearing today, because really the health of our rivers is extremely important now. While we represent ocean fishermen -- that is, people who make their livelihoods at sea -- the health of our rivers is critical to their being able to make that livelihood because it's critical to so many of our resources.

Dr. Jacobs, of course, has already mentioned in her presentation about the salmon, and certainly the health of our anadromous fish is dependent upon healthy rivers. And of course, in addition to the salmon, we also have the sturgeon, steelhead and trout populations which support important recreational fisheries.

Additionally, our rivers also support two important non-native species: the striped bass and the shad, at least in the Central Valley streams.

Our rivers, of course, too, are also critical to the health of our coastal estuaries which are, in turn, important ecosystems, spawning and nursery habitat for such species as dungeness crab, certain species of sole and Pacific herring. So really, it's all one system. It's not the rivers, the estuaries, and the ocean waters being separate. They are really all part of one system, and what happens in one part of the

system can very much affect what happens elsewhere.

But I'd really like to concentrate specifically just in my comments here today on the salmon. Of course, the salmon fishery has been, until recently, California's most important fishery. Salmon really are along the whole Pacific coast, and not something we just find in the Pacific Northwest or Alaska.

But really, if you look at our history, the history of immigrants to California, it's that this species has really defined the character of the Pacific coast, from Central California to southeast Alaska. The first salmon fishing by immigrants really began here in the 1850s to provide food for the miners. It is, in fact, one of this state's oldest fisheries.

The first salmon cannery on the whole of the West Coast was right here in Sacramento. This is important. I think back to the commercials that the pork industry ran, you know: "Pork, the other white meat." There's sort of a variation of that for salmon. Salmon is California's original red meat; it's native red meat. And I think people, perhaps, if they ate more of it, then we'd have even bigger population problems in this state, so I'm not encouraging additional consumption at this time.

But nevertheless, it is important and very important to the many of our coastal economies. It provides not only jobs at sea, but many more jobs ashore in the distribution. And, of course, it's not only an important food source, it's important for recreation and it has been, until recent years, an important part of our export market. And of course, it's what makes --

it's an ideal complement to, of course, our wine industry. So, they go very well together.

But looking at what's happened to our salmon fisheries, I think if you read the recent New York Times articles and that, you'd come to the conclusion that the fishing industry as a whole, which is going through some serious problems nationally and internationally, you'd come to believe, well, it's just too many fishermen out there is being the problem.

But really, if you look at what's happened to our anadromous stocks, whether it be in the Sacramento, or the Klamath, the Eel, the Columbia River, I think the story is much broader, and that is that we just destroyed these resources because we've destroyed the rivers that they rely upon.

Keep in mind that in this state, we've regulated our salmon fishery since the 1850s to protect against over fishing.

We've gotten through, because of the California Congressmen, former California Congressmen, helping getting it through in 1976, laws protecting against the unregulated fishing by foreign fleets.

But really what we haven't done a very good job of regulating are the other impacts affecting that resource, whether it be overdrafting of the rivers, overcutting of the watersheds. That's really the overage that we really have done such a poor job in this state and along the whole Pacific as far as protecting against.

We have, I think, as the Secretary of Resources said, have had various statutes on the books here in California,

beginning with the Wild and Scenic bills in 1972. But frankly, the only really effective measure we've seen to date as far as protecting our rivers has probably been the one that's caused the most controversy in this state, and interestingly the one that the Secretary of Resources and others fought so hard against, and that was the Central Valley Project Improvement Act. That, I think, really holds out a lot of promise for at least improving the state's most important watershed, that is the Central Valley and the Bay-Delta Estuary, which have historically provided -- produced about 70 percent of the state's salmon fisheries.

But I really think that type of legislation, where we set goals out for ourselves of specific things, will be accomplished. In the case of the CVPIA, it was to double our salmon population. And certainly if we get water back in those streams, we can double, we may even be able to triple those populations and really put people back to work along the north coast of California, along even parts of the central coast and elsewhere.

So, I think that's really the type of, if we're looking at legislation, that's the type of legislation we ought to be looking at; something with some real teeth in it.

I also do want to thank particularly Assemblyman Sher. I know he's been very active in a lot of this. He helped last year, when we came to him with a problem that our spring run salmon, that are found in Deer and Mill Creek, and he acted, as did you, Senator Thompson, very positively in getting that legislation through, which I think will be important to keeping

that particular species off the Endangered Species list. Not only keeping it off the list, but indeed, recovering the spring run salmon of the Sacramento system.

The economic benefits to the fishing industry, just the commercial salmon fishery alone, by having decent river protections, is probably going to amount to at least $200 million a year annually additional income to the state, if not much more. And that's just in the commercial fishery alone.

So, I think in protecting our rivers, it doesn't have to be a burden, an economic burden on certain groups that have had free access to these waters. But in fact, it can help grow other economies, or recover, restore, some of our older economies. So, I think from that sense, standpoint, you know, something along the lines of the "do no harm" bill to our rivers that Charles Warren suggested would very well be a good start.

In fact, it's too bad that we didn't do that in 1884, right after Judge Sawyer's decision banning hydraulic mining, because certainly that should have been a lesson to this state at that time of what happens when you destroy the system. And of course we know at that time both farmers and fishermen alike rose up in arms over what happened to our rivers because of the impact of the hydraulic mining. We probably should have acted then.

Well, it's 110 years later, and I'd hope we'd act now. Thank you.

CHAIRMAN THOMPSON: Thank you very much.

I just want to reiterate that it was with great reluctance that I carried that Sher bill on the Floor once they

took Antelope Creek out. that's my favorite fishing spot.

Next we'll hear from Peter Goodwin, the economic impacts of river management.

DR. GOODWIN: Thank you and good afternoon, Mr. Chairman and Senator Rogers.

I have a few slides which will take about ten minutes to show.

The topic of this talk and what I intend to concentrate on are the economic impacts of alternative river management strategies. And in order to understand some of the impacts, and some of the new techniques we've been hearing about earlier this afternoon, perhaps it's worthwhile just going back and reviewing the traditional approach to river management.

Traditionally, the number one priority in river management has been for flood control. And also resource extraction we've heard a lot about, whether it's water for agricultural purposes, whether it's extraction of gravel and aggregate from the river, or for minerals with hydraulic mining.

Our rivers have also been used for the disposal of pollutants, treated effluent. This whole approach, particularly with the emphasis on flood control, has led to development of the flood plains.

The flood damage, of course, is very real. To date in the United States, the investment in flood control work stands at $25 billion, and yet despite this enormous investment, the annual average damages run at $2 bill a year, and that's a number which is rising.

The question is, with these huge amounts being invested into flood control, why should this number still be rising?

There are a few examples here. The Napa River, which has already been mentioned, the 1986 flood damages ran at about $100 million. The 1993 flood damages on the Mississippi and Missouri Rivers are estimated at about $10 billion. And in the Los Angeles basin, had there not been the Corps of Engineers flood control project, it is estimated that between the mid-1930s and today, more than $4 billion of damages would have resulted.

But if we go back and have a look at the way river flood plains have been managed, on the left, those two images, you can see the historic condition. And there you can see that most of the agricultural land is concentrated on the flood plains, with the development being in small areas of high land.

You'll notice on the lower figure there, there's something called flood plain storage, which means that at high flood elevations, the river naturally flows out onto the flood plain in a fairly gradual and predictable sense. And that provides, as I say, storage during very high flood events.

If you look at the traditional management approach on the right-hand side, there you can see the river's being channelized. The river's been reduced to the absolute minimum width in order to convey the flood flows, and development has occurred on the flood plain.

The problem is, if you go with that traditional approach, and protect the community and the flood plain by

levies, the failure and the damage associated with those levies is neither predictable, and when it does happen, it is usually extremely catastrophic. One particular example resulting after the Mississippi flooding is the Monarch Chesterfield Levee. This was an area built according to FEMA guidelines in 1992, and behind that there was a light industrial park created. In the 1993 floods, only two years after the levee was completed, the entire area was inundated, resulting in $200 million of damage just at that one site.

The other effect of these traditional approaches is to worsen the flood conditions downstream. If you channelize the river, or you urbanize the watershed, that leads to increases in the peak flood at the -- during a flood event. And it also means that the peak in the flood occurs much earlier in the flood hydograph.

It's also very important to realize that any flood control, or any structural work that you undertake, will never provide 100 percent guarantee against flooding. There always be the flood event which comes and inundates the area behind your defenses.

Also, if you remove the natural functioning of the flood plain, that is going to worsen the downstream flooding effects. And development on the flood plain increases the flood damages, as I indicated on the earlier slides, and it's usually the taxpayer who ends up footing the bill.

There are other examples associated with this traditional affect. This is the San Lorenzo River in Santa Cruz before the installation of the 1956 flood control project. As

you can see, it's a fairly wide river channel. Following the implementation of the flood control project, that had an interference on the natural geomorphic, the natural processes, within the river. This created accelerated deposition of sediments, which were somewhere between ten and thirty times what had originally been predicted. And of course, with many of the problems associated with the disposal of dredged material, this created a real problem.

This was designed to withstand the project floor or a time period of about 150 years. It now has somewhere between 20 and 30 year flood protection.

Other effects, there's acceleration of erosion associated with banks. This is just a small example in Marin County associated with a development upstream, and this is what happened afterwards. And this is beginning to get into the kinds of river management approaches which have been outlined by the earlier speakers this afternoon. You can see, there's enough space there for the river, and there's many features within that design which allows for both recreation and also environmental benefits.

So, what are the consequences of this traditional approach to river management? Potentially, an increase in flood hazard, increase in flood damage in the dollar amount, increases potentially in channel maintenance, and also in infrastructure repair costs, and there are significant adverse impacts on people's property, structures, water quality, and water supply.

I'd just like to run through two or three examples to illustrate this.

Water quality, I'm sure everyone here is familiar with the known points of those programs. I just chose here one fairly modest city in California, the City of Berkeley. They're currently investing $700,000 a year in cleaning up water quality. In addition, they make $200,000 donation to the $3 million a year county program. There are many benefits associated with environmental river management which will, perhaps, reduce the annual costs associated with these.

So what are these new approaches to how we should be looking at rivers? Instead of just looking at, perhaps, flood control, or gravel extraction, or any single purpose, it should be a multi-objective approach which would be very balanced. Instead of looking at flood control, we shouldn't be so arrogant that we believe that we can control nature. We should be certainly looking to protect lives and properties up to a design flood, but in addition to that, we need to be minimizing damages for much larger events.

Secondly, there are many economic effects which must be considered, but due to maintenance costs, looking at perhaps increasing property values by maintaining the natural characteristics of the river, improving the aesthetic view of the river, attracting business into downtown areas, which is what Napa is attempting to do, and also protecting water supplies.

And there are several other issues which are really beyond this presentation: many of the social impacts, and the benefits of providing parkland adjacent to our rivers in areas like Los Angeles, and also environmental benefits.

This is one very small example of a community which decided that they weren't going to accept the channelization of rivers. This is Strawberry Creek in Berkeley. Here, the community wants to restore some of the river, and they took it out of this concrete coffin and exposed it to create local parks. This had the impact of increasing property values in the area, as well as providing a place for families and children to play.

This is an example of one of the tributaries of the River Platt. We heard about San Antonio earlier. The River Platt in Denver is another fine example of a comprehensive river development right through downtown, which is, both in business and increased property values, close by. Clearly, you'd much rather live next door to something like that than, perhaps, the slide we saw earlier of the Los Angeles River.

Other impacts of poor river management, Dr. Jacobs earlier on spoke about the effects of the degradation on the Russian River. This is the bed elevation in the Russian River taken in 1940, which is the top line, and that in 1991 by the county. The river bed has dropped by over 20 feet in many areas, and there have been many severe impacts associated with that.

This is the Highway 101 bridge at Healdsburg. Here the footings of this bridge are now exposed. You can actually see the pilings at low flow beneath the footings. This clearly creates a very dangerous condition and a potential for the river collapsing, either in high flows or in earthquake.

It's estimated that the structural repair of this

bridge is going to run somewhere between $7-10 million.

The water supply, again, perhaps if we consider the Russian River, the City of Ukiah obtained its water supplies from a series of horizontal wells beneath the river. As the river bed has dropped by 10 feet, the water now contains a lot of material, very fine material, which were previously filtered out by the natural bed process.

In order to rectify this, a water filtration plant was constructed in 1991 at the cost of $2.8 million.

Other benefits of a more comprehensive approach to river management are in terms of groundwater recharge. This is a very hot topic at the moment by many utilities like East Bay MUD and down in the Los Angeles River area.

And here I've just given some figures which were developed by the City of Pasadena, who've estimated that just -- that a more environmentally sensitive approach to river management could result in a five percent increase in the local supply. At the cost of 400 acres -- dollars per acre foot, this would represent about $40 million a year. In periods of drought, that $400 per acre foot went up as high as $600 per acre foot.

Finally, I would just like to leave with a thought that whatever or however we decide to manage our rivers, that is going to be there for future generations.

Thank you for your attention.

CHAIRMAN THOMPSON: Thank you very much.

What I'd like to do now is take a short break so our stenographer can rest her fingers, and we'll come back in about

ten minutes. We'll recess for ten minutes.

[Thereupon a brief recess was taken.]

CHAIRMAN THOMPSON: We'll reconvene.

We'll start the next panel. What we're doing to do is break it up. We're going to hear first from Julie Spezia from the California Association of Resource Conservation Districts, and Joanna Lennon, Executive Director of the East Bay Conservation Corps. And then, once you leave and you conclude, then we'll bring the second half of the next panel up.

So, Julie, we'll start with you.

MS. SPEZIA: Good afternoon. My name is Julie Spezia, and I'm the Executive Director of the California Association of Resource Conservation Districts.

I work with 114 Resource Conservation Districts around the state, many of which are actively leading river restoration projects. Many of these projects that you're familiar with -- Tomki Creek, Grass Valley Watershed, and the Feather River Watershed -- are known as CRiMPS. They're also known as CRMPs, but CRiMPS is the common name, and so that's how I'll refer to them.

CRiMPS are coordinated resource management planning groups that follow a consensus decision making model for resolving conflict on resource issues. That's a long way to say that it's a group of people from the community who get together in one room to define a problem, discuss possible solutions, commit to which one they're going to do using the consensus method of decision making, and then begin to implement the actual solution.

They have to work cooperatively as a group, and that

requires that a certain number of people need to be a part of the process. That usually includes the County Board of Supervisors, the private industry and private landowners that live in that watershed, the state and federal resource agencies that have jurisdiction, either regulatory or actually land management within the watershed, and other interest groups such as some of the ones that you've had here, like the Steelhead and Trout Restoration Federation and others.

The RCD, the Resource Conservation District, can play an important role in coordinating these meetings and really in providing some leadership, and in seeking cooperation from landowners in the area that might not be active participants in the process, but in the implementation stage, have to cooperate. I should say: are encouraged to cooperate.

We really try to maintain this as a voluntary approach. We generally try to avoid bringing in regulations. We follow all the regulations -- CEQA and all of the requirements that Fish and Game and others have -- but we generally try to do this in a cooperative way, and tackle the issues that everyone can agree to first, and then gradually take on the more and more contentious issues.

These meetings are usually facilitated because they are very contentious issues. They quickly touch upon our core values. And if they could be easily resolved without litigation or legislative intervention, then a CRiMP would probably not be necessary. But the CRiMP process addresses the lack of communication, which is usually the root of all of these resource problems.

The coordinated resource management planning is a process that allows fractured communities, communities divided over the appropriate way to use resources, to come together. And through this process, the factions in the community develop lines of communication and build relationships with one another.

Over time -- and this process does take a lot of time and a lot of work -- the resource issues are defined and actions are proposed, and an implementation strategy's agreed upon.

I really enjoyed learning the art of managing a CRiMP from Leah Wills, who I believe you met when you were in Blairsden. She is the coordinator for all of their watershed projects for the Plumas Corporation, and I had the pleasure and the challenge of keeping up with her on a creek walk one day, as they were looking at a new stretch of the -- of one of the tributaries to the upper Feather River watershed, when they were walking with a multi-agency team, and they had some landowners involved. And they're walking up and down the creek, trying to evaluate what kinds of strategies were they going to use to actually repair the watershed.

And she began to tell me some of the things that she's learned over the last five years in coordinating these projects. The first project they started with was fairly modest compared to the complicated projects they've gotten involved in more recently. It was the Red Clover project, and all it involved was addressing a riparian area in an upper tributary creek that was badly damaged, perhaps -- they didn't come in with any foregone conclusions -- but perhaps by uncontrolled grazing.

So, they began by bringing all of the community groups together that were relevant, and also the cattlemen. And there was some real concern in the community. The cattlemen were very concerned that this might be the first step towards sort of a "cattle-free" approach for the Feather River watershed.

At the same time, PG&E, as you mentioned earlier, was very concerned because the sediment that was coming down the watershed was actually impairing the hydroelectric power plants that were downstream.

So, there was a lot of interest in doing something about it, but real concern and fear about what might be done.

The CRiMP resulted in fencing off the riparian area, accompanied by a controlled grazing plan. And it's always really fun to hear about how a community gets behind these decisions and enforces them themselves. And now, if someone cuts the fence and lets their cattle in when they're not supposed to, it's generally discussed down on the porch at the store, the General Store. And they try to figure out who that is, and basically, they police themselves. So, there's really not a problem of enforcement.

And the success of this initial effort has since inspired them to do much larger projects.

The cooperative working relationship between the Feather River RCD and the Plumas Corporation has yielded a lot of fruit. They've brought hundreds and thousands of federal watershed restoration dollars to their local community. They have spun off a program to retrain forest workers in watershed

restoration work, and I've enclosed an article that was just in the Bee about that, and they've fostered a significant education outreach program through the Adopt-A-Watershed program in local schools.

And I was just mentioning at the break that a lot of people don't think that local people will do some of the things that they have done in the Plumas watershed -- or, the Feather River watershed, but in fact, one of the directors for the RCD has allowed a stream restoration project and an education outreach -- it's like an outdoor classroom -- to be developed on his property. He has not deeded over the land to the school district; it's on his property.

I asked him about the liability issue, and he's really not concerned. He really trusts the people in his community to do the right thing when they're there, and he's allowing them access. They've restored, done all this restoration work, and it's all done more or less on a handshake.

CHAIRMAN THOMPSON: Is that the retired postmaster?

MS. SPEZIA: Yes.

The work that they've done on the Feather River, just to sort of expand on what has happened as a result of all of these different CRiMP projects, has also led to the success of the Library Group. And I think a lot of times, people see the Library Group, and they get all excited about what they're doing as a community, and they forget that it was the five years of the CRiMP projects that really built the lines of communications for the Library Group to be successful.

And however people feel about the recommendations the

Library Group is coming out with, I think you have to all marvel that they've been able to reach agreement.

CHAIRMAN THOMPSON: That they can all sit in the same room together.

MS. SPEZIA: Yes.

CHAIRMAN THOMPSON: That amazed me.

MS. SPEZIA: Yes.

In this divided community, where the environmentalists didn't speak to the timber industry, and the landowners distrusted the Forest Service, they've been able to work past all those issues, and they're able to chart a course for their community. And they've been able to put their community first. I think that's really the most admirable part of it.

I asked Leah Wills if the CRiMP group reaches consensus on values after working together for a while. And she laughed at my naivete. She said, "We can't expect individuals to ever come to consensus on their values, but we can expect them to reach consensus on desired outcomes."

So, we provide a forum where we can share our fears and dreams, and where a concrete plan can be hammered out that respects everyone's concerns and makes everyone's dream, common dream, a reality.

I've witnessed this phenomenon again and again. Communities are coming together and solving their own problems. This is good government, and local government RCDs are leading the way in this effort.

People are empowered when they're able to resolve

issues among themselves. They are committed to sustaining the solutions when they are participants in crafting the outcomes, and they are willing to tackle bigger and more complicated issues once they experience success.

Funding is always the Gordian Knot that people mention when discussing CRiMP style watershed restoration efforts. And it's a serious issue that must be addressed, but at the same time, the CRiMP process is showing us that this cooperative approach is part of the funding answer.

Implementation is generally funded by the group members, meaning that every agency and private organization and landowner chips in to some part of the cost of implementing. Then, as a group, they apply for grants -- some of the grants that are available, like the EPA 319 program -- and they try to basically reduce the gap between what they want to do and the available funds over time.

The problem is that there still is not presently enough money in the system to pay for all of the CRiMP projects currently proposed or underway. This means that restoration will take longer, and some groups may become discouraged and disband.

There's also a lack of recognition for the cost of coordination and facilitation. Very few grant programs will pay for this part of the project. For instance, EPA 319 grants will only pay for implementation. They say they have moved past the need for any planning grants. This doesn't recognize the amount of groups that are just coming on line and getting organized.

Currently, no one is paying for that part of the

process, and yet we know the process is a highly efficient way to get conservation on the ground. So, whatever the Legislature can do to encourage this approach in facilitating this approach with state and federal agencies would be welcome.

I have to close with a few caveats about the CRiMP process. It works best when the boundaries for the resource problem area coincide with the boundaries of the community. And someone mentioned, well, the Delta. It ought to just use the CRiMP process. Well, one of the problems is that my property drains into the Chicken Ranch Slough, which drains into the American River, which drains into the Delta, and yet I don't really, personally, feel like I'm part of the Delta community.

So there does have to be a match, and so the CRiMP process, I think, is somewhat limited. You have to have that motivation to enter a room with people you don't particularly like, and hang in there, and work out your problems. And that's usually only when you have a community that reinforces that.

The process also takes time, and the political reality is that not every issue allows us a year or more, or sometimes five years, to work out the solution.

It also requires a great deal of cooperative behavior, and community leaders are not always ready to embrace a consensus model for decision making.

Having said all that, when this process of local decision making is embraced, tremendous results are possible. Communities can experience the real joy of successfully resolving conflicts over resource issues, and fractured

communities can begin to glue themselves back together.

Thank you.

CHAIRMAN THOMPSON: Thank you very much.

I think it's important that you talked about what's happening up in the Blairsden area, because I think that speaks to some of Senator Rogers' concerns, in that there's an economic cost, and that economic cost in that situation was the incredible increase in power rates had the siltation process been allowed to continue. It was going to be an ongoing dredging, and that just causes electrical costs to go out of sight.

MS. SPEZIA: And the other one that he might be really interested in is that they've actually seen the productivity of the watershed, the amount of water that they're producing for Southern California, decrease because of some poor management practices.

And what their plan -- what they think will happen, and I think from the success that they've seen with some of their smaller projects, is that they will actually restore much of the lost productivity. So, we will not only see lower electric rates, but we will see more water for the people of California to drink, because there's not enough people up there to use it, and so there's going to be some increase in productivity. That's going to be an economic benefit as well.

CHAIRMAN THOMPSON: Thank you very much.

Joanna Lennon.

MS. LENNON: My name is not spelled this way. Does it matter? I don't know, but it's spelled as in L-e-n-n-o-n.

Irish, not Russian.

Thanks very much for the opportunity to be here. My name is Joanna Lennon.

CHAIRMAN THOMPSON: Sorry about the name.

MS. LENNON: No problem. It happens regularly.

I'm the Executive Director and founder of the East Bay Conservation Corps, which serves the people and young people of Alameda and Contra Costa Counties.

The Corps has really served as a model for 80 corps now that have started across the country, and was also the model for President Clinton's National Service program. As you may know, we ran the largest Summer of Service program last summer in the country. We had 250 young people. We're one of 16 programs that modeled how young people could really contribute to help solve major social problems in the environmental field, health, and education.

The Corps has been going since 1983. We're a nonprofit corporation with a budget of close to 6 million, and it seems like we're going up as everybody else is going down. I think that one of the reasons for that is that the community has very much bought into the program. It's very much a public-private partnership. Much of the money is generated through contracting out with cities and land management agencies to do needed resource management work, while at the same time providing our young people with an opportunity for youth development through the medium of community service.

We right now are in the process of applying for charter school status, and we run our own school. We run a very

large program in the Oakland Unified School District, which we're probably going to expand into Sacramento, and have been asked to expand nationally, which is a program called Youth Engaged in Services, Project YES, which is a program that's focused on 12-14 year olds.

The Corps has probably worked on over a hundred different creek projects since our inception, as well as working with the Coastal Conservancy and others on projects that border the Bay. A couple of examples of how we do that, one of the most interesting projects, I think, we did with our school children, 12-14 year olds, was a project with a creek in East Oakland, where I don't think that people knew there was a creek there. And we used it as a medium to teach, to kind of link academics with doing an environmental project. There was an area in East Oakland which was heavily trashed, where there was this wonderful creek that came down and went into the Bay.

The kids cleaned out the creek. They separated out the recyclables. They used their math skills to calculate the tonnage of the recyclables. They wrote a report to the Department of Conservation, who was funding that project. They then looked at ecologically what happens when you trash a creek and it goes into the Bay, and then they looked at the sociological ramifications of what happened in the community.

While they were doing this project, we also had them come up and give a report on the Floor of the Legislature. They reported to their city council representatives, so they used public speaking skills. At the end of this project, these kids were kind of creek experts. They did raps. We had radio

stations donate time, and they wrote poems, and they did raps that were aired. And they became kind of the leaders in their community in terms of environmental issues, and this creek was the genesis of that.

As a result of that project, where we had churches, and businesses, and others really coming together to help with this project, that has led into other projects in the community, like reclaiming vacant lots to do community gardens, doing tree planting, starting recycling programs. So, it was one kind of example of how doing a creek clean-up led to a whole educational curriculum for the young people, which, as we followed these kids through school, we showed really a direct correlation between participation in this program and grade level gains, attendance at school, rise in self-esteem. And it really -- the kids became kind of leaders, and this was a way to really do that.

After the East Bay Fire, another really good example in our year-around Corps, which Zakee is a member of, in the 18-23 year old program, the Alverado Vicente Creek behind the Clairemont was really destroyed in that fire. And we have had a number of grants through the Department of Water Resources and the Urban Creeks Council to do a total restoration project which involved meeting with neighborhood community organizations whose properties backed up on that creek, having the young people learn to work with residents in the neighborhood.

We did an entire restoration, returning it to a real riparian zone, where they did planting, they did creekside stabilization. There was a whole educational program that went

along with that, so it was a real community effort. And in fact, we're still working on that project now.

But it's been a real source of inspiration, I think, to many of the young people to not only learn, but these are really urban young people who have not hung out in creeks as their normal thing of recreation. And I think that it has provided a whole new way of looking at resource management, our natural resources, how creeks in urban areas are also connected to the Bay, and connected to the whole ecosystem.

We have done a large number of projects, for example, for the Alameda Flood Control District which have to do with daylighting, where we've gone along flood control channels where there have been large crime incidences, because there's such heavy vegetation that you can't see. And the daylighting, the Corps crew has come in and thinned that out, and pruned that whole area so that it's safe.

There is a high incidence in a number of the creek channels where rapes were taking place, were kids were getting assaulted. Kids were walking home from school through the creek channels, and the Corps worked on projects like that.

They've also done a lot of revegetation for animal habitat and other kinds of things. But what happens in an urban area where you're working on urban creeks is, the whole community winds up getting involved in that process, and it becomes an educational tool, not just for the young people in a way to encourage the young people to take responsibility for their environment as citizens in a democratic society, which is what the Corps is really all about, but it also brings the

community into that process. So, you become partners. No longer are people in the community afraid of the young people.

They can use the creeks, and the channels, and areas that border their residences and businesses without fear. And I think that it has really provided kind of a win-win situation. We've probably have about a thousand young people a year. We've been in operation almost 11 years.

We have also really been able to be -- we've been pretty successful also of bringing in citizen groups. For two years in a row now we've had a large serve-a-thon in the East Bay, where we've had major corporations, like Esprit, and Levi, and Wells Fargo Bank, and others, bring out their employees who have worked hand-in-hand with the Corps members to do creek restoration projects, trail building along creeks, access kinds of projects, which has really hooked in a lot of the corporate community, who now are coming back over and over again.

We've also been able to kind of connect the young people in the Corps with schools in the area. We just had a number of folks come out from a number of elementary schools who want to do community service projects, and they work with these young people who serve as the leaders on those projects.

We just had an extension class from Holy Names College come and do work with us, where the Corps members supervised them doing creek restoration.

And I brought along Zakee so he could, maybe, say a few words. He's working on a creek project right now. He's been in the Corps for three months.

If he could be as eloquent with you as he was with me

in the car on the way up --

[Laughter.]

MS. LENNON: Zakee, you're on.

MR. ZAREEF: I don't where to start, really.

MS. LENNON: Why don't you talk about the project you're working on now.

MR. ZAREEF: Right now, we have Vicente Creek. It was damaged by the Berkeley-Oakland Hills Fire. I've been on the project for about two months now. And when I first got there, I was like, I was devastated, because that was the first time I'd ever see that area after the fire. And it was no vegetation, no grass. It was real bare.

And the creek had, like, a whole bunch -- there's a lot of building going on there, too. There was a lot of construction material down there, where a lot of trees had been dropped and just left. And the water flow was real, real shallow. It was almost no water; it was real thin.

And after about a month or so of being in the area, we put in some check dams. Check dams sort of like sift the water. It cleans it. And also, too, it was sort of like a gully where erosion had started. And on each side of the erosion were homes. And we put in check dams, and then filled in the check dams, and brought back -- it slowed down erosion. There was no wildlife. We'd see no birds, no animals. And about two weeks ago, we seen the red tailed hawks come back, the native vegetation has come back, there's grass everywhere.

And for me, it's been a good learning experience, because I, like, grew up going fishing a lot, but never knew any

technical things about the rivers or how they worked, or anything. I have a lot more respect for the nature and wildlife now, too, because before, I'd go fish. Just wouldn't even care; wasn't even conscious of the effect that the rivers or creeks have on the environment, on the community. And now I'm a lot more conscious. I have a lot more respect for it.

I also learned a lot of technical skills, too, that if I hadn't came to the Corps, I wouldn't have never even knew, such as check dams. I never heard the term "check dam" before I came to the Corps. Crib walls, where I use for erosion reduction; going out with Reg, walking creeks, and talking about the situation the creek's in. What are the best things to do.

It makes me feel more a part of my community now, too, because I have a say-so or involvement in the effect of the creek right there. We talk about it; we discuss it. We have on-site education, and then we started doing the thing that we discussed and the thing that we learned.

And I think, like, ten years down the line, when I have my family, I can come back and say, I helped, you know, had a part in this. It's been very motivational for me and a lot of my peers, too.

CHAIRMAN THOMPSON: Thank you very much for coming up here.

You have a very good presentation, and it sounds like you've got a real winner in that program.

MR. ZAREEF: A lot of us. It's not only me. There's a lot of us that really benefit.

CHAIRMAN THOMPSON: I can tell you're very

enthusiastic about it.

MR. ZAREEF: I am.

CHAIRMAN THOMPSON: Thank you very much.

MS. LENNON: Thank you.

CHAIRMAN THOMPSON: You did a good job. Is this your first presentation before the Senate?

MR. ZAREEF: Yes.

CHAIRMAN THOMPSON: Where do you live?

MR. ZAREEF: East Oakland.

CHAIRMAN THOMPSON: Is that Tom Bates's district?

MS. LENNON: Yes, it is.

CHAIRMAN THOMPSON: He better watch out. It looks like you might be right on his heels.

[Laughter.]

CHAIRMAN THOMPSON: Next we'll hear from Jud Ellinwood, Executive Director of California Salmon, Steelhead and Trout Restoration Federation, and Rich Bettis, Property Manager and Fisheries Coordinator for Pacific Lumber Company.

MR. ELLINWOOD: Thanks for having us here today. I appreciate the opportunity to speak before your Committee.

I must say that -- my name is Jud Ellinwood. I'm Executive Director of the Salmonid Restoration Federation. We're kind of going through a name change, too.

I wanted to say, that was quite an articulate young man, and if he ever finds himself up on the North Coast, I hope we can find him a job on a contracting crew up there.

CHAIRMAN THOMPSON: His Legislators may want to get him out of there.

MR. ELLINWOOD: That's true.

[Laughter.]

MR. ELLINWOOD: I thought today to -- we would spend most of our time going over something that I think you really obtained some insight to on your tour of restoration projects up on the North Coast this last fall, and that is referring to a tradition in California that really is not duplicated anywhere else in the Pacific Northwest, which, incidentally, to many of us involved in fishery conservation is everywhere Pacific salmon can go.

The tradition I speak of is that of public involvement in the restoration of California's salmon and steelhead fishery resources. In the early 1970s, a few groups on the North Coast were established for the purpose of restoring local fisheries.

Through that decade, there was an increasing interest in North Coast communities for the public to become directly involved in the restoration of these resources. Initially, the first projects were small hatch box type rearing projects. But as time passed and there was a growing recognition among Fish and Game personnel and the public that habitat was the problem, there was a fairly switch in emphasis from rearing projects to habitat rehabilitation projects.

Unfortunately, during the '70s there was much less funding available to support these cooperative projects, which, by this time, Fish and Game was actively encouraging. This problem was partially solved in 1982, with the passage of the Bosco-Keene restoration funding, authorizing legislation which created a grants program for restoring habitat in North Coast

streams that were inhabited by salmon and steelhead.

This hurdle really opened the flood gates, so to speak, and there was really an incredible amount of interest in restoring habitat that was being directly expressed by individuals who were fortunate enough to organize themselves and get ahold of some of this grant money.

The untested seat-of-your-pants instream habitat restoration projects that were undertaken in those early years have long since evolved into the planned, prioritized, and field-tested strategies currently employed today by an interactive group of experienced, nonprofit, local agency, tribal and microbusiness contractors. Now the grant program emphasizes restoration of watershed and riparian area and selective application of instream project methods.

Historically, statutory restrictions placed on used funded by the grant program have prevented the state from funding several important activities, including project monitoring and evaluation, and more relevant to what I have to say today, technical and public education projects. The community of fishery restoration practitioners has had to historically depend, to a great degree, on its own organization resources, community support, and group cooperation to carry out projects in these activity areas.

One of the most laudable traits of California's restoration community has been its ongoing commitment to improving the technical skills and knowledge of its grant program contractors. In fact, our organization, the Salmonid Restoration Federation, was formed by the leaders of several

local restoration groups in 1986, who wanted to create an organizational framework for planning and producing an annual conference that would provide technical education and networking opportunities for restoration practitioners throughout the state. That conference, which is now in its 13th year, has grown from a two to a four-day event that currently features four all-day workshops and a full day of concurrent technical sections, and is attended by approximately 300 people.

To better fulfill its organizing purpose of improving the effectiveness of California's salmonid restoration community, we have also expanded on the conference, and now offer services that include referral and liaison work with California's resource agencies.

We have have also become vocal advocates for the development and maintenance of public involvement funding sources and watershed, and for the stream restoration programs of state resource agencies that fund public involvement in restoring salmonid habitat, particularly the Department's Salmon, Steelhead, and Anadromous Fisheries program, which was created in 1988 by the enactment of SB 2261.

Which brings me to the question of why the Salmonid Restoration Federation is such an outspoken advocate of public involvement in fish restoration. We can cite several reasons, including the cost effectiveness of grant program restoration work, the high level of volunteerism that characterizes grant program projects, a commitment to monitor and maintain projects after contract work has been completed, employment of local workers, and providing a measure of stability to rural economics

that are characterized by seasonal unemployment.

But to us, the most important aspect of public involvement is the spin-off benefit of public education. We believe this indirect benefit of grant program projects is key to the success of the state's efforts to protect and restore fish habitat.

What we see in case after case of citizens physically engaging in restoration work of even the most mundane and grueling sort is that they become passionately attached to the fishery resources in their watersheds. Invariably, many of these citizens end up playing instrumental roles in developing fishery conservation projects in their communities and local public school systems.

These projects are extremely successful at teaching the public about the habitat needs of local fishery resources, the impacts of their land and water uses, and alternatives ways to mange resources that minimize impacts on fishery resources.

With virtually no state or local funding, grant program participants have been able to establish effective watershed and fish habitat fish conservation projects in schools throughout rural California, and originations such as ours, and a variety of local agencies, produce technical workshops specifically designed to teach ranchers, farmers, and timber operators, and foresters cost effective ways to protect the public trust fishery resources while continuing to manage their lands for traditional uses.

As harmful traditional management practices begin to give way to those that are more benign, we are seeing profound

transformations occurring in communities as their residents begin to collectively assume the roles of stewards of their local fishery resources.

It is these glimpses of what the future can hold that convince us of two things. First, the ultimate success of state habitat restoration efforts hinges on how successfully the state can facilitate, encourage, and maintain public involvement in the restoration of these resources. And second, education must be a central, core feature of that involvement. Public education can become a powerful tool of state resource managers, but it must be enabled with adequate funding.

This, then, is the promise and the challenge of the future that we leave with you today.

CHAIRMAN THOMPSON: Jud, thank you very much.

MR. ELLINWOOD: Thank you for this opportunity.

CHAIRMAN THOMPSON: Rich, I wish the Secretary of Resources was here. We've heard a lot about everything that they were doing, and I kind of got the feeling that maybe they didn't want us to proceed.

But I was very interested in the last time that you and I talked, we were able to see first-hand some problems where state agencies, conflicting with other state agencies, actually got in the way of the private sector from doing some pretty good restoration work that would have benefitted everyone.

Maybe he's listening.

MR. BETTIS: Thank you, Mr. Chairman.

It's a pleasure to be here today to tell you about our cooperative fisheries program at the Pacific Lumber Company.

Excuse me, my name's Rich Bettis, Pacific Lumber.

First of all, I born and raised in the Rio Dell/Scotia area, which is located on the Eel River in Humboldt County, which is also a part of California. Being a life-long resident of that area, I can remember the runs of salmon and steelhead that used to migrate up the river to spawn in its many tributaries. In fact, it was quite easy to walk to the river after school in the '50s and '60s and catch a limit of salmon or steelhead when they were in the river.

I have always had an interest in the fish and their habitat requirements. Therefore, it has been a real educational experience for me to be able to work with and develop the fisheries program that is now in place at the Pacific Lumber Company.

In a unique partnership between private industry and government, the Pacific Lumber Company and the California Department of Fish and Game have developed a cooperative program aimed at the enhancement of the anadromous fishery resources. The program is intended to maintain, expand, enhance, and utilize anadromous fish habitat through cooperation between an industrial timberland owner and a state regulatory agency.

To date, the program has accomplished many things, such as: the improvement of over 30 miles of fishery habitat; the rearing and releasing of 115,000 natal anadromous fish; the training and incorporation of best management practices for fisheries into timber harvesting operations; and the reduction of sediment into fish-bearing streams.

The partners in this program, the Inland Fisheries

Division of the California Department of Fish and Game, and the Pacific Lumber Company, came together in 1991 to discuss a shared concern for the sustainability of anadromous salmon and steelhead populations. Inland Fisheries Division brought expertise about the habitat needs and biological requirements, as well as the ability to conduct planning, monitoring, education, and evaluation of fishery enhancement programs.

The Pacific Lumber Company brought nearly 350 square miles of watersheds, containing hundreds of miles of anadromous streams. These lands are zoned specifically for timber production and have been managed for that use for over a century.

The partnership originated at the grassroots level in response to needs first voiced from ground level personnel and not from an industry or government mandate. The program was sold to management from below.

A letter of understanding was mutually drafted in 1992 that established the operational guidelines. The letter has successfully outlined the requirements for a successful working relationship and program. It also reflects a deep commitment and trust relationship between the program's partners.

This trust has overcome what can be an adversarial relationship between landowners and regulatory agencies. This has resulted in a powerful positive action to benefit the fisheries.

Public outreach has led to support and participation from other groups and individuals, and a vigorous fishery

educational benefit has developed.

Objectives toward the program's goal include: designing and conducting timber harvest activities with fisheries and wildlife as important considerations; guaranteeing access and cooperation to program participants for fishery activities without linkage to the status of timber harvest plans; requiring mutual review of fishery project proposals, data, publicity; and the sharing of evaluation, education, and training activities, and also cost sharing.

The action plan process begins with watershed, stream, and fishery inventories. Based upon the inventories, projects are then selected, planned and implemented. Project evaluation is the conducted on a yearly basis.

Project level options include: watershed activities, such as erosion control; riparian zone measures, such as set asides and vegetation retention; instream improvements, such as habitat modification; artificial propagation, such as supplemental stocking; and public involvement, such as tours, and land use workshops.

In the three years since the project has begun, significant achievements have been realized. The direct results include: conducting of over 400 hours now of personnel training; opening of over 12 miles of additional stream habitat to migrating fish; reducing the risk of several thousand cubic yards of sediment from reaching fish-bearing streams; enhancing instream fish habitat at over 20 locations; the rearing of 90,000 natal chinook fry and 25,000 steelhead; and consolidating the best management practices for fish in timber harvest

planning activities.

Indirect results include the developing of positive feelings for the Pacific Lumber Company employees, and the local community contributing to the recovery of local fish runs, creating an excellent resource for local educators in natural resource management, and creating an opportunity for the California Conservation Corps youths, which are utilized for much of the hand labor involved, to grow in an atmosphere of rigorous outdoor work while benefiting the natural environment.

In closing, I would like to emphasize the four major elements of our program. The most important, I feel, is the communication and education. And this communication is communication within the community and within special interest groups. The education is not only educating the community, but also educating ourselves on how to do a better job.

The second important part of our program is the upslope watershed restoration. The third part of our program is the instream restoration projects, and the fourth but not least is our fish hatchery operation.

And by the way, the company has recently won the American Forest and Paper Association Wildlife Stewardship Award with this cooperative fisheries program.

Thank you.

CHAIRMAN THOMPSON: I want to thank you both very much, not only for coming down today and testifying, but for the work that you're doing.

Are you still having problems with the agencies? I think at the time it was Caltrans and Fish and Game, and it was

river crossing.

MR. BETTIS: Somewhat. In our instream restoration projects, we have a number of them already identified through our inventories, and we have submitted them to the state for approval. We're having problems getting through the CEQA documentation.

Actually, last year we only were able to perform one restoration project because of all of the red tape that we're involved in.

MR. ELLINWOOD: Mike, I'd just like to add that the action that we proposed at the Fisheries Forum that was proposed by the California Advisory Committee, the action on permit, Section 404 permits, I think, would go a long way to relieving the problems that not only Rich's program is experiencing, but other contractors as well.

CHAIRMAN THOMPSON: I think I mentioned it there. We're having a similar problem in a wetlands habitat restoration project down in the southern part of my district, and George Miller has agreed to come out and go on site and look at that, and come up to Eureka and look at the problem.

MR. ELLINWOOD: I'd be more than happy to meet with him when he's there.

CHAIRMAN THOMPSON: Thank you both very much.

That concludes the scheduled testimony. We have two individuals who've asked to speak. We have Linda Falasco, from the Central Valley Rock, Sand and Gravel Association, and William Davis, North Coast Gravel Operators.

MS. FALASCO: Good afternoon. Thank you very much

for extending the invitation to us today to talk a little bit about instream mining issues.

Given the lateness of the day, however, and the length of your hearing, I would like to defer comments on the context of the State Lands report, which need to be put into a perspective. I don't think you are getting the appropriate picture from the text, and those issues related to where mining activities predominantly occur, the mining pollution potential, the proposal to extend the jurisdiction to the river ecosystem that includes the riparian corridors, flood plains, and possibly upland activities as well.

