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Congress of the United States

House of Representatives

Washington, DC 20515-3701

March 10, 1993

The Honorable Albert Gore, Jr.
Vice-President of the United States
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20505

Dear Mr. Vice-President:

Yesterday, the Subcommittee on Environment and Natural Resources of the House Merchant Marine and Fisheries Committee heard testimony on the status of fish populations in the Pacific Northwest and their restoration through watershed rehabilitation. I believe this testimony is directly relevant to the Forest Summit.

At the hearing, Dr. Robert Naiman of the Center for Streamside Studies at the University of Washington stated to the subcommittee:

Of the Pacific salmon, steelhead, and sea-run cutthroat trout once common in the states of the Pacific Coast, 106 are extinct, 102 are endangered, 58 are at moderate risk, and 54 are a matter of concern. . . . For example, populations of naturally spawning salmonids in the Columbia River have declined by more than 95%. This precipitous decline in salmon populations is indicative of the progressive degradation of our region's watersheds.

However, the scientists who testified at the hearing also offered positive alternatives for watershed restoration based on west coast research and pilot projects that could be implemented immediately on public lands.

In my opinion, watershed protection and restoration is an essential aspect of the Forest Summit because of the importance of salmon spawning and rearing habitat on the public lands. Therefore, as plans for the Forest Summit are being finalized, I am enclosing copies of this testimony for your consideration.

Please do not hesitate to call upon me if I may be of any assistance.

Sincerely,



Elizabeth Furse
Member of Congress

RESTORATION OF WATERSHEDS AND NATURALLY-SPAWNING SALMON
POPULATIONS IN THE PACIFIC NORTHWEST

TESTIMONY OF

DR. ROBERT J. NAIMAN, DIRECTOR, THE CENTER FOR STREAMSIDE STUDIES
UNIVERSITY OF WASHINGTON, SEATTLE, AND

KEVIN L. FETHERSTON, THE CENTER FOR STREAMSIDE STUDIES
UNIVERSITY OF WASHINGTON, SEATTLE

BEFORE THE

U.S. HOUSE OF REPRESENTATIVES SUBCOMMITTEE ON ENVIRONMENT AND
NATURAL RESOURCES, COMMITTEE ON MERCHANT MARINE AND
FISHERIES, MARCH 9, 1993

Mr. Chairman, thank you for inviting us to appear before you and the subcommittee to address issues concerning the management of watersheds and naturally-spawning salmon populations in the Pacific Northwest.

Healthy watersheds are essential to the social, economic, and ecologic well-being of all who inhabit the Pacific Northwest region. This includes fishermen working our Pacific coastal waters, the growing human population benefiting from locally available clean drinking water and hydroelectric power, and the families who vacation along the beautiful rivers and streams of our National and State Parks. Healthy watersheds are also essential for naturally spawning salmon and the myriad other living creatures that collectively make up the living fabric of our rivers and streams. The social and economic quality of the Pacific Northwest will be greatly diminished if we do not maintain the biotic integrity of our region's rivers and streams.

The watersheds and rivers of the Pacific Northwest are presently moving toward a level of biotic impoverishment that will be in large part irreversible. Indeed, the fate of the imperiled Pacific salmon, the collective symbol of the Pacific Northwest people, is dependant upon the biotic and physical integrity of the region's watersheds, rivers, and streams. However, this imminent loss is preventable. Prevention will require a new approach to watershed health taken from the ecosystem perspective. In addition, there are no adequate scientific or management infrastructures to deal with the scale of the crisis at hand. We need a new interdisciplinary, inter-agency, and inter-university initiative in the Pacific Northwest where watershed-level issues can be defined and solved. Innovative approaches to watershed and river restoration and management must be developed, tested, and taught to future professional resource stewards of the Pacific

Northwest. We have a responsibility as a people to pass on to future generations a different legacy than biologic, economic, and social impoverishment. We can leave a regional legacy of ecological health founded upon an ecosystem perspective toward the restoration and sustainable use of our rivers, streams and watersheds.

The key points of this testimony are summarized in Table 1.

I The Ecological Health of Pacific Northwest Watersheds Under Present Management Regimes

Rivers and Streams

Historic, and existing public and private land-use in the Pacific Northwest, have simplified the natural structural complexity and hydrology of the region's rivers and streams (Bisson et al. 1992; Sedell and Froggatt 1984). In other words, our rivers have been straightened, stripped of their streamside forests, isolated from streamside wetlands, and cleared of the in-stream woody debris that provides essential habitat for salmon, other fish and aquatic organisms, and riparian wildlife. Loss and degradation of riparian forests is extensive throughout the Pacific Northwest due to past and present forest management practices, development pressures, and the invasion of exotic plant species (Sedell and Froggatt 1984). Riparian forest degradation has resulted in loss of stream and river habitat complexity (Bisson and Sedell 1984; Grant 1986).

Sustainable management practices for riparian forests are lacking. Maintaining biological diversity and fish habitat involves much more than the present set-aside forest buffer strips (Naiman et al. 1992). Indeed, ecosystem management of riparian forests is synonymous with managing fish habitat complexity (Sedell et al. 1989).

The natural river and stream flow patterns of virtually all Pacific Northwest rivers and streams have been altered as a result of historic land-use. Alterations include: dams, water withdrawal for irrigation, river channelization for flood control, diking of river floodplains for agriculture, forest management practices, and cattle grazing. The consequent modifications of river flow, physical channel properties, and sediment movement appear as cumulative effects throughout the river network (Simenstad et al. 1992). The cumulative result of decades of poor land-use practices in the Pacific Northwest has been the loss of the capacity of our rivers to support historic numbers of fish and other aquatic organisms (Bisson et al. 1992).