I would like to take advantage of the door that was opened today by Secretary Wheeler in discussing the Rank Island acquisition by the Wildlife Commission. That was a former mine site. The one-half that was purchased outright, I believe, occurred about ten days ago. It was a former sand and gravel operation that was restored and reclaimed to wetland and riparian habitat, and the remaining half of the island is still optioned by the Commission.

The statement that the sand and gravel operations, and in my neck of the woods, and really the predominance throughout the state, is off-channel; it's not instream. Only about one-seventh of the mines are in-channel, and that's because they have no other local options for the supply of the aggregates.

But it's a misstatement to believe that these settling ponds and that the off-channel excavations are not suitable for reclamation to wildlife habitat and/or riparian

corridors. I think that that's a statement that I heard State Lands make, the biologist, this morning.

Their wildlife habitat values have been widely recognized, not only in this nation but in the European community. It's documented that, for example, on the San Joaquin River, that 30 percent of the existing riparian corridor and habitat along the channel was created by mining activities, and that that is a significant potential and opportunity. It's identified that the riparian corridors are part of the river ecosystem that need some sort of improvement, and here we have an opportunity to create and restore and expand that opportunity.

I would save any other comments and specifics for the two hearings that you are anticipating holding, and offer any assistance we can provide to you in furthering your efforts.

The written statement is being prepared as a collaborative effort between all of the sand and gravel associations in the state, and hopefully, we'll have that for you on Friday.

CHAIRMAN THOMPSON: Thank you very much.

Just as a point of information, the idea is, and you'll see a lot of it in the subsequent hearings, is to actually bring the locals in.

This is a very important part of it, the overview is incredibly important. The basis for everything we're doing is going to be not only the State Lands Commission study, but the national study as well.

Then the idea is to incorporate participation from

throughout California, of the people who use the stream.

No one's disputing the fact that all of us use the gravel. We drive on the roads that are gravel based. We have our houses built on foundations that are gravel based. We also eat the agricultural products that need the water, and drink the great California wine, most of which comes from my district.

SENATOR ROGERS: The grapes come from mine.

[Laughter.]

CHAIRMAN THOMPSON: No, not the wine we make in my district.

SENATOR ROGERS: A lot of them do.

CHAIRMAN THOMPSON: So, we're all responsible for any deleterious effects of the rivers.

What's important is that we recognize that it is in our best interest, economically as well, to restore these rivers and to use those resources as widely, and as carefully, as possible.

So, I promise you that you'll not only have an opportunity to speak, but we'll look to you to help play a role in identifying and working towards the solutions that'll make our rivers better in California.

MS. FALASCO: We're very willing and prepared and appreciate that offer.

There is one last thing that I think is probably appropriate to convey, and those people that are aware of your hearings and of the proposals conveyed in the report.

Establishing another layer of bureaucracy is something that is causing some concern. And I think that we all

agree that a collaborative effort -- we don't believe that there is not enough regulation. We think there is enough regulation. We just need to use the framework better.

CHAIRMAN THOMPSON: That's fine, thank you.

MR. DAVIS: William Davis. I'm an attorney. I represent the majority of the mining operators who work instream in the three North Coast counties in California, and we happen to be in Senator Thompson's district, so we went and talked.

Really, I'm here to just say that we would support you in a proactive approach, because it regularizes what we have to deal with with agencies, and it may lead to some expediency and some consistency, where now there's a complexity and confusion and delay.

So, industry, the mining industry in this case, in those North Coast counties are supportive of what you're doing.

We're also concerned, as Senator Rogers has indicated, people will be concerned about what the impact on their freedom to use their property is, and what their historical uses will become under any new regime. And I think the key to it -- that you've said, and many people have articulated; I know that you're committed to this -- is your local control and participation by local people.

Originally, I think the concept was that I would address very briefly the Mad River MOA. In the interest of time what I would do is just refer people to it. The document that came out of it is an EIR, which recommends adaptive management practices for the regulation of instream mining. And it would be very consistent with the kinds of concerns that the Secretary

and the State Lands Commission have described today for the overall river basin system.

That adaptive management policy and procedure's based on science. It's not based on emotion or politics.

I think that's what I would be most concerned about, urging you forward to do, is incorporate scientific analysis, and not attempt to just derive some sort of low common denominator consensus as the basis of your new law.

CHAIRMAN THOMPSON: As you know, I'm in favor of that. Had we relied on that, Antelope Creek would have in the aforementioned legislation.

MR. DAVIS: Right.

Well, I can understand where all political sides, actually, are going to have to cooperate. That was the lesson we learned in Humboldt County.

Actually, if you try to impose a regime on these local communities, especially your rural communities, where you have a predominant Republican-based, or red-neck based, or whatever you want to call it, independent, free American people based group, they'll bridle, and you won't be effective.

Whereas, if you do, through a process, include them in meetings and discussion, solicit their comments, you can have an incredibly effective program.

This document, without, I think, any government money hardly at all, cost a million dollars. There's actually two volumes. A million dollars. That's all paid for by instream miners.

Now, as far as I know, it's the only significant

study done on the Mad River since the 1950s, when the Fish and Game Department commissioned scientists from Washington State to study the Mad.

So, you have all these agencies and environmental groups saying they're concerned about the rivers, and yet the people who have done something about it are the industry, through their million dollar-plus contribution and this study.

That's why I'm here. My clients are both supportive, therefore, and nervous.

CHAIRMAN THOMPSON: Are these billable hours?

[Laughter.]

MR. DAVIS: I billed approximately 50 hours a week for three years on this, and a near divorce from it.

I was out on the Metol, and I've got to mention, I would submit a poem to you later that characterizes, I think, your concerns, "November Surf" by Robinson Jeffers, probably our greatest California poet. And I was sitting there on the river bank with my wife. I spent two days mulling over what I'm doing in this nutty business of river management, and what I came up with was real simple.

Jeffers espoused it, and the people who read his works espouse it, that you would have to approach problems like this from a perception of geological duration. That is, those rivers were here before humanity; they'll be here long after humanity will disappear from this earth, from Jeffers's perspective, if that were to occur. And so, all we're doing is stewarding and trying to keep them a little cleaner, a little nicer, than we have in the past.

I think that can be done by harmonizing environmental and commercial concerns. The Bee ran an article which poses these things as opposites, and I don't think they are. I think that's a perspective you should avoid.

When we got rid of that in Humboldt County, we started to move forward. As long as we viewed ourselves as Republicans, or Democrats, or whatever, in dealing with this, environmentalists or industry, we were constantly at loggerheads.

So, the concept that Jeffers espoused was really one that could be summarized by just looking at this issue as one of being Californians, and it's our inheritance that we're dealing with now, and our children's inheritance, and it's the quality of our lives. And that includes the economic and the environmental factors in total.

And one of the examples, or two of the examples, of why my clients are concerned that I would leave you with, and then I'll try and submit some summary comments on some of the other things that were said, we have examples where Fish and Game came in and said they were going to help fix the rivers. One some time ago, in which they stripped some stream beds of all the logs and debris in the river, a stream bed channel. They basically killed those rivers or ruined them, and we've been restoring them.

In other words, science can be dangerous, or well meaning bureaucracies can be dangerous and when those regimes are imposed without sensitivity.

Another one was trenching on the Mad River, which

largely precipitated the crisis that led to this MOA. In the EIR Fish and Game fish proposal, you should trench because you shouldn't cut the slopes down too far into the banks, so these disastrous trenches were put in the river, which we're just recovering from.

So, those are two instances where we have government agencies acting, at least espousing, the interests of the river, and requiring my clients to do things that were costly and devastatingly destructive for them politically, socially, economically, and ultimately environmentally. And I guess that's where they're concerned. They've seen this happen.

And then one last thing, as a lawyer, I guess, I just want to point out in this Massachusetts law, Mr. Rogers asked about the impacts on property owners.

I think it's very important that you read this preamble, if I'm in the right law, which says: "Existing uses are grandfathered."

In other words, you don't restrict an existing use to be called a legal nonconforming use, so there's certain problems with these laws that you have to deal with now. Another aspect of just today where I get concerned, because the discussion that went on didn't reflect that legal description of what would happen.

And then it's very clear, the act does not establish any new programs or require the expenditure of additional funds. So, this is a very limited or narrow law.

I didn't hear it being read that way, and that's where I get nervous, and is that in the free flow of

conversation and negotiation, a wholenlot of things can be done or given away from one side or the other which ought not to be, and which would be excessive.

So, with those kinds of basic statements, I guess, I'll let everybody go.

CHAIRMAN THOMPSON: Well, again, we plan to build the answer to this problem from the ground up. And I think at least the people who are on this Subcommittee believe that we'll be better off, and more apt to succeed, in doing that.

If we sit in Sacramento and try and tell people, not only in Eureka and Los Banos, but everyplace else, how they need to deal with their issues and their problems, I think it's doomed from the beginning.

So, we need everybody's participation, and there's going to be give and take, I think, on everyone's part. Hopefully, we'll come out of it --

MR. DAVIS: At least what I see Linda saying, industry will support you in this kind of activity. It's not, I think, like in some of the old days, we would knee jerk, say no, refuse to participate or obstruct, literally. And I don't think you'll see that happening here because it's the proactive course that will best preserve and protect our instream mining.

We know that we can be thrown out of the river at any point, and we don't want to see that happen throughout this state. It would just choke the economy, the building and trades industry, Caltrans, your infrastructure projects.

CHAIRMAN THOMPSON: Thank you all very much.

Senator Rogers, thanks for sticking it out to the

end. I appreciate it.

That concludes today's hearing. We're adjourned. Thank you very much.

[Thereupon this hearing of the Subcommittee on River Protection and Restoration was terminated at approximately 5:02 P.M.]

--oo0oo--

CERTIFICATE OF SHORTHAND REPORTER

I, EVELYN J. MIZAK, a Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing Senate Natural Resources and Wildlife Committee hearing was reported verbatim in shorthand by me, Evelyn Mizak, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing, nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 24th day of March, 1994.

EVELYN J. MIZAK
Shorthand Reporter

APPENDIX A

California Legislature

Senate Committee on Natural Resources and Wildlife

STATE CAPITOL
ROOM 2205
SACRAMENTO, CALIFORNIA 95814
TELEPHONE: (916) 445-5441

MIKE THOMPSON
CHAIRMAN

AGENDA

RIVER PROTECTION AND RESTORATION IN CALIFORNIA

1:30 p.m. -- March 15, 1994
State Capitol, Room 2040
Sacramento, California

1:30 **Introductory Remarks**

Senator Mike Thompson

1:40 **Presentation: California's Rivers: A Public Trust Report**

Charles Warren, Executive Officer
State Lands Commission

Diana Jacobs, Ph.D., Environmental Specialist/Ecologist

Elizabeth Patterson, Environmental Specialist/Planner

2:15 **Presentation: Current State Activities**
Douglas Wheeler, Resources Agency Secretary

2:30 **Panel: Economic Benefits of River Protection and Restoration**

Downtown Revitalization
Kent Imrie, Immediate Past President
Napa Chamber of Commerce

Contributions of the Fishing Industry
Zeke Grader, Executive Director
Pacific Coast Federation of Fishermen's Association

Economic Impacts of River Management
Peter Goodwin, Ph.D.,P.E. Technical Director/Principal
Phillip Williams and Associates

*Please sign up to testify with the Sergeant-at-Arms. Depending on the number of persons who wish to testify, a time limit will be established.

3:15 **Panel: Community Development Opportunities from River Restoration**

Gluing Together Fractured Communities
Julie Spezia, Executive Director
California Association of Resource Conservation Districts

Community Development by Young People
Joanna Lenin, Executive Director
East Bay Conservation Corps

Community Education through Stream Restoration

Jud Ellinwood, Executive Director
California Salmon, Steelhead and Trout Restoration Federation

Rich Bettis, Property Manager and Fisheries Coordinator
Pacific Lumber Company

4:10 **Open Testimony***

*Please sign up to testify with the Sergeant-at-Arms. Depending on the number of persons who wish to testify, a time limit will be established.

#1609

APPENDIX B

STATEMENT
By Senator Mike Thompson
For the Subcommittee on River Protection and Restoration
First Informational Hearing
March 15, 1994

California's rivers contribute greatly to the wealth of this state. Every resident of the state depends on the resources provided by rivers, whether it be gravel for highways, drinking water, agricultural products, or recreational activities. Because of this dependence, we have strained the carrying capacity of our rivers leaving them less productive for future generations.

During this next year we intend to explore the factors that affect our rivers, and identify ways that will allow us to continue to find value in this renewable resource without further degrading it. We also will look for opportunities to restore our damaged rivers, so that we can leave the next generation with a healthy and productive resource.

This hearing represents our first effort toward improving our level of knowledge about this complex resource. We intend to hold hearings in both Southern and Northern California throughout the next year. Subsequent hearings will focus on local issues and local solutions. Today's hearing will take a broader statewide perspective.

We will begin the hearing with a presentation by the State Lands Commission. The Commission has recently released a report entitled: California's Rivers, A Public Trust Report which provides an historic account of the use of rivers, and depicts the conditions of rivers today throughout the state. This presentation will be followed by the Resources Agency Secretary who will outline current programs in the agency that relate to river protection and restoration. Following that, we will hear from two panels that will discuss first, the economic benefits of river restoration and second, community development opportunities associated with river restoration.

We have set aside time at the end of the hearing to hear from any other persons who may wish to speak to us on these important issues. Those wishing to testify should see our Sergeants at Arms to sign a sign-up sheet. We will impose a time limit depending on the number of those persons who wish to testify.

Before we begin, I want to caution our witnesses to be brief because we have a full agenda.

#1686

APPENDIX C

Background Paper
Subcommittee on River Protection and Restoration
1:30 P. M. -- March 15, 1994
Room 2040, State Capitol

OVERVIEW

California's rivers meet the critical needs of all citizens of the state for drinking water for humans, livestock and wildlife, agricultural production, fisheries, commerce, and numerous extractive resources such as minerals and aggregate. Since the 19th century, California has sought to modify and harness its rivers to maximize the value for specific purposes. Such modifications led to tremendous growth in some industries, such as agricultural production and urban development in flood plains, but came at the expense of other activities, such as fishing, both commercial and recreational.

The State Lands Commission report entitled *California's Rivers: A Public Trust Report* lays out the history of river use and provides a snapshot of the condition of rivers today. It points out many of the causes and effects that human intervention has had on rivers and notes that our river system has been significantly altered. The losses of fisheries and other species dependent on riparian habitat have been substantial over the past century and these species continue to decline. The report notes that many opportunities for river restoration do exist, however, and identifies a number of tools available to conduct such restoration.

The Subcommittee on River Protection and Restoration has initiated a year-long process of hearings in both Northern and Southern California. The purpose of this effort if to gain a deeper understanding of the actual condition of various rivers in the state, and what actions are possible that will enhance both the long-term economic viability of the area as well as the ecological health of the rivers. Each hearing will highlight the local issues and conflicts and seek solutions that are tailored to the local needs. At the end of the process, legislation will be introduced in January 1995 to build on the lessons learned through the previous year and address issues that require a statewide policy.

KICK-OFF HEARING

At the first of these hearings, the State Lands Commission will highlight the major points of the report. This will be followed by a presentation by the Resources Secretary who will identify the current programs in the Resources Agency relating to rivers. The remainder of the hearing will be comprised of two panels that will discuss first, the economic benefits of river restoration and second, the community development opportunities associated with river

restoration. Each panel will identify some of the positive aspects of river restoration, making a case that restoration can benefit the economy and the community, as well as the environment. Following these presentations, testimony will be taken from the public to provide the opportunity for various interest groups to offer their perspective and concerns.

Each of the panelists offers a unique perspective on the benefits of river restoration, based on the program goals that panelist represents. What follows is a brief description of the individual programs and objectives of the organizations represented by each speaker, and the principal issues of concern of that group.

ECONOMIC BENEFITS OF RIVER RESTORATION

Restoring rivers provides obvious aesthetic values, but it can also provide economic benefits, either through increased employment in some sectors, or by avoiding costs attributed to river degradation. This panel will identify three areas where river restoration can both improve the economy as well as the environment.

City of Napa

In 1986 the City of Napa commissioned the Downtown Riverfront Concept Plan that discussed river restoration, traffic circulation, and downtown economic development. Just as the city was poised to adopt this plan, the 1986 flood devastated the downtown, causing $100 million in damage. Following that flood, the development project stalled due to the clear need to address flood control prior to embarking on any major restoration and development plan. The citizens of the City of Napa have worked closely with the U.S. Army Corps of Engineers to develop a proposal that will address the aesthetic, environmental and flood control objectives of the city. Although many decisions and implementation are still in the future, the conceptual framework for the revitalization of the downtown, in conjunction with river restoration has been laid.

Fishing Industry

The fishing industry, both sport and commercial, has suffered tremendously in the past few decades. Populations for numerous fisheries have declined for a number of reasons. Those fish whose lifespan includes time spent in the ocean and in fresh water, known as anadromous fisheries, have suffered particularly. Not only are they subject to fishing pressure, but to numerous inland environmental pressures as well. Scientists have noted over the years the sensitivity of fish to their environmental conditions when they come in to spawn. They require specific cold temperatures and clear water, and clear gravel to spawn in. Human activities that increase the temperature, such as water diversions, loss of riparian cover due to deforestation, and drought, increased sediment load from timber harvesting and grazing and

in-stream mining, and loss of spawning gravel from in-stream gravel mining serve to undermine habitat for spawning and rearing.

Given such a broad array of pressures from ocean and inland watershed activities, the anadromous fisheries that once filled the streams are quickly vanishing. Estimates of commercial salmon landings in California over the years indicate that whereas 1982 yielded approximately 8 million pounds, in 1992 landings yielded 1.6 million pounds. Employment fell correspondingly: the number of vessels dropped from a high of 4,919 vessels in 1978 to 1,083 in 1992, resulting in an estimated loss of approximately 35,000 jobs.

The loss of anadromous fisheries affects not only the commercial fishing industry, but the sport fishery as well. Loss of fisheries reduces the number of individuals booking on guide boats, reductions in sales of equipment, and a loss of other related tourist activities such as lodging, gas, and food.

Hence, the reduction in the fisheries poses not only a threat to the biological diversity of the state, but the very real livelihood of many communities and individuals and their families. Restoration of streams, and improvements in the fisheries would clearly serve to offer an economic boost to the currently depressed coastal communities.

Infrastructure Losses

Various measures that modify the flow of a river and the physical shape of the river often have long-term and unintended consequences. Some activities, such as in-stream gravel mining and some flood control projects, have the effect of changing the rate of flow of the river. Extensive studies have shown that in certain areas, such changes actually erode and compromise bridges and roads. These actions, over time, can add up to significant costs to the general public, particularly for road maintenance and bridge rehabilitation. Such costs are often overlooked, as the connection between river channel modification and infrastructure are not well understood.

Community Development Opportunities in River Restoration

Restoring rivers offers many opportunities for public education, community building, and physical improvement to an asset to the community. This hearing will highlight just three efforts currently underway in the state to restore rivers and streams in both urban and rural areas.

Resource Conservation Districts

Resource Conservation Districts (RCDs) are nonprofit organizations comprised primarily of local landowners and others who volunteer their time and talents to assist conservation programs in their community. Numbering 116 in California, RCDs began over 50 years ago as a way of providing a structure to cope primarily with soil erosion. Since that time, RCDs have implemented numerous projects to restore and protect various natural resources including streams and watersheds in a manner that benefits both agriculture and the environment. RCDs assess conservation problems, set priorities, and coordinate federal, state and local resources to bring about a solution. RCDs offer a cooperative model for improvements in the natural resource base and the application of sustainable agricultural practices through communication and education.

East Bay Conservation Corps

The East Bay Conservation Corps (EBCC), founded in 1983, provides a program designed to build a young person's skills, self-esteem and sense of social responsibility through a variety of activities, including academic and life skills education, work, service-learning and leadership development. EBCC serves over 1,000 participants annually, the majority of whom live below standard poverty levels. This program has provided an effective intervention strategy of today's alienated youth and young adult population, and at the same time provides community service needs.

One program that meets such needs is the Environmental Improvement and Community Service Work Program. In this work program, corpsmembers work 32 hours per week on various environmental and community improvement projects, including urban stream restoration projects. Corpsmembers learn basic work skills including punctuality, acceptance of supervision, initiative, and motivation. They also learn transferable job skills such as tool usage, recordkeeping and supervision, and technical skills including trailbuilding, fencing, carpentry, construction. Recent projects over the past five years have included the rehabilitation of six creeks, requiring the installation of native plants, debris removal, and bank stabilization.

Salmonid Restoration Federation

This organization represents men and women actively engaged in restoring California's salmonid (salmon, steelhead, and resident trout) populations and their habitat. The Salmonid Restoration Federation works cooperatively with landowners to restore stream habitat. This nonprofit organization conducts extensive public education forums with local high school students. In addition, the federation has found that by assisting in training operators of various businesses that affect the watershed, such as timber operators or farmers, they can greatly improve the conditions of the habitat. Such technical assistance provides operators

with alternative methods to achieve the desired goal, but also minimize the impact on the watershed and streams.

Pacific Lumber Company

For a number of years, the Pacific Lumber Company (PALCO) has allocated resources toward fisheries restoration, initially through fish rearing facilities and more recently through stream restoration. PALCO owns 350 square miles of watersheds containing over 100 miles of fish bearing streams. PALCO staff work cooperatively with various groups, including the Department of Fish and Game to improve fish habitat on PALCO property. As part of this process, staff of PALCO have increased their awareness of the impacts of the use of machinery on streams and have developed better methods to minimize the impacts on the streams.

We anticipate that this hearing will set the stage for future hearings which will focus on local issues and local solutions. We will use these hearings as an opportunity to allow all interested groups to present their views on these issues. Only after we learn both the broad perspective as well as the local perspective can be begin to craft legislation to facilitate river restoration.

APPENDIX D

California's Rivers
A Briefing

Prepared by the
California State Lands Commission
for
The Senate Natural Resources and Wildlife Subcommittee on River Restoration
Senator Thompson, Chair
Senator Rogers and Senator Torres

March 15, 1994

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ACADEMY OF SCIENCES

ENTERING THE WATERSHED

A NEW APPROACH TO SAVE AMERICA'S RIVER ECOSYSTEMS

BOB DOPPELT
MARY SCURLOCK
CHRIS FRISSELL
JAMES KARR

THE PACIFIC RIVERS COUNCIL

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PREFACE

This book is the product of a two-year project to develop new federal river protection and restoration policy alternatives. The project has its roots in a growing frustration, felt nationwide, that river conservation is overwhelmingly losing the battle with river degradation. That degradation spans the range from declining water quality and extinction of riverine species to reduced recreational value and aesthetic appeal, declining productivity of sport and commercial fisheries, and threats to human health. Too few effective restoration tools and policies are available to reverse these trends, and time is running out. Failure to take action soon may result in irreversible degradation.

Our first awareness of the severity of the problem occurred, ironically, as a result of one of the successful initiatives of the Oregon Rivers Council (the Pacific Rivers Council's original name). In 1988, we successfully led an effort to push through Congress the landmark Oregon Omnibus National Wild and Scenic Rivers Act. This Act designated 40 Oregon river segments totaling almost 1500 miles and including almost 500,000 acres of land. Many organizations, including the National Sierra Club and American Rivers, were vital to the process. The Act remains the largest river protection act in the history of the lower 48 states. Implementing the Act, however, introduced us to the magnitude of the challenge we face in effectively protecting and restoring our nation's river systems.

In 1989 we crafted a strategy to help develop effective Wild and Scenic river management plans. The Act protected primarily mainstem river segments within federal lands. The headwaters of the streams, tributaries, and the contiguous private land sections downstream were not included. Private landowner opposition killed most of our efforts to include private land segments in the 1988 Act. To address the other river areas, we tried to identify appropriate federal and private land river conservation policies. This was especially important because we were determined to protect the habitat for dwindling runs of migrating Pacific

Northwest salmon, steelhead and trout that inhabit these rivers and streams. Our search for effective policies was fruitless.

The Forest Service and Bureau of Land Management had no effective policies to protect tributaries outside the designated corridors or in the headwater areas. Timber cutting, grazing and other activities continued almost unabated, degrading the upstream federal land river reaches even as we had, in theory, protected the mainstem sections. The only private lands-protection mechanisms we found were the Oregon State Scenic Waterway Act and the Clean Water Act. The State Waterways Act is very limited and would have required an entirely new legislative campaign. Further, the state act again addressed only special river segments and not entire rivers flowing through private lands. The Clean Water Act seemed effective only at preventing point-source pollution, and failed to address riparian areas, riverine habitat, biodiversity or water projects. The other state and federal policies that even mentioned rivers were a convoluted mishmash of conflicting laws pointing in all directions and completely disconnected from the fundamental science of how the rivers function.

As a result, we questioned the value of what we had actually accomplished with the Wild and Scenic Rivers Act. Although the 1988 Act may be a landmark step for national river conservation, we wondered whether we had done something truly meaningful for the rivers. Some of the best scenic and recreational river segments were protected, along with some important riparian areas. Nevertheless, we ultimately began to feel that we had bought more doughnut hole than doughnut.

We canvassed conservation groups nationwide to determine if others felt as we did about the need for new river protection policies, and found an overwhelmingly positive response. We then sought the advice of the nation's top stream ecologists and fishery biologists to identify what was needed to protect and begin to restore river systems. We also sought the ideas of those in the trenches of river conservation to help craft new private land river-restoration mechanisms: conservationists, public interest attorneys,

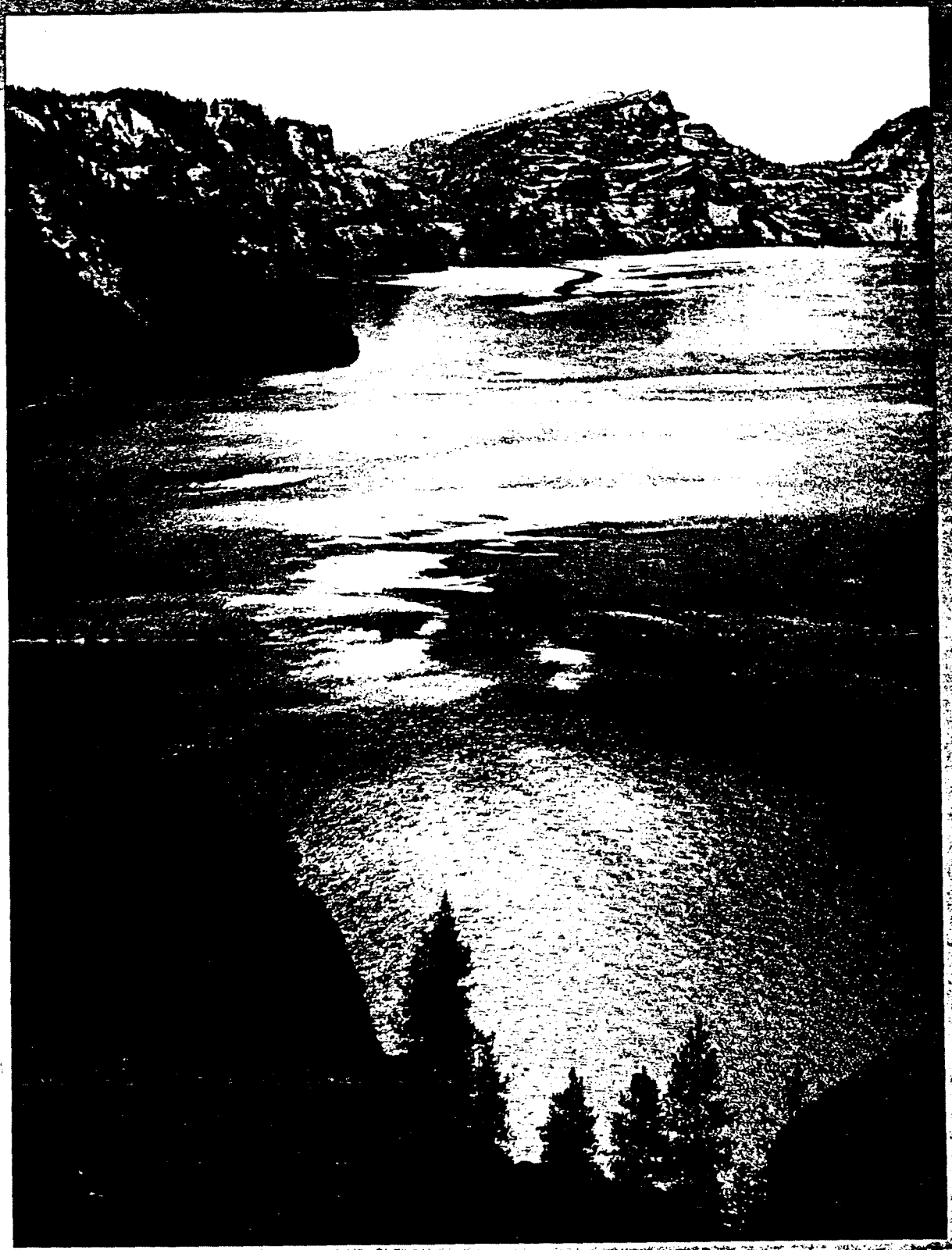
and public agency personnel. These groups came together to form our "Scientific/Federal Lands Committee," and our "Private Lands Task Force."

Numerous meetings were held to assess the problems, identify potential solutions and hammer out the underpinnings of new policy proposals. Subsequently, we developed a separate task force of scientists to assist us in developing a scientifically sound watershed restoration strategy. Workshops were held in several river basins, and the Rapid Biotic and Ecosystem Response (RBER) strategy proposed in this book emerged. The extensive research by our staff, feedback from experts nationwide, and the efforts of our task forces resulted in the policy assessments and final proposals in this book.

It is important to note that although we have had considerable assistance from our task forces and many others, the assessments and recommendations presented in this book are the sole responsibility of the Pacific Rivers Council.

We hope this book will prove helpful in stimulating a new day for America's river systems and biodiversity. This is certainly needed. Existing policies clearly have not been effective. We do not pretend to have all the answers. Other approaches may prove helpful, and as the science of rivers and ecosystem restoration evolves, even better policy proposals may emerge. No matter what new approaches and policies are finally enacted, if this book helps to stimulate a new national debate over riverine management and helps to catalyze a new age of restoration for America's river systems and biodiversity, it will have served its purpose.

Restoration of Aquatic Ecosystems



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Summary

The acid test of our understanding is not whether we can take ecosystems to bits on pieces of paper, however scientifically, but whether we can put them together in practice and make them work.

A. D. Bradshaw, 1983

INTRODUCTION

Aquatic ecosystems perform numerous valuable environmental functions. They recycle nutrients, purify water, attenuate floods, augment and maintain streamflow, recharge ground water, and provide habitat for wildlife and recreation for people. Rapid population increases in many parts of the United States—accompanied by intensified industrial, commercial, and residential development—have led to the pollution of surface waters by fertilizers, insecticides, motor oil, toxic landfill leachates, and feedlot waste. At the same time that water pollution and releases of nutrient-laden municipal sewage effluents have increased, water consumption has also increased, thus reducing the flows available for the dilution of wastes.

Increased sediment delivery resulting from urban construction, agriculture, and forestry also has resulted in greater turbidity and sedimentation in downstream channels, lakes, and reservoirs, with attendant losses of water storage and conveyance capacity, recreational and aesthetic values, and quantity and quality of habitat for fish and wildlife. Increased demands for drainage of wetlands have been ac-

ommodated b· hannelization, resulting in further loss of stream habitat. This h. ted to aquatic organisms becoming extinct or imperiled in increasing numbers and to the impairment of many beneficial water uses, including drinking, swimming, and fishing

Although public and private decisions to manage aquatic ecosystems have enhanced water transportation, developed sources of hydroelectric power, reduced flood hazards, and provided water for municipal, industrial, and agricultural purposes, these activities have also altered the physical, chemical, and biological processes within aquatic ecosystems. This committee is convinced that U.S. public opinion strongly supports an increased level of attention to environmental protection. The nation's investment in different types of environmental programs has been considerable but piecemeal and has not always been effective. An accelerated effort toward environmental restoration and preservation is needed. The committee believes that a comprehensive and aggressive restoration component should be the centerpiece of such an effort.

The premise of this report is that *ecological restoration* of aquatic ecosystems is possible. Restoration means returning an ecosystem to a close approximation of its condition prior to disturbance. Accomplishing restoration means ensuring that ecosystem structure and function are recreated or repaired, and that natural dynamic ecosystem processes are operating effectively again. At times, however, restoration may be impractical or undesirable, as when a body of water that is naturally without fish is successfully transformed through stocking into a valuable trout fishery or when important urban developments have been situated on wetlands. In such cases, the committee recognizes that the economic value of these developments may preclude any attempt to restore preexisting natural systems at these locations. The committee also recognizes that preventive measures to protect aquatic ecosystems are important and that priority should be given to preventive measures that benefit more than one portion of the hydrologic cycle. Had environmental protection been adequate in the past, many expensive restoration projects would not be necessary today.

Naturally, restoration of aquatic ecosystems may be accomplished in stages, and particular ecosystem functions and characteristics—such as potable water—may be restored even when other ecosystem characteristics deviate from natural conditions. Thus, in certain situations, partial ecological restoration may be the operant management goal and may provide significant ecological benefits even though full restoration is not attained.

Therefore, since the loss and impairment of aquatic ecosystems is accompanied by loss and impairment of valuable environmenta' ıctions and amenities important to humans, and since restoration oı aquatic ecosystems is possible, the committee concludes that a large-scale aquatic ecosystem restoration program in the United States should be implemented to regain and protect the physical, chemical, and biological integrity of surface water. Such a program should seek to:

- correct nonpoint source pollution problems;
- arrest the decline of wildlife populations; and
- restore all types of wildlife habitats with priority to endangered species habitat.

Failure to restore aquatic ecosystems promptly will result in sharply increased environmental costs later, in the extinction of species or ecosystem types, and in permanent ecological damage.

NATIONAL STRATEGY

The committee recommends that a national aquatic ecosystem restoration strategy be developed for the United States. This comprehensive program should set specific national restoration goals for wetlands, rivers, streams, and lakes, and it should provide a national assessment process to monitor achievement of those goals. The following recommendations are proposed as building blocks for the program and its guiding strategy. Details of the program design should be developed by federal and state agencies in collaboration with nongovernmental experts. A national strategy would include four elements:

1. National restoration goals and assessment strategies for each ecoregion (regions that have broad similarities of soil, relief, and dominant vegetation).
2. Principles for priority setting and decision making.
3. Policy and program redesign for federal and state agencies to emphasize restoration.
4. Innovation in financing and use of land and water markets.

Achieving these restoration goals will require planning, federal leadership, and federal funding, combined with financial resources and active involvement from all levels of government, as well as the involvement of nongovernmental organizations and businesses. Therefore, the federal government should initiate an interagency and intergovernmental process to develop the national aquatic ecosystem restoration strategy. The program should be developed and maintained under the firm leadership of a single responsible organization

ith the characteristics stipulated in Chapter 8. Implementation of he program should include reliance on local and regional environmental restoration boards for program planning, synthesis, and leadrship. Current appropriate federal programs should be reviewed to dentify available opportunities for aquatic ecosystem restoration.

CONGRESS

In light of existing budgetary constraints, innovative ways to finance restoration efforts are necessary. Thus, Congress should establish a National Aquatic Ecosystem Restoration Trust Fund. Private andowners and corporations should be given powerful federal and tate incentives to restore their aquatic ecosystems. Every effort should e made to use federal and other governmental funding to encourage itizen participation in restoration. Citizen participation (either through rivate citizen groups or public interest groups) has been instrumental in initiating and continuing restoration activities. In addition, ongress should allow states and local governments to trade in federal water development construction, maintenance, and major repair unds to finance aquatic ecosystem restoration programs.

The Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624) authorized the U.S. Department of Agriculture (USDA) to nter into long-term contracts with farmers to take former wetlands n agricultural use out of production and allow them to be restored s wetlands. However, the act limits the number of acres eligible for he program to 200,000 per year, with a maximum of 1 million acres. Each acre of cropland taken out of production and restored as wetland is no longer eligible for USDA program benefits. Thus, Congress should request that USDA investigate where and how an expansion of the Agricultural Wetland Reserve Program would result in a savings of USDA farm program expenditures; and saved funds could then be reallocated to expand the wetland reserve program beyond 1 million acres.

Any redirection of federal policies and programs for aquatic ecosystem restoration should take into consideration the following:

- use of a landscape perspective in restoration efforts;
- use of adaptive planning and management (this refers to analysis of alternative strategies, reviewing new scientific data, and reanalyzing management decisions);
- evaluating and ranking restoration alternatives based on an assessment of opportunity cost rather than on traditional benefit-cost analysis;

- incorporating the definition of restoration as the return of an ecosystem to a close approximation of its condition prior to disturbance, in the mandates of all appropriate federal agencies;
- reliance on nonfederal and federal units of government to coordinate restoration programs in local areas; and
- initiating an interagency and intergovernmental process to develop a unified national strategy for aquatic ecosystem restoration.

LONG-TERM, LARGE-SCALE, COORDINATED RESTORATION—PLANNING, EVALUATING, AND MONITORING

Although restoration ecology applied to aquatic ecosystems is in a very early stage of development, the prospect for substantive improvements in damaged aquatic ecosystems is excellent. However, current federal and state environmental programs and policies are fragmented and do not adequately emphasize restoration based on management of large, interconnected aquatic ecosystems. The diverse responsibilities of all layers of government affecting aquatic resources need to be better coordinated if large-scale restoration is to be accomplished efficiently and effectively. Because aquatic ecosystems are interconnected and interactive, effective restoration efforts should usually be conducted on a large enough scale to include all significant components of the watershed.

In addition, aquatic restoration efforts also need to be long-term to ensure that restoration project goals have been achieved and that restored ecosystems can endure stressful episodic natural events such as floods, droughts, storms, pestilence, freezing, heavy cyclical predation, invasion by exotics, and other perturbations. Because of limited resources, it is impossible in the short term to undertake all worthy aquatic ecosystem restoration projects. Criteria are thus needed to set priorities, select projects, and evaluate project designs. It is important to give priority to the repair of those systems that will be lost without intervention. A "triage" framework needs to be applied as a minimum initial step. In this approach, threatened systems would be divided into three categories: (1) those that will recover without intervention, (2) those that cannot be restored to a meaningful degree even with extensive intervention, and (3) those that can be significantly restored with appropriate action. Systems in the third group require further consideration. Selections from that group should be based on criteria such as the likelihood of success, opportunity cost, and technical review of the restoration plan. It is imperative that these criteria be applied to the selection of projects because many restoration projects will not coincide with political boundaries.

Planning a restoration project must start with specifying the project mission, goals, and objectives. Goals should be prioritized so that project designers and evaluators have a clear understanding of their relative importance. In addition to specifying goals, objectives, and performance indicators, project managers and designers need to propose a monitoring and assessment program that is appropriate in scale as well as in sampling frequency and intensity to measure the performance indicators accurately and reliably, and thereby assess progress toward the project's objectives, goals, and mission. Postproject evaluation will enable scientists to determine when and to what degree the system has become self-maintaining and whether or not the restoration attempt was effective.

Monitoring of a restoration effort should include both structural (state) and functional (process) attributes, and should not be restricted to one level of biological organization. Monitoring of attributes at population, community, ecosystem, and landscape levels is appropriate in a restoration effort.

LAKES

By far the most widespread problem facing lakes and reservoirs is agricultural nonpoint runoff of silt and associated nutrients and pesticides. Lakes often do not cleanse or restore themselves. They are sinks for incoming contaminants that recycle and maintain the impaired conditions. Federal drinking water standards, for example, cannot be met, except with great difficulty and expense, unless degraded lakes and reservoirs are improved and then protected from further contamination.

A net gain over the next 20 years of 2 million acres of restored lakes, out of the current 4.3 million acres of degraded lakes, is an achievable goal. By the year 2000, it is recommended that a minimum of 1 million acres of lakes be restored. The costs for research, development, and technical guidance are federal responsibilities. The costs for actual restorations should be borne by federal and nonfederal sources, working through individual state lake programs. The committee realizes that the goals for the restoration of lakes should be realistic and tailored to individual regions of the country. Further development of project selection, goal setting, and evaluation techniques based on the concept of "ecoregions" as explained in Chapter 4 should be encouraged and supported by the U.S. Environmental Protection Agency (EPA).

All states have degraded lakes, and each state should develop restoration plans and programs. States should consider establishing trust funds for environmental restoration and protection. The Clean Lakes Program (CLP) administered by EPA has been the most reliable source of grant support for lake restoration efforts. This program should receive stable administrative support and increased funding from Congress. The 1991 appropriation for the CLP was $8 million. Although this amount will help to maintain or initiate a few lake restoration programs, it is inadequate for the large task of lake restoration facing the country. This program's mandate should be broadened to include all aspects of lake ecosystems, including habitat restoration, elimination of undesirable species, and restoration of native species.

Knowledge of the current ecological condition of the nation's lakes is grossly inadequate, and a national assessment of lakes is necessary to determine the severity and extent of damage and to measure changes in their status. The CLP should increase support of research and development of effective tools for restoration, and should continue guiding states in developing lake restoration programs.

The federal government should support research and development for demonstration watershed-scale restorations that integrate lake, stream, and wetland components. Research could be coordinated under an interagency program, such as the Federal Coordinating Council for Science, Engineering, and Technology, to coordinate the selection, planning, and evaluation of demonstration projects. Although many techniques are available to restore lakes, further development is required to improve their efficiency and effectiveness. The research and development programs in lake restoration should take an experimental approach, emphasizing controlled manipulation of whole-lake ecosystems or large in-lake enclosures.

Research and development programs in applied limnology are needed to study

- improved techniques for littoral zone and aquatic macrophyte management;
- biomanipulation (food web management);
- contaminant cleanup in lakes, especially for mercury and polychlorinated biphenyls (PCBs);
- the relationships between loadings of stress-causing substances and responses of lakes;
- paleolimnological approaches to restoration; and
- prediction of lake trophic state from nutrient loading relationships.

RIVERS AND STREAMS

Given that healthy, vegetated riparian habitat and bottomlands are essential to the natural ecological functioning of associated streams and rivers—and are among the nation's rarest habitats due to prior devastation—riparian habitat and bottomland restoration should be made a high national priority along with the restoration of the stream or river channel itself.

Because a river and its floodplain are intimately linked, they should be managed and restored as integral parts of an ecosystem. Remnant and undisturbed large river and floodplain ecosystems are rare and ecologically valuable. Therefore, reaches of certain large rivers and their floodplain ecosystems (such as portions of the Atchafalaya River and the Upper Mississippi River Fish and Wildlife Refuge) and at least 50 other large rivers (greater than approximately 120 miles in length) should be designated as "reference reaches" for use as restoration templates and should be protected as quickly as possible. Reference reaches should be designated and protected on representatives of all orders of streams and rivers in each of the nation's ecoregions. Highest priority should be given to protecting representative orders of rivers and streams not already protected as national wild and scenic rivers, or by being located in national or state parks.

Stream and river restoration should begin with improved land management practices that will allow natural restoration of the stream or river to occur. Therefore, the committee recommends the following:

- Erosion control programs in watersheds should be accelerated, not just to conserve soil, but also for the purpose of restoring streams and rivers.
- Grazing practices on federal lands should be reviewed and then changed to minimize damages to river-riparian ecosystems and to restore damaged rivers and streams.
- Erosion control by "soft engineering" approaches, such as bioengineering techniques for bank stabilization and repair, should be considered first, in preference to "hard engineering" approaches, such as dams, levees, channelization, and riprap.
- Dikes or levees no longer needed or cost-effective should be razed to reestablish hydrological connections between riparian and floodplain habitats and associated rivers and streams.
- Classification systems for land use and wetlands should explicitly designate riparian environments and floodplains that retain their periodic connections to rivers.

The committee could not find a recent national assessment of the number of stream and river miles affected by channelization or leveeing, but the total is probably much greater than the number of miles of river dammed. Although water resources agencies track their own development projects, the only nationwide inventory of rivers and streams was conducted in the 1970s (DOI, 1982) in response to passage of the Wild and Scenic Rivers Act of 1968.

Therefore, the committee believes there is a need for a comprehensive up-to-date nationwide assessment of rivers, comparable to the National Wetland Inventory. It would be very useful to know how many miles of free-flowing, unchannelized rivers remain in the United States, and where these reaches are located.

The Food, Agriculture, Conservation, and Trade Act of 1990 and Section 404 of the Clean Water Act of 1977 (P.L. 95-217) now encourage the restoration and protection of wetlands. These laws should be expanded to provide for the protection and restoration of large active floodplains and riparian zones that are key components of riverine ecosystems. In addition, the Conservation Reserve Program, the Environmental Easement Program, and short-term agricultural set-aside programs should be amended to ensure that riparian zones and floodplains of all kinds are eligible for inclusion along with wetlands.

Opportunities to allocate water to in-stream uses arise (1) when land with water rights is sold or transferred, (2) when municipalities and irrigators decrease water withdrawals through conservation, and (3) when operating permits for dams are scheduled for renewal. Although the prior appropriations system (the basis of water law in the West) initially did not permit in-stream flow rights, many western states now recognize in-stream flow water rights. Therefore, states that have not established a water right for in-stream uses should do so. Flow that becomes available as the result of water conservation or lapse of permits should not automatically be reassigned to a consumptive use or withdrawal. Instead, consideration should be given to assigning the flow to in-stream uses. In addition, operating plans for dams should consider the annual water regime required by riverine fish and wildlife.

Federal agencies should be requested to update channelization estimates and to estimate miles of bank stabilization work already performed. The agencies should provide average and mean costs per mile for construction and maintenance of these conventional river management strategies, so that unit costs are available for comparison of different strategies. Government agencies should also conduct post-project evaluations of fluvial modifications, enhancement, improvement, channelization, and restoration projects to determine whether

these projects actually achieve the benefits (e.g., flood protection, fish and wildlife enhancement) for which they were designed at costs that were projected.

The committee also recommends that a national river and stream restoration target of 400,000 miles of river-riparian ecosystems be restored within the next 20 years. This target represents only about 12 percent of the total 3.2 million miles of U.S. rivers and streams, and is recommended because it is comparable to the miles of streams and rivers affected by point source and urban runoff (EPA, 1990).

WETLANDS

Historically, the most destructive alterations to wetlands have been physical, often eliminating the topographic and hydrologic characteristics that support the wetland ecosystem. Their position in the landscape, whether as isolated wetlands or floodplains contiguous with rivers and streams, gives wetlands a major role in storage of floodwater and abatement of flooding. When wetlands are converted to systems that are intolerant of flooding (drained agricultural lands, filled developed lands), their storage capacity decreases and downstream flooding occurs. Wetlands have properties of both aquatic and terrestrial ecosystems. Their most widely valued function is providing habitat for fish, birds, and other wildlife, which contributes to the maintenance of biodiversity.

Controversy exists as to whether or not certain wetland systems can be restored. The arguments are particularly important when wetland restoration is undertaken with the promise that because full restoration of a degraded site is possible, other natural wetlands can be destroyed without any net loss of wetland habitat. Wetland restoration should not be used to mitigate avoidable destruction of other wetlands until it can be scientifically demonstrated that the replacement ecosystems are of equal or better functioning. Funding priority should be given to programs for restoration of damaged wetlands over wetlands creation because of the superior chances of success. An exception would be cases in which restoration is part of a mitigation agreement that would result in a net loss of acreage.

Wetlands restored in regulatory contexts often receive little management after initial restoration because private and public landowners, who are not motivated to provide such management, may move on or have no legal obligation for such management. Similarly, the responsible federal agencies do not have staff to assess the adequacy of restoration projects and do not monitor or require monitoring of permit mitigation conditions for sufficient time periods (10 years or

longer). As a result, such wetlands may be overrun by exotic species, quickly filled by sediment, polluted, or otherwise misused.

The practice of wetland restoration needs to move from a trial-and-error process to a predictive science. The following recommended practices should be applied by resource managers to wetland restorations:

- Strive to restore wetlands to self-sustaining ecosystems requiring minimal maintenance.
- Provide buffers to protect restored wetlands, ensuring that restored coastal wetlands have room to migrate inland as long-term increases in sea level occur.
- Develop innovative methods of accelerating the restoration process (e.g., better propagation techniques for native plant species and protocols for obtaining adequate genetic diversity in the transplant material), and establish regional and national data bases to provide comparisons of the natural functioning of different wetland ecosystem types in different regions.
- Design and conduct experimental research programs to examine wetland restoration techniques and functional development over time in different system types.
- Use wetland restoration sites for scientific experiments that are designed to accelerate the restoration process.
- Support baseline studies of wetland ecosystem functioning to provide comparisons of different wetland types among regions and at different stages of development.

Traditional research on wetlands and ecosystem development should also be continued, using both natural and restored wetlands. Examples of this traditional research include the following topics adapted from Kusler and Kentula (1989):

- The hydrologic needs and requirements of wetland plants and animals, including minimum water depths, hydroperiod, velocity, dissolved nutrients, the role of large-scale but infrequent events, such as floods, and the effects of long-term fluctuations in water levels.
- The importance and functional significance of substrate to wetland plants and animals and to chemical and biological functions.
- Characteristics of development rates for natural successional vegetation.
- Recolonization of restored sites by invertebrate and vertebrate fauna.
- Functions of wetlands, with special emphasis on habitat values for a broad range of species, food chain support, and water quality enhancement.

- Evaluation of the stability and persistence of wetland ecosystems.
- Evaluation of the impact of sediment deposition or erosion, nutrient loading or removal, toxic runoff, pedestrian and off-road vehicle use, grazing, and other impacts on wetland structure and function.
- The ability of microbes, which are important to global carbon, sulfur, and nitrogen cycles, to perform these roles in restored wetlands.

The committee recommends that inland and coastal wetlands be restored at a rate that offsets any further loss of wetlands and contributes to an overall gain of 10 million wetland acres by the year 2010, largely through reconverting crop and pastureland and modifying or removing existing water-control structures. This represents a tenfold increase in the wetlands restoration target included in the Agricultural Wetland Reserve Program of the Food, Agriculture, Conservation, and Trade Act of 1990. This number also represents less than 10 percent of the total number of acres of wetlands lost in the last 200 years. The committee further recommends that, in the long term, this acreage be expanded to restore more of the approximately 117 million acres of the wetlands that have been lost in the United States over the past 200 years.

EDUCATION AND TRAINING

To accomplish the preceding tasks, the nation will require resource management professionals with multidisciplinary training. Restoration of aquatic ecosystems requires an integrated, broad-based approach; those trained to help restore these systems must have an interdisciplinary education. Although specialization will still be necessary, professionals will need the ability to coordinate work that draws on aquatic biology and fisheries, chemistry, hydrology, ecology, fluvial geomorphology, hydraulic engineering, social sciences, and wildlife management.

Some well-intentioned restoration projects have failed because fluvial and biological processes were not adequately taken into account in their design and implementation. The public has become increasingly aware of the need for restoration of river-riparian ecosystems (as several case studies in Appendix A indicate), and numerous public and private agencies and citizen groups are likely to initiate further stream and river restoration projects. These organizations, if properly guided and supported, can be a valuable impetus for effective aquatic ecosystem restoration and, in some cases, a valuable source of volunteer labor to accomplish restoration.

A new emphasis on resource stewardship and restoration cannot succeed without public understanding and support. Thus, educational programs aimed at raising the level of public knowledge and comprehension of aquatic ecosystem restoration rationales, goals, and methods should receive adequate government funding.

The committee believes that hydrological advisory services should be operated by states or federal agencies to provide technical assistance to groups interested in stream and river restoration. Universities with experts in natural resources or hydrology and water resources institutes, based at universities in every state, also should contribute technical assistance required for the restoration of aquatic ecosystems through free or at-cost expert hydrological and biological advisory services.

CONCLUSION

Without an active and ambitious restoration program in the United States, our swelling population and its increasing stresses on aquatic ecosystems will certainly reduce the quality of human life for present and future generations. By embarking now on a major national aquatic ecosystem restoration program, the United States can set an example of aquatic resource stewardship that ultimately will also improve the management of other resource types and will set an international example of environmental leadership.

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MASSACHUSETTES S 948

MASSACHUSETTS RIVER PROTECTION ACT
[S 948]

• The **purpose of the Act** is to **prevent further degradation** of the natural integrity of the state's rivers.

• The operation of the Act will **protect and enhance the values of rivers** and adjacent lands for natural habitat, beautiful landscapes, water supply, pollution absorption, flood storage, and fishing, boating and other forms of recreation.

• The chief mechanism of the Act establishes a **setback** for certain types of potentially harmful land use activities adjacent to rivers and streams ranging from 25 to 150 feet. Other **beneficial** land use activities are specifically **permitted** within the riverfront area.

• The state's twenty most populous and/or densely developed **cities and towns** are prequalified for a 25 foot setback; for all other communities, the setback is reduced to 25 feet for densely developed areas (such as the downtowns of mill communities) and/or areas covered by an approved municipal development or river corridor plan. Cities and towns are also empowered to adopt local river protection bylaws.

• Cities and towns are also empowered to **grant variances** to any landowner for which the strict application of the setback would constitute a hardship, and are **required** to issue variances where the failure to do so would constitute a "taking".

• **Existing uses** are grandfathered as well as projects that have building or other specified permits in hand and/or have gone through the MEPA process but have yet to begin construction.

• **The Act does not establish any new programs or require the expenditure of additional funds** at the state or local level.

• **The Act does not establish additional rights of public access** over private land.

• The Act aids in the administration of the Wetlands Protection Act and **reduces the workload of Conservation Commissions** by designating an easily defined area within which specific land use activities are allowed or restricted.

• The Act is intended to **stabilize and enhance property values** through the protection of rivers as natural amenities.

• The Act would lead to a **reduction in flood insurance premiums**, as restrictions on additional development within the floodplain lowers the risk of flood damage to existing structures.

Please call Reps. David Cohen (617-722-2380) or Pamela Resor (617-722-2060) for more information.

12/1/93

[List of Rivers Bill supporters on reverse side]

C00114

Massachusetts River Protection Act (a.k.a. the Rivers Bill)

LIST OF ORGANIZATIONS THAT HAVE EXPRESSED SUPPORT FOR THE RIVERS BILL
as of December 1, 1993

American Farmland Trust
American Rivers
Appalachian Mountain Club (AMC)
Assoc. for the Preservation of Cape Cod (APCC)
Back River Protection Association
Berkshire Litchfield Environmental Council
Berkshire Natural Resources Council
Blackstone River Watershed Association (BRWA)
Boston Chapter Canoe Committee, Appal. Mtn. Club
Boston Greenspace Alliance
Brookline Bird Club
Buzzards Bay Coalition
Canoe River Aquifer Advisory Committee
Charles River Watershed Association
Chicopee River Watershed Council (ChicRWC)
Clean Water Action
Compact of Cape Cod Conservation Trusts
Congress of Lake and Pond Associations (COLAP)
Connecticut River Watershed Council (CRWC)
Deerfield River Compact
Dudley Land Trust
Earth Works
Environmental League of Mass. (ELM)
Essex County Greenbelt Association
Friends of the Five Mile River
Friends of the Williams River
Framingham Advocates for the Sudbury River (FASR)
Gun Owner's Action League (GOAL)
Hoosic River Watershed Association (HOORWA)
Housatonic Valley Association (HVA)
Ipswich River Watershed Association (IRWA)
Isaac Walton Fishing Assoc., Weymouth
Jones River Watershed Association
League of Women Voters (LWV)
Mass. Association of Conservation Commissions (MACC)
Mass. Assoc. of Health Boards (MAHB)
Mass. Assoc. of Planning Directors (MAPD)
Mass. Audubon Society (MAS)
Mass. Campaign to Clean Up Hazardous Waste
Mass. Public Interest Research Group (MASSPIRG)
Mass. Recreation and Park Association (MRPA)
Mass. Save James Bay
Mass. Section, American Planning Association (APA)
Mass. Sportsmens Council
Mass. Watershed Coalition (MAWACO)
Mass. Wildlife Federation
Merrimack River Watershed Council (MRWC)
Merrimack Valley Paddlers
Metropolitan Area Planning Council (MAPC)
Monterey Preservation Land Trust
Mystic River Watershed Association
Nashua River Watershed Association (NRWA)
Nature Conservancy, MA Field Office (TNC)
Neponset River Watershed Association (NepRWA)
New England Aquarium
New England Coastal Campaign
New England Forestry Foundation (NEFF)
N.E. Friends for the Liberation of Water (FLOW)
New England Paddlers
New England Salmon Association
North and South Rivers Watershed Association
Organization for the Assabet River (OAR)
Quinebaug Rivers Association
Regional Environmental Council (REC), Worcester
Restore Olmsted's Waterway Coalition (ROW)
Safari Club International
Saugus Action Volunteers for the Environment (SAVE)
Saugus River Watershed Association
Saugus River Watershed Council
Save The Bay (STB), RI
Save the Harbor, Save the Bay
Shawsheen River Environmental Action Team (SWEAT)
Sheffield Land Trust
Sierra Club, New England Chapter
Soil and Water Conservation Society, So. New Eng. Chapter
South Weymouth Neighborhood Association
Sudbury Valley Trustees (SVT)
Taunton River Watershed Alliance
Trout Unlimited (TU)
Trustees of Reservations (TTOR)
Wampanoag Paddlers
Ware River Preservation Society
Water Supply Citizens Advisory Committee (WSCAC)
Westfield River Watershed Association
Westport River Watershed Alliance (WRWA)
Wilderness Society
Worcester County League of Sportsmen

Please call Peter Donahue at the Appalachian Mountain Club
(617) 523-0655 ext. 314 to add your organization's name to this list.

[Description of the bill on reverse side]

MASSACHUSETTS RIVER PROTECTION ACT (MRPA)
[Senate Bill 948]

Guide to the bill's contents.

PREAMBLE [as presented in earlier versions of the bill] - why the Act is necessary:

- rivers are among the Commonwealth's most valuable natural features;
- undeveloped lands adjacent to rivers serve key functions for pollution control, water supply protection, wildlife habitat, flood control and scenic value; and
- the public's investment in river cleanup is increasingly threatened by encroaching development on and nonpoint pollution coming from riverfront areas.

SECTION 1: Explanation and Purpose of Act

Purpose: to safeguard riverine values

Policy: to prevent further degradation of river corridors, and to establish a system of protected open spaces along rivers wherever possible

SECTION 2: CHAPTER 40A (Municipal Zoning) is amended with a new section: Section 9D: Cities and towns may adopt zoning ordinances or bylaws for river & stream protection

SECTION 3: Establishes new Mass. General Laws Chapter 131B: The Massachusetts River Protection Act:

Section 1: Definitions, including:

- river: the rivers and streams listed in a document entitled Massachusetts Stream Classification Program: Part I, excluding Channels and the portions of watercourses that are intermittent or enclosed in a subsurface conduit as of the Act's effective date; and
- riverfront area: the distance between a river's mean annual high water line and a parallel line 150 feet away, or reducible to 25 feet wide within areas that are already densely developed and/or covered by an approved municipal development or river corridor plan (see below); in the twenty most heavily and/or densely populated communities in the commonwealth (i.e., those with a population greater than 90,000 or population density greater than 7,000 persons/square mile), the riverfront area is 25 feet wide. Communities falling into this latter category are: Arlington, Boston, Brockton, Brookline, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lynn, Lowell, Malden, Medford, New Bedford, Revere, Somerville, Springfield, Watertown, Winthrop and Worcester. Also included in this latter category are two specifically described areas: an area along the Charles River in downtown Waltham, and a site northwest of the junction of Routes 128 and Route 20 on the Weston/Waltham line.

Section 2: Major operative mechanism of the Act [i.e., explanation of setback provision]

(a) Requirement that certain activities be set back beyond the riverfront area (see above def.), including:

- placement of structures larger than 200 sq. ft.
- septic systems
- clearcutting
- underground storage tanks

In addition, certain utility lines and parking lots are subject to a 25-foot setback requirement.

(b) Exemptions from the setback requirement include:

- non-conforming uses
  - existing roads, structures, septic tanks, etc.
  - projects that have cleared the MEPA process by the Act's effective date
  - projects with building permits issued by the Act's effective date
  - projects receiving special permit approval under Section 9 of the Zoning Act (Chapter 40A) or approved or endorsed under Section 81U or 81P of the Subdivision Control Act (Chapter 41).
- restoration of fish & wildlife habitat;
- normal maintenance & improvement of land in agricultural use (except that certain potentially polluting activities are restricted within 25 feet of rivers);
- forest harvesting in accordance with a state-approved cutting plan;
- engineering necessary for public safety or to protect public property;
- repair and/or replacement of structures or utility lines due to obsolescence, deterioration or casualty loss or damage;
- construction and maintenance of stormwater retention basins and similar facilities specifically designed for pollution control;
- activities related to the removal of hazardous wastes;
- rivers covered by the Watershed (Cohen) bill or are under a scenic river protective order;

[continued on reverse side]

[Section 2(b) - exemptions from the setback requirement, continued]

- facilities and other activities subject to Chapter 91;
- boat houses and related landings located on land owned or controlled by the commonwealth or its agencies and leased or licensed to educational institutions; and
- recreational land and uses (as defined in Ch. 61B) and public access facilities.

(c) The Secretary of Environmental Affairs shall adopt regulations to help implement the Act, including guidelines for the granting of variances from the setback by conservation commissions and the designation of densely developed area districts.

(d) Cities and towns are authorized to adopt local river protection ordinances, and the setback can be reduced to 25 feet for those portions of rivers and streams that flow through densely developed areas and/or are covered by and in accordance with an adopted local or regional river corridor plan or a municipal development and river protection plan (all of which are defined in Section 1 of Chapter 131B).

Section 3: Conflict of laws: In situations where the Rivers Bill conflicts with the statutory and regulatory provisions of Chapter 91 or the Endangered Species Act, the Rivers Bill shall yield to these two laws and any regulations promulgated thereunder.

Section 4: Powers of local boards, etc. to take notice of and enforce Act:

(a) Conservation Commissions, building inspectors, planning board, health board members or their authorized agents and Environmental Police officers empowered to enforce Act

(b) Conservation Commissions given power to grant variances from setback provision upon showing of substantial hardship; con comms must issue a variance when the failure to do so would result in a "taking".

(c) appeal resulting from action of conservation commission made be reviewed by the Secretary; appeals from decisions of conservation commission or the secretary may be made to superior court.

Section 5: Violations

(a) criminal violation: fines and penalties
(b) civil violation: fines and penalties
(c) violator may be required to restore affected riverfront area
(d) fines and penalties accrue to local conservation commission

Section 6: Parties eligible to bring action for injunctive relief or civil penalties:

- the commonwealth;
- governmental subdivision of the commonwealth where the violation occurred or within the same watershed where the violation occurred; or
- parties given the right to sue under another provision of the Mass. General Laws (such as Section 7A of Chapter 214, which gives any ten citizens the right to bring legal action to enforce the state's environmental laws).

Section 7: Statute of limitations: four years

SECTION 4: Severance clause

SECTION 5: Secretary (EOEA) shall submit Rivers Bill regulations to the Committee on Natural Resources & Agriculture for its review within 60 days prior to their effective date.

SECTION 6: Secretary (EOEA) is directed to establish a Riverfront Advisory Committee to assist in the drafting and review of rules and regulations to carry out the purposes of the Rivers Bill.

SECTION 7: Limitation of the applicability of "densely developed area" in Chapter 131B to land merely zoned or subdivided for dense development; and the determination of what is a "nonconforming use" under Chapter 131B is triggered by the date by which its regulations go into effect.

SECTION 7A: Requires the Executive Office of Environmental Affairs in consultation with the Executive Office of Communities and Development to do a study on transferable development rights.

SECTION 8: Effective date of the Act: upon passage, but the setback, variance and penalty provisions of the Act do not go into effect until one year after passage or until the regulations are adopted, whichever is earlier.

••••••••••••

[June, 1993]

[SIMILAR MATTER FILED DURING PAST SESSION · SEE SENATE HOUSE NO. 1620 OF 93] S 948

The Commonwealth of Massachusetts

IN THE YEAR ONE THOUSAND NINE HUNDRED AND

AN ACT

AN ACT TO PROTECT THE RIVERS OF THE COMMONWEALTH.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Whereas, The deferred operation of this act would tend to defeat its purpose, which is to immediately protect the commonwealth's rivers, streams and adjacent lands, vital factors in the ecological, economic and public health of the commonwealth, from further degradation, therefore it is hereby declared to be emergency law, necessary for the immediate preservation of the public convenience.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. (a) The purposes of this act are to further the maintenance of safe and healthful conditions; to provide for the wise utilization of water and related land resources within an

amended by inserting after section nine C the following section: -

Section 9D. Cities and towns may adopt zoning ordinances or bylaws for the purpose of river and stream protection that are consistent or bylaws shall be shown on a zoning or overlay district map pursuant to section four. Cities and towns may illustrate on their zoning or overlay district maps the location of any riverfront area as defined by chapter one hundred thirty-one B.

SECTION 3. The General Laws are hereby amended by inserting after chapter one hundred and thirty-one A the following chapter: -

CHAPTER 131B.

MASSACHUSETTS RIVER PROTECTION ACT.

Section 1. For the proposes of this chapter, the following words and phrases shall have the following meanings:

"Bank", the portion of the land surface which normally abuts and confines a river, occurring between a river and a vegetated bordering wetland, floodplain or upland, the upper boundary of which the first observable break in the slope or the mean annual flood level, whichever is lower, and the lower boundary of which is the mean annual low flow level.

"Basal area", the area in square feet of the cross section of a tree measured at a height of four and one-half feet above the ground.

"Clearing", the removal of more than one-half the cumulative total of basal area of all live trees, five inches or more in diameter breast height during any ten-year period, or the removal of more than one-half of the total vegetative cover within the

water and which distinguishes between predominantly aquatic and predominantly terrestrial land. The mean high tide line shall serve as the mean annual high water line for tidal rivers.

"Municipal development and river protection plan", a document which contains recommendations for the use of land adjacent to rivers and includes, but is not limited to, the following information: (i) identifies the location of riverfront areas; (ii) contains a detailed and comprehensive analysis of the rivers' ecological, aesthetic and recreational values; (iii) establishes setbacks at a minimum of twenty-five feet from a river's mean annual high-water line; and (iv) establishes enforceable performance standards for proposed activities and structures within one hundred fifty feet of rivers. Such plan shall conform to qualifying criteria established by the secretary under subsection (c) of section two and receive significant public support as evidenced by a vote in favor of adoption at town meeting or city council. Existing plans such as master plans and urban renewal plans if they may already meet or are subsequently amended to meet the above criteria.

"Nonconforming use", any excavation, structure, road, clearing, driveway, landscaping, utility lines, septic system, parking lot or expansion of structures, within the riverfront area in existence or for which any of the following conditions have been met; (i) a building permit has been issued; (ii) a final environmental impact report has been prepared and submitted pursuant to section sixty-two B of chapter thirty and a statement or certificate has been issued by the secretary of environmental

of existing water rights; or (iii) clearing and vegetative management for utility lines and related rights of way.

"Persons", an individual, corporation, partnership, trust, association or other private entity or any officer, agent, department or instrumentality of the federal government or any state or its political subdivisions.

"Regional", relating to or serving two or more cities or towns.

"River", the rivers and perennial streams listed in a document entitled "Massachusetts Stream Classification Program, Part I: Inventory of Rivers & Streams," prepared by the department of fisheries, wildlife and environmental law enforcement and the department of environmental quality engineering, dated July, nineteen hundred and eighty-two, or as modified pursuant to chapter thirty A; provided, however, that the term "river" shall not apply to the portions of any river or stream described as a "channel" in said document, nor shall it apply to any water-courses which are (i) shown as intermittent on a United States Geological Survey topographic map or (ii) enclosed in a pipe or other subsurface conduit.

"Riverfront area", that area of land situated between a river's mean annual high-water line and a parallel line located one hundred and fifty feet away, measured outward horizontally, from the river's mean annual high-water line. Riverfront areas within municipalities with (i) a population of ninety thousand or more persons or (ii) a population density greater than seven thousand persons per square mile, as determined by the nineteen hundred and

or salt.

"Substantial expansion", an expansion of a structure that increases the existing footprint by more than twenty-five percent, or twenty-five hundred square feet, whichever is larger.

"Utility lines", pipes, wires, cables and other conduits, including the supporting structures and associated facilities, including any rights of way that are used as a part of a collection, transmission, distribution, or communications system and are designed for the transport of various matter, including, but not limited to, the following electricity, steam, telecommunications, petroleum, and other toxic materials, natural or manufactured gas, uncontaminated water, stormwater or wastewater, but excluding septic tanks and leach fields.

"Vegetated buffer strip", a strip of fifty feet or wider, measured horizontally outward from a river's mean annual high-water line, which is composed of a relatively undisturbed stand of trees, shrubs and other vegetation, from which no more than one-half the cumulative total of basal area of all live trees five inches or more in diameter breast height are removed during any ten-year period.

"Watershed", an area of land from which water drains into a particular river or other surface water body, the boundaries of which are determined by a drainage divide line separating it from adjacent watersheds.

Section 2. (a) The construction, creation, placement or installation of any structure, road, clearing, driveway, parking lot, septic tank or leaching field, underground storage tank, solid

the riverfront area or if the portion of the expansion occurring within the riverfront area does not increase the footprint of the portion of the structure within the riverfront area by more than twenty-five percent or twenty-five hundred square feet, whichever is greater; (3) repair, restoration, alteration or replacement of structures and utility lines occasioned by obsolescence, deterioration, governmental orders or regulations, or due to loss or damage caused by fire or other casualty; provided, however, that such repair, restoration, alteration or replacement does not constitute a substantial expansion within the riverfront area; (4) the construction and maintenance of stormwater retention basins and similar facilities specifically designed to protect rivers from erosion, sedimentation or other sources of pollution, including any excavation or fill necessary for such purpose; provided, however, that such activity remains subject to section forty of chapter one hundred and thirty-one; (5) activities related to the removal or remediation of hazardous wastes or other current or potential sources of pollution within the riverfront area; provided, that any road, driveway, or structure constructed for such purpose is temporary in nature; (6) any activity necessary to comply with local, state or federal environmental laws and regulations, as stipulated by compliance or enforcement order or notice issued by the relevant enforcement agency; (7) maintenance, operation, construction or other activities of the department of highways; the Massachusetts Bay Transportation Authority and the Massachusetts Turnpike Authority; provided, however, that such activities by conducted under procedures approved the secretary; (8) dams and

section one of chapter sixty-one B, available to the general public or to members of a nonprofit organizations, but not including any structures, septic tanks or leach fields, underground storage tanks or solid waste associated with such recreational use; provided, however, that any clearing, road, driveway, excavation or fill exceeding ten cubic yards associated with such recreational use, other than any footpath, walkway, pedestrian or bicycle path, occurs more than twenty-five feet from the mean annual high water line; (15) activities within the riverfront area which are consistent with standards and policies of the department of fisheries, wildlife and environmental law enforcement and are designed to improve fisheries or wildlife habitat or migration; (16) work performed for normal maintenance or improvement of land in agricultural or aquacultural use; provided, however, that no tillage other than defined as "minimum tillage" by the Soil Conservation Service, no outdoor uncovered storage of manure, no use or outdoor storage of pesticides, herbicides or fertilizers which carry a mobility rating as provided for by the United State Environmental Protection Agency or which have been determined by the commonwealth using Environmental Protection Agency standards to pose a threat or potential threat to the river waters other than for the cultivation of cranberries take place less than twenty-five feet from the mean annual high water line; (17) the renovation of abandoned cranberry bogs or development of cranberry bogs in man-made wetlands that are currently maintained by the grower, provided, however, that such activity shall remain subject to statutory and regulatory promulgations under section forty of

regulations as are deemed necessary to carry out the purposes of this chapter. Such regulations shall include criteria for the issuance of variances, including specifically (i) the substantial hardship variance authorized by subsection (a) of this section and subsection (b) of section four, and (ii) the utility line setback variance granted by the secretary authorized by subsection (a) of this section; qualifying criteria for the establishment of municipal development and river protection plans; and criteria for determining violations in accordance with the provisions of section five. The secretary shall develop guidelines addressing suggested minimum standards for municipal zoning, land use controls and other mechanisms designed to carry out the purposes of this chapter. Such guidelines may include, but shall not be limited to, the following: provisions governing building and structure size, setback and location; the establishment of vegetated buffer strips; the location and mapping of riverfront areas; the establishment of densely developed area districts and other districts; and prevention of the direct discharge of untreated stormwater into rivers. The secretary shall also review and recommend modifications to programs and activities of the commonwealth as they affect the protection afforded by this chapter.

(d) Cities and towns may adopt ordinances or by-laws consistent with this chapter and with section nine D of chapter forty A; provided, however, that such ordinances or by-laws may permit the clustering, so-called, of development outside of the riverfront area on properties whose boundaries include portions of land within and outside of the riverfront area. Cities and towns

affecting structures which extend over the water or are placed on lands lying between high and low water lines or within wetlands. Facilities for regional wastewater treatment and their related structures and systems are exempt from this section.

Section 4. (a) The conservation commission, building inspector, planning board, health board of their duly authorized agents, and environmental police officers, are hereby empowered to take notice of this chapter and to enforce its provisions in the performance of their other duties, and to enter upon privately owned land, if necessary, to enforce the provisions of this chapter.

(b) The conservation commission shall have the power, after a public hearing for which notice has been given by publication, posting and mailing to all parties in interest pursuant to regulations developed under subsection (c) of section two, upon petition with respect to particular land or structures, and after due consideration of any regulations and guidelines developed under said subsection (c) of said section two, to grant a variance from the setback requirements of subsection (a) of said section two where the conservation commission specifically finds that a literal enforcement of the provisions of said subsection (a) of said section two, in the context of the entire parcel or adjacent parcels owned by or under option to purchase by the petitioner, would involve a substantial hardship, financial or otherwise, to the petitioner, and that desirable relief may be granted without substantial detriment to the public good and without nullifying or substantially derogating from the propose and intent of this

(b) After a hearing, the conservation commission may issue an order assessing a civil penalty on any person who orders or conducts any activity in violation of this chapter. Such persons shall be subject to a civil penalty of not more than five thousand dollars per day of such violation. Any person receiving a subsequent civil penalty shall be subject to a penalty of not more than ten thousand dollars per day of such violation. The superior court shall have jurisdiction to enforce civil penalty orders issued by conservation commissions, in actions brought by the attorney general.

(c) In addition, or as an alternative to subsections (a) or (b), any person who orders to conducts any activity in violation of this chapter may be ordered by the conservation commission, after a hearing, to restore the affected riverfront area to its prior or an improved condition. The superior court shall have jurisdiction to enforce such orders issued by conservation commissions, in actions brought by the attorney general.

(d) Fines and penalties assessed under this chapter shall accrue to the conservation commission in each city or town in which the violation occurred. In a legal action in which the pleadings challenge the validity or legality of this chapter or any ordinance or bylaw adopted hereunder, the attorney general shall be made a party until removed by the attorney general's consent. No action may be commenced under this section if the attorney general has commenced and is diligently pursuing a civil action to enforce the provisions of this chapter.

Section 6. The following parties may bring an action for

natural resources and agriculture for its review within sixty days prior to the effective date of said regulations.

SECTION 6. There shall be established a riverfront advisory committee for the purpose of participating in the review of the rules and regulations promulgated pursuant to the provisions of chapter one hundred thirty-one B of the General Laws. Said advisory committee shall consist of fourteen members appointed by the secretary of environmental affairs, seven of whom shall represent environmental organizations and seven of whom shall represent the real estate community. At least two of the members, one each from an environmental organization and the real estate community shall own or have an interest in land located in a riverfront area, as defined by said chapter one hundred and thirty-one B. The advisory committee shall meet with the secretary or the secretary's designee for the purpose of advising the secretary as to the criteria for variances, and shall also recommend any legislative proposals which would make the implementation of said chapter more efficient. Meetings of the advisory committee shall be at the discretion of the secretary; provided, however, that the committee shall meet at least four times in the first twelve months after the effective date of this act, and at least once annually thereafter. The secretary may dissolve the advisory committee following the adoption of regulations for chapter one hundred thirty-one B or at any time thereafter.

SECTION 7. The definition of "Densely developed areas" in

affairs shall report to the joint committee on natural resources and agriculture no later than one year following the adoption of regulations under chapter one hundred thirty-one-B.

SECTION 8. Subsections (a) and (d) of section two of chapter one hundred thirty-one B and sections five, six, seven and eight of said chapter one hundred thirty-one B, inserted by section two of this act, shall not take effect until one year after the effective date of this act, or until the regulations promulgated under subsection (c) of section two of said chapter one hundred thirty-one B, as inserted by said section two of this act, are adopted, whichever is earlier.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The undersigned, citizen of _____ *respectfully petitions for the passage of the accompanying bill and/or for legislation*

AN ACT TO PROTECT THE RIVERS OF THE COMMONWEALTH

David B. Cohen	11th Middlesex
Ben G Gray	6th Middlesex
Susan P Fargo	5th Middlesex
Pamela P. Resor	14th Middlesex
[illegible]	3rd Barnstable
[illegible]	4th Berkshire
Barbara Gardner	8th Middlesex
Douglas W. Petersen	8th Essex
James [illegible]	28th Middlesex
Lynn O'Sullivan	13th Worcester
Anne M. Paulsen	36th Middlesex
Thomas Palumbo	2nd Essex

C00150

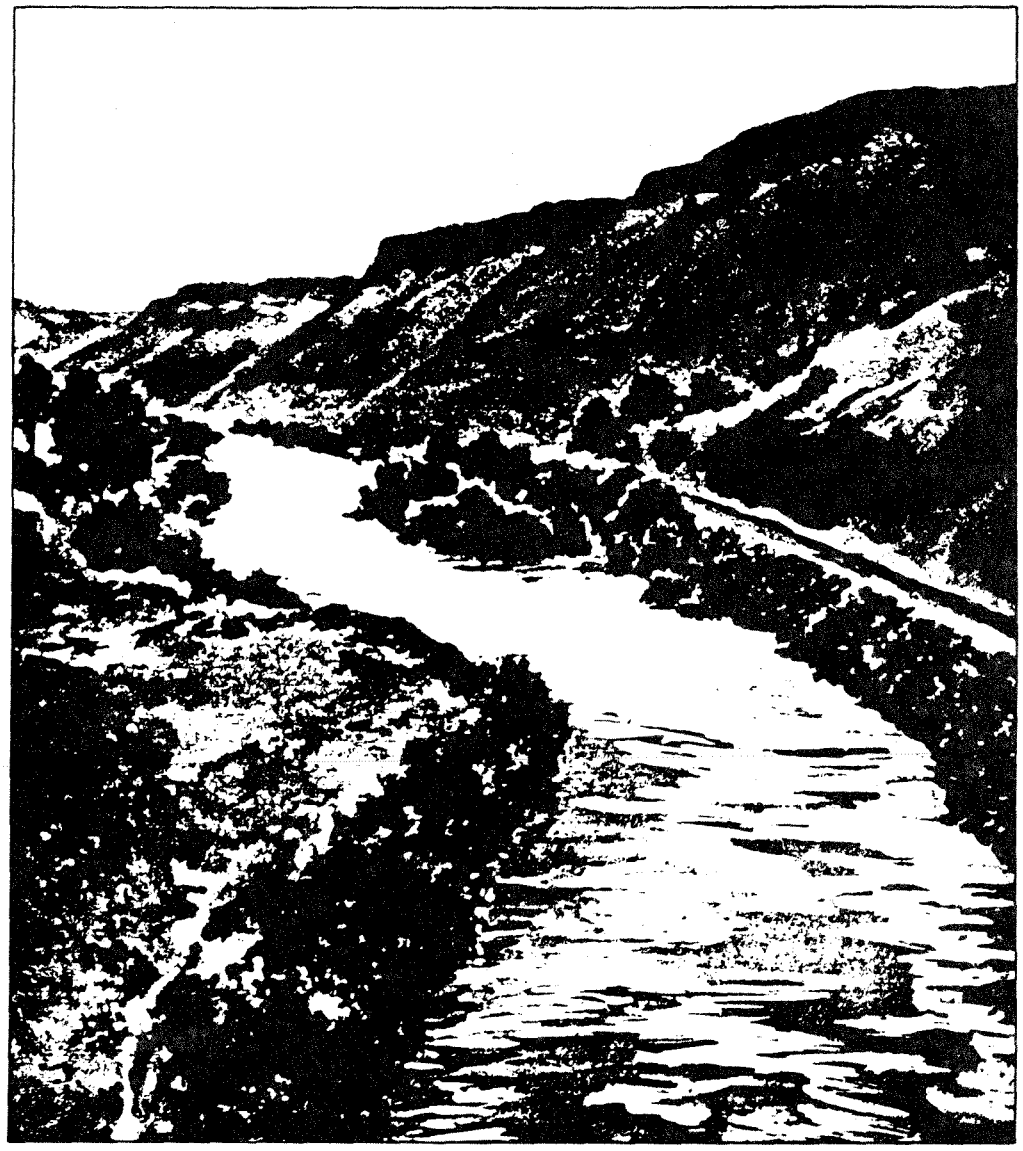
OREGON/DESCHUSETES RIVER PLAN

U.S. Department of the Interior
Bureau of Land Management

Prineville District Office
185 East 4th Street, P.O. Box 550,
Prineville, Oregon 97754

February 1993

Lower Deschutes River Management Plan Record of Decision



U.S. Department of the Interior
Bureau of Land Management

Prineville District Office
185 East Fourth Street
Prineville, Oregon 97754

Lower Deschutes River Management Plan

Record of Decision

February 1993

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I. Record of Decision

Lower Deschutes River Management Plan

This plan documents decisions on 20,641 acres of public land administered by the Bureau of Land Management in the Prineville District. This land is located within the boundaries of the Lower Deschutes Wild and Scenic River. Proposed decisions contained in this document are identical to those proposed decisions in the Final Lower Deschutes River Management Plan and Environmental Impact Statement. The publication of this Record of Decision complies with Federal policy requirements and outlines the role and responsibility of BLM in implementing portions of the overall plan. Implementation of decisions in this document will protect and enhance natural and cultural resources, accommodate a variety of recreational activities and provide for public safety and services.

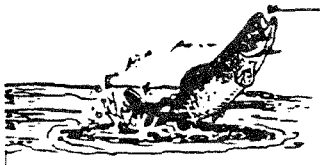
Comparison of Alternatives

Five alternatives for management in the Lower Deschutes River Planning Area were analyzed in the Draft Lower Deschutes River Management Plan and Environmental Impact Statement dated May, 1991. The environmental consequences of implementing each of the alternatives were described in Chapter VI of the Draft Lower Deschutes River Management Plan and Environmental Impact Statement. They are summarized in Table 1 of this document.

The selected plan provides for somewhat higher levels of overall use from 1988 baseline levels while attempting to redistribute use from peak weekends and holidays to weekday periods. Interaction with other individuals or groups would generally be moderate. The management objectives under this alternative would be to allow overall use levels to slightly increase over 1988 levels while reducing both peak recreational use levels and conflicts between user groups. Natural resource condition for most resources would be improved significantly over the 5 to 10-year implementation period. Facility development to accommodate recreational activities such as camping, boating, fishing and vehicle-oriented activities would occur so long as the natural character of the area is not significantly changed and natural values such as soil, water, vegetation, wildlife habitat and cultural resources are protected and wherever possible, enhanced. Regimentation and controls would be handled both on-site and off-site through regulations, fees and, as a last resort, use limitations. On-site regimentation and controls would be obvious, but would be compatible with the environment and aimed at protecting natural values and visual quality. This alternative is the environmentally preferable alternative. This river management plan best meets the intent of Federal and State statues and best resolves the river-related planning issues while contributing to the local and regional economy and protecting or enhancing outstandingly remarkable river-related resource values.

Alternative 1 would have provided for a higher level of use. The management objectives under this alternative would be to accommodate increased levels of recreational use, while protecting the environment where the sights, sounds and interaction with other individuals or groups would often be high. The character of the area would remain in a generally natural-appearing condition; however, facility development to enhance recreational opportunities such as camping, boating, fishing and vehicle-oriented activities would occur. On-site regimentation and controls would be obvious, but limited to those necessary for public safety as well as to accommodate increased numbers of visitors, and to maintain fisheries condition, soil stability and vegetative cover. This alternative would provide the widest range of beneficial uses of the river environment, but would provide the second lowest level of protection for both renewable and nonrenewable resources.

Alternative 2 described existing management. Alternative 2 is the baseline from which the other alternatives can be compared. This is the no-action alternative required by the National Environmental Policy Act. The intent of this alternative would be to continue present levels of management. Overall recreational use levels would be unregulated and would continue to increase causing a moderate to



high degree of interaction with other individuals and groups. On-site regimentation and controls would be evident in some areas and lacking in others. This alternative would provide a high level of beneficial uses and low or declining levels of protection for both renewable and nonrenewable resources.

Alternative 3 provided for lower levels of peak use. The management objectives under this alternative would be to maintain present overall levels of use while reducing peak recreational use levels while natural resource condition would be improved. The sights, sounds and level of interaction with other individuals or groups would be moderate. Facility development to accommodate recreational activities would occur so long as the natural character of the area was not affected. Regimentation and controls would be obvious, but would be compatible with the environment and aimed at protecting natural values and visual quality. This alternative would provide moderate levels of resource protection and enhancement while maintaining current beneficial uses.

Alternative 4 provided for much less use. The management objectives under this alternative would be to significantly reduce recreational use levels, improve overall natural resource condition and provide recreational opportunities in a less crowded setting. The sights, sounds and overall level of interaction with other individuals or groups would be low to moderate. New facility development would occur away from sensitive areas to disperse recreational use. Regimentation and controls would be handled both on-site and off-site through fees, regulations and limitation. On-site regimentation and controls would fit into the natural landscape to the greatest degree possible. This alternative would provide the highest level of protection or enhancement of resource values but would reduce beneficial uses.

A supplement to the Draft Management Plan was prepared as a result of the need to consider public access upstream from the Portland Deschutes Club locked gate. A range of alternatives which presented various options for providing public access was considered. See Volume 2 of the Final Lower Deschutes River Management Plan/EIS and the Access: Road, Trails and Launch Sites section of this document.