Table 1: WATERSHED RESTORATION AND NATURALLY-SPAWNING SALMON
POPULATIONS - KEY POINTS

- Ecological health of Pacific Northwest riverine corridors is declining.
- Existing state and federal land management practices will continue the incremental decline in watershed health and fish populations.
- Effective management requires an ecosystem perspective to restore and maintain the ecological vitality of riverine systems. This perspective includes all organisms, not just salmonids.
- Ecologically effective riparian management zones extend up the drainage network into non-fish bearing streams. This does not exclude some commodity extraction, as appropriate knowledge and technologies are developed.
- There is an urgent need for a Pacific Northwest regional initiative or center for watershed management which transcends political barriers, institutional structures, and philosophical approaches and disciplines.
- There are substantial economic and social benefits to managing rivers on a watershed basis that accrue directly to human populations and the environment.

Fish Populations

In this century fish populations of the Pacific Northwest have been profoundly diminished along with much of the regions unique character (Eley and Watkins 1991). More than 200 distinct stocks (genetically distinct fish populations native to a particular drainage system; Bisson et al. 1992) of anadromous salmon in the western United States are presently at risk of becoming extinct (Nehlsen et al. 1991). Of the Pacific salmon, steelhead, and sea-run cutthroat trout once common in the states of the Pacific Coast, 106 are extinct, 102 are endangered, 58 are at moderate risk, and 54 are a matter of concern (Nehlsen et al. 1991). For example, populations of naturally spawning salmonids in the Columbia River have declined by more than 95%. This precipitous decline in salmon populations is indicative of the progressive degradation of our region's watersheds.

Habitat destruction, overfishing, and harmful interbreeding of wild and hatchery fish have been implicated in the observed declines of Pacific Northwest salmon stock abundance (Nehlsen 1991, Bisson et al. 1992). Existing fish culture practices have resulted in an overall loss of genetic diversity among wild fish populations (Bisson et al. 1992, Allendorf et al. 1987). State fish hatcheries' programs address the symptoms of the decline of salmon populations, but do not address the real problems of overharvest and habitat degradation (Meffe 1992). Furthermore, hatchery fish are being released into degraded riverine systems that are largely unsuitable for survival, reproduction, or migration (Meffe 1992). In final analysis, the future of the Pacific salmon depends upon the preservation and restoration of its wild populations and their habitats through management based on an ecosystem perspective (Frissell 1992, Maclean and Evans 1981, Nehlsen et al. 1991).

II Fundamental Elements of Ecologically Healthy Watersheds and Fish Habitat in the Pacific Northwest

Four fundamental components comprise ecologically healthy watersheds in the Pacific Northwest (Naiman et al. 1992). These are: 1) basin geomorphology as it relates to natural disturbance regimes, 2) hydrologic patterns, 3) riparian forests, and 4) diverse and abundant habitat.

Basin Geomorphology

Basin geomorphology (landform development in river drainage basins) in ecologically healthy watersheds is determined by the type, frequency, and intensity of natural disturbances. Recent studies in the Pacific Northwest have shown that the delivery and routing of water, sediment, and woody debris to streams are the key processes regulating the vitality of watersheds and their drainage networks (Naiman et al. 1992). The natural occurrence of these disturbances is essential to the health of the watershed. For

example, landslides occur at a magnitude and frequency characteristic of a specific landscape and geologic setting. Landslides deliver new sediment and gravel to river channels where it is sorted by flowing waters into spawning beds and used by the next generation of salmon. Landslides are thus integral to the health of salmon populations *when they occur at natural frequencies*. In turn, the salmon are genetically adapted to such geologic conditions within their river of origin. However, an increase in landslide frequency and magnitude within a watershed due to poor land-use management, such as road building on steep unstable slopes, results in deleterious downstream impacts on fish populations, on the riparian forest, and on the full array of organisms using the riverine corridor.

Hydrologic Patterns

Hydrologic patterns of ecologically healthy watersheds in the Pacific Northwest are a function of the timing and quantity of stream flow, characteristics of seasonal water storage and source area, and the dynamics of surface-subsurface exchanges (Naiman et al. 1992). Water flow in natural rivers is a complex pattern of fast and slow current velocities, eddies, and backwater pools. The complexity of stream flow creates a rich variety of habitats that harbor a large community of diverse plants and animals. In addition, flooding plays a significant role in structuring the riparian forests throughout much of the river system. For example, floods disturb existing vegetation (i.e. physically remove or damage), and reconfigure landforms in active river channels.

When the natural variation in stream discharge and water level is suppressed by water diversions, dams, and channelization, many of the varied stream and riparian forest habitats disappear along with much of the diverse flora and fauna that depend on their existence. The flow of water from headwater streams to oceans creates strong physical and ecological links between stream reaches that are otherwise separated geographically. Ecologically healthy watersheds require these lateral, longitudinal, and vertical hydrologic linkages between aquatic habitats. Because rivers and streams are a continuum of physical and biotic processes the effects of manipulations at one site are never confined to that one location. Thus, site-specific solutions are an ineffective approach to watershed management.