Mitigation Measures

All protective measures and standard operating procedures identified in the plan will be taken to mitigate adverse impacts. These measures will be strictly enforced during implementation. Monitoring and evaluation will tell how effective these measures are in minimizing environmental impacts. Therefore, additional measures to protect the environment may be taken during or following monitoring.

Area Manager Recommendation

I recommend adoption of the Lower Deschutes River Management Plan Record of Decision.

Signed/Date:

Feb. 1, 1993

James G. Kenna, Area Manager

I approve the Lower Deschutes River Management Plan Record of Decision as recommended. This document meets the requirements for a Record of Decision as provided in 40 CFR 1505.2.

Signed/Date:

Feb. 1, 1993

James L. Hancock, District Manager

Appeals Process

Within 30 days of the receipt of this decision, you have the right to protest to the Bureau of Land Management State Director and there after appeal to the Board of Land Appeals, Office of the Secretary, U.S. Department of the Interior, in accordance with the regulations of 43 Code of Federal Regulations 4.400. The Protest to the State Director must be filed in writing in the Oregon State Office of the Bureau of Land Management, 1300 N.E. 44th Avenue, P.O. Box 2965, Portland, Oregon 97208. If no protests or appeals are filed, this decision will be become effective and be implemented in 30 days.

Table 1 - Summary of Long Term Impacts to All Resources by Alternative[1]

Managing:	*Pref. Alt.*	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*
Soil	+M	+L	-L	+M	+H
Water	+M	+L	+L	+M	+M
Vegetation	+M	+L	-L	+M	+M
Livestock Grazing	+L	-L	-L	+L	-L
Cultural Values	+M	+M	-L	+M	+H
T & E Species	+M	-L	-L	+M	+H
Scenery	+M	+M	-L	+M	+M
Overall Recreational Use					
Quantity of Use	+L	+M	+M	-L	-M
Quality of Experience	+L	-L	-M	+L	+M
Access	+M	+M	-L	+M	+L
Economic Values	+M	+H	+H	-L	-H
Law Enforcement and Emergency Services	+M	-L	NC	+L	+M
Fire	+M	-L	-L	+L	+M
Public Safety	+L	+L	-L	+L	+L
Private Land & Property Rights	+L	-L	NC	+L	+L

[1] + Beneficial, - Adverse, NC No Change; H High, M Moderate, L Low

OREGON

1987 - SB 202

1987 - HB 3019

river by virtue of ownership of the other land:

(a) The right to the beneficial use of such waters shall not be affected by such condemnation; and

(b) The owner of the other land shall retain a right of access to the lake or river necessary to use, store or divert such waters as the owner has a right to use, consistent with concurrent use of the land so condemned as a part of the Oregon Scenic Waterways System.

(8) Any owner of related adjacent land, upon written request to the department, shall be provided copies of rules then in effect or thereafter adopted by the department pursuant to ORS 390.805 to 390.925.

(9) The department shall furnish to any member of the public upon written request and at expense of the member a copy of any notice filed pursuant to subsection (3) of this section.

(10) If a scenic waterway contains lands or interests therein owned by or under the jurisdiction of an Indian tribe, the United States, another state agency or local governmental agency, the department may enter into agreement with the tribe or the federal, state or local agency for the administration of such lands or interests therein in furtherance of the purposes of ORS 390.805 to 390.925. [1971 c.1 §5; 1971 c.459 §1; 1973 c.756 §2; 1981 c.236 §3; 1983 c.334 §4]

390.848 Passes for use of parts of Deschutes River; fee; exemption from fee; disposition of moneys. (1) The department shall establish, by rule, a system for issuing passes necessary to comply with the requirements under ORS 390.851. The department shall establish a reasonable fee for issuance of a pass under this section. The department may establish any form of proof of payment of the user fees that it deems appropriate.

(2) The system for issuance of passes established by the department under this section may include issuance of the passes by governmental entities or private persons who have entered into appropriate agreements with the department for issuance of the passes. Agreements under this subsection may include, but are not limited to, terms providing for locations for the collection of fees, methods the department determines appropriate to assure payment of moneys collected and provisions for the distribution of river-user information.

(3) The department shall issue, without charge, annual passes to comply with the requirements under ORS 390.851 to persons who own ranch, farm or residential property immediately abutting those portions of the Deschutes River designated as scenic waterways under ORS 390.826 and to members of the immediate family of such persons. This subsection does not authorize the issuance without charge of passes to persons holding less than a majority interest in a firm, corporation or cooperative organization which owns land immediately abutting the Deschutes River designated as scenic waterways under ORS 390.826.

(4) Moneys collected under this section shall be deposited in the separate fund established for the State Parks and Recreation Department under ORS 366.512 and, subject to the limitations under subsection (5) of this section, are continually appropriated to that department to be used:

(a) For operation of the pass system established under this section;

(b) For providing river-user oriented law enforcement services;

(c) For providing river recreation information and education;

(d) For developing and maintaining river oriented recreation facilities; and

(e) For any other purposes the department considers appropriate for the maintenance, enhancement or protection of the natural and scenic beauty of the scenic waterway consistent with ORS 390.805 to 390.925.

(5) The use of moneys for purposes described under subsection (4) of this section is limited to the performance of those purposes for areas of the Deschutes River designated as scenic waterways under ORS 390.826. [1981 c.798 §2; 1985 c.606 §4; 1987 c.291 §2; 1987 c.624 §15]

390.851 Activities prohibited on parts of Deschutes River without pass; exceptions. (1) Unless the person has an appropriate pass issued under ORS 390.848, no person shall launch, operate or ride in any boat or engage in any camping, fishing or other activity in connection with being transported by a boat on those portions of the Deschutes River designated as scenic waterways under ORS 390.826.

(2) This section does not apply to:

(a) Peace officers, members or employees of a governmental body or their agents while engaged in the discharge of official duties; or

(b) Any member of the Confederated Tribes of the Warm Springs Indian Reservation.

(3) A person who violates this section commits a Class B parks and recreation infraction. [1981 c.798 §3; 1987 c.291 §3]

390.855 Designation of additional scenic waterways. The department shall

390.915 Determination of value of scenic easement for tax purposes; easement exempt. For ad valorem tax purposes, real property that is subject to a scenic easement shall be valued at its real market value, less any reduction in value caused by the scenic easement, and assessed in accordance with ORS 308.232. The easement shall be exempt from assessment and taxation the same as any other property owned by the state. [1971 c.1 §12; 1981 c.804 §99; 1991 c.459 §394]

390.925 Enforcement. In addition to any other penalties provided by law for violation of ORS 390.805 to 390.925 or rules adopted thereunder, the department is vested with power to obtain injunctions and other appropriate relief against violations of any provisions of ORS 390.805 to 390.925 and any rules adopted under ORS 390.805 to 390.925 and agreements made under ORS 390.805 to 390.925. [1971 c.1 §13; 1981 c.798 §6]

1987 HB3019

DESCHUTES RIVER SCENIC WATERWAY RECREATION AREA

(Administration)

390.930 Definitions for ORS 390.930 to 390.940. As used in ORS 390.930 to 390.940:

(1) "Committee" means the Deschutes River Scenic Waterway Recreation Area Management Committee.

(2) "Department" means the State Parks and Recreation Department.

(3) "Managing agencies" includes:

(a) State Parks and Recreation Department;

(b) State Department of Fish and Wildlife;

(c) Confederated Tribes of the Warm Springs Indian Reservation;

(d) State Marine Board;

(e) Sherman, Wasco and Jefferson Counties;

(f) Oregon State Police;

(g) United States Bureau of Land Management;

(h) United States Bureau of Indian Affairs; and

(i) The City of Maupin.

(4) "Recreation area" means the Deschutes River Scenic Waterway Recreation Area created under ORS 390.932. [1987 c.624 §1; 1989 c.904 §26]

Note: Section 18, chapter 624, Oregon Laws 1987, provides:

Sec. 18. On June 30, 1993, section 1 of this Act [390.930] is amended to read:

390.930. As used in ORS 390.930 to 390.940:

(1) "Department" means the State Parks and Recreation Department.

(2) "Managing agencies" includes:

(a) State Parks and Recreation Department;

(b) State Department of Fish and Wildlife;

(c) Confederated Tribes of the Warm Springs Indian Reservation;

(d) State Marine Board;

(e) Sherman, Wasco and Jefferson Counties;

(f) Oregon State Police;

(g) United States Bureau of Land Management;

(h) United States Bureau of Indian Affairs; and

(i) The City of Maupin.

(3) "Recreation area" means the Deschutes River Scenic Waterway Recreation Area created under ORS 390.932.

390.932 Creation of Deschutes River Scenic Waterway Recreation Area. There is created the Deschutes River Scenic Waterway Recreation Area consisting of the segment of the Deschutes River scenic waterway under ORS 390.825 that is designated as the segment from immediately below the existing Pelton reregulating dam downstream approximately 100 miles to its confluence with the Columbia River, excluding the City of Maupin as its boundaries are constituted on October 4, 1977. [1987 c.624 §17]

390.934 Management of Deschutes River Scenic Waterway Recreation Area; plan; budget. (1) The State Parks and Recreation Department shall have primary management responsibility for the State of Oregon to manage the Deschutes River Scenic Waterway Recreation Area. In managing the recreation area, the department shall cooperate with other managing agencies having jurisdiction to manage all or part of the recreational area.

(2) Within two years after September 27, 1987, the committee shall develop, in cooperation with all managing agencies, a comprehensive plan for the Deschutes River Scenic Waterway Recreation Area. The committee shall use past studies of the Deschutes River for developing the plan which shall:

(a) Stress a segment by segment design; and

(b) Be in accordance with guidelines set forth in ORS 390.938.

(3) The department shall adopt a management plan by rule. The department shall implement the plan and shall prepare a budget for implementation taking into consideration the budget recommendations of the committee and the provisions of the management plan. [1987 c.624 §3]

Note: Section 19, chapter 624, Oregon Laws 1987, provides:

Sec. 19. On June 30, 1993, section 3 of this Act [390.934] is amended to read:

390.934. (1) The State Parks and Recreation Department shall have primary management responsibility for the State of Oregon to manage the Deschutes River

Scenic Waterway Recreation Area. In managing the recreation area, the department shall cooperate with other managing agencies having jurisdiction to manage all or part of the recreational area.

(2) The department shall adopt a management plan by rule. The department shall implement the plan and shall prepare a budget for implementation taking into consideration the provisions of the management plan. [1987 c.624 §19]

390.936 Rules. In accordance with applicable provisions of ORS 183.310 to 183.550, the department shall adopt rules necessary to carry out those provisions of ORS 390.930 to 390.940 that the department is charged with administering. The committee may review these rules and recommend changes to the department. [1987 c.624 §12]

Note: Section 22, chapter 624, Oregon Laws 1987, provides:

Sec. 22. On June 30, 1993, section 12 of this Act [390.936] is amended to read:

390.936. In accordance with applicable provisions of ORS 183.310 to 183.550, the department shall adopt rules necessary to carry out those provisions of ORS 390.930 to 390.940 that the department is charged with administering. [1987 c.624 §22]

390.938 Guidelines for management and development. The Deschutes River Scenic Waterway Recreation Area shall be managed and developed in accordance with the following guidelines:

(1) To the extent allowed under ORS 390.805 to 390.925, the recreational area shall be administered to allow continuance of compatible existing uses, while allowing a wide range of compatible river-oriented public outdoor recreation opportunities, to the extent that these do not impair substantially the natural beauty of the scenic waterway or diminish its esthetic, fish and wildlife, scientific and recreational values.

(2) The management plan shall include provisions for the development of appropriate facilities and services in the recreation area to meet resource needs for protection and preservation and user needs. This development may include but need not be limited to:

(a) River and car camp development;

(b) Sanitation stations for human waste and garbage;

(c) Parking and access road improvement;

(d) Signs indicating land ownership;

(e) Tree and riparian zone protection and restoration;

(f) Educational programs; and

(g) Initiation of additional volunteer programs.

(3) Before restricting access through the use of a permit system, all other management options shall be considered.

(4) Special emphasis shall be placed on protecting the recreation area and all adjacent property from recreationist-caused wildfires. This goal shall be equal in priority to the other primary goals set forth in this section. This protection shall include but not be limited to:

(a) Permanent adoption of a fire rule that provides the same protection as the fire rule in force during the 1986 fire season.

(b) Requiring boater passes to include the name of the group leader, date and section of river used.

(c) The establishment of information centers near major points of entry into the recreation area to provide users with information and education regarding the fire rules and general rules of the river.

(d) Conducting cadet patrols at the levels considered necessary to facilitate reasonable compliance with recreation area rules. [1987 c.624 §4]

Note: Section 20, chapter 624, Oregon Laws 1987, provides:

Sec. 20. On June 30, 1993, section 4 of this Act [390.938] is amended to read:

390.938. The Deschutes River Scenic Waterway Recreation Area shall be managed and developed in accordance with the following guidelines:

(1) To the extent allowed under ORS 390.805 to 390.925, the recreational area shall be administered to allow continuance of compatible existing uses, while allowing a wide range of compatible river-oriented public outdoor recreation opportunities, to the extent that these do not impair substantially the natural beauty of the scenic waterway or diminish its esthetic, fish and wildlife, scientific and recreational values.

(2) The management plan shall stress a segment by segment design and shall include provisions for the development of appropriate facilities and services in the recreation area to meet resource needs for protection and preservation and user needs. This development may include but need not be limited to:

(a) River and car camp development;

(b) Sanitation stations for human waste and garbage;

(c) Parking and access road improvement;

(d) Signs indicating land ownership;

(e) Tree and riparian zone protection and restoration;

(f) Educational programs; and

(g) Initiation of additional volunteer programs.

(3) Before restricting access through the use of a permit system, all other management options shall be considered.

(4) Special emphasis shall be placed on protecting the recreation area and all adjacent property from recreationist-caused wildfires. This goal shall be equal in priority to the other primary goals set forth in this section. This protection shall include but not be limited to:

(a) Permanent adoption of a fire rule that provides the same protection as the fire rule in force during the 1986 fire season.

(b) Requiring boater passes to include the name of the group leader, date and section of river used.

(c) The establishment of information centers near major points of entry into the recreation area to pro-

vide users with information and education regarding the fire rules and general rules of the river.

(d) Conducting cadet patrols at the levels considered necessary to facilitate reasonable compliance with recreation area rules. [1987 c.624 §20]

390.940 Relationship to other laws. The department, the committee, and state and local managing agencies shall manage the recreation area according to the provisions of ORS 390.805 to 390.925 and 390.930 to 390.940 and rules adopted under ORS 390.805 to 390.925 and 390.930 to 390.940. Federal and tribal managing agencies with jurisdiction over their respective lands and waters shall be encouraged to manage their lands and waters in a manner consistent with the provisions ORS 390.805 to 390.925 and 390.930 to 390.940. [1987 c.624 §5]

Note: Section 21, chapter 624, Oregon Laws 1987, provides:

Sec. 21. On June 30, 1993, section 5 of this Act [390.940] is amended to read:

390.940. The department and state and local managing agencies shall manage the recreation area according to the provisions of ORS 390.805 to 390.925 and 390.930 to 390.940 and rules adopted under ORS 390.805 to 390.925 and 390.930 to 390.940. Federal and tribal managing agencies with jurisdiction over their respective lands and waters shall be encouraged to manage their lands and waters in a manner consistent with the provisions of ORS 390.805 to 390.925 and 390.930 to 390.940. [1987 c.624 §21]

(Committee)

Note: Sections 6 to 11, 13, 14 and 23 of chapter 624, Oregon Laws 1987, provide:

Sec. 6. (1) There is established a Deschutes River Scenic Waterway Recreation Area Management Committee consisting of nine members. The Governor shall appoint one member from each of the following groups:

(a) Deschutes River noncommercial boaters.

(b) Deschutes River sports fishermen.

(c) Deschutes River permitted outfitters.

(d) Deschutes River area land-based users, campers or hikers.

(e) Private landowners in the Deschutes River area.

(f) Confederated Tribes of the Warm Springs Indian Reservation in consultation with the tribal council.

(g) Elected city or county officials from Wasco, Sherman or Jefferson Counties.

(h) The general public at large.

(2) In addition to the members appointed under subsection (1) of this section, the Governor shall appoint one member to serve as a liaison with the Legislative Assembly.

(3) Committee members shall be selected on the basis of their ability to contribute to the overall management and protection of recreation area resources and although they may advocate the position of particular interest groups they shall not have as their primary responsibility the advocacy of positions of interest groups from which they were selected.

(4) The term of office of each member is four years, but a member serves at the pleasure of the Governor. Before the expiration of the term of a member, the Governor shall appoint a successor whose term begins on July 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the Governor shall make an appointment to become immediately effective for the unexpired term. [1987 c.624 §6]

Sec. 7. (1) Notwithstanding the term of office specified by section 6 of this Act, of the members first appointed to the Deschutes River Scenic Waterway Recreation Area Management Committee:

(a) Three shall serve for a term ending June 30, 1989.

(b) Three shall serve for a term ending June 30, 1990.

(c) Three shall serve for a term ending June 30, 1991.

(2) The Governor shall appoint the first committee within 90 days after the effective date of this Act. [1987 c.624 §7]

Sec. 8. A member of the committee is entitled to expenses as provided in ORS 292.495. [1987 c.624 §8]

Sec. 9. (1) The committee shall select one of its members as chairperson and another as vice-chairperson, for such terms and with duties and powers necessary for the performance of the functions of such offices as the committee determines.

(2) A majority of the members of the committee constitutes a quorum for the transaction of business. [1987 c.624 §9]

Sec. 10. The committee shall meet at least once every three months at a place, day and hour determined by the committee. The committee also shall meet at other times and places specified by the call of the chairperson or of a majority of the members of the committee or at the call of the managing agencies. [1987 c.624 §10]

Sec. 11. (1) The Deschutes River Scenic Waterway Recreation Area Management Committee shall:

(a) Work with the State Parks and Recreation Department to manage the recreation area by:

(A) Working together to develop a recreation area comprehensive management plan.

(B) Communicating regularly and in a timely manner.

(C) Observing management implementation, evaluating progress and participating in subsequent planning.

(D) Consider implementation of a user fee system for the recreation area.

(b) Coordinate and recommend the final budget prepared for the recreation area after considering input about plans for expenditures by all managing agencies.

(c) Compile an annual report containing:

(A) Data collected for analysis of recreation area use and condition;

(B) Recommendations of changes in management policies; and

(C) Changes in rules to be implemented in the next recreational season.

(2) The State Parks and Recreation Department shall provide staff for the committee. [1987 c.624 §11]

Sec. 13. (1) To aid and advise the committee in the performance of the functions of the committee, the committee may establish such advisory and technical committees as the committee considers necessary. These technical or advisory committees may be continuing or temporary. The committee shall determine the representation, membership, terms and organization of the committees and shall appoint their members.

(2) Members of the technical or advisory committees are not entitled to compensation, but at the discretion of the committee may be reimbursed from funds available to the committee for actual and necessary travel and other expenses incurred by them in the per-

formance of their official duties, subject to ORS 292.495. [1987 c.624 §13]

Sec. 14. In addition to the uses permitted under ORS 390.848, moneys collected under ORS 390.848 may be used by the State Parks and Recreation Department for providing staff to the Deschutes River Scenic Waterway Recreation Area Management Committee. [1987 c.624 §14]

Sec. 23. Sections 6, 7, 8, 9, 10, 11, 13 and 14 of this Act are repealed June 30, 1993. [1987 c.624 §23]

RECREATION TRAILS

390.950 Short title. ORS 390.950 to 390.989 and 390.990 (4) may be cited as the Oregon Recreation Trails System Act. [1971 c.614 §1]

390.953 "Department" defined. As used in ORS 390.950 to 390.989, unless the context requires otherwise, "department" means the State Parks and Recreation Department. [1971 c.614 §2; 1989 c.904 §27]

390.956 Policy. (1) In order to provide for the ever-increasing outdoor recreation needs of an expanding resident and tourist population and in order to promote public access to, travel within and enjoyment and appreciation of, the open-air, outdoor areas of Oregon, trails should be established both near the urban areas of this state and within, adjacent to or connecting highly scenic areas more remotely located.

(2) The purpose of ORS 390.950 to 390.989 and 390.990 (4) is to provide the means for attaining these objectives by instituting a system of recreation trails in this state, by designating certain trails as the initial components of that system, and by prescribing the methods of which, and standards according to which, additional components may be added to the system. [1971 c.614 §3]

390.959 Composition of trails system; establishment of markers. The system of Oregon recreation trails shall be composed of trails established as provided in ORS 390.962 and 390.965. The department, in consultation with appropriate federal, state and local governmental agencies and public and private organizations, shall establish a uniform marker for the system of Oregon recreation trails. [1971 c.614 §4]

390.962 Criteria for establishing trails; location; statutes authorizing trails for motorized vehicles unaffected. (1) Upon finding that such trails will meet the criteria established in ORS 390.950 to 390.989 and 390.990 (4) and such supplementary criteria as the department may prescribe, the department is encouraged and empowered to establish and designate Oregon recreation trails:

(a) Over lands owned by the State of Oregon, by the Federal Government or by any county, municipality or other local governmental body, with the consent of the state agency, federal agency, county, municipality or other local governmental body having jurisdiction over the lands involved; or

(b) Over lands owned by private persons, in the manner and subject to the limitations provided in ORS 390.950 to 390.989 and 390.990 (4).

(2) In establishing such trails, the department shall give special recognition to the need for the establishment of recreation trails in or near, or reasonably accessible to, urban areas. Upon the establishment of any such trail, the department shall designate the primary kind of trail it is to be, based upon the mode or modes of travel to be permitted on such trail, including one or more of the following:

(a) Footpath.

(b) Horseback riding trail.

(c) Bicycle path.

(3) Nothing in ORS 390.950 to 390.989 and 390.990 (4) affects any other statute authorizing trails for motorized vehicles which is not inconsistent with ORS 390.950 to 390.989 and 390.990 (4). [1971 c.614 §5]

390.965 Hearing required; information to be considered. (1) The department may establish trails after public meetings in the areas of the state where trails are planned and only in accordance with the following criteria:

(a) Emphasis shall be given to the development of trails across public lands.

(b) No trails shall cross private land occupied by a residential dwelling, or upon which a residential dwelling is under construction, within 300 feet of such residential dwelling, without the consent of the owner.

(c) Trails shall be selected to minimize the adverse effects on adjacent landowners or users and their operations.

(d) Development and management of trails shall be designed to harmonize with and complement any established forest, agricultural, or other use plan that is compatible with the purposes of ORS 390.950 to 390.989 and 390.990 (4).

(2) Before establishing a trail the department shall consider at a public meeting the following information:

(a) The proposed route of such trail (including maps and illustrations) and the recommended mode or modes of travel to be permitted thereon;

(b) The areas adjacent to such trails, to be utilized for scenic, historic, natural, cultural or developmental purposes;

H. R. _____

RIVER ACT OF 1994

103D CONGRESS
2D SESSION

H. R. ____

IN THE HOUSE OF REPRESENTATIVES

Mr. ———— introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Land and Water Conservation Fund Act to authorize the Secretary of the Interior to establish a national registry of rivers and watersheds to be protected and restored, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE

This Act may be cited as the "River and Watershed Protection and Restoration Act of 1994".

SEC. 2. AMENDMENT OF LAND AND WATER CONSERVATION FUND ACT OF 1965.

The Land and Water Conservation Fund Act of 1965 is amended by adding the following at the end thereof:

"TITLE III-RIVER AND WATERSHED PROTECTION

"Sec. 301. Findings and purposes.
"Sec. 302. National river and watershed registry.
"Sec. 303. Nominations for inclusion.
"Sec. 304. Inclusion on registry.
"Sec. 305. Watershed councils.
"Sec. 306. Federal and State agencies.
"Sec. 307. Watershed protection and restoration standards and assistance.
"Sec. 308. Additional incentives.
"Sec. 309. Authorization of appropriations.
"Sec. 310. Definitions

"SEC. 301. FINDINGS AND PURPOSES.

"(a) FINDINGS.—The Congress finds that-

"(1) the biological integrity of river ecosystems is important to maintain biodiversity and the economic vitality of communities located in watersheds through which rivers flow, as well as the health and welfare of the American people;

"(2) the degradation of America's riverine ecosystems and the loss of riverine biodiversity have reached alarming levels, affecting all rivers in the United States, from the smallest streams to the largest rivers, such that entire hydrologic systems and all forms of riverine and riparian biodiversity are at risk; and

"(3) current Federal policies are fragmented, ineffective, and inadequate to address the decline of riverine and riparian ecosystems and to stem the continued degradation of riverine biodiversity because-

"(A) there is no overall national goal to protect and restore riverine systems and biodiversity; and

"(B) there is inadequate coordination among various Federal and State programs (including Federal programs providing financial and technical assistance) affecting river systems and watershed management.

"(b) PURPOSES.—The purpose of this title is to establish national policies and mechanisms to-

"(1) protect the remaining relatively undisturbed watershed, riparian ecosystems, flood plains, refuges for riverine biodiversity, and the network of small areas with greater concentrations of biological diversity ('hot spots') found throughout river systems;

"(2) restore disturbed watersheds, focusing first on less disturbed watersheds, headwaters areas, key ecosystem areas and biological and ecological 'hot spots' to provide better management between them,

and then ultimately linking and expanding the restored areas; and

"(3) involve the active participation of local communities and citizens in developing and implementing strategies to protect and restore all watersheds and in identifying new opportunities for economic revitalization which will sustain both the ecological health of the watersheds and the economic viability of affected communities.

"SEC. 302. NATIONAL RIVER AND WATERSHED REGISTRY.

"(a) ESTABLISHMENT.—The Secretary is authorized and directed to establish and maintain a National River and Watershed Registry to be comprised of rivers and associated watershed areas, the natural, scenic, cultural, fish and wildlife, or recreational values of which are to be protected or restored, as provided in this title.

"(b) CRITERIA FOR INCLUSION.—Within 180 days after the enactment of this title, the Secretary shall promulgate rules establishing criteria for the inclusion of rivers and associated watershed areas on the national registry. Such criteria shall include (but not be limited to) requirements that a river or associated watershed area may be included on the National Registry only if—

"(1) a petition for nomination has been submitted to the Secretary which contains a strategy, with

specific techniques and methods, for undertaking measures contributing to the protection and restoration of riverine and riparian resources within the watershed area concerned, and

"(2) the Secretary determines that the strategy is consistent with the standards published under section 8 and that nominating entity or entities have the ability to implement such strategy.

"SEC. 303. NOMINATIONS FOR INCLUSION.

"(a) SUBMISSION OF NOMINATION.—

"(1) STATE AGENCIES.—A nomination for the inclusion of any river and associated watershed area on the national registry may be submitted to the Secretary by the designated State agency for the State in which such river and associated watershed area is located on after providing notice and an opportunity of at least 60 days for public comment. The designated State agency shall notify the governing body of any Indian tribe with jurisdiction over any Indian lands in which such river and associated watershed area is located and provide an opportunity for such governing body to comment.

"(2) INDIAN TRIBES.—The governing body of an Indian Tribe with jurisdiction over Indian lands in which such river and associated watershed area is

located may also submit to the Secretary a nomination for inclusion of such river and associated watershed area.

"(3) OTHER ENTITIES.—A designated State agency shall also submit, within 90 days after receipt thereof (including a period of at least 60 days for public comment), a nomination which has been received by that agency from any of the following entities:

"(A) Another State agency within the State in which the river and associated watershed area is located.

"(B) A local government agency or a combination of local governments or a combination of State and local government agencies having jurisdiction over the river and associated watershed area covered by the nomination.

"(C) One or more owners of lands within the associated watershed area covered by the nomination.

"(D) A watershed council, watershed task force, or other similar group or organization concerned with river or watershed management.

"(E) A citizens group or nonprofit organization with membership residing in the watershed area covered by the nomination.

Where a river or associated watershed area is located in more than one State, the nomination shall be submitted by the designated State agencies of all such States.

"(b) STATE AGENCY REVIEW.—The designated State agency submitting a nomination received from another entity under subsection (a)(3) shall include in its submission of such nomination to the Secretary the agency's comments and recommendations with respect to such nomination, including any comments by the State agency regarding the compliance or noncompliance of the application with the requirements of this section and any comments of the State agency regarding the extent to which the applicant has the ability to implement the strategy contained in the nomination. At least 60 days before submitting any nomination to the Secretary, the designated State agency shall notify each affected unit of local government and each affected Tribal governing body and provide as full public notice as practicable (as determined by such State agency) within the area covered by nomination. The designated State agency and any Indian Tribe submitting a nomination shall promptly make a copy of each nomination, together with any supporting documents, available to

any person making a request for such nomination or documents, or both.

"(c) ASSISTANCE.—The designated State agency may assist any entity referred to in subsection (a)(3) in preparing a nomination under this section and in insuring that the entity making such nomination will have the ability to implement the strategy contained in the nomination. The Secretary of the Interior shall assist any Tribal governing body in preparing a nomination under this section.

"(d) CONTENTS OF NOMINATION.—A nomination under this section shall include each of the following:

"(1) A map of the watershed within which the river and associated watershed area covered by the nomination is located, including a depiction on such map of the river and associated watershed area.

"(2) Such data as may be available to the nominating entity regarding the natural, biological, scenic, cultural, fish and wildlife, or recreational values to be protected or restored pursuant to the nomination.

"(3) A strategy referred to in section 302(b).

"(4) A statement describing the ability or authority of the nominating party or parties to implement such strategy.

"(5) A brief description of the types of Federal, State and other assistance, if any, which will be needed in order to implement the strategy.

"(e) MODIFICATION OF REGISTRATION.—Any entity entitled to nominate a river and associated watershed area for inclusion on the registry may also submit a nomination—

"(1) to amend the registration of any such river and associated watershed area to modify the boundaries of the registered river segments and associated lands within the watershed concerned,

"(2) to modify the strategy referred to in section 302(b)(1), or

"(3) both.

Any nomination under this subsection shall be subject to the same requirements of this title as are applicable to original nominations.

"(f) CONSISTENCY AMONG NOMINATIONS AND STRATEGIES.—The Secretary shall resolve conflicts and inconsistencies between nominations, and between strategies in effect, for the same river and associated watershed area (including nominations and strategies for a single river or associated watershed area which is located in more than one State or which is located on Indian lands as well as other lands) and between proposed amendments to and

modifications of any strategy. The Secretary shall resolve such conflicts and inconsistencies in such manner as will best contribute to the protection and restoration of the watershed concerned in accordance with the standards published under section 307.

"SEC. 304. INCLUSION ON REGISTRY.

"(a) INCLUSION.—Within 90 days following the receipt of a completed nomination from a designated State agency or Indian Tribe, the Secretary shall include the nominated segment on the registry unless the Secretary determines that the nomination does not contain the elements required by section 303(d).

"(b) PERIODIC REVIEW.—

"(1) IN GENERAL.—Every 5 years after inclusion of a river and associated watershed area within any State on the national registry, the designated State agency shall review the implementation of the strategy referred to in section 302(b) applicable to such river and associated watershed area. Such State agency shall periodically report to the Secretary on the adequacy of each such strategy to protect and restore the watershed concerned and on the extent to which each such strategy is being implemented. Such report may include recommendations for modifications to the strategy which would con-

tribute to the protection and restoration of the watershed concerned in accordance with the standards published under section 8.

"(2) INDIAN LANDS.—Paragraph (1) shall not apply in the case of any portion of a river and associated watershed areas located on Indian lands. Every 5 years after inclusion of such a river and associated watershed area within any State on the national registry, the Secretary shall review the implementation of the strategy applicable to such river and associated watershed area to determine its adequacy to protect and restore the watershed concerned and the extent to which such strategy is being implemented.

"(c) REMOVAL FROM REGISTRY.—If the Secretary determines, after notice and opportunity for comment, that the strategy for any river and associated watershed area requires modification in order to adequately protect and restore the watershed concerned or that any such strategy is not being implemented according to its terms, the Secretary shall notify the entity or entities which nominated such river and associated watershed area and which are responsible for implementation of the strategy and each affected Indian Tribe. If the Secretary determines, within 180 days after notifying such entities, that correc-

tive action has not been undertaken to modify the strategy or begin implementing the strategy in accordance with its terms, the Secretary shall remove the river and associated watershed area from the national registry and notify all affected agencies and Indian Tribes that the provisions of this Act shall cease to apply to such river and associated watershed area. A nomination may not be submitted for inclusion of any river and associated watershed area which has been so removed for a period of at least 3 years after the date of such removal.

"(c) ASSISTANCE TO STATES.—Not more than 50 percent of the funds made available to State Water Quality Management Agencies under section 319 of the Clean Water Act for water quality management planning shall be available to designated State agencies to carry out this section.

"SEC. 305. WATERSHED COUNCILS.

"(a) APPLICATION FOR QUALIFICATION.—Whenever any river or associated watershed area is proposed to be nominated for inclusion on the registry under this title, or after any such river or associated watershed areas has been included on such registry, any watershed council, watershed task force, or other similar group or organization concerned with river or watershed management may apply to the Secretary for a determination that such group or

organization is a qualified watershed council eligible for assistance under section 307 and section 308. The Secretary shall act on any such application within 60 days after receipt thereof. If the Secretary determines that such group or organization meets the requirements of subsection (b), he shall publish notice of such determination in the Federal Register.

"(b) REQUIREMENTS FOR QUALIFICATION.—A group or body referred to in subsection (a) and any Tribal governing body shall be deemed to be a qualified watershed council for any watershed if such group or body or Tribal governing body has the authority to coordinate the development and implementation of a strategy contributing to the protection and restoration of the watershed. In addition, in the case of a group or body referred to in subsection (a), such group or body may be a qualified watershed council only if such group or body is comprised of:

"(1) owners of lands within the watershed or corporations doing business within the watershed;

"(2) members of citizens groups or other nonprofit organizations with membership residing in the watershed;

"(3) State or local government officials; or

"(4) any combination of the foregoing.

"(c) TECHNICAL AND FINANCIAL ASSISTANCE.—A qualified watershed council may enter into agreements pursuant to which State or local government officials with jurisdiction over any activity or activities within the watershed will provide technical or financial assistance or staff personnel to the council.

"(d) EXISTING WATERSHED COUNCILS.—The Secretary may, upon application from a watershed council, commission, task force, or other group or body formed to coordinate watershed planning which is in existence on the date of the enactment of this title, waive compliance with any requirement of paragraphs (1) through (4) of subsection (b) for that watershed council if the Secretary determines that the council has the authority to coordinate the development and implementation of a strategy contributing to the protection and restoration of the watershed and can otherwise carry out the purposes of this title.

"(e) WATERSHED COUNCIL NOT MANDATORY.—Nothing in this section shall be construed to require that a watershed council must be established for any registered watershed.

"SEC. 306. FEDERAL AND STATE AGENCIES.

"(a) NOTICE.—Before approving or authorizing any Federal or State or federally or State assisted undertaking that may adversely affect the implementation of a strategy

in effect for a river and associated watershed area listed on the national registry, the head of any Federal or State department, agency, or instrumentality having direct or indirect jurisdiction over the undertaking shall promptly notify the Secretary, the designated State agency, any affected Indian Tribe, the appropriate local governmental officials, and the public of the undertaking planned.

"(b) NO PRUDENT AND FEASIBLE ALTERNATIVE.—An approval or authorization referred to in subsection (a) may be issued if the Secretary (after consultation with such State, tribal, and local officials and after notice and opportunity for public comment) determines (1) that the undertaking is consistent with the strategy in effect for the river or watershed under this title, or (2) that there is no prudent and feasible alternative to the proposed approval or undertaking and all reasonable steps to mitigate the adverse effects of the undertaking on such strategy will be taken.

"(c) EXEMPTIONS.—The provisions of subsections (a) and (b) shall not apply to any undertaking—

"(1) where the head of the Federal agency proposing to approve or authorize the undertaking determines that the undertaking is necessary for reasons of national security,

"(2) in an area the President has declared to be a major disaster area under the Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.),

"(3) involving only the repair or reconstruction of a building or facility constructed before the date on which the river and associated watershed area concerned were included on the national registry, or

"(4) if the undertaking is a mandatory action required to be undertaken pursuant to Federal or state law.

For purposes of paragraph (3), the terms 'repair' and 'reconstruction' do not include the moving of a building or facility to another location or any substantial enlargement of a building or facility.

"SEC. 307. WATERSHED PROTECTION AND RESTORATION STANDARDS AND ASSISTANCE.

"(a) STANDARDS FOR WATERSHED PROTECTION AND RESTORATION.—The Secretary is authorized and directed to enter into an agreement with the National Academy of Sciences to develop and publish standards for the protection and restoration of rivers and associated watershed areas, including the protection and restoration riverine and riparian resources. The National Academy shall develop and publish such standards after appropriate

peer review and after opportunity for public comment. The standards shall, at a minimum require compliance with all Federal, State, and Tribal environmental laws, rules, and regulations, including, but not limited to those relating to water quality and groundwater protection.

"(b) TECHNICAL ASSISTANCE.—The Secretary, in cooperation with other appropriate departments and agencies of the United States, shall provide technical assistance and advice to qualified watershed councils and to State, Tribal and local governments, individuals, and private nonprofit organizations—

"(1) engaged in the restoration and conservation of rivers and associated watershed areas listed on the National River and Watershed Registry, or

"(2) proposing to nominate a river or associated watershed area, or both, for listing in accordance with section 304.

Such assistance may include technical assistance and advice in the identification and documentation of the natural, biological, scenic, cultural, fish and wildlife, or recreational values of any river and associated watershed area and in the preparation and implementation of a strategy for undertaking restoration or conservation measures. All such assistance shall be consistent with standards pub-

lished under subsection (a). Except in the case of Indian Tribes, such assistance shall be coordinated through the designated State agency.

"(c) ASSISTANCE FROM OTHER AGENCIES.—The Administrator of the Environmental Protection Agency and other appropriate departments and agencies of the United States, in consultation with the Secretary and in coordination with the designated State agency or affected Indian Tribe, are also authorized to provide technical assistance described in subsection (b), consistent with standards published under subsection (a).

"(d) FEDERAL TRUST RESPONSIBILITY FOR TRIBAL GOVERNMENTS.—The standards published under this section shall take into acount the Federal trust responsibility to Tribal governments.

"SEC. 308. ADDITIONAL INCENTIVES.

"(a) STATE REVOLVING FUNDS FOR WATERSHED RESTORATION AND CONSERVATION.—

"(1) GENERAL AUTHORITY.—(A) The Secretary shall make capitalization grants to the States and Indian Tribes under this subsection to be deposited in river and watershed restoration and conservation revolving funds established by the State or by the Tribal governing body.

"(B) Amounts deposited in any such revolving fund established by a State or Indian Tribe, including loan repayments and interest earned on such amounts, shall be used by the designated State agency for that State (or by the Indian Tribe) only for carrying out its responsibilities and authorities under other provisions of this title and for—

"(i) providing grants and loans to qualified watershed councils, or

"(ii) with the approval of a qualified watershed council, loans to other entities contributing to the strategy applicable to the river and watershed under this title.

Grants and loans under this subparagraph shall be used only for the purpose of carrying out projects contributing to the protection or restoration of rivers and associated watershed areas listed on the national registry. Not more than 20 percent of the amounts in any such revolving fund may be used by the designated State agency or by an Indian Tribe for purposes of carrying out its responsibilities and authorities under other provisions of this title.

"(C) Each such revolving fund shall be established, maintained, and credited with repayments and interest. The fund balance shall be available in

perpetuity for providing financial assistance under this section. To the extent amounts in such each such fund are not required for current obligation or expenditure, such amounts shall be invested by the State in interest bearing obligations of the State or of the United States.

"(D) A percentage of the total amount of grants made by the Secretary under this subsection to States and Indian Tribes in any fiscal year shall be set aside only for allocation to Indian Tribes. Such percentage shall be determined by dividing the total acreage of Indian lands in the United States by the total acreage of lands in the United States.

"(2) SPECIFIC REQUIREMENTS.—The Secretary shall enter into an agreement under this section with a State or Indian tribal governing body only after the State has established to the satisfaction of the Secretary that—

"(A) the State or Tribe will deposit all capitalization grants received from the Secretary under this subsection, together with all repayments and interest on such grants, in a revolving fund established by the State or Tribe in accordance with this subsection; and

"(B) the State or Tribe will deposit in the fund from State or Tribal moneys an amount equal to at least 10 percent of the total amount of all such capitalization grants on or before the date on which each grant payment is made to the State or Tribe.

"(3) FUND ADMINISTRATION.—(A) Each State or Tribe may use up to 4 percent of the monies in a revolving fund established under this subsection to cover the reasonable costs of administration of the assistance program under this subsection.

"(B) The Secretary shall promulgate such regulations as may be necessary to carry out the provisions of this section, including provisions to ensure that each State or Tribe commits and expends funds from revolving funds established under this subsection in accordance with applicable laws and that the State or Tribe uses accounting, audit, and fiscal procedures that conform to generally accepted accounting standards.

"(C) Each State or Tribe administering a revolving fund and assistance program under this subsection shall publish and submit to the Secretary a report every 2 years on its activities under this subsection, including the findings of the most recent

audit of the fund. The Secretary shall periodically audit all revolving funds established under this subsection in accordance with procedures established by the Comptroller General.

"(4) STAMPS.—In addition to such amounts as are made available for purposes of this subsection pursuant to section 309, the Secretary is authorized to arrange, by contract or otherwise, for the design, printing, and sale of river and watershed restoration stamps. Such stamps shall be issued and sold in the same manner as provided for of stamps issued under the Duck Stamp Act (16 U.S.C. 718 and following), except that such stamps shall be sold for such amount as the Secretary may determine and the net proceeds of all such sales shall be retained by the Secretary, notwithstanding sections 3302 and 1511 and following title 31 of the United States Code, and transferred to the revolving fund for the State in which such stamps are sold. In the case of stamps sold in any State which has not established a revolving fund under this subsection, the Secretary shall disburse such net proceeds to other States which have established such funds on a pro rata basis according to the volume of stamps sold in such other States. The provisions of subsections (b) and (c) of

section 5 of the Duck Stamp Act (16 U.S.C. 718e(b) and (c) shall apply to the stamps referred to in this section in the same manner as to stamps described in that Act. The court, in any action to impose fines or apply civil penalties with respect to a violation of the Clean Water Act, or of the Federal Power Act, affecting a waterway in any State shall have discretion to order that all or a portion of such fines or civil penalties be deposited in the State revolving fund established under this title for that State.

"(b) PRIORITIES.—The Secretary shall establish priorities for providing assistance under subsection (a). A higher priority for assistance shall be accorded river and watershed restoration and conservation projects to the extent that such projects meet the following criteria:

"(1) Projects proposed to be monitored and supervised by qualified watershed councils.

"(2) Projects for river or associated watershed areas which have a high potential for restoration or conservation.

"(3) Projects which have widespread local support in the affected communities

"(4) Projects which provide significant short—and long—term economic benefits, including job creation in areas with chronic unemployment.

"(5) Projects which provide for the participation of economically disadvantaged groups, including minorities and low income individuals.

"(6) Projects which contribute to the economic revitalization of communities within the watershed concerned.

"(7) Projects which contribute to the conversion of industrial, agricultural, or range practices in the affected watershed to less energy and water—intensive and more ecologically sound industrial, agricultural, or range practices.

"(8) Projects which provide for full participation by Indian Tribes.

"(c) ASSISTANCE PROVIDED UNDER CERTAIN RELATED PROVISIONS OF LAW.—

"(1) WATERSHED PROTECTION AND FLOOD PREVENTION ACT ASSISTANCE (PL 566).—(A) The purposes for which assistance may be provided under the Watershed Protection and Flood Prevention Act Assistance Act (Public Law 566; 16 U.S.C. 1001 and following) shall include projects which contribute to the protection and restoration of registered rivers and associated watershed areas in accordance with the standards published under section 8. Such projects shall be treated as 'works of im-

provement' within the meaning of section 2 of such Act (16 U.S.C. 1002), except that the 20 percent limitation contained in such section 2 relating to direct benefits for agriculture, and the other limitations set forth in section 5 of such Act (16 U.S.C.1005), shall not apply to any project referred to in the first sentence of this subparagraph which is carried out in a river and associated watershed area listed on the national registry.

"(B) For purposes of any assistance referred to in subparagraph (A), a qualified watershed council for any registered watershed and any other organization carrying out a protection or restoration strategy for a registered watershed under this title shall be deemed to be a 'local organization' within the meaning of section 2 of such Act (16 U.S.C. 1002) and any such qualified watershed council or other organization shall be eligible to receive assistance that Act.

"(C) Not more than 50 percent of the assistance available under that Act may be used for purposes of projects referred to in subparagraph (A) of this paragraph.

"(2) CONSERVATION RESERVE PROGRAM.—In entering into contracts and making payments under

section 1234 of the Food Security Act of 1985 (16 U.S.C. 3834), the Secretary of Agriculture shall waive the 50 percent cost sharing requirements of section 1234(b)(1) and (3) of that Act in the case of any contract entered into with a person for the purpose carrying out any project which is the Secretary determines to contribute to the protection and restoration of a river or associated watershed area listed on the national registry in accordance with a strategy adopted under this title for such river or associated watershed area.

"(3) FORESTRY INCENTIVES PROGRAM.—In distributing funds for the forestry incentives program under section 4 of the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2103), whenever any such funds are provided to a landowner to carrying out measures specified in the strategy adopted under this title for a registered river or associated watershed area, the term 95 percent shall be substituted for the term 75 percent in the cost sharing provisions of subsection (f) of such section 4.

"(4) WETLANDS RESERVE PROGRAM.—In establishing priorities for including lands in the Wetlands Reserve Program established under subchapter C of chapter 1 of title XII of the Food Security Act

of 1985 (16 U.S.C. 3837 and following), the Secretary of Agriculture shall, in addition to the priorities listed in section 1237C(d) of such Act (16 U.S.C. 3837c(d)), accord a high priority to lands within a watershed area listed on the registry under this title.

"(5) CONSERVATION EASEMENTS.—In carrying out the program authorized under section 3 of the Water Bank Act (16 U.S.C. 1302), the Secretary of Agriculture shall have the authority to enter into agreements with landowners and operators in areas referred to in such section 3 which areas are covered by a protection and restoration strategy adopted under this title for any river or associated watershed listed on the registry. In any such case such strategy shall apply in lieu of the conservation plan referred to in such section 3.

"(6) AGRICULTURAL CREDIT ACT OF 1978.—Assistance under the Agricultural Credit Act of 1978 (16 U.S.C. 2201 and following) shall be available for river and watershed restoration projects directly affecting rivers and associated watershed areas listed on the national registry under this title.

"(7) ASSISTANCE UNDER 319.—In providing assistance under section 319(h) and (i) of the Clean

Water Act, the Secretary shall give a priority to assistance which will further the implementation of any strategy referred to in section 702(b)(1) for a river and associated watershed area which is listed on the national registry under this title.

"(8) AGRICULTURAL CONSERVATION PROGRAM.—The policies and purposes of the agricultural conservation program enumerated in section 7 of the Soil Conservation and Domestic Allotment Act (16 U.S.C. 590g(a)) shall include the protection and restoration of rivers and associated watershed areas listed on the national registry under this title and the Secretary of Agriculture is authorized to carry out such policies and purposes by providing financial assistance under that Act for projects carried for the protection and restoration of such rivers and associated watershed areas in accordance with the standards published under section 8 of this title. In formulating the national program under section 8 of the Act of April 27, 1935 (16 U.S.C. 590g), and in approving farming practices under subsection (d) of such section 8, the Secretary shall take such standards published under section 8 of this title into account. No farming practices shall be approved under such subsection (d) directly affecting a river

or associated watershed area listed on the registry unless such practices are determined by the Secretary to be consistent with the strategy adopted for such watershed under this title.

"(9) ASSISTANCE FROM INTERIOR OR DEFENSE.—Whenever the Secretary of Secretary of the Interior, acting through the National Park Service or acting under section 6 of this Act, or the Secretary of Defense, acting through the Army Corps of Engineers, provides assistance to State or local agencies or to any other entities for any project affecting a river or watershed, such Secretary shall give a priority to assistance which will contribute to the protection or restoration (in accordance with the standards published under section 8) of a river or associated watershed area which is listed on the national registry under this title.

"SEC. 309. AUTHORIZATION OF APPROPRIATIONS.

"There is authorized to be appropriated such sums as may be necessary to carry out this title but not more than $13,000,000 for fiscal year 1995 and for each succeeding fiscal year.

"SEC. 310. DEFINITIONS

"As used in this title—

"(1) The term 'associated watershed area' means, with respect to any river, the riparian zone, flood plain zone, and any other area within the watershed of such river.

"(2) The term 'designated State agency' means the State agency having jurisdiction over river and watershed conservation and designated by the Governor to review and submit nominations under this title and to monitor implementation of conservation and restoration plans adopted under this title.

"(3) The term 'Indian lands' means Indian reservations, public domain Indian allotments, former Indian reservations in Oklahoma, land held by incorporated Native groups, regional corporations, and village corporations under the provisions of the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.), and dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State.

"(4) The term 'Indian tribe' means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settle-

ment Act (85 Stat. 688; 43 U.S.C. 1601 et seq.), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

"(5) The term 'National Registry' means the National Watershed Registry established under this title.

"(6) The term 'qualified watershed council' means a watershed council, watershed task force, or other similar group or organization concerned with river or watershed management which the Administration has determined to be a qualified watershed council under section 305.

"(7) The term 'restoration', when used in connection with a river, means any repairing of ecological damage in order to return, to the extent feasible, the river and the riverine—riparian ecosystem to its predisturbance condition. Such term includes reconstruction of physical hydrologic and morphologic conditions, chemical cleanup or adjustment, and biological manipulation, including revegetation, and the reintroduction of absent or currently nonviable native species.

"(8) The term 'restoration measure' means any identifiable action or sequence of actions contributing to the restoration of a river.

"(9) The term 'riparian lands' means, for any river, the portion of the terrestrial ecosystem that directly affects, or is directly affected by, the wetted zone adjacent to a river, including ground water and wetland areas adjacent to a river.

"(10) The term 'river' includes any stream, brook, creek, or tributary of a river and any segment of a river.

"(11) The term 'riverine and riparian resources' includes the natural, biological, scenic, cultural, fish and wildlife, or recreational values of the river and associated watershed area.

"(12) The term 'Secretary' means the Secretary of the Interior.

"(13) The term 'strategy' means a statement of mission and objectives together with an explanation of the methods to be used for achieving such mission and objectives and a timetable for undertaking action.

"(14) The term 'watershed' means, for any river or stream, the surface drainage area that contributes water to that river or stream.".

Summary of "RIVER AND WATERSHED PROTECTION AND RESTORATION ACT OF 1994"

FINDINGS AND PURPOSES

The biological integrity of river ecosystems in American is in rapid decline and should be protected to insure the health, welfare and economic vitality of the communities affected by these rivers and the watersheds associated with them. Current Federal policies show no specific national goal to protect and restore these systems and are fragmented, ineffective and unable to address the continued degradation of riverine systems.

The purpose of this act is to establish national policies which will protect the remaining relatively undisturbed components of our riverine systems, restore disturbed watersheds, headwaters and other key ecosystem elements within these systems, provide better management between these, ultimately linking and expanding the restored areas. This program is designed to foster and involve active participation of local communities and citizens in developing and implementing strategies to protect and restore their rivers and watersheds, and identify new opportunities for economic revitalization associated with these goals.

A NATIONAL RIVER AND WATERSHED REGISTRY

The Secretary of the Interior will establish and maintain a registry of rivers and associated watersheds which will catalog the related values which are to be protected and restored.

* Inclusion on the registry of a river segment or portion of a watershed will require a petition outlining a specific strategy to protect and restore the riverine resources concerned. Such petition shall contain a map of the river and associated watershed, such data as may be available, the strategy for protection and restoration, a statement of the authority and capability of the nominating party to carry out the strategy, and a brief description of the types of Federal, State or other assistance that will be necessary to carry out the strategy.

* The Secretary must determine that this strategy is consistent with established standards and that the nominating entity(s) has the authority and ability to implement the strategy.

NOMINATIONS AND INCLUSIONS

The nomination of a river segment or watershed area may be submitted to the Secretary by the State agency (which has been designated by the Governor of that State) in which it is located.

* Governing bodies of Indian Tribes do not need to go through the State agency, but may submit the nominations for rivers and watersheds associated with tribal lands directly to the Secretary.

* The agency must provide notice and a 60 day public comment period.

* Nominations must be forwarded to the Secretary by the agency within 90 days of receipt, and such nominations may be on behalf of the State agency or a local government or agency; one or more owners of lands within the area; a watershed council or other similar group; or a citizens group or non-profit organization with members in the area. All such nominating groups shall reside in or have authority relating to the area covered by the nomination.

* The State agency shall forward with the nomination to the Secretary the comments and recommendations of the agency regarding compliance with this Act and the applicant's ability to implement the strategy.

* Any person so requesting shall receive a copy of the nomination and supporting documents from the agency or the Indian Tribe. The agency may assist the nominating party with development of the nomination.

* Nominations to amend the registration of any river or watershed area may be made by any entity entitled to submit a nomination. Such amendments may modify the boundaries of the nomination and/or the strategy.

* The Secretary shall resolve conflicts and inconsistencies between nominations and strategies in such a manner as will best contribute to the standards developed under this Act.

INCLUSION ON THE REGISTRY

Within 90 days of the receipt of a nomination from the State agency or Indian Tribe, the Secretary shall place the segment on the Registry unless the Secretary determines that the nomination does not contain the required information.

* every five years after a segment or area is placed on the Registry, the State agency will review the implementation of the strategy for compliance and shall report to the Secretary. The report may also include recommendations of the agency for modifications in the strategy.

* For Indian Tribal lands on the registry, the Secretary shall review such lands every five years for compliance with the strategy.

* If the Secretary determines, after notice and comment, that the strategy requires modification in order to protect the values of the nomination, or that the strategy is not being implemented according to the original terms, the Secretary shall notify the nominating entity(s) of such. If corrective action by the responsible entity(s) is not undertaken within 180 days of such notice, the Secretary shall remove the segment or areas from the Registry, and all assistance shall be terminated. Once removed, a segment or area can not be nominated again for a period of three years.

WATERSHED COUNCILS

After a river segment or associated watershed area is proposed for nomination to the Registry, any watershed council, Tribal governing body or similar group concerned with the area nominated may apply to the Secretary for a determination that the group is a qualified watershed council and is eligible for assistance made available under this Act. The Secretary shall act on the request within 60 days and shall publish notice in the Federal Register if such a determination is made. A watershed council is not mandatory under this Act and the Secretary may waive the requirements for existing watershed councils or similar groups under certain circumstances. Requirements for qualification as the watershed council shall include:

* determination that such group has authority to coordinate the development and implementation of the protection and restoration strategy.

* the group must be comprised of owners of lands within the watershed; corporations doing business within the watershed; citizen groups or nonprofit organizations with members living within the watershed; State or local officials; or any combination of the above.

* A qualified watershed council may enter into agreements which will provide technical or financial assistance to the council to develop and implement the strategy.

FEDERAL AND STATE AGENCIES

Before approving or authorizing any Federal or State (or assisted) undertaking that may adversely affect the implementation of a strategy in effect for each river segment or watershed area, the head of the agency with direct or indirect authority over the proposed undertaking shall promptly notify the Secretary, the designated State agency, the governing Tribal body, the appropriate local officials, and the public of the planned undertaking. Approval of such planned undertaking shall be issued by the Secretary only after it is determined that the undertaking is consistent with the strategy or that there is no prudent and feasible alternative, in which case all reasonable steps must be taken to mitigate the adverse effects caused by the undertaking. Exemptions to this provision may be granted in limited circumstances.

WATERSHED PROTECTION AND RESTORATION STANDARDS AND ASSISTANCE

The Secretary is authorized to enter into agreement with the National Academy of Sciences to develop and publish standards, after peer review and opportunity for public comment, for the protection and restoration of rivers and associated watershed areas to be nominated to the Register.

* At a minimum these standards shall comply with all Federal, State, and Tribal environmental laws, rules and regulations.

* The Secretary, and other departments and agencies of the United States, shall provide technical assistance to qualified watershed councils, State, Tribal and local governments, individuals and nonprofit organizations engaged in the protection and restoration of the areas listed on the Registry, or proposing to nominated an area to the registry. This assistance will be coordinated through the designated state agency, except in the case of Indian Tribes.

ADDITIONAL INCENTIVES

The Secretary is authorized to make capitalization grants to the States and Indian Tribes to be deposited in perpetual revolving funds for purposes in accord with this Act.

* Loans and grants may be provided to qualified watershed councils, and to other entities with the approval of said council.

* Not more than 20% of the amount in the revolving fund may be used by the designated State agency or Indian Tribe to carry out its responsibilities and authority under this Act.

* A percentage of the total grant amount each fiscal year shall be allocated to Indian Tribes in proportion to the percentage of total lands held by Tribes in the United States.

* Not more than 50% of funds made available to States and Tribes under section 319 of the Clean Water Act shall be used to implement the provisions of this Act.

* Specific requirements the States and Tribes must meet to receive capitalization funds are set forth in the Act.

* In addition, the Secretary is authorized to arrange for the production and sale of river and watershed restoration stamps, under conditions similar to those set out in the Duck Stamp Act. The proceeds from the sale of these stamps shall be transferred to the revolving funds of the State in which they were sold.

* The Secretary shall establish priorities for assistance from the revolving funds and will include the following: 1. projects which will be monitored and supervised by watershed councils; 2. project areas which have a high potential for restoration or conservation; 3. projects which have widespread local support; 4. projects which provide significant short and long term economic benefits; 5. projects which provide for the participation of economically disadvantaged groups; and 6. projects which contribute to the economic revitalization of communities within the watershed; 7. projects which contribute to the conversion of land use to one that consumes less energy and/or water; and 8. projects which allow for full participation by Indian Tribes.

Assistance under other related provisions of law are listed and made available for the purposes of this Act and include: Watershed Protection and Flood Prevention Act (PL 566); Conservation Reserve Program (16 U.S.C. 3834, section 1234); Forestry Incentives Program (16 U.S.C. 2103, section 4); Wetlands Reserve Program (16 U.S.C. 3837); Conservation Easements under the Water Bank Act (16 U.S.C. 1302, section 3); Agricultural Credit Act of 1978 (16 U.S.C. 2201); Assistance under section 319 of the Clean Water Act; Agricultural Conservation Act (16 U.S.C. 590g); and priority for various programs under the authority of the Department of the Interior and the Department of Defense.

AUTHORIZATION OF APPROPRIATIONS

The Act authorizes $13 million in 1994 and each year after to carry out the purposes of this Act.

The Imperative of
RIVER AND WATERSHED PROTECTION AND RESTORATION

The State of the Rivers

The degradation of America's riverine systems and the extinction of riverine-riparian biodiversity have reached alarming levels. Not one river system in America has been spared. Fisheries, surface and groundwater quality and quantity produced by watershed ecosystems, and entire aquatic food chains are at risk nationwide.

For example, of the 3.2 million miles of rivers in the contiguous 48 states, only about 2% remain healthy enough to be considered high quality and worthy of Wild and Scenic protection, leaving more than 98% of the miles with no real protection options. Of mid-sized rivers (200 Km long) only 42 have not been dammed.

A recent national study suggests that from one-third to three-fourths of aquatic species nationwide are rare to extinct, and that aquatic species are disappearing at a faster rate than terrestrial species. Fish are perhaps the best indicators of the integrity of the river systems they inhabit. Habitat alteration has been found to be the greatest cause of degradation for north American fish and other forms of aquatic biodiversity. Some of the nation's top scientists assert that the degradation or loss of riparian ecosystems nationwide, the keystone to maintaining healthy riverine ecosystems, is between 80 - 90%. The Ohio EPA believes that at least 50% of the nation's rivers do not meet water quality standards when bio-criteria are included. The nation's river's and associated biodiversity are in serious trouble.

Despite expenditures of at least $473 billion to build, operate, and administer water pollution control facilities since 1970, the nation's water resources continue to decline in both quality and quantity. Soil in America is eroding at the rate of 4 billion tons per year, costing the nation an estimated $3.2 billion each year. One-third of the soil eroded by water from agricultural land enters streams and other bodies of water, annually causing between $2-9 billion in off-site damage to water-related activities such as recreation, water storage, irrigation and navigation.

Every segment of our society has been affected by and pays heavy direct and indirect ecological, financial, and job-related costs for the degradation of America's riverine systems and biodiversity. The nation's existing riverine protection and restoration policies are inadequate and have failed to address the crisis. Entirely new strategies and policies must be established quickly to stave off the impending collapse of many riverine systems and to prevent wholesale biological extinctions.

The Problems That Must Be Addressed

The ecological problems: The problems facing America's riverine systems are caused by human activities. The cumulative result of the many human impacts is called *ecosystem simplification*: huge reductions in the life-supporting complexity and diversity of watershed and riverine ecosystems. As the complexity and diversity is reduced, the system's ability to self-repair is eroded, leaving the system with reduced ability to perform ecological functions and biodiversity seriously reduced. In other words, the biological integrity of the system is weakened or destroyed. The most damaging impacts usually result from changes in the basic structure and function of riverine-riparian ecosystems and habitats.

Riverine ecosystem simplification is caused by the following human-related impacts:

* changes in water quantity or flow due to irrigation and other withdrawals

* the modification of channel and riparian ecosystem morphology caused by damming, reservoirs, channelization, drainage and filling of wetlands, and dredging for navigation

* excessive nonpoint-source pollution, including erosion and sedimentation caused by damaging land-use practices, including agriculture, forestry, and urbanization;

* the deterioration of substrate quality or stability;

* the degradation of chemical water quality through the addition of point-source contaminants

* the decline of native fish and other species from over harvest and intentional or accidental poisoning, and

* the introduction of exotic species.

These activities may occur anywhere within the watershed, along the riparian or floodplain areas, or in river channels.

The policy problems: All levels of government have failed to stem the degradation of America's riverine systems and the extinction of riverine-riparian biodiversity. This failure has many dimensions. The United States has no national goal to protect or restore riverine ecosystems or riverine-riparian biodiversity. Consequently, there are no national policies that mandate coordinated federal, state, and private management and conservation of whole riverine systems. Traditional river assessments have been ineffective because they fail to assess the biological status of America's riverine systems. No policies provide self-sustaining levels of riverine-riparian biodiversity. No policies require the identification and protection of the remaining healthy riverine habitats. No effective riverine restoration policies exist at any level of government. Finally, no policies effectively integrate riverine protection and restoration with local economic benefits and community revitalization.

The Watershed Ecosystem: A Dynamic System

Most people think of rivers simply as water flowing through a channel. This narrow view fails to capture the actual complexity and diversity of riverine systems, and is one of the reasons for failed policies. In the past 15 years many scientific studies and reports have documented that riverine systems are intimately coupled with and created by the characteristics of their *catchment basins*, or *watersheds*. The concept of the watershed includes four-dimensional processes that connect the longitudinal (upstream-downstream), lateral (floodplains-upland) and vertical (hyporheic or groundwater zone-stream channel) dimensions, each differing temporally.

Watersheds are ecosystems composed of a mosaic of different land or terrestrial "patches" that are connected and drained by a network of streams. In turn, the flowing water environment is composed of a mosaic of habitats in which materials and energy are transferred. These habitats are connected through biologically diverse food webs. Human activities often fragment and disconnect the habitat patches if management is not planned and implemented from an ecosystem and watershed perspective. In-stream conditions are largely determined by processes occurring within the watershed and cannot be isolated from or manipulated independent of this context. Management and conservation activities which do not fully address this watershed perspective run the risk of being ineffective at best and destructive at worst.

The Private Lands Strategy

As an initial component of a comprehensive new approach to the crisis facing America's riverine systems and biodiversity we are proposing a strategic national community and ecosystem based watershed restoration initiative. We propose the establishment of a *River and Watershed Protection and Restoration Act*. This initiative would support existing programs and launch new voluntary, non-regulatory local efforts to recover riverine systems on private lands.

Many local river restoration efforts are under way throughout the nation. However, because no federal umbrella policy exists to guide and support these efforts, most are piecemeal and limited in their effectiveness. In addition, most fail to generate local jobs in restoration or community revitalization projects, or to support appropriate economic conversions and are therefore often opposed by rural communities. At times well meaning programs can exacerbate or precipitate riverine problems. A new enabling mechanism is needed to help local programs become more effective and to proliferate nationwide.

Communities and citizen groups concerned about a river segment or system with special values or problems would, after approval by the state, petition the Secretary of the Interior for the river's inclusion in the River and Watershed Protection and Restoration Act. The Secretary would place the system on the River and Watershed Protection and Restoration Act if it is determined that the system holds special values or problems and if the local communities demonstrate sufficient commitment to implementing a riverine/watershed restoration strategy. No act of Congress or state legislature would be required.

Protection and restoration: Inclusion in the Registry would initiate a process by which local citizens and communities, working with state and federal incentives and technical assistance, could establish an independent, non-profit watershed council that would bring together all the interest and affected groups and citizens to plan and implement a watershed restoration plan. The strategy would be based on a set of federal criteria and directions, yet would not impose complicated basinwide land-use planning procedures. Instead, it might focus on protection and restoration of the more narrowly defined riparian areas, floodplains, and biological hot spots along with retirement or modification of dams, dikes, levees, and channelizations, and other sedimentation and run-off reduction strategies. The restoration plan should also provide a means of protecting open spaces for biological purposes. The programs would be encouraged to be linked with programs for the restoration of contiguous watersheds on federal lands, where such programs exist or may be started. Therefore, a key component of the plans would be to develop a system-wide policy coordination and consistency mechanism.

The restoration plans could be used by states to develop a comprehensive state hydroelectric plan for the river. The plan would be included as part of a state comprehensive hydroelectric plan, thus meeting Section 10(a) requirements of the Federal Power Act. The River and Watershed Protection and Restoration Act could therefore provide additional weight to the Federal Energy Regulatory Commission to deny hydroelectric license applications and allow states to deny Section 401 Clean Water Act permit requests for hydroelectric projects on the river.

Local community enhancement: As with the federal lands program, a major by-product of the program would be to generate local jobs in restoration technologies, compatible community revitalization projects, and appropriate economic conversions. To encourage participation and support for the process, a package of financial, tax, and administrative incentives are provided.

The River and Watershed Protection and Restoration Act is aimed at supporting local, voluntary, non-regulatory efforts to address private-land riverine systems and is therefore not a comprehensive solution. As stated, it is needed to support the many ongoing local efforts that have sprouted across the country but that currently are limited in effectiveness. It should also stimulate the growth of many new local efforts nationwide. As such, River and Watershed Protection and Restoration Act would be a starting point from which to nurture more comprehensive efforts from the ground up.

Many states have become active in riverine restoration and have begun to support local efforts. However, states have limited ability to influence federally licensed or constructed water projects or federal lands where they play a major role in the watershed. Further, many states face increasingly limited financial and technical resources. Most state programs also fail to directly support the creation of jobs in restoration technologies, compatible community revitalization projects or economic conversions to restore rivers. Federal leadership, guidance and incentives are required to make local programs more effective and abundant nationwide.

QUESTIONS AND ANSWERS ABOUT THE RIVER AND WATERSHED PROTECTION AND RESTORATION ACT OF 1994

What is the purpose of this bill?

To provide a new, unique mechanism to empower local river and watershed conservation advocates, Indian Tribes, communities, businesses and landowners to protect and restore aquatic resource values in rivers and watersheds of importance to them.

The bill provides a means for these local conservationists to tailor and integrate local, state and federal incentive and regulatory tools for the benefit of rivers and watersheds.

Why is the bill needed now?

Because rivers and streams around the nation are in decline and need more help. About one third of the nation's waters do not meet state water quality standards; many other rivers and streams are threatened by a variety of pollutants and human activities. More than one third of North American fish species are classified by the Nature Conservancy as rare, imperiled, critically imperiled, extinct or possibly extinct. This bill harnesses the power of local grassroots and community-based conservation efforts to provide a new and better way of protecting and restoring these resources.

Is the bill trying to protect remaining high quality rivers and watersheds or restore degraded rivers and watersheds?

Both. The conservation mechanism of the bill is flexible to allow for both protection of high quality watersheds and restoration of degraded but restorable aquatic systems. It allows the protection and restoration strategy to be dictated by the needs of the river or watershed of interest.

What is in the bill that will help local river and watershed conservationists?

The bill provides local, grassroots conservationists a mechanism that gives state and federal sanction of their own protection and restoration strategies.

This sanction is in the form of placing the watershed or river on a National River and Watershed Registry. Placement on the registry will allow local conservationists to obtain federal funding, technical assistance from federal and state aquatic resource agencies, and protection from activities that are inconsistent with the river or watershed conservation strategy.

How does this mechanism work?

To get a watershed or river placed on the registry, a state, Indian Tribe, local government, watershed council, or local citizens may nominate a watershed, river, or river segment of interest for registry inclusion to the Secretary of Interior.

The nomination must include a map of the watershed, a description of the protection or restoration strategy for the watershed, description of the aquatic values that are to be protected or restored by the strategy, a description of the types of assistance needed to implement the strategy, and proof that the nominating entity has the authority carry-out the strategy.

Following full public review and comment on the nomination and careful review by the appropriate state agency, the Secretary must place the watershed on the registry unless the agency determines the nomination to be inadequate. Nominations by Indian Tribes do not require State review.

What distinguishes this bill from the Wild and Scenic Rivers Act and the Clean Water Act?

The Wild and Scenic Rivers Act gives protection for high quality rivers. The Clean Water Act primarily is a federal and state regulatory program controlling discharge of pollution into all waters of the United States for the purpose of protecting and restoring all waters. Generally, both of these programs are "top-down", federal mandates. In contrast, the River and Watershed bill provides a "bottom-up", local conservationist-driven river and watershed conservation program.

Unlike the Wild and Scenic Rivers Act, the River and Watershed bill allows for restoration of rivers. Further, this bill emphasizes protection of rivers and watersheds, not just rivers and adjacent riparian areas.

Unlike the Clean Water Act, the River and Watershed bill is not a regulatory approach to conserving rivers and watersheds. It is largely a planning, local cooperation, and financial incentive-driven approach to river protection. **It is also entirely voluntary**. Also, this bill emphasizes watershed protection and restoration, rather than direct control of pollution entering waterways and wetlands as does the current Clean Water Act.

Aren't state river protection programs already doing what the bill proposes to do?

A few states do have small but relatively effective river conservation programs, such as South Carolina, Oregon, and Massachusetts; most states do not. No state has a truly vigorous, comprehensive river conservation program.

Although the River and Watershed Protection and Restoration bill does not provide for such a comprehensive program either, it will invigorate and improve existing programs, and it will foster state programs where there are now none. Why? Because of the bill's Registry conservation mechanism and the funding associated with it.

Why was DOI chosen as the federal agency to administer the law?

By virtue of DOI's considerable experience with watershed and river management programs, DOI is probably best suited to administering this program.

However, EPA and the Soil Conservation Service (Dept. of Agriculture) also have considerable experience with managing water quality and in interacting with landowners and local governments. The River and Watershed Protection and Restoration bill includes significant coordination and consultation roles for these agencies.

Which state agency will administer the Registry program?

The bill requires each state's Governor to determine the state agency best suited to fulfilling the considerable state role mandated by the bill. Indian Tribes will not be subject to state level administration for rivers and watersheds occurring on their lands.

How much will implementation of the bill cost?

The bill authorizes $13 million to be invested in this program. This figure is based on anticipated need of several hundred thousand dollars for the federal agencies to begin program implementation and several million dollars in initial grants to local watershed councils and other eligible entities to commence conservation activities on approved registry rivers and watersheds. It is anticipated that additional funding will be required to fuel the River and Watershed programs in each state and on tribal lands once the program hits full stride.

What are prudent and feasible alternatives determinations?

This provision of the bill provides federal protection to a strategy developed by local communities, conservationists, or Indian Tribes that have been approved and placed on the Registry. It provides a mechanism to help ensure that federally and state permitted or funded activities do not adversely effect implementation of the protection and restoration strategies. For example, developers of a proposed new, federally-permitted dam that would adversely affect implementation of a watershed strategy would have to prove that there was no prudent and feasible alternative to dam construction. Upon public notice and comment and review of the developer's application, EPA may determine that a prudent and feasible alternative did exist and deny the federal permits, disallowing the dam.

What do the terms "feasible" and "prudent" really mean?

These terms have been developed and used for many years in other federal programs, such as the Federal Highway Act, the National Environmental Policy Act, and the Clean Water Act. Agencies implementing these terms weigh carefully several factors, including relative costs associated with various alternatives and environmental values to be adversely affected by the alternative approaches, before making these determinations. We envision similar application of these terms in this bill.

Since several federal and state water laws already exist, why is the feasible and prudent provision necessary?

This unique, locally-driven program includes unique, federal protection mechanism. As stated above, this bill empowers local landowners, communities, Indian Tribes and watershed conservationists to develop protection and restoration strategies necessary to conserve watersheds of value to them. These strategies will entail integrated use of state and federal programs to achieve the goals of the particular strategy. Thus, an overarching protection provision is needed to ensure that the goals of each strategy are not compromised by another federal or state approved activity.

What is the purpose of watershed protection and restoration standards?

The bill directs DOI to contract with the National Academy of Sciences to develop watershed protection and restoration standards. The proposed standards would be subject to full peer and public review. The purpose of these standards is to ensure that protection and restoration strategies are scientifically sound, ensure quality control on implementation of the strategies, and to help guide "feasible and prudent alternative" decisions for activities potentially posing an adverse impact on the strategy.

How will the Registry program be financed?

The bill proposes three methods of funding the registry program:

1) establishment of a new State Revolving Fund for the program;
2) establishment of a river and watershed stamp program, modeled after the federal Duck Stamp program, with revenues transferred back through to the states from which the stamps were sold; and
3) re-allocation of some funds from several existing programs, such as the SCS Watershed Protection and Flood Prevention program (P.L. 566 program) and the Conservation Reserve program of the Food Security Act (Farm Bill).

Does this bill authorize federal land acquisition, condemnation, or land use control?

No, the bill does not authorize any of these, nor does it modify, in any way, existing regulatory authorities of local, state, and federal agencies.

NEWS ARTICLES

The Sacramento Bee
NOVEMBER 18, 1993

Waterways deteriorating badly, report says

Rivers: Local coalitions are urged

By Jim Mayer
Bee Staff Writer

On the compact Smith River near the Oregon border, timber cutting and gravel mining are blamed for declining salmon.

Along California's share of the Colorado River, more species are nearing extinction than on any other stream in the state.

From one end of California to the other – and on virtually every watershed in between – nearly 8,000 miles of streams are imperiled, concludes a government report released Wednesday.

"Our rivers are broken, and I mean just about every river in the state," said Diana Jacobs, an ecologist and principal contributor to the State Lands Commission report.

Jacobs, who has made a career studying California streams, said the breadth of the damage was startling. She expected the concrete-lined Los Angeles River to be sterile, but was disappointed to find even remote mountain streams to be choked with sediment from careless timber harvests.

"It was surprising and heartbreaking," Jacobs said.

The Lands Commission is a state agency with jurisdiction over tidelands and river bottoms. The document is titled "California's Rivers: A Public Trust Report." The public trust is legal doctrine recently applied by the courts to protect natural assets beyond economically coveted resources.

The commission hopes the rivers report will be a catalyst for legislation leading to greater protections and more restoration efforts. At a conference where the document was released, Sen. Mike Thompson, D-St. Helena and chairman of the Senate Natural Resources and Wildlife Committee, said he would hold hearings on the issue in Northern and Southern California.

The report itself does not contain recommendations on what should be done to arrest the decline of rivers or to settle longstanding water disputes. Rather, the report compiles the consequences of more than 150 years of intensifying development – mining, water diversions, flood control projects, and pollution.

The report blames those developments for nearly eliminating riverside forests, wetlands and the wildlife that depended on them: Nearly two-thirds of the 116 native fish in California are nearing extinction or are extinct. Another 80 mammals, birds, reptiles and amphibians dependent on streamside habitats have suffered similar fates.

In addition, the construction of dams and levees and development of floodplains have stymied the natural regeneration of habitat, the report said.

"We are all responsible," Jacobs said. "If you live in a wood house. If you eat fish. If you eat beef. If you eat lettuce and tomatoes. If you live behind a levee or drive on paved roads, you are part of the mismanagement and need to be part of the solution."

Jacobs said the upside is if given room, rivers will naturally regenerate the forests and wetlands that generate both economic and noneconomic benefits.

"These are not environmental wishes or theories, these are facts we have to live with," Jacobs said.

Charles Warren, executive officer of the Lands Commission, said he hoped political leaders will use the report to build a coalition of local conservation groups and to muster "scientific justifications" for restoring streams. "It is certainly no secret here that there will be many who don't share the new values we are talking about," Warren said.

Former Sacramento Mayor Anne Rudin, who attended the conference, said community officials who adopt broad general plans and approve incremental developments need to be aware of the cumulative problems affecting rivers.

"All the things you are talking about get right down to local land use planning," Rudin said.

State's rivers going downhill?

Bee/Owen Brov

Fishermen crowd the American River near the Nimbus Dam on Wednesday. A report says most of California's native fish are extinct or imperiled.

West Coast Fisherman

December 1993

Editorial

by Mark Hoffeditz

California's Rivers and Protecting the Public Trust

ASK MOST California outdoorsmen about the State Lands Commission, and they'll respond with something like, "The what?" This state agency receives nowhere near the attention of say, the California Department of Fish and Game or even the Department of Water Resources. The State Lands Commission may be small, but it packs a lot of wallop (*no pun intended, for you fishing tackle tax fans*).

What the Commission does is enforce the Doctrine of Public Trust. (*Did I hear another round of "whats" out there?*) Okay, the Doctrine of Public Trust traces its roots through English common law all the way to early Roman law. It holds that "natural law" dictates that certain natural resources (*i.e., air, running water, the sea and its shores*) are all available to all humankind. Navigable waterways were considered "common highways, forever free." Currently in California, Public Trust Doctrine ensures the right of the public to use the state's water resources for "navigation, fisheries, commerce, environmental preservation and recreation...." and a variety of other, similar uses.

The State Lands Commission holds title to and manages approximately four million acres of California coastline and tidelands, and all navigable rivers, streams, and lakes. These lands cannot be sold and must be used for the purposes mentioned above.

The State Lands Commission holds title to and manages approximately four million acres of California coastline and tidelands, and all navigable rivers, streams, and lakes.

The Commission recently issued a report titled: *California's Rivers – A Public Trust Report*. The last time this agency issued a report, it had a big impact. *The Delta Estuary – California's Inland Coast: a Public Trust Report* turned plenty of heads and ultimately resulted in California Legislature's *Delta Protection Act of 1992*. I would be greatly surprised if this report generates any less response.

In essence, the report says that California's rivers are among the most damaged of all natural ecosystems in the state. The causes of the problems with the rivers include water pollution, dams, channel clearing and straightening, aggregate mining, and poor land use practices related to logging, grazing, farming, and urban development.

The report continued, saying that over two-thirds of the 116 native California fishes have declined to such a degree that they are state species of concern. Additionally, a number of these species are extinct either totally or within the boundaries of the state. Native populations of Pacific salmon, steelhead, and coastal cutthroat are highly threatened, with at least 39 unique populations or "stocks" (*including the Sacramento River winter-run chinook*) at risk of extinction. Twenty-one stocks have already been lost.

Only five to 10 percent of riparian forests (*unique woodland and forest vegetation that grows along rivers and streams*) remain from those that existed in 1850. This loss has coincided with the decline or endangerment of over 80 wildlife species of amphibians, reptiles, birds, and mammals.

The conclusion drawn is that California's rivers are stressed to the point where their viability as sustainable ecosystems is in danger. The report calls for a comprehensive program of watershed and river basin protection and restoration. It also recommends that agencies that issue permits for activities that degrade the rivers take action to alter or phase out those activities.

The report went on to cite the National Research Council's *Restoration of Aquatic Ecosystems* report, which called for a new national priority to be given to the restoration of the nation's rivers. The goal mentioned was to restore 400,000 miles of river's and streams over the next 20 years.

The Commission's report concluded by urging the legislature to hold public hearings, consider the findings of public agencies, and listen to academic, scientific, and private sector interests. Then, it should recommend actions for the protection and restoration of California's rivers.

After the actions that followed the Commission's Delta report, it seems logical to expect a similar reaction after this one. The difference here is that the area involved is so much greater and the activities affected are so much farther reaching than those associated with the Delta, that it is difficult to imagine the magnitude of the changes that will be necessary to turn things around. ■

LOS ANGELES TIMES

2-2-94

White House Unveils Plan to Further Clean U.S. Waters

■ Environment:
Proposals would rewrite and expand landmark 1972 federal act. Cutting flow of remaining toxics is termed 'the hard part.'

By MELISSA HEALY
TIMES STAFF WRITER

WASHINGTON—The Clinton Administration, grappling with what it called "the hard part" of water pollution control, on Tuesday unveiled a series of initiatives designed to improve the quality of the nation's waterways.

In its broadest terms, the plan would streamline regulations, increase federal funds available to towns and cities and reduce the use of some toxic pollutants, such as chlorine, by American industry.

The package of proposals, which must be weighed by what appears to be a largely receptive Congress, would extend the life—and the reach—of the 1972 Clean Water Act, a landmark piece of environmental legislation that has dramatically cut the flow of industrial waste and toxins into American waters. Carol Browner, administrator of the Environmental Protection Agency, called that "the easy part."

But with 38% of the country's lakes, rivers and estuaries still too polluted for swimming or drinking, the Administration has designed a plan to attack still-unregulated sources of pollution. Those include agricultural runoff and municipal waste-water facilities that spill raw sewage into lakes and rivers when rain or melting snow cause them to overflow.

The plan would cost Americans roughly $70 billion a year to implement, an increase of roughly $6 billion over current spending by towns, cities and businesses on water pollution control. But Administration officials insisted that Americans will save if the package is adopted by Congress: Browner said that the changes would cost Americans $30 billion less to implement than would the law in its current form.

At stake in the debate is the health of rivers, lakes, estuaries and wetlands throughout the nation. Roughly 1,300 bodies of water have become so polluted that state authorities have had to limit public consumption of fish and shellfish that live in them.

While 20 years of controls have stemmed the flow of toxic chemicals into the water by major industrial enterprises, farmers and smaller industries continue to pour 740 million pounds of toxic chemicals into waterways and municipal sewers each year.

Such pollution causes as many as 3.2 million cases of intestinal disease yearly and is widely believed to contribute to cancer, nervous disorders and birth defects, officials said.

Citing the potential for these more serious effects, the Administration asked Congress on Tuesday to approve a federal study that would recommend whether and how to substitute, reduce or prohibit the use of chlorine in the United States.

Chlorine and related compounds, which are used at lower levels to clean water, are thought to lead to the creation of dioxin, which has been linked to birth defects and cancer.

Environmental groups and several key lawmakers hailed the Administration's proposal. But environmental groups expressed concern that the government's willingness to give states new latitude in enforcing anti-pollution measures might allow some polluters to escape censure.

Rep. Gerry E. Studds (D-Mass.), chairman of a House committee that will help draft a new Clean Water Act, also warned that existing federal funds will not be enough to pay for communities to improve their water facilities.

Studds gave the Administration what he called a "friendly nudge" to adopt a proposal under which the federal government would raise $4 billion in new environmental taxes on commercial and industrial water users and the makers of pesticides, fertilizers and animal feed.

To reduce the diffuse sources of pollution such as agricultural runoff and storm overflow, the new legislative proposal would give states almost eight years to implement pollution controls to reduce farm runoff. The proposal also would make federal money available to states to fund activities designed to reduce pollutants from fields and storm drains.

While such aid has been provided in the past, the federal government has placed strict limits on the types of projects that can be undertaken with the money. But under the Clinton plan, states also would be given new latitude in parceling out federal funds to communities.

For the first time, for instance, the funds could be used to create wetlands, to promote water conservation or to experiment with agricultural programs that use fewer toxic pesticides.

In an effort to step up enforcement of anti-pollution laws, the Administration also will ask Congress to make federal facilities such as Energy and Defense Department installations subject to all Clean Water Act provisions and to allow citizens to sue the government for violations.

Under another proposal, citizens would be permitted, within five years, to sue water polluters for past violations even if the polluter had come into compliance. A recent Supreme Court decision had severely curtailed citizens' right to sue under such circumstances.

State plans to restore Valley streams, fishery jobs

By Jim Mayer
Bee Staff Writer

California wildlife officials, promising that healthy fisheries would create jobs, on Wednesday released a $500 million plan for restoring 27 Central Valley streams.

The document details specific actions that would help reduce decades of environmental damage – from major modifications on the giant Shasta Dam on the Sacramento River to putting water back in Stony Creek.

"This is an effort to look at what can be done, should be done, to bring back these fish," said Fish and Game Director Boyd Gibbons.

While expressing confidence that the plan would contribute to restoration efforts, Gibbons acknowledged that most of the fixes required money and water – two commodities in as short supply as salmon and steelhead trout.

And deciding who should give up what water for fish will be decided in most cases by the State Water Resources Control Board, Gibbons said.

The report also assumes that a solution is found for the Sacramento-San Joaquin River Delta, where millions of young fish are consumed in giant pumps providing fresh water to Southern California farms and cities.

The report, "Restoring Central Valley Streams: A Plan for Action," was prepared at the request of Gov. Pete Wilson as part of his plan to cure environmental ills and shore up California's faltering water system.

But the governor's plan has been caught in the feud over restoring the Delta without inflicting hardship on San Joaquin Valley growers dependent on its water.

The state's report comes a day after the U.S. Bureau of Reclamation, the largest water provider in California, said it would restrict deliveries this summer. The cutbacks are mostly the byproduct of dry weather, but also are the result of restrictions on Delta pumps intended to protect endangered winter-run chinook salmon and Delta smelt.

Recreational and commercial fishing representatives said tens of thousands of jobs have been lost in the past decade as striped bass, salmon, shad, trout and other fish have declined.