Riparian Forests

Riparian forests are the heart of an ecologically healthy watershed (Décamps and Naiman 1989, Naiman and Décamps 1990). The riparian zone extends from the edge of the average high water mark of the river or stream toward the uplands (Figure 1) (Naiman et al. 1992). This zone includes terrestrial areas where vegetation and microclimate are influenced by perennial or intermittent water associated with high water tables, and by the ability of soils to hold water. Higher in elevation is the riparian "zone of influence," a

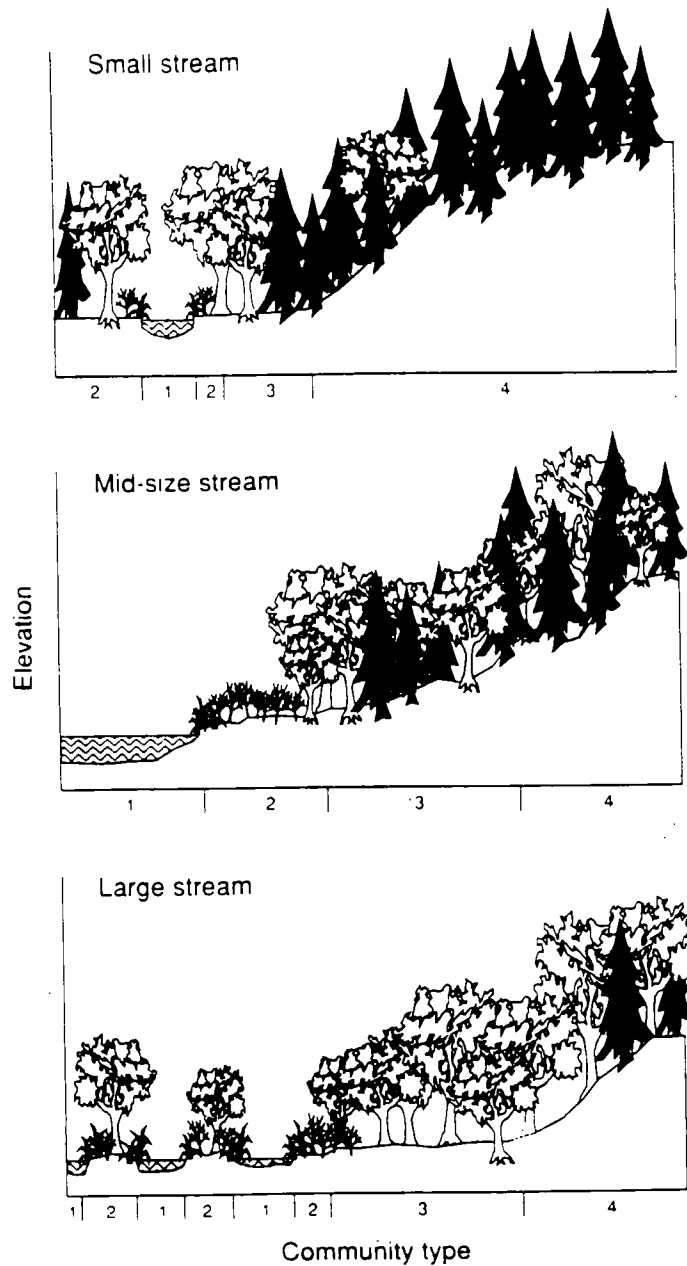


Figure 1. The natural characteristics of the riparian zone change with stream size. In low- and mid-order streams the links between the riparian forest and the stream are strong. In large rivers the links are not as strong in the main channel but they do remain strong in the secondary channel. KEY: (1) active channel, (2) riparian zone, (3) zone of influence, (4) uplands. Note that (2) and (3) make up the complete riparian zone of influence (Naiman 1992).

transition area between the riparian zone and the upland forest where vegetation still influences the stream under some conditions (Gregory et al. 1991). The riparian forest is shaped by channel geomorphology, frequency, magnitude, and timing of flooding, the spatial position of the channel in the watershed, and the disturbance regimes (Naiman et al. 1992). The maintenance of riparian forests in their historic abundance and condition is essential to the long term vitality of a watershed.

Riparian forests provide a number of ecological services to the stream. These include:

- 1) Control of stream temperature resulting in part from the density of the tree canopy in forested streams. Stream temperature is critical in spawning and rearing habitat, and plays a role in the level of aquatic productivity.
- 2) The addition of large amounts of leaves, cones, wood, and dissolved nutrients to streams (Gregory et al. 1991). These materials are sources of nourishment for the aquatic organisms living in the streams.
- 3) Contribution of large woody debris in healthy forested streams large woody debris is the principle factor structuring aquatic habitats (Naiman et al. 1992). Without this woody structure stream biodiversity and carrying capacity for fish are greatly diminished. Large wood also shapes the stream channel structure and its ecological processes.
- 4) The foundation for wildlife habitat including thermal and resting cover, corridors for migration and substrate for substantial biological activity by microorganisms, invertebrates, and other aquatic organisms (Naiman 1990, Gregory et al. 1991, Naiman et al. 1992).

The biotic complexity provided by a functional riparian forest is essential to the ecological health of rivers and streams.

Habitat Characteristics

In ecologically healthy watersheds, there are strong interactions between river and stream channel geomorphology, hydrology, spatial position of the channel, and the riparian forest that provides habitat for terrestrial and aquatic organisms (Naiman et al. 1992). The result of these interactions is habitat complexity and variety. Gradients in current velocity and temperature, patches of rock and gravel of different sizes, piles of branches and leaves, small dams formed by dead trees and a multitude of other distinct patches created by the complex interplay between water movement, geologic events and riparian vegetation all provide the diversity of habitats required by a rich community of organisms for shelter, food, and reproduction.

Ecologically healthy watersheds provide a complex array of stream conditions which are used directly by a variety of species at some point in their life-cycle (Everest 1987). Stream temperatures vary throughout river networks depending upon the density of riparian forest canopy, stream depth, presence of groundwater seepage and other factors. All fish populations are adapted to local temperature regimes. Significant alterations of these regimes result in the disruption of important life cycle events, such as the timing of migrations (Beschta et al. 1987, Naiman et al. 1992).