John Beuttler, executive director of United Anglers of California, citing a state report, said California is losing $116 million a year in sales revenue because of declining fisheries.

Nat Bingham, habitat director for the Pacific Coast Federation of Fishermen's Associations, said that since 1980 the commercial salmon industry has gone from providing 50,000 jobs to 10,000 jobs.

State officials are hoping that local governments and organizations will use the document to restore streams close to them. They also hope it guides larger restoration efforts mandated in the Central Valley Project Improvement Act of 1992.

"Russian River in Peril"

Gravel pits in former vineyards along the left bank of the Russian River south of Healdsburg.

- More than a dozen deep pits have been dug in and along the Russian River since 1940.
- Salmon and steelhead runs have declined to less than 10% of original levels.
- Drinking water quality is endangered.
- Come and learn the costs to our community and what can be done.

A Conference for the Public
Saturday, March 19, 1994,
8:30 a.m. to 5:30 p.m.

Villa Chanticleer in Healdsburg

- Speakers include river experts & prominent officials.
- Italian country lunch.
- $30 Admission for the day with lunch.

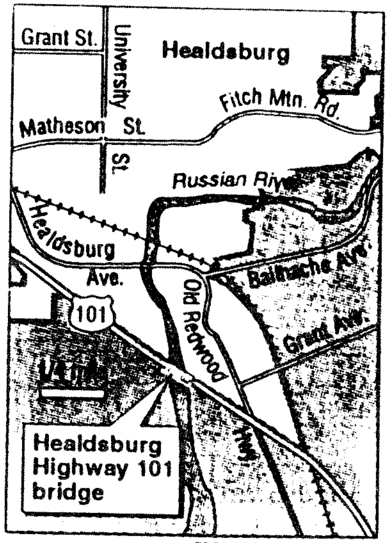
Sponsored by Friends of the Russian River

To sponsor, volunteer, or receive a conference announcement, call (707) 576-1791.

THE
Press
DEMOCRAT

Santa Rosa, California, Wednesday, January 5, 1994

State to replace Highway 101 bridge



PRESS DEMOCRAT GRAPHIC

By STEVE HART
Staff Writer

The Highway 101 bridge over the Russian River at Healdsburg has been damaged by erosion and will be replaced starting next year, at a cost of at least $11 million.

State engineers say the 700-foot freeway span is in no danger of collapse, although it could be weakened in an earthquake.

Jim Smith, senior engineer for the state Department of Transportation, said construction is slated to begin in mid-1995. It should be complete in mid-1996.

He said all four lanes of the freeway will remain open while the work is being done.

Caltrans considered a less costly repair project but has now concluded the bridge must be replaced. Smith said there is a "tremendous scour problem" around the bridge's footings in the bed of the Russian River.

When the bridge was built in 1959, the river bed was higher and the bridge footings were covered by 10 feet of gravel, according to Kathy Crossett, a hydraulics engineer for the state. But severe erosion has exposed the footings and the problem is getting worse, engineers said.

"The footings weren't designed to be exposed," Crossett said a year ago.

Smith said the rate of erosion is unusually high. The bridge was supposed to last 50 years, but it has lasted only 34 years, he said. Because its footings are above ground, the bridge is more susceptible to earthquake damage, he said.

According to several state reports, in-stream gravel mining in the river below Healdsburg has contributed to the problem. The river south of Healdsburg was heavily dredged during the 1950s and 1960s. The river bed between Healdsburg and Wohler Bridge has dropped as much as 20 feet since the 1940s, according to one study.

However, gravel industry officials dispute the reports. A gravel industry consultant said erosion in the deepest part of the river channel is largely due to year-round releases of water from Russian River dams.

Caltrans has asked Sonoma County to consider impacts on bridges when considering future applications for in-stream gravel mining.

Smith said the new bridge will be located at the same spot. It will be wider and will be designed to better resist earthquakes, he said.

Smith said the bridge could be repaired for about $7 million. But a repaired bridge would be more costly to maintain and wouldn't last as long as a new bridge.

The current bridge has two separate platforms for the northbound and southbound lanes. But the new bridge will have a single platform with a paved median, Smith said.

Traffic will be switched to the median during construction so that all four lanes can remain open.

The project will be financed by state and federal highway funds.

State engineers say bridges on Highway 116 at Austin Creek and Highway 128 at Geyserville also have been damaged by erosion.

THE Press DEMOCRAT
Santa Rosa, California, Saturday, January 22, 1994

Russian River wildlife habitat in decline

By STEVE HART
Staff Writer

The Russian River has lost much of its wildlife habitat to development during the past 50 years, according to a state-sponsored study.

The new report, prepared as part of a two-year study of the river's environmental problems, is expected to play a key role in decisions on future river management.

It says natural habitat along the river banks has been reduced by farming, flood control, gravel mining, dam building and other practices. Wildlife habitat continues to be threatened by urbanization, according to the report.

The river project, led by the state Coastal Conservancy, is expected to recommend measures for reversing the river's environmental prob-

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River

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lems, including erosion and loss of wildlife habitat.

The Russian River's riparian habitat — the natural growth alongside rivers and streams — includes a diverse mix of trees, vines, shrubs and other plants that provide food and shelter for wildlife, says the report. Native species include cottonwood, willow, alder, wild grape, blackberry, ash, oak, laurel and elderberry.

The work of Philip Northen, a Sonoma State University biologist who has studied the river, was cited in the report. He said the river's remaining habitat is rich in wildlife and that in some spots, the diversity of bird life is "extraordinarily high." Half of all the state's reptiles and three fourths of its amphibians also are dependent on such habitat.

Cooling effect

Streamside vegetation also shades the river, providing cool water favored by fish. The river supports some plant and animal species that are becoming increasingly rare, Northen said.

The report released Friday was prepared by Circuit Rider Productions, a Windsor non-profit organization that does environmental consulting work.

According to the study, more than a third of riparian habitat has been lost since 1942 in the river's Middle Reach, between Healdsburg and Forestville. The study said about 1,244 acres existed in 1942, compared to about 827 acres in 1990.

It said the Middle Reach is an important wildlife corridor that is seeing more urbanization from Windsor and the Sonoma County Airport.

Northen said wildlife habitat in the Middle Reach is in fairly good shape, with a favorable balance of young, middle-aged and old trees. But he said the river's Alexander Valley reach doesn't show the same healthy mix.

He said the stretch north of Healdsburg "is seriously lacking in young and middle-aged stands." As a result, some species may disappear from the zone.

Recommendations

The study recommends protecting the most sensitive areas of wildlife habitat. A final version of the report is expected to suggest a comprehensive program for preserving the wildlife zone.

The river project is aimed at correcting a number of problems on the river, but some of its recommendations have sparked disagreement among environmentalists, river property owners and the gravel industry.

Gravel industry officials dispute a project report that says continued mining poses a threat to the river. Some river property owners also blasted a suggestion that the river be allowed to take a more natural course, charging such a change would cause flooding and damage private property.

A project task force is expected to recommend river management policies later this year.

THE PRESS DEMOCRAT
Sunday December 19, 1993

Clean water's nemesis

Gravel mining threatens aquifer

By TOM ROTH

Roth

There are two Russian Rivers.

One is the visible river that reflects the hues of verdant banks or rushes brown in the winter. This is the river that erupts with the leap of a steelhead and slaps friendly against the ankles of waders.

The second Russian River is enveloped in darkness. It flows through a gravel membrane as

CLOSE TO HOME

deep as 60 feet below the visible river's channel and 1,000 feet or more on either side.

Over the years the visible river has been battered by damming, diversions and dumping. Now, unless the Sonoma County Board of Supervisors changes course, the most vital section of the underground Russian River may be destroyed.

The stretch of 10 miles between Healdsburg and Wohler Bridge is called the Middle Reach. Here are some of Sonoma County's richest vineyards and the municipal wells of Healdsburg, Windsor and the Sonoma County Water Agency.

Hydrologists call the Middle Reach's subterranean flow an *unconfined* aquifer — unconfined because there is a direct connection between the visible river and the honeycomb of gravel, rocks and sand that make up the aquifer. During the wet season, water flows from the river to the aquifer, resupplying water to farm and municipal wells. In the summer, it is the aquifer that recharges the river.

This river of darkness is not the Styx. It pulsates with life. Scientists at the University of Montana have found dozens of species of worms, shrimps, insects and microscopic organisms inhabit similar subterranean channels. These creatures living in the water-gravel medium perform the aquifer's most wondrous task: the cleansing and filtration of drinking water.

Other counties rely on expensive water treatment plants to guarantee clean drinking water. But 375,000 customers of the Sonoma County

See Gravel, back page

Tom Roth is executive director of Friends of the Russian River.

Gravel

Continued from Page G1

Water Agency are blessed with the free natural filtration that the aquifer provides. The agency's Ranney collectors, embedded deep in the aquifer, pump out water transported by the visible river from vast reservoirs at Warm Springs and Coyote Valley.

In 1972, the eminent Berkeley hydrologist H.A. Einstein, a consultant to the water agency, predicted that unless steps were taken to prevent the destruction of the aquifer from river gravel mining, its filtering and storage capacity would be destroyed. The agency heeded at least part of his advice. In-stream gravel mining just across from the agency's collectors was stopped.

Yet destruction of the aquifer continued.

The fragile barriers

Under the 1981 Aggregate Resources Management plan, deep-pit mining increased from 400 to 630 acres. Prime farmland and irreplaceable aquifer were mined in pits as large as 72 acres with depths of up to 80 feet.

The plan called for monitoring and reclamation of the pits. Monitoring fell by the wayside; reclamation was deemed infeasible.

The river is now confined by unengineered levees between its channel and the pits. Hydrologists fear that floods could wipe out those fragile barriers, "capturing" the river and sucking down the river's bottom.

The mined-out pits filled with water. Once, the pits and the river were linked by the underground gravel membrane. But something strange has happened to most of the pits. The river would go down after a storm; the water in the pits would not.

The pits have become great catch basins of silt. The once-porous gravel wall between the pits and the river and its aquifer are plugged with silt.

Bid to expand mining

A few thousand feet from the water agency's Wohler pumps, a great blocking formation of silted pits now arches across the floodplain to the edges of the aquifer on both banks of the river.

Syar Industries is attempting to expand mining at one pit in this arch. If they do, warns a report commissioned by the U.S. Army Corps of Engineers and the state Mining and Geology Board, there could be reduced flows and a lesser ability to flush contaminants out of the aquifer.

The water agency denies that plugged pits affect their operations. Yet the productivity of their two Wohler pumps has decreased by 25 percent, the agency acknowledges. Prudently, the water agency is attempting to purchase the last section of aquifer between their collectors and the pit mines to serve future supply needs.

Elsewhere there is evidence that gravel mining operations have had an adverse effect on clean water supplies. A degraded river bed has pulled down with it the water table, drying up numerous farm wells. One of Windsor's municipal wells is sucking air.

Healdsburg officials are suing the county because planned changes in operations at the Healdsburg Dam, which artificially holds up the water table, may dry up some city wells.

Proposed in-stream mining above the dam would also impact the city's Fitch Mountain wells, which are already experiencing turbidity problems.

In the face of environmental degradation, the county has cited overriding economic considerations — the need for jobs and construction materials — to approve mining.

Yet we need only look upriver to see who is going to pick up the bill.

In 1988, state Health District Engineer Dave Clark warned that excessive gravel mining could harm Cloverdale's filtering aquifer. His prophecy went unheeded. Clark had no authority to stop the mining.

Ironically, his successor had the power to order Cloverdale to build a $3-million treatment plant. Mining-impacted Ukiah has already built a plant. Healdsburg is examining the possibility.

Some new alternatives

Within weeks the Board of Supervisors will be looking at a revised ARM plan that will allow the same kinds of devastation to continue. They need to adopt some new alternatives:

- Recycling building materials. If we follow current practices, recycled concrete and asphalt can provide about 1 percent of estimated gravel needs. A more aggressive collection program can easily double that amount. We might start by clearing the rubble off Wohler Beach.
- Lowering demand estimates. We shouldn't destroy our aquifer to export one-fifth of the county's gravel to other counties.
- Expanding quarry operations. The ARM plan's framers see an eventual transfer from river reliance for gravel supplies. This won't happen unless there are adequate financial incentives for the shift.
- Substitute materials. High-quality gravel suitable for portland cement production is taken out of pits and crushed for low-quality construction specifications. Reprocessed tires can supplement gravel-based roadbed materials.
- Shallow pit mining. Mining companies can still harvest some of the river terrace's gravel, but they should not be allowed to dig below the water table. Shallow pits can be reclaimed for agriculture, or they can be engineered to allow the river to regain its natural meander.

The lull in new construction provides the county with an opportunity to end the old bad practices.

The creation of this grand aquifer took three million years. It will only take three votes on the Board of Supervisors to preserve or destroy it.

HUEY D. JOHNSON

Bohemian Club should help save Russian River

THE RUSSIAN River was once one of America's finest steelhead trout rivers. It is now dying after decades of abuse and neglect.

In 1943, 250,000 steelhead were caught in the river. Last year, the estimate was about 400.

The river still flows poetically through Sonoma County to the sea at Jenner.

But its endless, cool, lovely pools, once sweet for swimmers and fishermen, are now compared with sewers.

The causes range from pollution to gravel mining to the dumb greed of local government water agencies to an explosion of irrigated vineyards.

Many grape growers in the river valley unnecessarily irrigate their lands, draining water from the watershed's precious spawning tributaries.

Yet there are some heroes.

Otto Teller, a vintner, fisherman and friend of the Russian River, has never irrigated his grapes. Ravenswood, the winery that buys his Oak Hill zinfandel grapes, was rated over all others last month by the Wine Advocate, a respected international publication.

Proof that quality earns profits is seen by Teller's example. His nonirrigated vines yield fewer tons of grapes per acre, but the resulting wine goes for a premium price. It was $11 per bottle; it recently sold out at $20.

Teller pointed out to me that in other Mediterranean climates, such as in Italy and Greece, grapes have been grown for thousands of years without irrigation.

Coming decisions by the regional water quality agency tell the story of the immediate threat to the river. Gallo Wineries wants to block a spawning stream. Chevron wants to divide an 8,000-acre estate into irrigated vineyard properties. The town of Windsor wants another 5,000 acre-feet of water for future development. The Sonoma Water District, having sold water it doesn't have to Marin County agencies, now proposes to take it from the river.

And the booming city of Santa Rosa still wants to put its treated sewage water back into the river instead of considering alternatives.

The need is to manage and share the water, not to think more is somehow available.

THIS IS a political battle to be fought uphill. With the local government agencies manipulated to the point of corruption, the river can only be saved by taking a more powerful political route.

This is why we need to enlist the help of the Bohemian Club.

The San Francisco-based club's Bohemian Grove, several thousand acres of magnificent redwoods, borders one of the Russian River's most beautiful stretches.

July is the month of the elite club's annual summer encampment for powerful, influential men who have enjoyed the pleasures of the river over the years. They look forward to a few days of relaxation and retreat, camping in the forest and wishing they could still swim in the river.

To my knowledge, the Bohemian Club has never gotten involved in environmental issues.

And yet, the founders protected this grove by establishing this idyllic refuge. Part of that refuge is polluted and shouldn't be. The members have an obligation to the principles of the founders to act just as much as if someone wanted to clear-cut their redwoods.

To save the river, there is only the need for a few voices to affect the regional and state water quality agencies, talk to the governor, members of Congress and, if necessary, the president. Bohemian Club members are from all over the state and the country. Most can reach members of Congress with one phone call.

IN THE political battle to save the river, the club should align itself with, or at least support, the citizen-based movement growing there.

Recently, a public meeting on the Russian River's future was convened by Reps. Lynn Woolsey and Dan Hamburg in a college auditorium. It drew a standing-room-only crowd.

A recent study by the California Salmon and Steelhead Advisory Committee said 8,000 jobs would be created in the recreation industry if coastal rivers, including the Russian River, were clean and protected.

In an ideal world, perhaps the Bohemian Club wouldn't be the last, best hope for saving a river. But because of the intricate collaboration of water boards and developers, citizens — and club members who stay at the Bohemian Grove — have become the underdogs.

> The need is to manage and share the water, not to think more is somehow available

The Bohemian Club chose the Russian River location for good reason.

Now they must join the fight for its survival.

Huey D. Johnson, California's resources secretary during the Jerry Brown administration, is an Examiner columnist.

San Francisco Chronicle

The New World Disorder
ENDPAPER BY NOVELIST CARLOS FUENTES

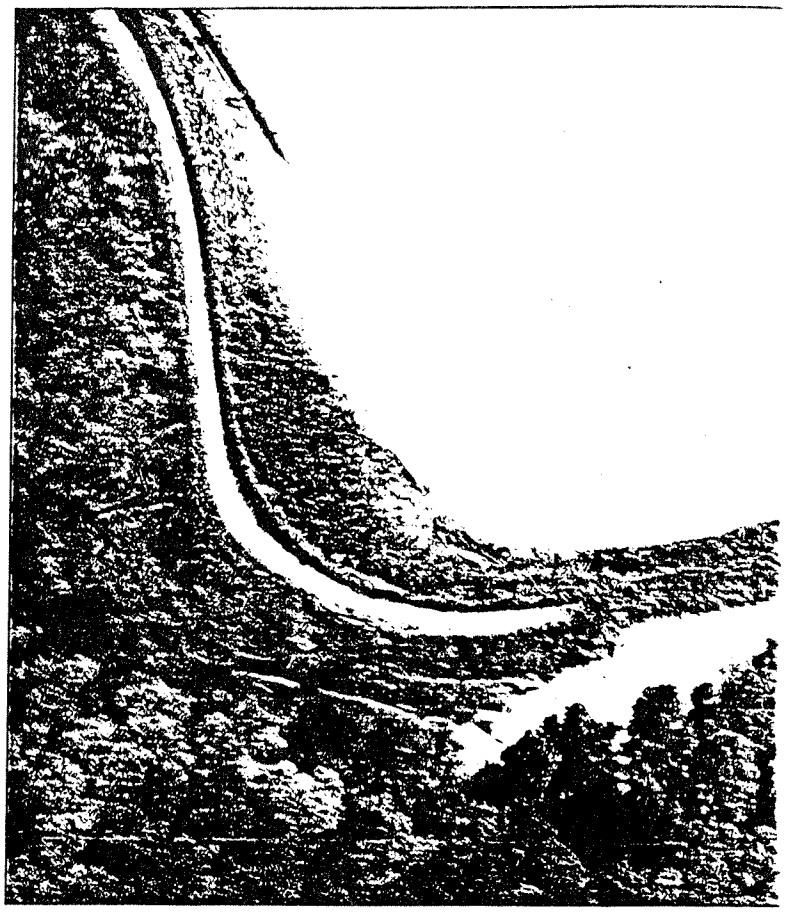
Wrestling Over The River

Are agriculture and recreation losing out to gravel mining in a battle for the Russian River?

BY HAROLD GILLIAM

Gravel pits in former vineyards along the left bank of the Russian River eight miles south of Healdsburg. The pits are filled with water because they were dug into the gravel aquifer that filters the drinking water supply for parts of Sonoma and Marin counties. A gravel processing plant is seen at center.

Wrestling Over The River



The battle over gravel mining on the Russian River is a struggle over the character of Sonoma County itself. Do agriculture and recreation have to move over to make way for the building boom?

BY HAROLD GILLIAM

The Russian River was a fantasy. Growing up in Southern California, I had seen only one river, the Los Angeles — the mighty stream that Mark Twain had said was the only river you could fall into and climb out dusty.

It was difficult for me to imagine a river that flowed all year long. From the stories I heard from my parents, the Russian was an idyllic river, the kind celebrated in song and story: Flow gently, sweet Afton . . . by Bendemeer's stream . . . the Suwannee, the Moldau, the Shenandoah . . .

When I first saw the Russian I was not disappointed. The idyll was true: I saw emerald water flowing past groves of redwoods, overhanging maples where you could swing from ropes and drop into deep pools, long curving stretches where you could paddle a canoe like Hiawatha, sandy beaches where you could lie in the sun — or in the cool shade of the forest and ferns and willows when the sun was too hot.

In the years since, the crowds have proliferated and the towns on its shores have become more raucous, but during the summer the Russian still flows gently through the redwoods in those wondrous curves that have brought generations of vacationing Californians to its shores for a river experience.

But that river is now in deep trouble from human activities upstream.

Vineyard owner Martin Griffin is soft spoken and mild mannered, but it is obvious from his words that he is mad as hell. We are standing in the bottom of a dry gulch where there was once a creek that flowed through his farmlands and joined the Russian River about 100 yards downstream.

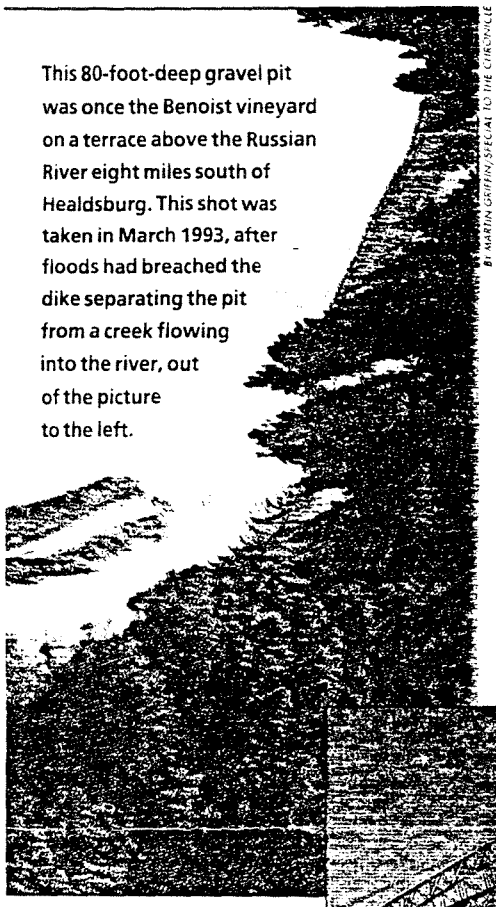
"The creek was 10 or 15 feet higher than where we're standing," he says. "We used to get maybe 20 big steelhead coming up the creek to spawn every year. One night in the winter of 1967, after three days of rain, I came down here with a flashlight to inspect our pump, and I discovered the whole creek bed had suddenly slid into a big pit the gravel miners had dug in the river.

"This gulch is being eroded deeper during the rains every winter. The pit is filled with silt that has sealed off the bank so the river can't recharge the aquifer. The water table, which is the top of the aquifer, has fallen; and the production of our wells has dropped 90 percent. The lowering of the aquifer has also dried up the creek, except during storms.

"This has happened to farmers for miles along the river. The gravel dredging in the 1960s and '70s has caused sections of the riverbed to sink along eight or nine miles of the middle reach. At Healdsburg it has dropped 17 feet and undermined the Highway 101 bridge. Here, opposite my land, the riverbed has sunk 22 feet as a result of gravel mining and the two big dams upstream that stop the gravel flow."

Later Griffin drives down the river road and points out hundreds of acres of water-filled pits and gravel plants next to the river. "Most of these used to be vineyards. Those pits have turned this area into an industrial wasteland. They're plugging the aquifer, and now the mining companies want to dig more pits. Here on the middle reach of the river we've lost 100 acres of vineyards."

Griffin some years ago retired from his practice as a Marin County physician and now devotes his time to his Hop Kiln winery and vineyards along the west side of the river several miles below Healdsburg. In 1989 he and other vineyard owners formed the Russian River Task Force to persuade county authorities to halt the mining. Their battle cry was "Save the Russian River."



BY MARTIN GRIFFIN/SPECIAL TO THE CHRONICLE

This 80-foot-deep gravel pit was once the Benoist vineyard on a terrace above the Russian River eight miles south of Healdsburg. This shot was taken in March 1993, after floods had breached the dike separating the pit from a creek flowing into the river, out of the picture to the left.

BY MARTIN GRIFFIN/SPECIAL TO THE CHRONICLE

BY KRISTI MACDONALD/FOR THE CHRONICLE

*"**The gravel dredging** in the 1960s and '70s has caused sections of the riverbed to sink along eight or nine miles of the middle reach. At Healdsburg it has dropped 17 feet and undermined the Highway 101 bridge. Here, opposite my land, the riverbed has sunk 22 feet as a result of gravel mining and the two big dams upstream that stop the gravel flow.'*

— MARTIN GRIFFIN (TOP LEFT), OWNER, HOP KILN VINEYARD.

***Instead of trying** to reclaim the pits for agriculture, which everybody now admits is not feasible, we'll reclaim them for wildlife and natural habitat. And we'll still be producing the concrete and asphalt the county needs as the population grows. I'd say that's a fair trade-off.'*

— DENNIS RIPPLE (BOTTOM LEFT), PLANT MANAGER, KAISER SAND AND GRAVEL

In 1990 the Sierra Club Legal Defense Fund joined with the Russian River Task Force to sue the gravel companies. That suit, together with several other developments — a suit against the companies by the Sonoma County district attorney for illegal practices, a similar suit by the state attorney general, a grand jury investigation, and exhaustion of some of the existing pits — pretty well shut down mining along the river for about 18 months. By last year, enough of the legal dust had settled for mining to be resumed on a reduced scale. However, the opponents of the mining companies recently went to court again, claiming one of the principal environmental impact reports was inadequate.

The Russian River, like any river, is far more than moving water. It's a biological artery, with hundreds of forms of life in it and around it — aquatic plants, fish, trees, birds and mammals. Originally the Russian supported one of the biggest steelhead runs in the country.

The river is also a geologic force, containing silt, sand and rocks that move downstream with the water. In times of heavy rains and high water, the river overflows its banks, and when the flood waters recede it drops much of its load on the broad river-cut terrace, the flood plain.

The gravel and sand are dropped first; the silt settles last and forms layers of rich alluvial topsoil. As a result the valleys along the river contain very productive farmlands, most of them now in vineyards. Sonoma County grapes, like those of neighboring Napa Valley, produce some of the world's finest wines, a prolific source of wealth for the region.

But beneath those soils is another source of wealth, a mother lode of aggregates consisting principally of the sand and gravel. Mining companies dig it up to use in producing most of the concrete and asphalt used for roads, bridges and buildings in the booming North Bay region. The most accessible gravel was in the riverbed itself, where giant dredges for decades scooped up tons of aggregate like dinosaurs with dripping mouthfuls of food.

By the late 1960s so much gravel had been pulled out of the river that the companies began to shift their operations from the riverbed to the terraces of the flood plain on either side. Here they dug into the aquifer, the gravel beds deposited over the millennia by the river at flood stage and filled with water by the river and rainfall. (See diagram on page 11.)

Agriculturists blame the mining companies for the sunken riverbed and fallen water table. The heaviest mining and the greatest drop in the riverbed have been in the river's middle reach, the nine miles between Healdsburg and the narrows where the river enters the canyon it has carved through the westernmost hills of the Coast Range to the ocean. That forested canyon is the principal recreation area on the river. There is no substantial mining in that stretch, but any river is a single unit, and what happens upstream can have unpredictable impacts downstream.

A few blocks off Highway 101 in Santa Rosa, in a group of temporary buildings, are the local offices of Kaiser Sand and Gravel, one of the two big companies mining along the river. (The other is Syar Industries.) Towering above the buildings is the tall framework of a concrete batch plant, where trucks unload gravel that is carried by a conveyor belt to the top of the structure. On the topmost pinnacle someone has rigged some lights into a Christmas-tree shape, the only aesthetic touch in the dusty yard.

Inside the offices I meet plant manager Dennis Ripple, who points to a big color drawing of the lower part of the middle reach. In the picture the river is bounded on one side by seven blue lakes, lined with marshes and riparian forests. The drawing is labeled "Windsor Lake Reclamation Plan."

Ripple explains: "This is how I hope the place will look eventually. We just got an award for the plan from the American Society of Landscape Architects. It will be a great benefit to the county for wildlife and natural habitat."

He explains that Kaiser's present gravel pits would be converted gradually to "Windsor Lakes" as the gravel is taken out, provided the plan is approved by the county.

"About 600 acres have been mined in the middle reach up to now, and the maximum the mining companies want to do in the next 20 years is another 400. And that's it. That should finish it off."

I ask him about the argument that terrace mining destroys invaluable topsoil and vineyards.

"That point came up in 1980 when the county's first Aggregate Management Plan was made, and the plan called for the pits to be reclaimed for agriculture. At the time there were 26,000 acres of vineyards in Sonoma County. Now there are 32,000 acres. All we want to use is

See Page 10

BY MARTIN GRIFFIN/SPECIAL TO THE CHRONICLE

***The Russian River** impasse is a symbol of much larger problems involving gravel mining on other California rivers and streams. It also calls into question the piecemeal approach to planning that has been endemic in California and was unquestioned before the advent of environmental awareness.*

***'It's not a matter** of jobs vs. the environment. I think workers would have more jobs protecting the environment, replanting the banks, widening the levees, providing wildlife habitat and more flood protection.... But that requires quite a bit more operating capital from the companies than it does just to sit there with a big crane and pull the stuff out of the ground.'*

— ERNIE CARPENTER, SONOMA COUNTY BOARD OF SUPERVISORS

RIVER

Continued From Page 9

another 400 acres. And not all of it is in vineyards.

"Instead of trying to reclaim the pits for agriculture, which everybody now admits is not feasible, we'll reclaim them for wildlife and natural habitat. And we'll still be producing the concrete and asphalt the county needs as the population grows. I'd say that's a fair trade-off."

But Griffin and other critics maintain that these 400 acres are crucial because they're along the river and are part of the system that recharges the aquifer. I ask Ripple about Griffin's objection that gravel mining next to his vineyard eroded the channel, sealed off the recharge area and caused the water table to fall.

"There's no doubt," Ripple responds, "that there has been channel erosion, but there's no single villain. There are several causes. They were reported by the Russian River Resource Enhancement Project: Farmers have cultivated too close to the river and removed the riparian vegetation. That caused erosion. Two big dams upstream have blocked the natural movement of gravel down the river. Urbanization has increased the runoff and contributed to flooding.

"Gravel mining was done in the riverbed in our area by previous owners beginning about 1953, but we haven't done any in-stream mining since we acquired the operation here in 1967. There's almost no in-stream mining going on now in the middle reach except for some shallow skimming operations.

"All our work is terrace mining, and it doesn't make any contribution to channel erosion in the river. That's not just *our* conclusion. That's in the report."

Laurel Marcus is the director of the Russian River Resource Enhancement Project, sponsored by the Coastal Conservancy and other public agencies to develop a river plan not just for gravel mining but for other resources as well, including recreational and fish and wildlife values.

"We're trying to do something that's never been done before," she says. "We're looking at the river from the river's point of view. We're looking at the river and its watershed as an ecological system with a life of its own. We're looking at how the natural regime is affected by human activities.

"We'll develop a plan for watershed restoration. We can never restore it exactly as it was in nature, but we hope much of the damage can eventually be repaired."

What about Ripple's quote from the project's interim report that terrace mining does not contribute to riverbed erosion?

"That's true as long as the river stays where it is," she says. "But the river has never stayed exactly the same for very long. Historically it has risen and fallen and changed its course as it meandered over the flood plain. We can expect that the river sooner or later will pop out of its channel again and flow into the pits on the terraces.

"What would happen if the river overflowed into the pits, which are much deeper than the riverbed, and the river abandoned its present channel and flowed entirely into the pits? The river might drop its load of sediment into the pits, which are as much as 80 feet deep. The water flowing out of the pits would be clear.

"That's called 'hungry water.' Clear running water will pick up much more sediment downstream than water that is already carrying a natural sediment load. It's 'hungry' for more sediment, which it will pick up downstream by eroding the banks and channel. So we could expect a lot more downstream erosion, taking out beaches, cutting back banks and toppling trees along the shoreline.

"I'm not predicting that this will happen," Marcus cautions. "It's simply a possibility we're studying. We don't have enough data yet to say whether it's a serious threat."

Historically, Sonoma County officials have looked the other way while the gravel companies took out all they wanted, paying no royalties on the gravel mined. Partly as a result of complaints from Griffin and his allies, the county belatedly enacted the Aggregate Resources Mining (ARM) plan in 1980, designating 2,000 acres along the river where terrace mining would be permitted — providing the pits were reclaimed for agriculture after the gravel was taken out.

However, attempts to put the soil back into the pits and grow commercial crops have not been successful, partly owing to the great depths of the pits, some of them more than 80 feet deep. Worse yet, some hydrologists concluded that even if the pits were filled with soil for agriculture, in the absence of the porous gravel beds, the clay-like soil would seal the pit walls, block the groundwater recharge and cause the water table to drop, leaving more wells high and dry and perhaps threatening the pumps where the Sonoma County Water Agency draws water for half a million residents of North Bay counties.

Robert Gaiser is project manager of the Sonoma County Planning Department's effort to rewrite the ARM plan. The new version has not yet been adopted and is going through Planning Commission hearings.

"Up to now," Gaiser says, "about 600 acres on the middle reach have been terrace mined. There are proposals in the new ARM plan to limit new deep-pit terrace mining to a maximum of 230 acres. Each pit could not be over 20 acres, compared to some existing pits of 50 to 100 acres.

"The new ones would have to be 450 feet from the river and at least 450 feet apart. The companies would have to prove on computer models that their operations wouldn't lower the water table more than one foot. So there would be no major effect on the groundwater.

"These standards would not apply to shallow pits that don't get into the groundwater, which is 15 to 20 feet below the surface," Gaiser said. "I have to emphasize that these are only proposals and may be changed as they go through the Planning Commission and the Board of Supervisors.

"We're trying to encourage quarry mining at locations away from the river to reduce terrace mining. One way to encourage it would be the proposed fee on terrace mining — $1 a ton, at maybe 2 million tons a year. The quarries, which are more expensive to mine, would not have to pay the fee. There are about 18 small quarries in the county, and last year they produced 60 percent of the county's aggregate."

Alderon Laird of Arcata, in Humboldt County, is a river expert who has made studies for mining companies and government agencies, with emphasis on restoring rivers to natural conditions. Relevant to the Russian River are studies he has made on the Tuolumne and the Merced, which flow down from Yosemite National Park through foothills and valley lands rich in river-borne gravels.

"The Merced," he says, "was extensively terrace-mined in the 1960s and '70s. In the floods of 1983 and '86 it breached the levees and changed its course into the pits, a huge expanse of water. The salmon and steelhead can't find their way upstream any more. In the pits they're preyed upon by the kind of fish that grow in reservoirs — small-mouth bass, large-mouth bass and squawfish.

"Water hyacinths proliferate on the water, and in some places you could almost walk across the river on them. In other places the wind across that big expanse of water stirs up waves that continually erode the levees and the other shore banks.

What about the "Windsor Lakes" plan to make Kaiser's deep Russian River pits into wildlife refuges?

"Well, they look pretty in the picture," Laird says, "but my concern is that the design should be based on biological processes rather than aesthetic appeal. Wetland areas which are significant wildlife habitat are dependent on shallow water."

"Another problem is that sandy beaches along a river are nourished by the sediments brought down by rivers. If the river breached the levees and flowed through the pits — as has happened on the Merced — the sediments would be trapped in the pits and the areas downstream would become starved of sand and gravel."

In recent years some of the beaches near Guerne-ville and Rio Nido have diminished or disappeared, a loss that many residents believe is a result of in-stream mining on the middle and upper reaches. And since sediments from the Russian River nourish ocean beaches near the river mouth and probably for miles along the Sonoma coast, gravel mining could conceivably contribute to similar erosion or disappearance of beaches there.

Hydrologists disagree on how terrace mining affects the aquifer. The disputed question is whether water is able to permeate the pit walls, recharging the aquifer at high water and flowing

into the river at low water periods, as it did in natural conditions. (See diagram.)

Phillip Williams and Associates, San Francisco hydrologists, while making a study for the Sonoma County Water Agency, examined the Grace Ranch Pit at the upper end of the middle reach near Healdsburg and found that the water in the river and the pit were at the same level; they rose and fell together, indicating that the walls of the pit were permeable.

Hydrologist Robert Curry of Santa Cruz, consultant to the Russian River Task Force, assumed that Williams' discovery also applied to other pits until he observed Kaiser's Benoist pit at the lower end of the middle reach and reported that after a recent storm the water in the pit was 10 feet higher than the river, indicating little or no permeability. The pit walls, he believes, are apparently sealed with silt. If so, in that and perhaps other pits there would be no recharge between the aquifer and the river, and the water table would be expected to fall, drying up more wells.

Curry's conclusions and Laird's fear that the river might flood and flow into the pits are not shared by David K. Todd, emeritus professor of civil engineering at the University of California at Berkeley and consultant to Kaiser Sand and Gravel: "I don't have any basis for believing that whatever happened on the Merced can happen on the Russian. It may be that the 'pit capture' occurred on the Merced because the valley there was narrower and the water was more confined.

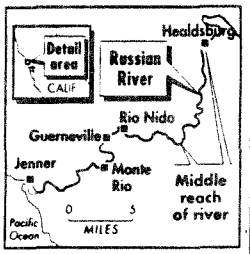
"On the Russian River the flood plain is a mile wide in many places, and there are times when the river overflows and most of the valley is under water. It's impossible to keep the floods from going over the levees into the pits, but what you have is one big sheet of water on both sides of the levees, and it recedes so slowly that there is no significant erosion. I just don't see any possibility of the river being captured by the pits and changing its course."

In spite of these disagreements and uncertainties, the Sonoma County supervisors, by a 4-1 vote, recently approved an application by Syar Industries, the other major mining company on the middle reach, to dig a new deep pit on the west terrace next to the river. The new Syar pit would not have to conform to the proposed ARM restrictions on mining. The majority of the supervisors felt that the need for jobs in the mining industry overrode environmental considerations. When the ARM plan comes before the supervisors for approval, it could be so modified as to become innocuous — if it is not gutted by the Planning Commission first.

The lone dissenter on the board in the Syar decision was Supervisor Ernie Carpenter, who says the gravel companies have failed to carry out the reclamation requirement of their previous permits: "The gravel companies want to go on with business as usual. I'll vote against them until they find a better way to mine. It's not a matter of jobs vs. the environment. I think workers would have more jobs protecting the environment, replanting the banks, widening the levees, providing wildlife habitat and more flood protection.... But that requires quite a bit more operating capital from the companies than it does just to sit there with a big crane and pull the stuff out of the ground."

THIS COULD BE YOUR DRINKING WATER

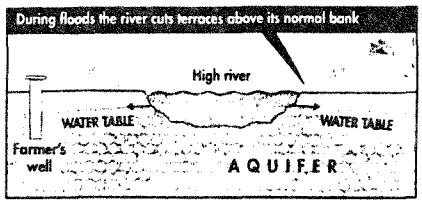
Millions of Californians receive their drinking water from aquifers, natural underground reservoirs that store water much more efficiently than man-made reservoirs above ground. A half-million people in Sonoma and Marin counties drink water from the Russian River aquifer, which consists mostly of gravel beds overlain by topsoil and filled with water by the river and rainfall.



The aquifer in normal conditions:

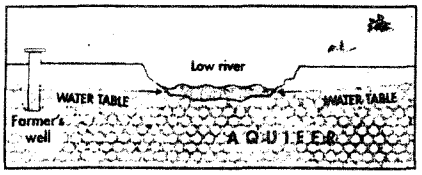
■ High water

When the river runs full in the winter and spring, water penetrates the banks and flows into the aquifer, recharging it and raising the water table. Rainfall also contributes to the aquifer.



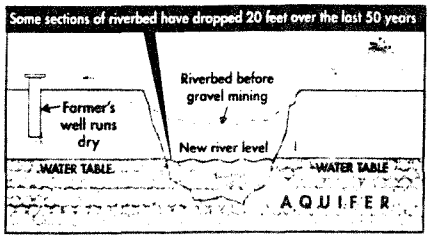
■ Low water

During summer and fall — and droughts — water from the upper part of the aquifer flows back into the river through the porous banks. It's a neat year-round ecological balance.



The impact of mining:

The gravel of the Russian River aquifer, both under the river and the terraces on either side, is a mother lode that has been tapped by miners for more than a century. But critics say that mining is among the chief causes of ongoing damage to the aquifer.

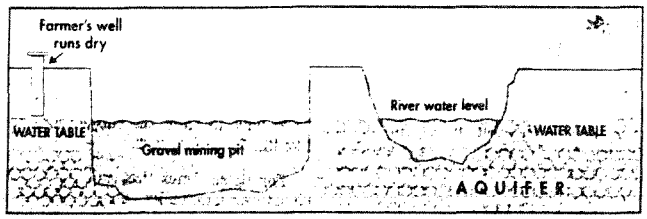


■ Instream mining

Until recent decades, most mining was in the riverbed where giant dredges scooped up tons of gravel, in some places lowering the riverbed 20 feet and more. This dropped the water table beyond the reach of many farmers' wells and contributed to the undermining of bridges.

■ Terrace mining

Since the 1960s, mining companies have shifted their operations to the terraces on either side of the river. There they have dug into the aquifer, creating pits as deep as 90 feet. Farmers complain that the pit walls silt up and act as dams, diminishing the natural recharge of the aquifer, dropping the water table and drying up wells. But the gravel companies claim their pit walls are porous, and blame damage on vineyard owners who they say farm too close to the river and cause erosion of the banks.



Source: Chronicle research

Note: Drawings not to scale

BY STEVE KEARSLEY/THE CHRONICLE

In evaluating the confusing claims and counterclaims, keep in mind some basic environmental principles. Environmental impact reports on separate mining projects are piecemeal approaches; they do not consider the cumulative effects of all mining, as well as those of agriculture, sewage discharge, dams and other human activities. The same is true of the proposed ARM plan, which is a mining plan, not a total river-management plan.

The Coastal Conservancy's Russian River Resources Enhancement plan would be a good start toward an overall plan for the watershed, and a valid question is whether any more mining projects should be approved before the plan is completed in another six months or so.

The Russian River impasse is a symbol of much larger problems involving gravel mining on other California rivers and streams. It also calls into question the piecemeal approach to planning that has been endemic in California and was unquestioned before the advent of environmental awareness.

Consider a river and its watershed as a living community. Humans are members of that community and are having a drastic impact on it, for better or for worse, mostly worse. The aquifer is part of that community. It is composed not merely of soil, sand, gravel and water but thousands of micro-creatures at the base of a food chain that supports fish, birds, small mammals — and humans.

Remove the soil covering the aquifer, remove the sand and gravel below — as terrace mining does — and you leave only the water, exposed to evaporation. You upset the interlocking community of creatures that inhabit the aquifer — with unpredictable results on the river and its life.

You also destroy prime soils that were thousands of years in the making and now support profitable agriculture. Acre for acre there is greater immediate profit in gravel mining than in agriculture. But mining would remove the gravel in two decades.

The soil, if carefully tended, would produce crops indefinitely and create more wealth in the long run than gravel. But long-run thinking is not characteristic of most elected officials, who focus primarily on the next election and the next campaign contributions.

Gravel is needed to build roads, house foundations, bridges and buildings to accommodate the record growth in Sonoma and Solano counties. So the problem of growth control is an essential part of the picture — another long-run consideration ignored too often in the political process. Nobody is asking, in any systematic way, the ultimate question: How much growth is enough?

There are alternative sources of gravel in quarries, both in Sonoma County and elsewhere, but they are lower quality and more expensive. What price are we willing to pay to preserve our rivers? How do we learn to bring the long-term future into our political calculations? We may hope the plight of the Russian and other rivers produces some hard thinking on these larger questions.

We have only recently begun to learn that the survival of the human race is entirely dependent on the natural systems that nurture all life. Reckless interference with those systems can result in such potential and actual disasters as ozone-layer depletion, global warming, deforestation, soil erosion and the destruction of thousands of plant and animal species of inestimable value. We cannot avoid intervening in natural systems, but the interventions should be planned with every attempt to minimize the disruptions and to calculate their long-run consequences.

My own view is that aggregate mining in the aquifers represents the kind of massive assault on natural processes that should be avoided until we know precisely what we are doing, based on a reasonable consensus in all relevant disciplines — hydrology, biology, ecology, geography, demography — with a healthy respect for the natural systems of the Earth.

To me the Russian River is still an idyll — a wounded idyll that could in some measure recover from the damage we have inflicted on it. This summer thousands of vacationers will flock to its banks and beaches to swim and sunbathe and picnic and fish, to paddle canoes and float downstream in inner tubes, to enjoy the healing ambience of the flowing water, the stream-side willows and the redwood forests. If the river is restored to health, that experience will be available for generations to come, as it has been for generations in the past. ■

Water-Based Animals Are Becoming Extinct Faster Than Others

THE NEW YORK TIMES

THE ENVIRONMENT

TUESDAY, APRIL 21, 1981

Studies reveal gaping holes in the food chain.

By JANE E. BRODY

WHILE the threat of a silent spring may be abating, the danger of lifeless waterways looms ever larger, recent findings suggest.

Fish and other animals that live in North American waterways are disappearing much faster than land-based fauna, survey data indicate. And without broad measures to protect water-dependent creatures from such threats as pollution, unnatural competition and draining and damming of habitats, the rate of aquatic extinctions is likely to accelerate.

This gloomy assessment of the status of the continent's aquatic animals punctuates an "endangerment alert" issued this month by the Nature Conservancy. The conservancy, a privately supported organization that protects endangered plants and animals by buying critical habitats to create preserves, began tracking the fate of North American fish, mollusks, crayfish, dragonflies, damselflies and other selected aquatic invertebrates in the 1970's. It now has data on hundreds of species from all 50 states, three Canadian provinces and 13 Latin American countries.

Save for the desert pupfish, which won its own Mojave Desert preserve through the conservancy's efforts, and the snail darter, which lost scarce territory to a Tennessee reservoir, the plight of North America's endangered aquatic animals rarely captures public notice.

As Dr. Larry Master, the conservancy's chief zoologist, pointed out, fish, mussels and crayfish lack the fur or feathers that traditionally muster public sympathy and support. In addition, they live in environmental obscurity — under water where few people notice them. Unlike elephants and eagles, water-borne animals are neither majestic nor highly prized. Nor are they cute and cuddly like pandas or humanoid like chimpanzees and gorillas.

Even conservation biologists, Dr. Masters said, have paid relatively little attention to aquatic species.

Overall Deterioration Seen

But in many ways the challenges to survival are far greater for the hundreds of animal species that live in the lakes, rivers and streams of the United States, Canada and Mexico. According to the conservancy's alert, issued in its bimonthly magazine, one-third of the continent's fish, two-thirds of its crayfish and nearly three-fourths of its mussels are now "rare or imperiled."

Dr. Jack E. Williams, who two years ago reviewed the status of fish in need of protection, noted that recent recovery efforts have been "locally effective for some species," but are not keeping up with the overall deterioration of fish fauna.

"The health of aquatic habitats in North America continues to decay," he noted, adding that the trend was not likely to be reversed without "a major commitment to conservation of entire ecosystems."

Dr. Mark Gordon, who has been trying to reintroduce extirpated mussels into the Duck River in Tennessee, said in an interview that "the decline in habitat is so bad that it's hard to find a place to put them where they could survive." He added that "the degradation goes from bad to worse, with very little recovery of habitat."

Indeed, while few were looking, many aquatic species recently disappeared, sometimes leaving gaping holes in the food chain and always diminishing forever the biological diversity that keeps the earth genetically healthy. According to data from the American Fisheries Society analyzed by Dr. Williams and collaborators, in the decade between 1979 and 1989, 10 species of freshwater fish are believed to have become extinct. An additional 139 species have become endangered, threatened or listed as "of special concern" for their survival.

Despite increasing attention to conservation and pollution control, no aquatic animal could be removed from the list because its status improved sufficiently to inspire confidence in its ability to survive.

More Than One Factor

In fact, the researchers said, "entire communities of native fishes now appear to be endangered." Currently more than half the freshwater fish in the United States and Canada are legally protected in at least part of their range.

And while a few fish once thought to have been extinct have been "rediscovered by surprised scientists" in recent years, Dr. Robert R. Miller of the University of Michigan and his collaborators note that "the chances of rediscovery are past for an increasing number of fishes."

Dr. Miller and Dr. Williams, who is the fisheries program manager for the Bureau of Land Management in Washington, in collaboration with Dr. James E. Williams of the National Fisheries Research Center in Gainesville, Fla. analyzed the probable causes for extinction of 40 species of North American fish that are known to have disappeared since the turn of the century. In most cases, more than one factor accounted for a species' demise.

A dramatic change in the fish's watery home was a major factor in 73 percent of extinctions, the researchers reported. Competition from introduced species helped wipe out 68 percent of the native fish. Pollution and genetic mixing with other species contributed to the demise of 38 percent, and overfishing compromised the survival of 15 percent.

For example, the Tecopa pupfish, which once enjoyed the warm outflow from two California hot springs, disappeared about 20 years ago when the springs were modified for use as bathhouses. Another pupfish was able to move in and mosquitofish were introduced, resulting in competition that extirpated the species.

Noting that 19 of the 40 species analyzed have disappeared since 1964, the researchers concluded that "unfortunately, the rate of extinction of North American fishes is likely to increase." They believe that "present

Fish lack the fur and feathers that traditionally muster public support.

laws and recovery activities appear inadequate to stem the increasing tide of endangered fishes."

The greatest losses occurred in the Great Lakes, the Great Basin, the Rio Grande, the Valley of Mexico and Parras Valley in Mexico. But according to Dr. Andrew L. Sheldon, zoologist at the University of Montana in Missoula, the fish of the arid West are presently most endangered, the result of fast-expanding, water hungry human settlements that drain what little water remains.

"In conflicts over development of increasingly valuable water resources, the fishes have few advocates," Dr. Sheldon pointed out. Yet, he added, people are likely to benefit from better water quality and other environmental improvements when steps are taken to protect endangered fish. In addition, many other threatened organisms, including mollusks and crayfish, would have a better chance for survival.

"We've spent most of our resources on fishes, but clams, snails, crayfishes and even aquatic insects are in equally bad straits," Dr. James Williams said in an interview. "These lowly invertebrates, which really support the entire system, have not received proper attention."

Though mollusks like freshwater mussels have even fewer champions than fish, they are in some ways more important to environmental quality. Mussels cleanse billions of gallons of water daily, removing microscopic plants, bacteria and suspended organic particles from the water as it courses through their gills.

But mussels depend on fish to reproduce. Gill-less mussel larvae latch onto fish gills, which breathe for them until the larvae mature. Each mussel species has its own fish host, and when the fish goes, so does the mussel.

Limited Success in Arizona

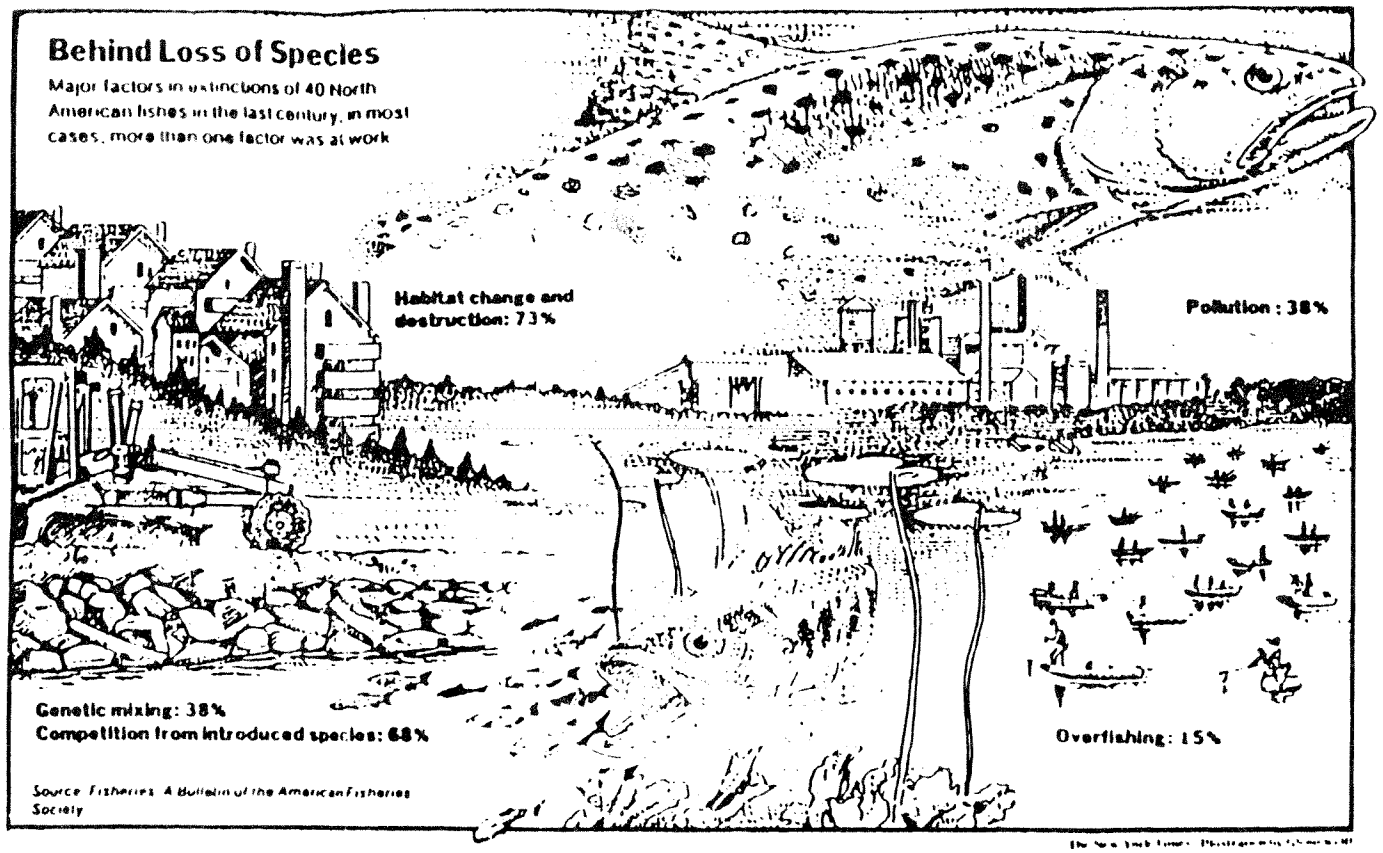
Dr. Gordon, a research associate for the Tennessee Cooperative Fishery Research Unit at Tennessee Technical University in Cookeville, said that since each kind of mussel depends on a particular host fish, "we can't reintroduce mussels unless the host fish is already there." To get around the problem, at least temporarily, his laboratory is propagating mussels in captivity, raising them past the larval stage before they are released into the river.

In the arid southwest, Francisco Abarca and his colleagues at the Arizona Game and Fish Department are struggling to reintroduce native fish that are severely endangered or gone from American waterways. In some cases — for example, the colorful Yaqui shiner and the Yaqui catfish, both of which are extinct in Arizona — the fish are being imported from Mexico, where they are still relatively abundant, Mr. Abarca said.

The celebrated desert pupfish and the Sonoran topminnow, both listed as endangered species by the Federal Government, have been the stars of the Arizona project, the largest aquatic reintroduction program in the Southwest. But the program has met with limited success. In only 1 of 18 reintroduction sites did the pupfish survive, and fewer than 30 of more than 200 reintroduced populations of topminnows have managed to hang on for at least three years, with prospects for continued survival considered slim for many.

Dr. Abarca said future efforts to reintroduce endangered species in the range of their historic Arizona habitats will first seek to remove nonnative fish that compete with them.

Still, according to Dr. Jack Williams, the situation could be worse. "While native fish recovery efforts may not seem very successful," he noted, the list of endangered aquatic species would be much longer if not for the efforts of Federal, state and private organizations.



River Life Through U.S. Broadly Degraded

Farming, logging and dams disrupt the habitat of water creatures.

By WILLIAM K. STEVENS

TWO decades of Federal controls have sharply reduced the vast outflows of sewage and industrial chemicals into America's rivers and streams, yet the life they contain may be in deeper trouble than ever.

The main threat now comes not from pollution but from humans' physical and ecological transformation of rivers and the land through which they flow. The result, scientists say, is that the nation's running waters are getting biologically poorer all the time and that entire riverine ecosystems have become highly imperiled.

Dams disrupt temperature and nutrient patterns on which organisms depend. Countless river and stream channels have been straightened, eliminating the meandering course on which rivers depend for their ecological variety. Repeated diversions of water from a river's flood plain can decimate populations of fish that spawn there. Sediments from farming run into streams and suffocate many small forms of aquatic life. Vacationers who cut down trees to improve the view in front of summer homes may erode stream banks. The stream then carries more sediment and becomes wider, shallower and warmer, making the water unfit for many vital organisms.

"If you take a drive out into pretty, rolling farm country, nobody thinks of the farming activity as habitat destruction," says Dr. J. David Allan, a freshwater ecologist at the University of Michigan. "But the transformation of the landscape by agriculture is taking its toll" on life in rivers and streams, as are urban and suburban development and the spread of exotic, disruptive species of aquatic life.

The transformation, says Dr. Allan, is far more destructive to aquatic life than are spills of oil or toxic chemicals. For all the one-time harm they may cause, these spills have relatively little long-term impact. And because the transformation is so much a part of deeply entrenched patterns of land and water use, it is also far harder to deal with.

Dr. Allan lays out the threat to riverine organisms and ecosystems in an article in the current issue of the journal BioScience.

A 1990 study by Larry Master of the Nature Conservancy found that in North America, 28 percent of amphibian species and subspecies, 34 percent of fishes, 65 percent of crayfish and 73 percent of mussels were imperiled in degrees ranging from rare to extinct. The comparable figures were 13 percent for terrestrial mammals, 11 percent for birds and 14 percent for land reptiles.

In the West, where dams and the introduction of exotic species are common, the situation is particularly acute. Of 20 species of native fish in Arizona, 25 are listed as threatened or endangered, according to Dr. W. L. Minckley, a zoologist at Arizona State University.

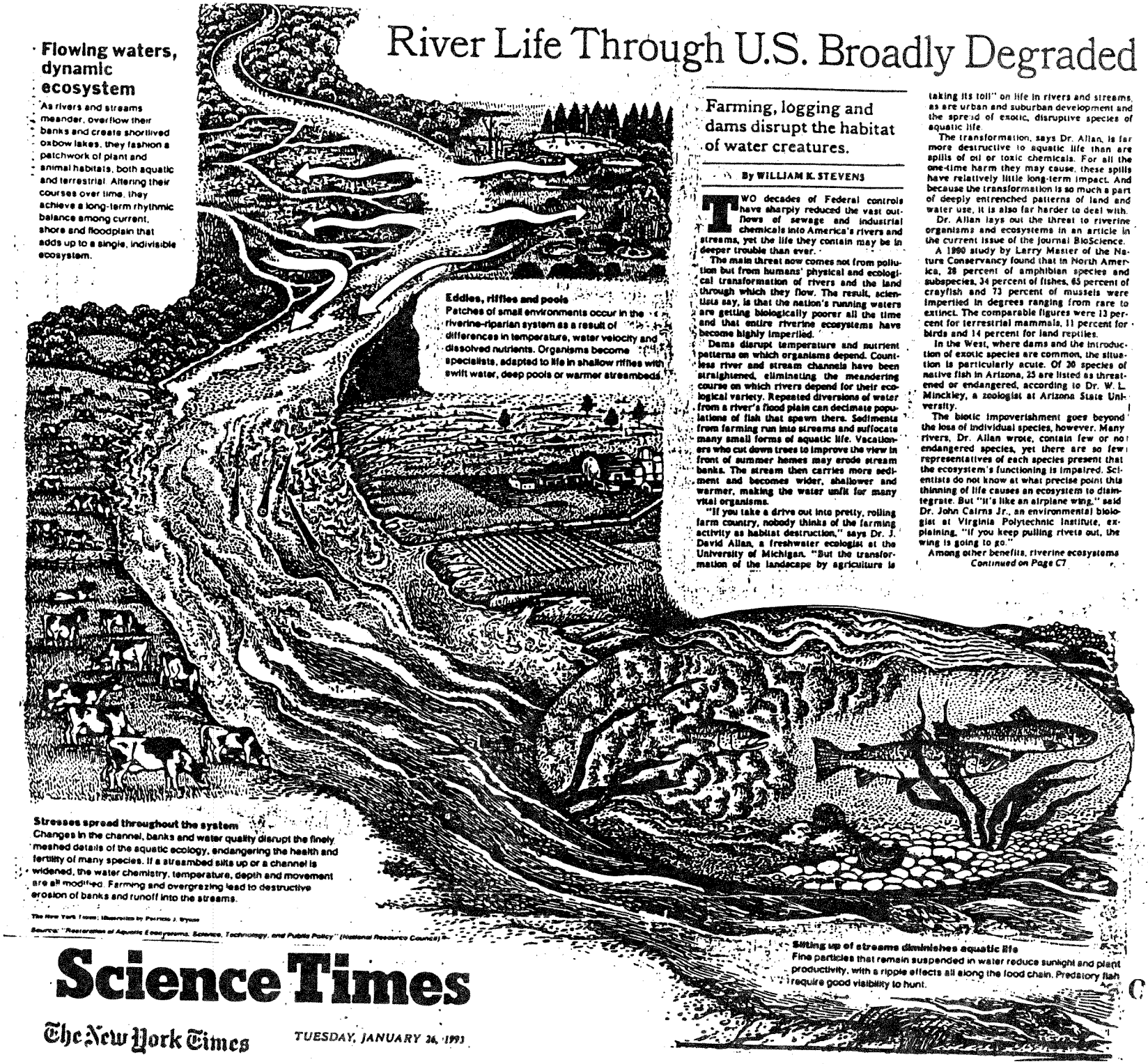
The biotic impoverishment goes beyond the loss of individual species, however. Many rivers, Dr. Allan wrote, contain few or no endangered species, yet there are so few representatives of each species present that the ecosystem's functioning is impaired. Scientists do not know at what precise point this thinning of life causes an ecosystem to disintegrate. But "it's like an airplane wing," said Dr. John Cairns Jr., an environmental biologist at Virginia Polytechnic Institute, explaining, "if you keep pulling rivets out, the wing is going to go."

Among other benefits, riverine ecosystems

Continued on Page C7

Flowing waters, dynamic ecosystem

As rivers and streams meander, overflow their banks and create short-lived oxbow lakes, they fashion a patchwork of plant and animal habitats, both aquatic and terrestrial. Altering their courses over time, they achieve a long-term rhythmic balance among current, shore and floodplain that adds up to a single, indivisible ecosystem.



Eddies, riffles and pools
Patches of small environments occur in the riverine-riparian system as a result of differences in temperature, water velocity and dissolved nutrients. Organisms become specialists, adapted to life in shallow riffles with swift water, deep pools or warmer streambeds.

Stresses spread throughout the system
Changes in the channel, banks and water quality disrupt the finely meshed details of the aquatic ecology, endangering the health and fertility of many species. If a streambed silts up or a channel is widened, the water chemistry, temperature, depth and movement are all modified. Farming and overgrazing lead to destructive erosion of banks and runoff into the streams.

Silting up of streams diminishes aquatic life
Fine particles that remain suspended in water reduce sunlight and plant productivity, with a ripple effects all along the food chain. Predatory fish require good visibility to hunt.

The New York Times; illustration by Patricia J. Wynne

Source: "Restoration of Aquatic Ecosystems, Science, Technology, and Public Policy" (National Research Council)

Science Times

The New York Times TUESDAY, JANUARY 26, 1993

Rivers in U.S. Broadly Degraded, Harming Many Critical Habitats

Continued From Page C1

create breeding grounds for commercial fisheries, carry nutrients to them and support multimillion-dollar recreational activities. In concert with wetlands, they regulate the flow of water, releasing it more slowly in flood times so that more will be left for dry times.

Few if any major river systems are unaffected by the threat to ecological integrity.

Sediment from farm fields, for instance, has clouded the mighty Mississippi, making it more hostile to many organisms. Levees prevent the sediments from settling out naturally on the Mississippi Delta. Instead, they are channeled directly to the continental shelf. This contributes to a sinking of the land in southern Louisiana and releases so many river-borne nutrients into the Gulf of Mexico that plankton growth is stimulated. The plankton use up oxygen when they decay and die, and scientists fear this oxygen depletion may harm Gulf fisheries.

Loss of Native Fish

The Colorado River south of Lake Mojave has been so altered by disruption of water flow and the introduction of exotic fish species, Dr. Minckley said, that it has become the first major river in North America with no native fish left.

Dams on the Columbia River have so interfered with salmon migrations that one variety of Columbia salmon has been listed by the Government as endangered. Another has been declared threatened, and five more have been proposed for listing.

All three of these watercourses appear on a 1992 list of North America's 10 most endangered rivers compiled by American Rivers, a Washington-based conservation organization. Others include the Alsek and Tatshenshini river system in Alaska and Canada, the Great Whale River in Quebec, the Everglades, the American River in California and the Penobscot in Maine.

The list is rounded out by the Beaverkill and the Willowemoc, legendary Catskill trout streams where American fly fishing was born, and Montana's Blackfoot, the putative setting of the current hit movie, "A River Runs Through It."

Habitat in lower stretches of the Beaverkill-Willowemoc system is threatened by developers' cutting of streamside vegetation. The Blackfoot has become so degraded by timber cutting, agriculture, water diversions and mining activities that the movie makers were forced to move to another location.

Kevin Coyle, the president of American Rivers, describes "the four horsemen of river destruction" as dams, diversion of water, alteration of channels and land development.

Dams trap nutrients and keep them from flowing downstream. Perhaps more devastating, they alter the temperature of downstream water, making it either too cold or too warm and thus annihilating whole populations of insects vital to the riverine food web. One dam might not be so bad, but many dams on the same river, as is common in the West, repeatedly interrupt the river's natural functioning.

Diversion of water for human use, also widespread in the West, has simply dried up many rivers and streams for much of the year, with the result that their ecosystems are, in Mr. Coyle's words, "ghosts of what they used to be."

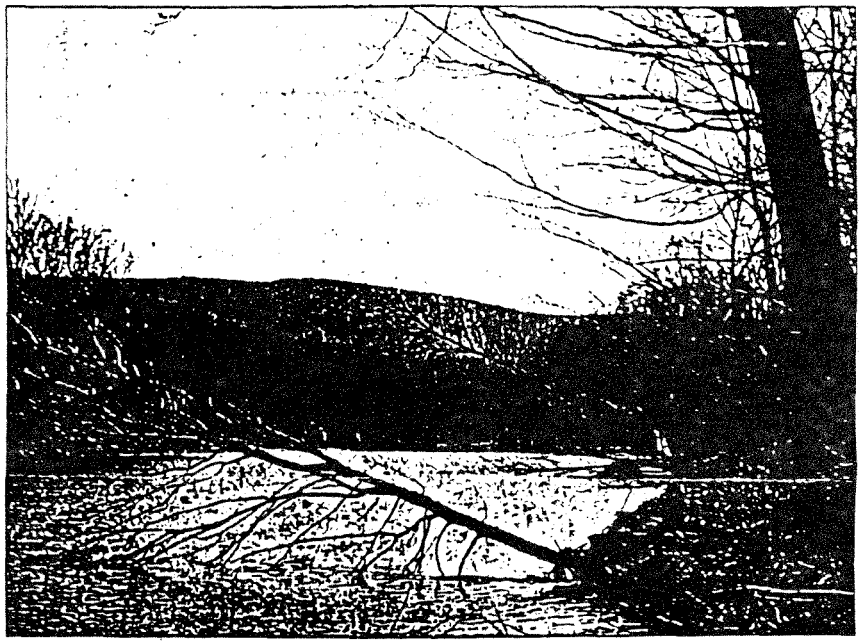
The straightening, diking and redirection of river channels, common across the country to control floods and convert flood plains to cropland, housing and highways, reduce the variety of habitats critical to biological diversity.

Land development often denudes stream and river banks of vegetation, eliminating the vital transition between the river and the uplands. Draining land for farming or development causes water to flow more rapidly into the river channel than it naturally would. This leaves less water to percolate into the river in drier times.

If the river channel has been straightened as well, water draining from the land moves more efficiently, producing more powerful floods. These carry the increased sediments from farming and development farther, choking organisms and ecosystems well downstream.

Tinkering With Nature

On top of all this, legions of exotic species have been introduced into running waters. Some, like the zebra mussel slowly spreading across the country, have appeared by accident. Others, like fish imported to provide sport or to clean vegetation from the waters, have been introduced on purpose. Together, Dr. Allan said, they have significantly reduced biological diversity through predation, alteration of habitat, introduction of diseases or parasites and interbreeding with native organisms.



Kris Law

Trees along an eroding bank falling into Willowemoc Creek near Roscoe, N.Y. As such banks erode, the river becomes wider and shallower and its water becomes too warm during the hot summer months.

Such ecological tinkering can unexpectedly cascade through the water, onto the land and into the economy as well. In one instance, fishery managers in Montana introduced opossum shrimp into Flathead Lake and its associated river systems, hoping the shrimp would provide forage for kokanee salmon that were the basis of a thriving tourist industry.

Instead, the shrimp consumed zooplankton that were the staples of the kokanee diet. The kokanee population collapsed. Bald eagles and grizzly bears that once congregated at the rivers to feed on salmon disappeared, as did tourists who had come to see them.

Once invasive species have established themselves, said Dr. Allan, it may be impossible to eliminate them. The other main causes of biological impoverishment seem only a little less intractable. Even so, Dr. Allan, Mr. Coyle and others say much can be done.

American Rivers advocates a three-pronged strategy: saving the headwaters of the major rivers, which for the most part are already publicly owned; protecting and restoring riparian zones by replanting green strips along rivers; and working with governments to regulate water discharges from dams so they disrupt ecosystems less. Federally controlled dams are also being examined for their environmental effects as their hydroelectric licenses come up for renewal.

A number of scattered efforts to restore rivers and streams are being undertaken. Restorationists have become expert at restoring streams for game fish like trout, Dr. Allan noted. What is needed now, he said, is a comparable effort to restore habitat for the full panoply of riverine organisms.

An ambitious effort along these lines involves the Kissimmee River in Florida. To control flooding, the Army Corps of Engineers basically turned the twisting 103-mile-long river into a straight canal, largely destroying the riverine-riparian ecosystem. Now, after a successful demonstration project, the State of Florida and the corps hope to restore the river's twists and turns — and its ecosystem.

Broader restoration of this sort is still in its infancy. But as fragile as riverine ecosystems are, Dr. Allan points out, they are also remarkably resilient. They tend to repair themselves once the causes of their impoverishment are removed.

So, he says, all is not lost.

Stresses on the Aquatic Environment of Rivers and Streams

Five major classes of factors that affect the river environments of living things and how human activities affect them.

ENERGY SOURCE	WATER QUALITY	HABITAT QUALITY	WATER FLOW	INTERACTIONS OF LIVING THINGS
The type and amount of organic material entering a stream from the riverside, versus primary production in the stream; seasonal patterns.	Temperature, turbidity, dissolved oxygen and nutrients, natural and synthetic chemicals, heavy metals and toxic substances, acidity.	Spawning, nursery and hiding places; substrate type; water depth and velocity; diversity (pools, riffles, woody debris).	The volume of water and the timing of floods and low flows.	Competition, predation, disease and parasitism.
CHANGES THAT RESULT FROM HUMAN-INDUCED ALTERATIONS:				
Coarse particles of organic matter decrease; silt and fine particles increase; production of algae increases.	More extreme temperatures; more suspended solids, nutrients and turbidity; altered daily cycle of dissolved oxygen.	Destabilization of substrate and banks by erosion and increased sediment; less habitat variation and vegetation; more uniform water depth; less habitat area.	Changes in flow extremes, including velocity and frequency; fewer protected sites; reduced diversity of flow in microhabitats.	Increases in fish disease and hybridization; alterations in reproduction, riverbed structure, decomposition rates and timing; disruption of seasonal rhythms; shifts in community assembly and species abundance.

Adapted from "Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy" (National Research Council)

APPENDIX E

MARCH 15, 1994

Mr. Chairman and Members:

My name is Charles Warren and I am Executive Officer of the State Lands Commission. I am accompanied by Robert Hight who is Chief Counsel for the Commission. We want to commend and congratulate you, Mr. Chairman and members, for having established and serving on this subcommittee for the protection and restoration of California's rivers. If you will permit a personal observation, it is my opinion yours is one of the more exciting, essential and promising legislative efforts to more responsibly manage the natural resources of California in recent decades. We at the State Lands Commission are pleased to join you in this effort.

As you know Mr. Chairman, a major and significant responsibility of the Commission is the management of the sovereign lands of California which include all lands which historically underlay the tide and navigable waters of the state. These lands are managed as legally mandated by the provisions of the Public Trust Doctrine. In order to responsibly meet its duties as trustee for such lands, the Commission recently commenced a major initiative to inventory the

status and trends characterizing all such lands. Our first effort was directed toward California's famous Delta and its findings were revealed in a report which was released in 1991. With the issuance of that report, a Senate Subcommittee on Delta Protection was formed, chaired by Senator Johnston and following hearings by the subcommittee, legislation which seeks to protect the Delta was introduced and signed into law.

Our second effort was directed toward California's rivers. Its findings were reported last year and is the subject of our comments today. Copies of the report itself as well as an executive summary have been provided you. We are encouraged to understand that the report was one of the considerations which led you to form this subcommittee and to hold this and, perhaps, other hearings.

The report itself consists of five parts: chapter one discusses the natural configurations of rivers and how they were used over time by native and immigrant populations; chapter two discusses the effects and consequences of the historical uses to which the rivers have been

put; chapter three is a status assessment of the rivers in seven regions of the State; chapter four is an exposition of the nature and function of rivers and of their restoration capability; and chapter five identifies the several governmental programs and initiatives and private party efforts to protect our rivers and streams.

To present the contents of the report in more graphic terms, Dr. Diana Jacobs, our staff biologist and principal author of the report, has prepared a slide demonstration.

Following Dr. Jacobs, Elizabeth Patterson, our staff senior planner and Project Director of the report will provide you with a summary of current national and regional efforts underway to protect and restore our rivers and streams. This summary may be useful to you when considering program options.

Following their presentation, I would appreciate an opportunity for a few closing words.

CLOSING WORDS

Mr. Chairman, it is clear that river protection and restoration are deserving subjects for legislative consideration. This will not be easy for you because until now the destruction of our rivers has been treated as a tolerable cost of doing business. However, we are now beginning to recognize and appreciate the considerable value of a river and its watershed and the unacceptability of their destruction. Fortunately, such recognition comes at a time when there are alternatives to historically destructive activities and their accompanying technologies and management practices.

It is my view, Mr. Chairman, that too many of such activities have been incorporated into or accepted by our existing statutory and regulatory framework.

So, as a first step, the subcommittee might consider the enactment of a "do no harm" statute which would apply to all state agencies whose jurisdictional responsibilities involve activities which affect rivers and their watersheds. Such a statute would direct all such

agencies to review and, as necessary, revise their regulatory requirements to avoid river destructive practices. This "do no harm" legislation should require such agencies to report back to the legislature describing their compliance in no more than two years.

Concurrently, the subcommittee should consider a more comprehensive and proactive river and watershed restoration program. In your hearings and deliberations there are a few suggestions of a general nature we would recommend you consider:

First - Rivers, their watersheds and their uses are unique in respects which suggest management plans for their protection and restoration should also be unique. Accordingly, any state program should reflect and provide for a regional and watershed approach to protection and restoration.

Second - Your program should recognize and provide for the fact that some uses of land are destructive to rivers and watersheds and, consequently, local government should be fully involved in helping

accomplish legislatively declared goals and objectives of river protection and restoration.

Third - Your program should recognize the several notable state projects which have as their subject a better understanding of the role and needs of rivers. I have in mind the California Rivers Assessment Program being conducted by the Resources Agency which will provide invaluable data on an ongoing basis to those engaged in river management planning and restoration. I have in mind also the collaborative effort to repair the Upper Sacramento River watershed. There are a number of other notable projects, all of which are set forth and described in our report. The subcommittee might consider how best such efforts could be integrated and coordinated in a more comprehensive statewide program.

Fourth - Your program should provide for professional and scientific guidance in the development and implementation of river protection and restoration programs. As we now know, natural systems are complex, interrelated and many times the victim of the

law of unintended consequences.

To conclude Mr. Chairman and Senators, we wish you well as you undertake the task before you; we offer any help and assistance within our means you request; and we join with all Californians in anticipation of the success of your efforts.

MARCH 15, 1994 TESTIMONY

TO
THE SENATE SUBCOMMITTEE
ON
RIVER PROTECTION AND RESTORATION
BY
ELIZABETH PATTERSON
RIVERS PROJECT DIRECTOR
STATE LANDS COMMISSION

A BRIEF OVERVIEW OF EFFORTS AND INITIATIVES BY FEDERAL, STATE, LOCAL AND NON GOVERNMENTAL ORGANIZATIONS FOR RIVERS, RIVER BASIN AND WATERSHED, RESTORATION, PROTECTION AND MANAGEMENT.

Some people fear that the challenge of river restoration may paralyze policy makers. I want to allay those fears by showing what action other states and the Congress of the United States are taking. I will begin where we at the State Lands Commission began.

When we launched the Rivers Report project in 1992, we were fortunate to have the guidance of the then recently released National Research Council's publication, *Aquatic Restoration*. This remarkable book provided a framework from which we could construct our report. Our ecology specialist, Diana Jacobs, has shown how, in relying on this framework, we approached the rivers as a system, describing functions that are essential for the well-being of aquatic and riparian habitat. She has shown past practices and their consequences and new ways that sustain the river resources. She has shown the potential for restoration. My testimony is to demonstrate to you the need for coordinated, system-wide river restoration and examples of such coordination by other state legislatures. The following is a brief overview of these efforts and initiatives by federal, state, local and non governmental organizations.

The distinguished National Research Council is a creature of the Congressional charter of 1863 mandating the National Academy of Sciences to advise the federal government and provide services to the public, scientific and engineering communities on scientific

and technical matters. The Academy is a private, nonprofit, self-perpetuating society of notable scholars engaged in scientific and engineering research.

Investigating the plight of rivers, the Council recognized the importance of the emerging science of restoration ecology for aquatic ecosystems. They felt strongly that all too many environmental decisions had been made in a fragmented fashion and on a certain road to tragic failure for repairing and sustaining river systems.

The Council lamented that from a national perspective too many environmental decisions, including those involving restoration, biodiversity planning and habitat conservation plans are uncoordinated, diverse efforts often unrelated to the river's functions or watershed system. These findings suggested to us that 1) we must educate policy makers about these functions and systems, 2) that we must initiate an integrated approach to restoring aquatic ecosystems; 3) that we should identify the elements for such an approach; and 4) provide you the acid test for your assessment of a meaningful restoration and management program.

As the Council's first lesson on the strategy for reversing the degradation of rivers is informative and instructive, their second lesson revealing the expanding flood of restoration efforts that seek to protect and restore rivers is encouraging and promising: Efforts to repair a broken river, to protect a river segment, to management river basins and watersheds and to conduct old business in new ways. This flood has grown from a riffle of local efforts, such as the Russian River management planning, to rapids of state legislation, such as the Massachusetts and Oregon river protection and management mandates, and — if I may continue the metaphors — a federal waterfall known as the "River Watershed Protection and Restoration Act of 1994". This second lesson tells us that there are politically acceptable options for answering the need for restoration and preservation of the ecological integrity of rivers.

To illustrate the scope and breadth of river restoration at the local, state and federal level, I will briefly summarize Chapter 5 of our *Rivers' Report,* and briefly describe two state initiatives and the federal Rivers Act of 1994:

We began Chapter 5 with a Paul Bunyan parable quoted from Aldo Leopold, "The Round River" from the 1949 *A Sand County Almanac*, which I have shortened:

> "We the genus *Homo* ride the logs that float down the Round River, and by a little judicious "burling" we have learned to guide their direction and speed. The technique of burling is called economics, the remembering of old routes is called history, the selection of new one is called statesmanship, the conversation about on coming riffles and rapids is called politics. Some of the crew aspire to burl not only their own logs, but the whole flotilla as well. This collective bargaining with nature is called planning."

This quote is the summary of the multitude of programs, policies and initiatives that make up the current body of river protection, restoration and management in California. As you know the public trust is the artery of this body. In addition to the public trust, there are statutes and laws that proscribe activities that are harmful to rivers except for the public welfare. We note that there are standards of water quality, and requirements for fisheries. In all, there are 14 federal agencies with management and regulatory responsibilities. There are 17 state agencies with management and regulatory responsibilities. In addition, there are 58 counties, more than 350 cities and scores of special districts that may have jurisdiction and whose actions affect rivers.

Acknowledging the sheer number of agencies involved in river management or activities that affect rivers, the Resources Agency has formed a federal and state task force. This River Assessment project is to inventory, evaluate and provide information on a

statewide basis in recognition of the need for a comprehensive foundation of information in order to better conserve the state's rivers.

In the *Rivers Report* we also identity over 40 non governmental organizations which are addressing river restoration, protection and management, including the California Association of Riparian Parkways (CARP) an association of 40 elected officials representing river greenway initiatives in their jurisdictions. The report clearly demonstrates that those who use the river and its resources — the "economist and historian, statesmen and politician" of the parable — are searching for ways of river management albeit often uncoordinated, fragmented and conflicting.

California is not alone in this search. Massachusetts is a state with exciting and innovative local initiatives to reclaim and protect rivers. The Massachusetts "River Protection Act", Senate bill 948" augments their state sponsored "Adopt a River" program by establishing a setback ranging from 25 to 150 feet of land buffer for certain types of potentially harmful land use activities adjacent to rivers.

Oregon is a state that has already enacted legislation anticipating and envisioning the federal River Protection Act of 1994 and serving as a forecast of what states can do. The first step taken were two 1987 statutes: SB202 provides for the issuance of passes for a for river access fees for the maintenance, enhancement or protection of natural and scenic beauty of designated rivers; the second statute HB3019 enabled the creation of river management planning process for the Deschutes River. We have for you today copies of the "Deschutes River Management Plan". The plan is a collaborative planning process of federal, state and local governments, landowners and others who use river resources and who agree through this plan to protect and manage the river and its watershed.

The second step is the largest river protection act in the nation's history for the lower 48 states - the 1988 Oregon Omnibus National Wild and Scenic Rivers Act which protected 40 Oregon rivers, totalling over 1,500 miles, as Wild and Scenic rivers. Credit for this awesome achievement goes to the Pacific Rivers Council. The Council has received national acclaim for its imaginative river restoration approaches that merge contemporary ecosystem science with sustainable community development. They have played a major role in developing the recommendations of the National Research Council into a national legislative program of which I will describe shortly.

In spite of these noteworthy, numerous and promising restoration projects at all levels of government and by the private sector which are not insignificant, there is still lacking national direction. Much more is needed to slow the loss of national aquatic resources and reverse the damage of ecosystem functions and wildlife. A national prescription is needed and must be on a par with the current commitments to water quality and endangered species recovery plans. In fact, in many cases the most cost-effective strategy for meeting these legal commitments is the physical restoration of aquatic systems.

Both the National Research Council and the Pacific Rivers Council are urging the federal government to take the lead, to provide a national aquatic ecosystem restoration strategy that enables each state to be innovative, imaginative and inspired in developing a state legislative program. Guided by these recommendations Congressman Bill Richardson of New Mexico, Chairman of the House Natural Resources Subcommittee on Native American Affairs, may introduce today, March 15th, the "River and Watershed Protection and Restoration Act of 1994". The legislation will be considered in the Natural Resources Committee chaired by Congressman George Miller.

The purpose of the Act is to provide a new, unique mechanism to empower local river and watershed conservation advocates to protect and restore aquatic resource values in

rivers and watersheds. The bill provides a means for these local conservationists to tailor and integrate local state and federal incentive and regulatory tools for the benefit of rivers and watersheds. The bill provides local, grassroots conservationists a mechanism that gives state and federal sanction of their own protection and restoration strategies. This sanction is in the form of placing the watershed or river on a National River and Watershed Registry. Placement on the registry will allow local conservationists to obtain federal funding, technical assistance from federal and state aquatic resource agencies and protection from activities that are inconsistent with the river or watershed conservation strategy.

In conclusion, we have learned from the National Research Council and the Pacific Rivers Council that no truly effective, comprehensive river conservation program exists at any level of government. We see the growing knowledge of the general public and elected officials of the severity of the problems and the bankruptcy of existing approaches and policies. We have learned that while there are very worthy and respected river restoration programs such as the SB1086 Upper Sacramento River Riparian Restoration and the Central Valley Stream Restoring project, the scope of river protection and restoration is on such a scale that more is required than new laws for each river mile.

We have seen examples of local and state initiatives that are in need of a coordinated, comprehensive resource management program. And finally we have seen other state legislatures act with the current level of knowledge of aquatic restoration. Although more information and development of data is desirable, we must acknowledge that science and resource managers will never know all. To quote *Entering the Watershed*, "Rather than allowing the unknown to paralyze us as more systems and species disappear, we must apply the best of what we know today . . ."

California Association of Resource Conservation Districts

March 15, 1994

Good afternoon. My name is Julie Spezia. I am the Executive Director of the California Association of Resource Conservation Districts. I work with 114 Resource Conservation Districts around the state many of which are actively leading river restoration projects. Many of these projects such as the Tomki Creek, Grass Valley Watershed and Feather River Watershed projects are known as "CRiMPS."

CRiMPS are coordinated resource management planning groups that follow a consensus decision-making model for resolving conflict on resource issues. That is a long way of saying that the people in the community agree to meet in one room to work out a solution to a resource problem and commit to implementing the solution cooperatively as a group.

The people who need to participate are generally the County Board of Supervisors, private industry and private landowners, the state and federal resource agencies, and other interest groups such as the Steelhead and Trout Restoration Federation. The RCD can play an important role in coordinating these meetings and in seeking cooperation from landowners in the watershed who may not be active participants in the group.

GLOSSARY

Resource Conservation Districts (RCD)--RCDs are special districts governed by Division 9 of the State's Public Resources Code that administer programs to conserve natural resources. They are governed by locally elected directors and financed by a hodge podge of funding sources including local property tax, grants, and contracts. RCDs are uniquely empowered to work with all levels of government and the private sector. They are the only grassroots delivery system for putting conservation on the ground.