Available evidence suggests that ecologically healthy watersheds are maintained by an active natural disturbance regime operating over time scales ranging from days to centuries and spatial scales from inches to thousands of square miles. Because each scale influences the others, the effects of altering one cannot be isolated and may have consequences far removed both geographically and temporally. Ecologically healthy watersheds are dependent on the nature of the disturbance (e.g. fire, landslides, channel migration) and the ability of the system to adjust to constantly changing conditions. The natural disturbance regime produces a dynamic equilibrium for riparian forests, habitats, water storage, water quality, animal migration, and biodiversity resulting in resilient and productive ecosystems. The net result is an ecological system, at the watershed scale, which possesses a biotic integrity strongly valued for its long-term social, economic, and ecological characteristics (Naiman et al. 1992).

III Are Existing State and Federal Land Management Regimes Adequate To Prevent Further Watershed and Fish Habitat Degradation?

Existing state and federal land management regimes and regulations in the Pacific Northwest do not contain provisions adequate to prevent the further degradation of the region's watersheds and fish habitat. Regionally, only the state of Washington is developing watershed level management goals and programs (i.e., the Washington Timber, Fish and Wildlife Agreement 1987) and these remain inadequate. The absence of regionally-articulated goals for an integrated watershed health plan can only be understood as a failure of the local, state, and federal land management programs to perceive the rate and scale of degradation in Pacific Northwest watersheds, rivers, streams, and fish populations.

In nature fish interact in a complex way with water, stones, and trees, and rivers with little regard for jurisdictional boundaries. Yet in our research and management agencies the offices and activities of fisheries personnel, hydrologists, and foresters are poorly integrated. Until the structure of research and management institutions approaches the level of integration and scale of the natural ecosystems with which they deal, attempts at restoration and preservation will remain piecemeal and ineffective. Only a shift in management perspective from the site-specific to an interdisciplinary watershed-level

approach based upon scientific principles will substantively address the goals of watershed and fish population health. This integration of disciplines is inherent in an ecosystem perspective.

The scale of the degradation of the region's watersheds and fish habitat, exceeds the ability of our public institutions to respond. Unfortunately, site specific or system component-level management (e.g., fish, wildlife, timber production) supercedes integrated watershed needs. Naiman (1992) proposes the following essential conditions for implementing new approaches to watershed management:

1. Cooperation between industry, governmental agencies, private institutions, and academic organizations.
2. Technical solutions (e.g. hatcheries, silviculture) must be augmented with increased habitat protection and preservation of fundamental components of long-term watershed vitality (e.g., riparian forests).
3. Information management and scope of experimental manipulations needed should involve multiple institutions, demonstration and reference sites, and continuity over many years.
4. Conceptual solutions to resource management(e.g., perceptions, tradition) at the expense of empirically grounded, data-driven decisions must be reversed.
5. Integration of human activities as a key element of ecosystem vitality. Human needs must be integrated with environmental considerations before long-term sustainability of our watersheds can be achieved.

Additional statutory and administrative barriers that must be overcome to change existing river management regimes include:

1. The lack of inter-agency infrastructure in the Pacific Northwest necessary for watershed management.
2. Failure to implement existing wetland and forest practice regulations. This is a result of poor staffing and inadequate training of personnel. Furthermore, quality control reviews of regulatory program effectiveness do not exist. Analyses of specific land use management regimes (e.g., riparian forest practices) should be conducted to assess whether they are working as intended. Also, we must first consistently enforce existing regulations (e.g. forest practices within wetland riparian forests) before new watershed regulatory structures are implemented.
3. Lack of technically trained staff in local, state and federal agencies in the Pacific Northwest able to implement a watershed level management plan.

Potential social, economic, and political barriers to watershed restoration and management include:

1. Hydroelectric power industry water diversion projects.
2. Timber industry - ecologically appropriate riparian forest regulations will restrict timber revenues.
3. Agricultural interests - restrictions of water diversion to agricultural lands.
3. Floodplain development - ecologically appropriate restrictions of development within river floodplains.
4. Tax laws - use of tax revenues to fund a watershed initiative.
5. Private stewardship of watersheds.

IV Restoration and Maintenance of High Quality Watershed Health - Sustainability of Harvestable Naturally Spawning Fish Populations - Management Techniques and Directives.

To be successful watershed restoration must reestablish:

- 1) The watershed's natural hydrologic and disturbance regimes;
- 2) The historic physical linkages between streams and their associated floodplains and wetlands;
- 3) The riparian forest and other riparian plant communities.

Present and historic fish habitat management approaches focus primarily upon the site-specific establishment of in-stream structures to create habitat elements such as pools and riffles (e.g. cabled logs, in-stream boulders), and the reestablishment of stream temperature control through riparian reforestation. Though sometimes effective in the short term, the in-stream structure approach is neither a long term solution, nor cost-effective (i.e. the cost of in-stream structure placement throughout a watershed would be prohibitive). This approach is inadequate to achieve the goal of restoring and maintaining natural levels of physical and biological complexity in a stream ecosystem (Bisson et al. 1992). Watershed restoration goals need to be set within a long term context of many decades (>50 yrs) and should include the entire watershed from headwater streams to

estuarine tidal marshes. *Only at spatial and temporal scales of these magnitudes do the watershed hydrologic patterns, natural disturbances, and riparian forests become meaningful in the discussion of the restoration and management of naturally spawning fish populations.* To accomplish watershed restoration a major shift in philosophy, assumptions, and strategies toward fish habitat restoration and management is necessary (Frissell 1992). The restoration of streams and riparian zones throughout a watershed is a formidable task requiring an unprecedented level of cooperation and willingness to alter current land use practices (Gregory et al. 1991, Sedell and Beschta 1991, Bisson et al. 1992).

At present, there are no watershed-level restoration models applicable to the Pacific Northwest. However, river and watershed restoration approaches are beginning to emerge that focus upon reestablishing the key components of an ecologically healthy watershed (Sedell et al. 1990, Sedell and Beschta 1991, Frissell 1992).

We have many of the technologies necessary to restore forested watersheds in the Pacific Northwest (e.g., horticultural, silvicultural, engineering, geologic, and hydrologic techniques). What we lack is the breadth of vision and cooperation necessary to apply these technologies appropriately in a context of watershed restoration and management. An ecosystems approach to watershed restoration and management will incorporate fundamental watershed physical processes and the natural biologic diversity of the landscape. For example, studies of the recovery of aquatic systems from natural disturbances have revealed the occurrence of refugia, undisturbed habitats that function as a source of colonists to adjacent disturbed areas (Sedell et al. 1990, Frissell 1992). The ecologic properties of refugia throughout watersheds will be critical in the restoration of degraded rivers and streams.

None the less, we lack restoration projects that are based upon the restoration of watershed ecosystem processes. Restoration at this scale is our only real hope for sustaining harvestable naturally-spawning fish populations. To accomplish this will take unprecedented cooperation between public agencies, regional universities, Indian Tribes, and private industry.

We propose the development of a Pacific Northwest Regional Initiative for Watershed Studies, Restoration, and Management. The goal of the initiative would be the development of solutions to our region's watershed problems. The scope of the issue is beyond the ability of a single state government or federal agency to solve. We suggest an initiative open to all federal and state agencies, regional universities, Indian Tribes, and private industry. Staff would include policy makers, economists, social scientists, and natural and physical scientists from across local, state, and federal agencies, regional universities, Indian Tribes, and private industry. The task would be to develop solutions to regional as well as watershed level problems. Components of such an initiative would include:

1. Basic research into watershed science.

2. Establishment of a representative array of watershed reference sites throughout the Pacific Northwest.
3. Establishment of watershed restoration projects as demonstration sites for research and training.
4. Development of training programs for future professional watershed stewards.
5. Emphasis on watershed and regional consensus process.
6. Watershed restoration and management technical and policy information transfer.
7. New approaches to commodities extraction (e.g. riparian silviculture).

V The Economic Benefits of Managing Rivers on a Ecosystem Basis - Compared to the Existing Piecemeal Approach

Restoration and management of rivers and watersheds on an ecosystem basis is the only approach that will insure the sustainability of healthy native fish populations and watershed health, ocean harvesting levels not with standing. Without the active implementation of a region-wide watershed restoration initiative throughout the Pacific Northwest, potentially hundreds of native salmon stocks will go extinct bringing on a collapse of the regional fishing industry (Nehlsen et al. 1991). Concerning this crisis, proactive measures will save a significant part of our regional economy. Regional economic benefits resulting from ecosystem management of rivers and streams include:

1. Sustainable harvest of native fish populations.
2. Development of a sustainable riparian silviculture.
3. Reduced litigation and downstream mitigation and clean-up.
4. Development of specialty tree crops for pulp and fiber (e.g. poplar trees).
5. The export nationally and globally of watershed restoration and management expertise and techniques.
6. Improvement of human health through recreation.
7. A sustained ecological tourism industry.

CONCLUSION

If we do not act now we will we stand to lose much of what makes the Pacific Northwest unique. We will lose a significant aspect of our region's sustainable economy. The Pacific Northwest salmon are an indicator of our regional watershed health. Their loss will surely be followed by a number of other less visible riverine and riparian organisms. If we do not act we will be mandated to action as a society by provisions of the Endangered Species Act. Salmon species will be listed as endangered and recovery plans will be developed and implemented to recover and restore their critical habitat. We can either go forward with a proactive plan or wait and find ourselves facing a more significant crisis. We will end with the loss of species, loss of jobs, and a loss to future generations.

We do not have adequate scientific or management infrastructures to deal with the scale of the crisis at hand. We need a new interdisciplinary, inter-agency and inter-university regional initiative where watershed-level issues can be defined and solved. New professional resource stewards need to be trained. We have the collective expertise in our universities, local, state, and federal agencies, Indian Tribes, private industry, local, and state governments necessary to pursue a regional watershed effort.

Our watersheds, if provided with adequate protection and nurture, will supply us with many ecological services into the future. We can leave our children a regional legacy of ecological health based upon ecosystem restoration and the sustainable use of our rivers, streams and watersheds. Finally, understanding and integrating human activities into the watershed management process must be achieved if the region is to attain any form of sustainability (Ruckelshaus 1989, Naiman 1992).

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TESTIMONY OF DR. JAMES R. KARR, DIRECTOR
INSTITUTE FOR ENVIRONMENTAL STUDIES
UNIVERSITY OF WASHINGTON, SEATTLE, WASHINGTON

BEFORE THE COMMITTEE ON MERCHANT MARINE AND FISHERIES
and
SUBCOMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

MARCH 9, 1993

Thank you, Mr. Chairman, for inviting me to appear before this committee to comment on the status of watersheds in the Pacific Northwest and solutions to restore them, including naturally spawning salmon populations.

1. What is your assessment of the condition of river systems in the Pacific Northwest under the present management regime?