Coordinated Resource Management Planning (CRMP)--CRMP is a resource planning, problem solving, and management process that allows for direct participation of everyone concerned with natural resource management in a given planning area. The concept underlying CRMP is that coordinating resource uses results in improved resource management and minimizes conflict among land users, landowners, government agencies, and interest groups. Using this approach, resource problems are addressed and solved much more effectively because they are based on resource boundaries; they are not constrained by individual, agency, or political boundaries.

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The meetings are usually facilitated because these are contentious issues that quickly touch upon our core values. If they could be easily resolved without litigation or legislative intervention then a CRiMP would probably not be necessary. The CRiMP process addresses the lack of communication that is at the root of most of these resource problems.

Coordinated Resource Management Planning is a process that allows fractured communities—communities divided over the appropriate way to use resources—to come together. Through the CRiMP process the factions in the community develop lines of communication and build relationships with one another. Over time, and this process does take time and hard work, the resource issues are defined, actions proposed and an implementation strategy agreed upon.

I have enjoyed learning the art of managing a CRiMP from Leah Wills, the watershed coordinator for the Plumas Corporation. She has been working with the Feather River RCD since their first project—the Red Clover project. That project was modest compared to their current projects. It involved resolving one issue in a tributary watershed: how to protect a riparian area that suffered from uncontrolled grazing. The cattlemen who live in the area were very concerned. Would this be the beginning of a "cattle-free" policy for the Feather River watershed? PG&E was also concerned. The sediment resulting from the poor management of this tributary contributed to their overall expenses for dredging the downstream power generation facilities. The CRiMP resulted in fencing off the riparian area accompanied by a controlled grazing plan. The success of this initial effort has since inspired many subsequent larger more complicated sections of the upper Feather River watershed.

The cooperative working relationship between the RCD and the Plumas Corporation has yielded a lot of fruit. They have brought hundreds and thousands of federal watershed restoration dollars to their local community. They have spun off a program to retrain forest workers in watershed restoration work (see article). And they have fostered a significant education outreach program through the Adopt-A-Watershed program in the local schools.

It also laid the necessary groundwork for the success of the Library Group. However you may feel about the recommendations of the Plumas Library Group I think you can join me in marveling that they were able to reach agreement. This divided community where the environmentalists did not speak to the timber industry and the landowners distrusted the Forest Service has been able to work through these issues and chart a course for their community.

I asked Leah Wills if the CRiMP group reaches consensus on values after working together for awhile. She laughed at my naivete. We cannot expect individuals to share values but we can expect them to reach consensus on desired outcomes. So

we provide a forum where they can share their fears and dreams and where a concrete plan can be hammered out that respects their concerns and makes their dreams a reality.

I have witnessed this same phenomenon again and again. Communities are coming together and solving their problems. This is good government and local government RCDs are leading the way. People are empowered when they are able to resolve issues among themselves. They are committed to sustaining the solutions when they have participated in crafting the outcomes. And they are willing to tackle bigger and more complicated issues when they experience success.

Funding is always the Gordian knot that people mention when discussing CRiMP style watershed restoration efforts. It is a serious issue that must be addressed. At the same time CRiMP groups are displaying how this cooperative approach is part of the answer. Implementation is generally funded by the group members meaning that everyone chips in what their agency or corporation can and grants are written to make up the gaps. The problem is still that there is presently not enough money in the system to pay for all of the CRiMP projects currently underway. This means that restoration will take longer and some groups may become discouraged and disband. There is also a lack of recognition for the cost of coordination and facilitation. Very few grant programs will pay for this part of the project. For instance, EPA 319 grants will pay for restoration work but they want a CRMP to be in place and the plan finished. Currently no one is paying for the process of completing the plan. This process has proven to be a highly efficient way to get conservation on the ground. Whatever the legislature can do to encourage this approach will be welcomed.

I must close with a few caveats for the CRiMP process. It works best when the boundaries for the resource problem coincide with the boundaries of a community. CRiMP is dependent on personalities and people have to have some community ties for this kind of process to work. The process also takes time and the political reality is that not every issue allows us a year or more to reach a decision. It also requires a great deal of cooperative behavior and community leaders are not always ready to embrace a consensus model for decision-making. Having said all of that, when this process of local decision making is embraced tremendous results are possible. Communities can experience the joy of successfully resolving conflicts over resource issues. And fractured communities can begin to glue themselves back together.

STATE

Testing the waters in Plumas

Students find sparkling opportunities in technician program

By Jane Braxton Little
Bee Correspondent

QUINCY – David Grant pulled a 4-foot plastic tube out of a well and carefully emptied its murky contents into a sterile jar.

He handed the jar to workers at a makeshift lab set up on the grassy floor of a valley ringed by snow-capped peaks of the northern Sierra Nevada.

In less than a minute, Grant knew the temperature, electric conductivity and pH level of the well water he sampled.

The lab – actually a classroom – was one of the many field stations used daily by students in a water resources technician program at Feather River College in Plumas County.

The program is one of two in the nation offering hands-on, practical training in applying basic scientific concepts to stream restoration and pollution prevention, said Burkhard Bohm, a geology and hydrology consultant who coordinates the program. Students can graduate after one year with a water resources technician certificate or spend two years getting an associate science degree in watershed management.

The education Grant is getting at Feather River College is like nothing he remembers from his high school days.

"Here I get to work outside and do something I think is really important. It's got me so stirred up I want to go on for a four-year degree," said Grant, 43.

He has worked eight years as a mechanic for McElroy Brothers, a Quincy logging company. When he proposed enrolling in the college spring semester full time, his bosses were enthusiastic and gave him the time off.

"The way logging's going I'd better find something different. I think this is it for me," said Grant.

He is not the only water resources student looking for a new field. Bill Miller, 35, left a career as a cowboy and wrangler to become a full-time Feather River College student in the watershed program.

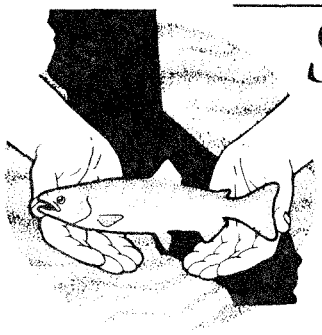
Kevin Hiatt, 33, is a construction worker who said he enrolled for "more promising" opportunities than the current job market for carpenters.

For his semester project in Bohm's water quality monitoring class, Miller surveyed 1,044 feet of a local stream. He will take periodic samples to test for dissolved oxygen, alkalinity and electric conductivity.

"Do people really get paid for this? For the first time in my life I'm getting in on the ground floor of something," Miller said.

The Feather River watershed is an ideal location for a college water-quality program, said Ken Roby, a U.S. Forest Service hydrologist and fish biologist who has taught in the program since it began in 1990.

Within a half-mile of the rural college campus, students can study all the major stream types, including creeks affected by fires, logging and overgrazing by cattle.



Salmonid Restoration Federation

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TESTIMONY PRESENTED BY

JUD ELLINWOOD, EXECUTIVE DIRECTOR

SALMONID RESTORATION FEDERATION

TO

THE SENATE COMMITTEE ON NATURAL RESOURCES AND WILDLIFE

AT ITS

MARCH 14, 1994 HEARING ON RIVER PROTECTION AND RESTORATION

To explain what our organization does, it will be helpful to briefly delve into a tradition of California that is not duplicated anywhere else in the Pacific Northwest, which to many of us involved in fishery conservation is everywhere a salmon can go. The tradition I speak of is that of public involvement in the restoration of California's salmon and steelhead fishery resources. Early 70's groups of individuals organized for purpose of restoring depleted fish populations.

The tradition was established at the end of the 60's when a few local Northcoast groups of commercial and sports fishermen organized themselves for the purpose of restoring local fish populations. Initially their efforts were largely limited to development and operation of a few small scale artificial propagation projects, although a few trial efforts at rehabilitating damaged stream habitat was also attempted. By the late 70's many more non-profits, civic groups and local agencies had indicated interest in starting up similar local programs. CDFG was beginning to realize the full value of this activity, which encompassed fostering community involvement in the stewardship of fishery resources, and was actively encouraging development of cooperative restoration projects. The major stumbling block then, as it is today, was funding. The state took a historic step forward in 1982 when state law was enacted that created the Bosco-Keene grant fund and enabled the Department to officially operate a salmon and

steelhead restoration grants program Other circumstances-notably a growing realization shared by fish resource managers and concerned citizens that stream habitat destruction, and not overfishing, was the principal cause of fish population declines, a mushrooming desire on the part of the public to become actively involved in conserving fishery resources, and CDFG's recognition that their agency would need the publics help to successfully protect and restore damaged California's salmon and steelhead-led to a rapid expansion of the grant program.

The untested seat-of-your-pants instream habitat restoration efforts of inexperienced non profit contractors that were undertaken in the mid seventies have long since evolved into the planned, prioritized, and field tested methods currently employed today by an interactive group of experienced non-profit, local agency, tribal and micro-business contractors. Now, the grant program emphasizes restoration of watershed function and selective application of instream project methods. It is instructive to remember that the field of stream habitat restoration was born a little over two decades ago, and in the last decade has been in a dynamic state of development as stream conditions have tested applications of what had recently been state of the art techniques and materials, design flaws were identified, and project evaluation information has been used to constantly upgrade project designs.

Historically, statutory restrictions placed on uses funded by the grant program have prevented the state from funding monitoring, evaluation, and, in our minds most importantly , education projects. The community of fishery restoration practitioners has had to historically depend to a great degree on it's own organizational resources, community support and group cooperation to develop and support technical and public education projects. One of the most laudable traits of California's restoration community has been its ongoing commitment to improving the technical skills and knowledge of its contractors.

The Salmonid Restoration Federation was formed by the leaders of several local restoration groups in 1986 in order to create an organizational framework for planning and producing an annual conference that would provide technical education and networking opportunities for restoration practitioners from throughout the state. That conference, with the support of a broad range of agency and private sector support, is now in its thirteenth year, has grown from a two to a four day event that currently features four all-day workshops and a full day of concurrent technical sessions and is attended by approximately 300 people.

To better fulfill its organizing purpose of improving the effectiveness of California's salmonid restoration community, we now offer an extensive program of support services to our

constituents. We have also become vocal advocates for the development and maintenance of public involvement funding sources and watershed, and for the stream restoration programs of state resource agencies that fund public involvement in restoring salmonid habitat-particularly CDFG's Salmon Steelhead and Anadromous Fisheries Program, which was created in 1988 by the enactment of SB 2261.

Since the creation of the Bosco-Keene Fund in 1982, a variety of other short-term sources for funding restoration have been created and have been subsequently exhausted. To give you a quick idea of the condition of funding: Annual grant program funding rose to a 1987 high of $8 million, and has declined steadily to current levels of approximately $1.5 million In 1987 the grant program was sustained by a total of 10 sources ; today there only three of the ten remain. One of these, Prop 70 will be exhausted in the next couple of years. Annual funding from a second source, Prop. 99 Public Resource Account funds, has been steadily whittled down from over $1 million four years ago to less than $250,000 in this fiscal year. And the third source, the Commercial salmon fisherman's Salmon Stamp Fund has been downsized as salmon landing s have steadily diminished.

The shocking news for many is that even if funding levels were tripled or quadrupled, the amount of funding available for restoring fish habitat would be dwarfed by the magnitude of the cost of repairing California's damaged habitat. Consider that last year ,combined state and federal expenditures on fish habitat restoration in California totaled approximately $5 million . Now compare that with the cost of controlling erosion that is destroying fish habitat in one sub watershed of the Plumas National Forest, which the Forest Service has recently estimated to be $183 million dollars. It is clear that restoration of stream habitat will only be an effective tool when a strong set of brakes are applied to the rate at which habitat continues to be damaged.

Stream habitat restoration in fact becomes a futile waste of the public's money if the causes of the damage that originate in the stream's watershed remain unabated. As fishery resource managers and conservationists have so graphically learned, preventing stream habitat damage by using appropriate land and water uses in adjoining riparian and upland areas is far more cost-effective and desirable than responding to the damage after it's already been done. Cost aside, we know now that the biological function of rehabilitated streams can not truly be restored back to an undamaged condition. The remaining healing that must be occur naturally will take decades and even centuries to be complete.

Experience also has taught us that regulation of harmful land and water management practices is only partially effective at preventing fish habitat from being degraded. Regulations designed to prevent habitat degradation are imperfect, seldom restrictive enough, and are frequently either intentionally or, because of circumstance, poorly enforced. Aside from the political difficulty of creating more and tougher regulations, the regulatory pathway, if followed to the exclusion of other options, can only proceed so far before it generates a counter-productive public backlash. Regulation, too, has its practical limitations. And it is a reactive approach that is always one step behind the environmentally damaging practices it seeks to curb. Regulations typically close the barn door after the horse has already escaped.

Which brings us to the question of why the Salmonid Restoration Federation is such an outspoken advocate of public involvement in fish restoration. We can cite several reasons, including the cost-effectiveness of grant program restoration work, the high level of volunteerism that characterizes grant program projects, a commitment to monitor and maintain projects after contract work has been completed, employment of local workers, and providing a measure of stability to rural economies that are characterized by seasonal unemployment. But to us, the most important aspect of public involvement is spin-off public education. We believe this indirect benefit of grant program projects is key to the success of the state's efforts to protect and restore fish habitat. What we see in case after case of citizens physically engaging in restoration work of even the most mundane and grueling sort is that they become passionately attached to the fishery resources in their local watersheds. Invariably, many of the citizens who participate in restoration projects end up playing instrumental roles in developing effective volunteer-based community public education and awareness projects. These projects are extremely successful at teaching the public about the habitat needs of local fishery resources, the impacts of their land and water uses, and alternatives ways to manage resources that minimize impacts on fishery resources.

With virtually no state or local funding, grant program participants have been able to establish effective watershed and fish habitat conservation projects in schools throughout rural California, and organizations such as ours and a variety of local agencies produce technical workshops specifically designed to teach ranchers, farmers, and timber operators and foresters cost-effective ways to protect public trust fishery resources while continuing to manage their lands for traditional uses. As harmful traditional management practices give way to those that are more benign, we are seeing profound transformations occurring in communities as their residents begin to collectively assume the role of stewards of these neglected resources.

It is these glimpses of what the future can hold that convince us of two things. First, the ultimate success of state habitat restoration efforts hinges on how successfully the state can facilitate, encourage, and maintain public involvement in fish restoration efforts. And second, education must be a central, core feature of that involvement. Public education can become a powerful tool of state resource managers, but it must be enabled with adequate funding. This then is the promise and the challenge that we leave you with today.

Settles

IT'S A PLEASURE TO BE HERE TODAY TO TELL YOU ABOUT OUR FISHERIES PROGRAM AT THE PACIFIC LUMBER COMPANY, AND THE MONITORING AND EVALUATION THAT GOES ALONG WITH THE PROGRAM.

FIRST OF ALL, I WAS BORN AND RAISED IN THE RIO DELL/SCOTIA AREA, WHICH IS LOCATED ON THE EEL RIVER IN HUMBOLDT COUNTY - WHICH IS ALSO A PART OF CALIFORNIA.

BEING A LIFELONG RESIDENT OF THAT AREA, I CAN REMEMBER THE RUNS OF SALMON AND STEELHEAD THAT USE TO MIGRATE UP THE RIVER TO SPAWN IN ITS MANY TRIBUTARIES. IN FACT, IT WAS QUITE EASY TO WALK TO THE RIVER AFTER SCHOOL IN

THE 50'S AND 60'S AND CATCH A LIMIT OF SALMON OR STEELHEAD WHEN THEY WERE IN THE RIVER.

I HAVE ALWAYS HAD AN INTEREST IN THE FISH AND THEIR HABITAT REQUIREMENTS, THEREFORE IT HAS BEEN A REAL EDUCATIONAL EXPERIENCE FOR ME TO BE ABLE TO WORK WITH AND DEVELOP THE FISHERIES PROGRAM THAT IS NOW IN PLACE AT THE PACIFIC LUMBER COMPANY.

SUMMARY

In a unique partnership between private industry and government, The Pacific Lumber Co. and the California Department of Fish and Game have developed a cooperative program aimed at "the enhancement of the anadromous fishery resources." The program is intended to maintain, expand, enhance and utilize anadromous fish habitat through cooperation between an industrial timberland owner and a state regulatory agency. To date, the program has accomplished many things, such as, the improvement of over 30 miles of fishery habitat; the rearing and releasing of 115,000 natal anadromous fish; the training and incorporation of the best management practices for fisheries into timber harvesting operations; and the reduction of sediment into fish bearing streams.

PROGRAM STATEMENT

The partners in this program, the Inland Fisheries Division of the California Department of Fish and Game, and The Pacific Lumber Company, came together in 1991 to discuss a shared concern for the sustainability of anadromous salmon and steelhead populations. Inland Fisheries Division brought expertise about the habitat needs and biological requirements, as well as the ability to conduct planning, monitoring, education and evaluation of fishery enhancement programs. The Pacific Lumber Company brought nearly 350 square miles of watersheds containing hundreds of miles of anadromous streams. These lands are zoned specifically for timber production and have been managed for that use for over a century.

The partnership originated at the grass-roots level in response to needs first voiced from ground level personnel, and not from an industry or government mandate. The program was sold to managements from 'below'. A letter of understanding was mutually drafted in 1992 that established the operational guidelines. The letter has successfully outlined the requirements for a successful working relationship and program. It also reflects a deep commitment and trust relationship between the program's partners. This trust has overcome what can be an adversarial relationship between landowners and regulatory agencies. This has resulted in a powerful positive action to benefit the fisheries. Public outreach has led to support and participation from other groups and individuals, and a vigorous fishery educational benefit has developed.

Objectives toward the program's goal include: designing and conducting timber harvest activities with fisheries and wildlife as important considerations; guaranteeing access and cooperation to program participants for fishery activities without linkage to the status of timber harvest plans; requiring mutual review of fishery project proposals, data, and publicity; sharing evaluation, education and training activities, and also cost sharing.

The action plan process begins with watershed, stream, and fishery inventories. Based upon the inventories, projects are then selected, planned and implemented. Project evaluation is then conducted on a yearly basis. Project level options include watershed activities (ie., erosion control), riparian zone measures (ie., set asides, vegetation retention), instream improvements (ie., habitat

modification), artificial propagation (ie., supplemental stocking), and public involvement (ie., tours, land use workshops).

In the three years since the project began, significant achievements have been realized. The direct results include: conducting 360 hours of personnel training, opening of over twelve miles of additional stream habitat to migrating fish, reducing the risk of several thousand cubic yards of sediment from reaching fish bearing streams, enhancing instream fish habitat at over 20 locations, the rearing of 90,000 natal chinook fry and 25,000 steelhead, and consolidating the best management practices for fish in timber harvest planning activities.

Indirect results include: developing of positive feelings for The Pacific Lumber Company employees and the local community contributing to the recovery of local fish runs, creating an excellent resource for local educators in natural resource management and creating an opportunity for California Conservation Corps youths, utilized for much of the hand labor involved, to grow in an atmosphere of rigorous outdoor work while benefiting the natural environment.

APPENDIX F

CALIFORNIA RIPARIAN HABITAT CONSERVATION PROGRAM

Riparian habitat in California has been removed, degraded, and disturbed at an alarming rate since the first European settlers arrived here. Many organizations, state and federal agencies, and local governments are actively protecting, or developing programs to protect these valuable streamside and wetland riparian ecosystems. In fact, the state has identified the need to protect and restore riparian habitat as a component of its "Resourceful California" plan.

To address the need to coordinate all approaches to riparian habitat protection, the state enacted the California Riparian Habitat Conservation Act (SB 906, Hill; Chapter 726, Statutes of 1991). This act established the California Riparian Habitat Conservation Program (CRHCP) within the State Wildlife Conservation Board (WCB), and allowed WCB to authorize the Department of Fish and Game (Department) to undertake certain activities for protection and restoration of riparian habitat.

The enabling legislation declared that the responsibility for protection of this habitat extends beyond WCB and the Department. The act states: "The preservation and enhancement of riparian habitat shall be a primary concern of the Wildlife Conservation Board, the department, and of all state agencies whose activities impact riparian habitat...".

The CRHCP was begun with a mission to coordinate and track riparian habitat protection on a statewide basis. The multitude of constituent groups involved in this process offer the potential for CRHCP to develop a powerful and effective partnership, a cooperative process with shared responsibility. This is needed to ensure all available approaches and solutions are explored.

Program Goals and Scope

The *goal* of the CRHCP is:

To protect, preserve, restore, and enhance riparian habitat throughout California.

The *objectives* of the program are:

1. Assess the current amount and status of riparian habitat throughout the state.

2. Identify those areas which are critical to the maintenance of California's riparian ecosystem.

3. Identify those areas which are in imminent danger of destruction or significant degradation.

4. Prioritize protection needs based on the significance of the site and potential loss or degradation of habitat.

5. Develop and fund project-specific strategies to protect, enhance, or restore significant riparian habitat.

6. Develop, administer, and fund a grants program for riparian habitat conservation.

7. Provide a focal point for the coordination of riparian habitat conservation efforts statewide.

The enabling legislation authorized a wide variety of approaches in the protection, restoration, and enhancement of riparian habitat. This was necessary because of the diverse nature, location, and ownership of riparian resources in California. In short, the program can use fee acquisition, easements, management agreements, exchanges, gifts, and grants as tools to meet the program goal. These tools can be applied to land and/or water interests. This array or "menu" of conservation, restoration and enhancement tools ensures the flexibility needed for the program to be effective.

A secondary focus of the program will be to secure, or generate funds to support these approaches.

The CRHCP presents an unprecedented and unlimited potential for cooperation in the conservation and wise use of California's riparian habitat. For more details about the program, please contact Mr. Scott Clemons, Riparian Program Manager, Wildlife Conservation Board, 801 K Street, Suite 806, Sacramento, CA 95814, (916) 445-1072.

CALIFORNIA RIVERS ASSESSMENT
PROJECT SUMMARY

California's widely diverse rivers are among the State's most valuable resources. They provide habitat for fish and wildlife, offer recreational and cultural opportunities for the public, and supply water for agriculture, commerce, and the public consumption. California's rivers are also among the state's most damaged ecosystems, because of the many demands that have been placed upon them by California's growing population.

In late 1992,the California Resources Agency recognized the need to develop a good base of information on rivers and began the California Rivers Assessment in collaboration with the National Park Service and 28 other federal, state and local agencies, and private organizations. The Assessment was begun in recognition of the need to better conserve the state's rivers.

Purpose and Goals

The goal of the California Rivers Assessment is to provide a comprehensive inventory and evaluation of California's river resources which will serve as an important information source as well as a planning and decision-making tool for use by agency officials, local and state resource managers and the interested public. By focusing initially on **riparian** and **aquatic** river resources, the Assessment reflects the value of rivers and streams as natural resources and incorporates the needs of resource management agencies and the priorities of the Governor's environmental agenda.

Uses and Anticipated Products of the Rivers Assessment

As a repository of riparian and aquatic information, the California Rivers Assessment will be a decision-making and planning tool of interest to those making river-related decisions on a local and statewide basis. The comprehensive statewide approach will also aid the California Riparian Habitat Conservation Program, state and federal land and resource management planning, the Central Valley Improvement Project, watershed and river conservation planning efforts, and other ongoing federal, state and local programs and initiatives.

The Assessment will enable resource information to be displayed spatially through a geographic information system (*GIS*). Products will include a project map identifying all rivers and watershed to be assessed, thematic maps of selected riparian and aquatic resources, a tabular database, a report of findings and informational brochures or newsletters. Progress on this project will be reported at the Second California Rivers Conference in

June, 1994.

The Assessment Process

The working subcommittees and the Coordinating Committee met over the past year to address definition of project scope and scale, selection of project rivers, and identification of data elements and database design.

A two-phased approach will be followed (summarized below) to collect existing riparian and aquatic data at both general and detailed levels, and to organize the data into a statewide database. First steps, many of which are currently underway, include identifying river resource components to be used as indicators of ecological integrity and health, selecting and coding rivers and watersheds to be assessed, designing a data management system, acquiring data, and creating and applying statewide assessment ratings.

Phase I: Professional Judgement Assessment
The knowledge and opinions of river resource managers and river-related interest groups will be solicited to identify where ecological integrity is at risk on river segments and in watersheds statewide. A "Professional Judgement Assessment" questionnaire will use indicators to obtain targeted information, by river segment, about the condition of riparian and aquatic resources within all 160 of California's watersheds, as delineated by the US Geological Survey.

Phase I is expected to be completed by late August, 1994

Phase II: Aggregated Information Method in Demonstration Basins
Phase II will collect and display existing river resource information from fourteen hydrologic basins selected from all nine of California's biological regions. This phase will develop an "Aggregated Information Model" for a more detailed, multi-level, interconnected database which can be expanded to the entire state in ensuing phases.

Phase II is expected to be completed by December, 1995

Project Participants and Funding

The in-kind contributions of participating agencies and organizations are key to this project. Overall direction for the project is provided by an Executive Advisory Committee of regional and state directors of governmental agencies, and executive

directors of several conservation organizations, organized at the invitation of California Resources Agency Secretary Douglas Wheeler. A Technical Advisory Committee was formed with representatives from the 28 agencies and organizations who have agreed to participate in this project. Three working subcommittees were assembled from those representatives to develop the elements of the Assessment, and focused on the following areas: (1) Scope, Scale and River Selection, (2) Assessment Components, and (3) Data Management. As the Assessment will be based on existing data, numerous data holders have also been invited to become key participants in the project.

Technical project coordination has been provided by a Coordinating Committee of representatives from the Wildlife Conservation Board, the Rivers, Trails and Conservation Assistance Program of the National Park Service, the US Environmental Protection Agency, the University of California at Davis, the California Department of Fish and Game, and The Nature Conservancy.

Funding to date is being provided by the Wildlife Conservation Board and the National Park Service Rivers, Trails and Conservation Assistance Program. In-kind staff support is being provided by the working subcommittee members, project coordinators, and the University of California at Davis.

A progress report was prepared for the Technical Advisory Committee, and is available upon request.

For more information, or to get on the mailing list, please contact:

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FLOOD CONTROL VERSUS FLOOD MANAGEMENT

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On the night of July 30, 1993, the rising waters of the Missouri River washed out yet another levee. This time it was the Monarch-Chesterfield levee protecting a former floodplain in the town of Chesterfield, a suburb of St. Louis. However, the effect of this levee failure was different from most of the others—instead of submerging crops and farmhouses, an entire new light industrial park that was the economic center of the town was inundated to depths of up to 9 feet, causing $200 million worth of damage. The Monarch-Chesterfield levee, unlike most of the others that failed in the summer of 1993, was a Federal Emergency Management Agency (FEMA) approved structure upgraded in the early 1980's to provide protection against what was estimated to be the 100-year flood.[2] Acting on the assumption that the floodplain was now flood proof, the town of Chesterfield over the last decade had encouraged high value development in what inevitably was still a flood prone area.

The Chesterfield levee failure dramatized what has been argued for decades by many flood managers, that flood control structures without effective land use controls can and often do result in increased flood damages.

In the U.S., investment in structural flood control works now exceeds $25 billion, yet according to the 1992 Federal Interagency Floodplain Management Task Force, flood damages have been steadily increasing and now average more than $2 billion a year. The reason these flood damages continue to escalate is that many communities have allowed a strategy of "flood control" to substitute for effective "flood management".

The goal of flood control is to eliminate floods by building appropriate structures such as levees or flood control dams. The underlying assumption is that the most important action is construction, and that once we have built the levee or dam we have dealt with the flood problem. With this assumption, maintenance and monitoring receive a low priority.

In contrast, the goal of flood management is the reduction in flood hazards to lives and property by the most cost effective measures, recognizing that we cannot eliminate all flood risk. The underlying assumption is that we have to commit to long-term management of all the factors that

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[1] Dr. Williams, MASCE, is president of Philip Williams & Associates Ltd., a consulting hydrology firm in San Francisco. He is also president of the International Rivers Network.

[2] A 100 year flood has a magnitude that is predicted to occur on an average once in 100 years.

affect flood risk. Effective management requires a management system with clear goals, accountability, monitoring, and organizational development.

When we rely exclusively on flood control structures, instead of using them as one of many possible components in a flood management strategy, these risk management factors can be disregarded, resulting in increased flood damages. For example, after construction of a flood control project, local government may allow expensive development in areas where flood risk has been reduced, but not eliminated. When flooding inevitably occurs, flood damages are significantly higher because property values are higher and they can outweigh the benefit of the reduced frequency of flooding afforded by the project. Not only is the property at risk more valuable, but due to the perception that flooding has been eliminated, people no longer take individual actions to reduce flood-risks such as flood proofing or elevating their buildings.

There is another way that the construction of flood control works can increase flood damages: natural flooding tends to be more gradual and predictable, whereas when a levee fails or a flood control reservoir has uncontrolled spills, flooding is catastrophic. In these circumstances, the flood wave can be rapid, unexpected, and unpredictable; inundating a floodplain where other effective means of reducing flood hazards such as flood warning systems, high ground refuges, or evacuation routes have been neglected because of the perception that flood risks had been eliminated. A recent FEMA study estimated that about one third of U.S. flood damages are now caused by levee overtopping or failure.

The experience of the 1993 Mississippi Flood illustrated the conflict between flood control and flood management, rekindling a debate that goes back to the 1850's when the U.S. Congress commissioned engineer Charles S. Ellet to undertake the nation's first river management plan. In his 1851 report Ellet recommended large areas of the Mississippi floodplains be utilized as flood storage and overflow areas.

However, it was the conclusion of his contemporary, Captain Andrew A. Humphrey of the U.S. Army Corps of Engineers, that Congress accepted in 1861. Captain Humphrey recommended that the Mississippi River be completely embanked in a single channel isolated from its floodplain. Captain (later General) Humphrey's ideas not only established the Corps of Engineers as the pre-eminent authority on rivers in the U.S., but have also greatly influenced river management decisions in the United States and internationally ever since.

Underlying river engineering works, such as channelization, levees, and flood control dams, was the nineteenth century's idea of civil engineering expressed by Thomas Tredgold as the "art of directing the great Sources of Power in Nature for the use and convenience of man." Their role in building river engineering structures established flood control engineers as de facto river managers, and over the last 100 years the institutions and technical methodologies were developed to support them.

The domination of this idea has completely transformed most of the rivers and wetlands of the U.S. Across the country, from the drainage of the Everglades, to the embankment of the Sacramento River, the driving motivation was achieving the increased utility—primarily for farming—of the rich, flat, floodplain land.

This transformation, which also occurred on rivers around the world, has had a huge environmental cost. The destruction of riparian wetlands and fisheries; the deterioration of water quality and disturbance of the natural river morphology devastated ecosystems and are now recognized as having had significant economic costs. But in 1926, environmental values were ignored or discounted, and the growing faith in the infallibility of flood control engineering led the Corps of Engineers to claim in its annual report that "The Mississippi is safe from serious flood damage". The nations' worst flood disaster on the Mississippi occurred the next year. It flooded out 700,000 people but did not shake confidence in a structural flood control strategy. It did, however, stimulate a redoubled effort to design more effective flood control structures—leading to the flood control acts of the 1930's that encouraged the construction of flood control reservoirs. Those who questioned the costs and effectiveness of massive federal taxpayer investment in flood control were outweighed by public support for job creation schemes in the Depression and by the power of the "pork-barrel" system under which U.S. congressmen would agree to vote for each other's water projects in order to get one for their own constituency.

Nevertheless, the ideas of one critic, geographer Gilbert White, started to take hold. Gilbert White's 1945 dissertation "Human adjustment to floods" and subsequent papers from the University of Chicago and the Natural Hazards Research Center examined the larger context of a flood control strategy and posed the question: what is the real purpose of flood control? For an individual farmer it might be to minimize crop damage, and for a landowner to increase the value of his property, but for society at large and for taxpayers who pay for water projects, the purpose of flood control should be to reduce flood hazards to an acceptable level. Answering the question in this way implies a new way of treating rivers by managing, instead of attempting to control, floods. The purpose of flood management is the alleviation of existing and future hazards to lives and property in the most cost effective ways whether through structures or other means such as floodplain zoning, flood proofing, flood warning, or financial incentives.

The growing acceptance of the ideas of flood management led to new initiatives in national policy. In 1973 the National Water Commission stated "there is a need for a better understanding by the public at large of the basic nature of the flood problem and in particular an understanding that the ultimate goal of all public flood control programs should be the *best* use of the Nation's floodplain lands." Also, in 1973 the U.S. government initiated implementation of a flood insurance program whose goals were to shift the burden of flood disaster relief from the federal taxpayer to those who occupy flood prone lands, and to encourage local government to adopt a non-structural flood management strategy.

In the last two decades the inherent conflict between flood control and flood management has not been resolved at the national policy level. While the language of flood management has been

adopted by most government agencies, the flood control paradigm still represents the dominant thinking in the minds of many politicians and the general public as well as public works and river engineers. (The fact that non-structural flood management alternatives are still defined by what they are not is indicative of the dominance of the structural flood control.)

However, the 1993 Mississippi Flood may now change that dominance because the media and the public's attention has focussed on a new and fundamental question—how effective are flood control structures at controlling floods?

A review of the performance of traditional flood control structures in the last few decades is disturbing. Most have been in place less than 50 years and have been typically designed for at least the 100-year event. In the few times they have been tested, a significant number have revealed unanticipated technical problems and failure mechanisms that undermine their rationale—that flood risk has been successfully eliminated below the level of their design flood. For example:

- The 1973 flood on the upper Mississippi showed that flood crests at St. Louis were now up to 10 feet higher due to the constricting effect of upstream levees. In the record 1993 flood the Corps of Engineers acknowledged that the floodwall protecting St. Louis may have survived because unplanned upstream levee failures reduced the flood stages at the peak of the flood.

- The concrete flood control channel of Corte Madera Creek in Marin County, California which had been designed for at least the 200 year flood overtopped its banks in 1982 and 1986, while it was conveying less than the 15-year flow. Subsequently, a Corps of Engineers Waterways Experiment Station review determined that the transport of bedload sediment had a significant adverse effect on flood hydraulics. Throughout the U.S. and around the world, concrete flood control channels have been constructed using "clear water" flow assumptions that assign low Manning roughness values to smooth concrete. Those that carry large amounts of bedload during their design flood will now require reevaluation of their effectiveness.

- The 1986 flood on the American River in California came close to flooding out the state capitol, Sacramento, which relies on the protection afforded by levees and a major flood control reservoir—Folsom Dam. Although the 1986 flood was well within the design capacity of Folsom, operational errors caused the reservoir to fill, requiring releases in excess of designated downstream levee capacity. Subsequently, the Corps downgraded the operational effectiveness of Folsom, arguing that its misoperation demonstrated

the need for a new flood control reservoir upstream at Auburn. When this proposal for a new dam was defeated, a National Academy of Engineering panel was set up to evaluate key technical flood control criteria that could prompt a re-evaluation of the real as opposed to predicted flood benefits of flood control reservoirs elsewhere in the U.S.

- The 1980 flood on the Los Angeles River showed that design flows had been underestimated by at least 30%, due to urbanization of the watershed. Portions of the U.S.'s largest concrete flood control channel are now estimated to have only 25 year flood capacity. Half a million people live in the 100 year floodplain and a $340 million reconstruction is being considered by the Corps.

The experience of communities like Chesterfield that had relied exclusively on flood control structures have now turned attention back to the hydrologic benefits of restoring floodplains, achieved by relocating flood prone property and removing or setting back levees. However, in returning full circle to the ideas of Charles Ellet we find significant institutional and technical barriers to their implementation. Institutional barriers in the U.S. exist because no single government agency has the mandate for flood management equivalent to the Corps of Engineers' clear mission to provide flood control. Technical barriers exist because we find that the methodologies used in flood control planning do not recognize the benefits of watershed management or preserving floodplain storage; both important tools in a flood management strategy. For example, the standard hydraulics method used by almost all flood control agencies for computing flood water surface elevations, HEC-2, is a steady state model that does not take into account the dynamic storage effect of floodplains in reducing floodpeaks during the passage of the flood wave. Because these beneficial effects are ignored in the model there is little incentive for protecting floodplains from filling or embankment, and the hydrologic benefits of restoring floodplains are discounted.

The same issues that are confronting the U.S. are also now being debated in Europe, where there is a belated but growing recognition that flood control can conflict with flood management. Like the upper Mississippi, the Rhine was straightened and embanked for navigation and flood control over the last 120 years. However, it is now recognized that complete elimination of the Rhine's floodplains by river engineering works to allow their use for more intensive agriculture has accelerated the passage of floodwaters downstream. Peak flows from major tributaries like the River Main now coincide with Rhine flood peaks, increasing flood hazards in the industrial Ruhr, where the 200-year flood has now become the 60-year flood. To reduce this flood risk, German and French flood control agencies are retrofitting the massive Rhine embankments with siphons to divert some of the flood peak into gravel pits behind the embankments. This hydraulic engineering attempt to create artificial floodplain storage is criticized by some river managers who argue that the same benefits could be achieved with substantive environmental improvements by directly restoring remaining portions of the natural floodplain of the river.

Many governmental agencies in Europe and the U.S. appear to be at a turning point, shifting from an emphasis on capital intensive structural flood control works to more sophisticated flood hazard reduction strategies as a component of a multiobjective river management that includes environmental management and restoration. In 1992 the U.S. National Research Council Committee on Restoration of Aquatic Ecosystems recommended as a national goal the restoration of 400,000 miles of rivers and streams over the next 20 years; partly to offset damage due to river engineering works. After the 1993 Mississippi Flood, the U.S. Fish and Wildlife Service has proposed a plan to move back 750 miles of the Missouri River levees to alleviate flooding and restore ecosystems.

However, in other countries the lessons of flood management have yet to be recognized, and some of the world's largest and most expensive flood control projects are in the planning or construction stage.

In China, the world's largest hydroelectric power plant, the Three Gorges Dam Project on the Yangtze is being promoted primarily as the means for controlling Yangtze Valley floods. These floods have caused enormous damage and loss of life, and over the last 40 years to reduce these flood hazards Chinese river engineers have developed a sophisticated flood management system of embankments, overflow weirs, diversion areas, and the use of floodplain lakes—similar to the approach advocated by Charles Ellet for the Mississippi.

The Three Gorges Dam is a classic example of how flood control conflicts directly with flood management. Because of the huge flood volumes on the Yangtze (200 km^3 in 1871) and the Three Gorges Dam's location above major tributaries, the 22 km^3 flood storage within the reservoir would have a relatively minor effect on flood river stages during many large flood events. The primary flood defense for the Yangtze Valley will remain the management and maintenance of the existing system of embankments and overflow areas. In tacit recognition of its limited value, the project's Canadian feasibility study determined that the economic justification for the Three Gorges flood control function is almost entirely the reduced frequency of flooding for an anticipated increased population who would be encouraged to settle between the existing river levees or within the downstream flood diversion areas. In these circumstances it is easy to envisage another repetition of the scenario that Professor White has documented, that people move into these flood prone areas believing them to be protected, flood proofing is neglected and flood damages escalate when the inevitable flood occurs.

In order to achieve its stated flood benefits the Chinese government assumes that the dam will be operated perfectly, drawing down the reservoir at the beginning of the flood season and then storing the flood peaks. Based on actual operating experience of other reservoirs such as Folsom Dam, this is unlikely to occur. Even disregarding the conflict between operating the dam for profitable power generation, against achieving less tangible flood benefits, the operators of Three Gorges will have a unique dilemma during a major flood. In order to save costs on the project, where at least 1.1 million people will have to be relocated, hundreds of thousands of people will remain living in the active flood control pool and in the backwater areas upstream. The dam operators will therefore

have to balance the certainty of flooding out these people versus the uncertainty of protecting people living in the floodway downstream.

In addition, Chinese experts whose opinions have now been suppressed by the Chinese government, argue that it is likely that flood hazards will actually be increased by allowing the construction of the Three Gorges Project to supersede the existing flood management system. With the massive expenditure on constructing of the Three Gorges Dam it will become harder to raise money for the continued maintenance and management of levees downstream. At the same time the dam itself will likely contribute to the deterioration of these levees. The capture of the Yangtze bedload in the Three Gorges reservoir will induce channel downcutting and migration that could destabilize critical levee systems that protect millions of people.

In Bangladesh the World Bank is coordinating studies for what was intended to be the world's largest flood control project—the Bangladesh Flood Action Plan, whose cost is estimated to be between $10 and 20 billion. The main focus of this plan is to complete the embanking of all the major rivers in Bangladesh, and it provides another example where the idea of flood control conflicts with flood management.

Most of Bangladesh is floodplain, whose rich soils depend on regular inundation from the monsoon floods to grow food for 110 million people. Over many centuries the rural population had adapted to and utilized floods; for example by building their villages on raised mounds and by planting fast growing varieties of rice that keeps pace with rising flood waters. Consequently, the idea of flood control is comparatively recent in Bangladesh, and was originated by a U.S. AID engineering study completed for Pakistan in the 1950's. This study essentially recommended replicating Captain Humphrey's vision for the Mississippi in Bangladesh. By the 1980's individual aid projects had completed about half the embankments envisaged in the U.S. AID plan but with unanticipated adverse results. The embankments were effective in preventing river flooding from the smaller floods but ineffective against the large floods that cause river channels to shift, sometimes scouring the riverbed to depths of 150 feet.

The reduction in frequency of inundation of floodplain soils caused by the embankments has reduced soil fertility; requiring the application of artificial fertilizers. Just as important was the catastrophic decline in the riverine fisheries which had provided Bangladesh with its main source of protein. Flooding is now less frequent but more sudden, and a new problem has emerged—the embankments interrupt natural drainage, aggravating local flooding from the intense monsoon rains—sometimes requiring the demolition of embankments by the villagers they were supposed to protect to allow inland floodwaters to escape.

In 1988 a record river flood in Bangladesh inundated large areas of the capital, Dhaka, including the airport and embassy area. This led foreign governments and aid agencies to propose to the then Bangladesh dictatorship the implementation of the "Flood Action Plan" that emphasized rapid implementation of structural flood control measures. An alternative flood management approach

proposed in a new U.S. AID "Eastern Waters" study was overruled and under World Bank leadership planning and design was initiated.

Independent Bangladeshi experts have long argued that the highest priority in flood management were not attempting to prevent river floods but measures to alleviate flood hazards caused by devastating cyclone driven storm surges that have regularly killed hundreds of thousands on the coast of the Bay of Bengal, (for comparison, about three thousand were drowned in the 1988 river flood). Cyclone flooding is only given token attention (about 2% of the budget) in the Flood Action Plan, possibly because large scale structural flood control works are clearly infeasible and implementation of effective measures such as flood warning systems, refuges, and disaster relief systems are of secondary importance for a flood control as opposed to a flood management strategy. In the last few years, with the advent of democracy in Bangladesh, and now with the experience of the 1993 Mississippi Flood (which was broadcast extensively in Bangladesh), there are now signs that after $150 million spent on studies and design, the World Bank will concede that the original plan was mistaken, because of its focus on structural flood control instead of a coordinated strategy of flood management.

With the impending demise of the structural elements of the Flood Action Plan, the uncertain future of the Three Gorges Project, and the rethinking of flood management strategies in the U.S. after the 1993 Mississippi Flood, it appears that we are now finally ready to give up the vanity of our attempt to control all floods and instead concentrate realistically on how we can best live with them and manage our rivers wisely.