Like rivers throughout North America, the rivers of the Northwest have been decimated in the last century. The magnitude of degradation in river resources eclipses that of other resources that have received far more attention (e.g., wetlands). That degradation is manifest in alteration and destruction of stream channels, alteration of river flow patterns, species endangerment and extinction, introduction of contaminants, declines in commercial- and sport-fishery harvests, consumption advisories due to contamination of fish and shellfish, and degradation of the aesthetic values of those river systems. An abundance of clean, productive streams and riparian corridors has been reduced to vestiges. Appendix I provides more detail on these points with quantitative information and citations (Appendix II) for the Northwest and nationally.

Although continuing degradation of aquatic systems is obvious, even to the untrained eye, concern by government agencies has been weak, inappropriately focussed, and largely ineffective at reversing resource declines. Failure to reverse the trend of aquatic degradation is unacceptable on legal, scientific, economic, and ethical grounds.

2a. What are the essential attributes of healthy watersheds and fish habitat?

A watershed "can be considered healthy when its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed is preserved, and minimal external support for management is needed" (Karr et al. 1986). By any of these criteria the watersheds of the Northwest cannot be considered healthy. Over 97% of the naturally spawning salmon runs of the Columbia River have been lost. Further, and perhaps of greater relevance, 100% of the production of major areas of the Columbia River watershed have been lost. The situation is similar for salmon, trout, and steelhead throughout the region. How would we respond as a society if our agricultural productivity declined by over 90%?

All watersheds cannot be preserved in pristine condition. But we can and should seek to protect rivers and their watersheds from the more egregious

influences of human society. Special attention should be paid to protecting the interests of individuals alive today (intragenerational equity) and future generations (intergenerational equity).

The ability to sustain a healthy biological community is one of the best indicators of the potential for beneficial use (broadly defined) of a water resource. Support of healthy assemblages of aquatic organisms requires the proper quantity and quality of water, a stream channel in relative equilibrium with its watershed (supply of water and sediment, geological substrate, and vegetation cover, etc.), riparian vegetation that buffers the impact of terrestrial environments, and land use with minimum negative impact on riparian and stream channel environments.

In their natural state, watersheds contain an interactive mosaic of environments that extend from headwater streams and wet meadows at the upper limit of drainage basins to the ocean. This mosaic includes small streams and large rivers, riparian zones, the terrestrial watershed, groundwater (including the hyporheic zone), and near coastal and estuarine areas. All are integral components of watersheds capable of supporting viable salmonid populations.

Individual human actions within the watershed may produce small effects, but when these impacts are combined, they spawn more complex problems that cascade across the landscape and down the river, resulting in considerable loss of natural resource values. The cumulative affect is often ignored because most conventional aquatic resource evaluations consider only local water quality parameters.

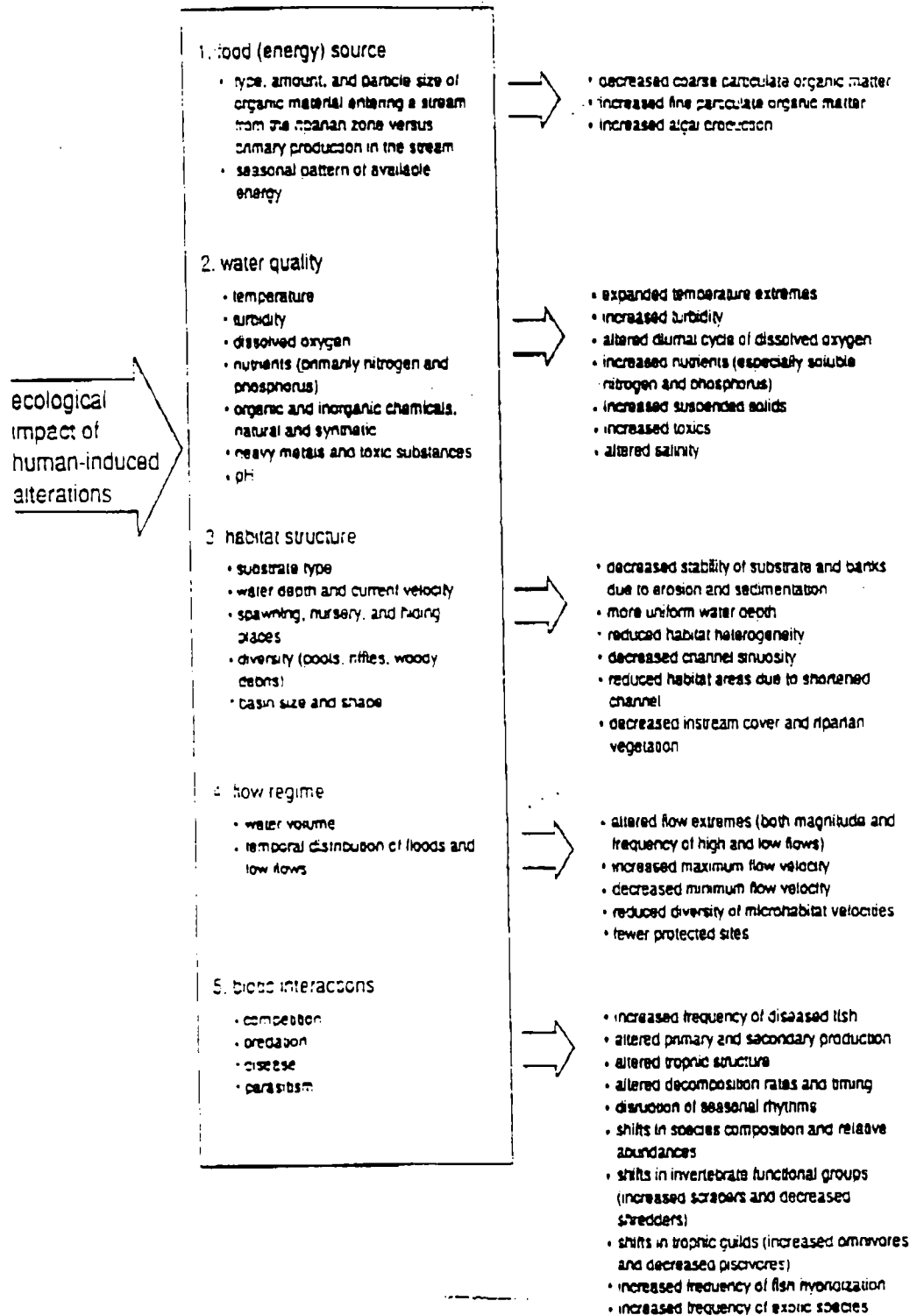
Human actions degrade water resources by their influence on five components of river systems (Table 1). Examples from Northwest watersheds are given for each of the five factors in Table 2. Efforts to protect the aquatic resources of Northwest watersheds are doomed to failure unless they explicitly incorporate knowledge of these factors into a comprehensive planning process that integrates the influences of local and regional human actions.

2b. What is the role that riparian areas play in promoting "ecosystem health," as well as providing high quality fish habitat?

Riparian areas serve as buffer zones between the terrestrial and aquatic components of regional landscapes (Karr and Schlosser 1978). Thus, riparian corridors are an important first line of defense because they have the capability of mediating the influence of landscape alteration on river resources. But the cumulative effect of activities in upland areas can overwhelm the effectiveness of riparian buffer strips. Thus, riparian strips should not be oversold as cures for depressed fish populations.

Beware of the quick fix!! Clean water, flood control and hatcheries have been the rallying cries of the past, but they have failed to protect the resource. Habitat, riparian corridor protection, barging of juvenile salmon, and bounties on squawfish are today's rallying cries. Most are important tools in the restoration arsenal but none is adequate.

Table 1. Five major classes of environmental factors that affect aquatic biota. Arrows indicate the kinds of effects that can be expected from human activities (From Karr 1991).



From:

BIOLOGICAL INTEGRITY: A LONG-NEGLECTED ASPECT OF WATER RESOURCE MANAGEMENT

JAMES R. KARR

Table 2. Examples of influences on each factor representative of problems in Northwest watersheds.

<u>FACTOR</u>	<u>TYPICAL DEGRADATION IN NORTHWEST WATERSHEDS</u>
Food (energy) source	Supply of organic material from riparian corridor altered Nutrients from the carcasses of adult salmon after spawning reduced or not available
Water Quality	Elevated temperatures Oxygen depletion Chemical contaminants
Habitat Structure	Sedimentation and loss of spawning gravels Obstructions that interfere with movement of adult or juvenile salmonids Lack of coarse woody debris Destruction of riparian vegetation and overhanging banks Lack of deep pools Altered abundance and distribution of constrained and unconstrained channel reaches
Flow Regime	Altered flows that limit survival rates during any phase of the salmon life cycle
Biotic Interactions	Increased predation on young by native or exotic species Overharvest by sport or commercial fishers

These examples of best management practices are much like the best management practices defined by soil conservationists to protect soil resources. But like soil conservation BMPs, application of watershed planning processes requires replacement of the current fragmented approach to BMP use with development of integrative Best Management Systems (Karr and Schlosser 1978). The legacy of narrow planning programs can be seen in fish ladders and hatcheries, solutions that developed to correct symptoms rather than problems. Like other BMP's, riparian corridors must be integrated into a watershed-level best management system. Only by integrating the planning process across landscapes can we protect river systems.

3a. Are existing management regimes on state, federal, and private land adequate to prevent further degradation of watersheds and fish habitat?

NO! The decline in water resource quality, salmonids populations, and Northwest watersheds continues because existing programs and the way they are implemented are not adequate. The goal of the Clean Water Act, to "restore and maintain the physical, chemical, and biological integrity of the Nation's

waters" is adequate but that goal is not clearly established by the implementing regulations and policies of the agencies responsible for enforcing the Act. For years the Clean Water Act has been implemented as if crystal clear distilled water flowing down concrete channels is the goal of the Act.

The Endangered Species Act is inadequate because, although it provides an emergency room for treatment of patients (listed species), it does not provide a hospital or a preventative care program that prevents the need to list and the listing process fosters legal impasses and extreme social dislocations. The National Forest Management Act of 1976 states that "management prescriptions...preserve and enhance the diversity of plant and animal communities," a goal that is attained by few forest plans.

Most past government programs have concentrated narrowly on issues such as prevention of chemical contamination (pollution), flood control, construction of fish ladders for adult passage, or harvest of wood. Often those programs have stimulated resource degradation due to secondary influences or because they did not address all factors responsible for degradation.

Rather than programs designed to maintain the natural regeneration capacity of these systems, we tried to substitute expensive, and usually unsuccessful, technological fixes. Indeed, technological fixes often contributed to the problem. Finally, current management programs require increasing amounts of societal energies and scarce funds to protect what remains and have little chance of success.

3b. If not, are there any statutory or administrative barriers that would hinder changes in the management regime for rivers?

YES! Current statutory programs and administrative structures are too fragmented to allow anything but a piecemeal approach to the protection of water resources. Statutes narrowly focus on individual problems such as endangered species, soil erosion or water quality. For the past two decades, wetlands have been the focus of major attention while rivers have been degraded by numerous human actions. Increased attention to old-growth forest has not adequately incorporated the water resource impact of forest alteration. Each habitat, species group (e.g. marine mammals), or resource (soil, water) is treated independently in different legislative initiatives and responsibilities are fragmented among agencies despite the broad connections among these resources and the values they provide for human society. Incentives for agencies to work in an integrative fashion at the watershed level are nonexistent.

One can conceive of legislation such as a Top of the Mountain Act or Bottom of the Lake Act as we attempt to protect all environments important to human society. Rather, we need a broad societal policy that protects ecological integrity or health, and avoids biotic impoverishment, the progressive erosion of Earth's capacity to sustain living systems, including human society (Woodwell 1990, Angermeier and Karr in review).

3c. In addition, are there other barriers (economic, social, or political) that might also create problems?

Perhaps the most important barrier is the lack of a societal literacy about the connections among resource systems and the dependence of human society on those resources. As a result, we act as if our ability to alter carrying capacity through technological innovation is unlimited. But we are subject to many constraints because, although our culture and technology changes rapidly, we are still dependent upon slowly changing ecological systems. New policy goals and management objectives that clearly integrate biological, social, cultural, and economic perspectives are needed.

The current predicament is to a large extent a by-product of the growth of economic models that Harman Daly (1991) characterizes as "boundless bull." Economics is an abstract science that, in its most common form, distorts the relationship between the economy, society and natural resources (Daly and Cobb 1989, Costanza 1991, Karr 1993). In reality, the human economy is supported by an array of services supplied free by natural systems. Thus, the concept of value must be extended beyond what "can be computed simply in terms of consumptive preferences" (Haskell et al. 1992). The failure to recognize the dependence of the economy (the frosting on a layer cake) on a healthy society and a natural resource base (the upper and lower layers of the cake) is best illustrated by the simplistic but often cited environment vs. economy dichotomy.

4. What management techniques are available to maintain and restore high quality watersheds that will sustain harvestable, naturally spawning fish populations?

An organized program is needed to restore these vital ecological systems to prevent extinctions, declines in valued resources (including consumptive and nonconsumptive use of those resources), and an emerging water crisis (including water rationing in Seattle last year!!).

Comprehensive watershed-level, restoration programs should involve a five-step process:

- 1) Identify resource condition (status and trends);
- 2) Identify the components of ecological health or integrity that have been degraded;
- 3) Identify the human action(s) responsible for the degradation;
- 4) Establish a watershed-level plan to reverse the degradation; and
- 5) Evaluate the success of protection and restoration programs.

The final step should involve direct assessment (step 1) of the condition of valued biological resources (e.g., salmon) to determine if program goals are being accomplished. The importance of avoiding sole dependence on use of water quality parameters or "habitat quality" as surrogates of biological integrity or status of salmon populations cannot be overemphasized. Special care should be exercised to insure that success is

not measured in terms such as number of construction projects, permits issued, or hatchery fish released. Procedures developed in recent years to protect the biological integrity of water resources (Karr et al. 1986, Lyons 1992, Kerans and Karr in review) provide easily used and ecological sophisticated approaches to assess resource condition. Biotic integrity assessment can easily be integrated with watershed-level planning at diverse spatial scales.

The principles required to plan protection and restoration programs are similar across watersheds. But, because human influences and natural conditions vary among watersheds, watershed specific evaluations must be undertaken to determine the cause of degradation. Then and only then, can plans be developed to correct local problems. General solutions (such as release of hatchery fish or habitat reconstruction) are not appropriate in the absence of careful problem assessment. Past approaches were often ill-conceived because planners proposed solutions as if ecosystem dysfunction could be reversed without broad understanding of those systems. Successful approaches should be based on a broad planning perspective and a planning effort based on evaluation of local ecological, social and economic conditions. The management techniques have been available for years but they have not been used in an integrative way.

The window of opportunity to reverse this decades-long trend in declining water resources and salmon populations is closing because of the extent of loss of watershed processes upon which those salmon depend and, thus, the salmon themselves. This decline can only be reversed by substantive change in our actions and in the conceptual framework used to define those actions. Immediate short-term actions are essential to provide the opportunity for long-term restoration programs. These actions include:

1. Identification and protection of existing high quality sites, sites with healthy biological communities. Recent scientific workshops have concluded that immediate actions must be taken to preserve the few healthy watershed refuges that remain in the region. Those refuges hold most of the spawning and rearing habitat for salmon. Quick action is needed to identify and protect those areas to safeguard existing salmon runs and provide viable populations that can recolonize additional areas to be restored.
2. Stabilize roads and other erosive or otherwise unstable areas in and near these protected areas
3. Move to restore nearby degraded reaches, taking advantage of the protected refuges as sources of colonists

These mostly local scale activities must be integrated with watershed level planning that produces Best Management Systems for regional landscapes. The cost of these efforts will not be high relative to the benefits to society. Environmental benefits include improved water resource quality, continued vitality of forest and river systems, protection of soil resources, more conservation minded uses of water, and protection of the aesthetic quality of the Northwest environment.

5. Are there economic benefits to managing rivers on an ecosystem basis, compared to our current piecemeal approach?

Economic benefits will accrue from improving the effectiveness of programs to protect water resources. Jobs lost in the salmon fishing and tourism industries will be restored; jobs will be created and the economic base and social structure of rural communities will be preserved. Water supplies (both quantity and quality) will be protected for agricultural and urban uses. Dredging of rivers and harbors will be reduced as the amount of sediment transported to rivers declines.

The Northwest has an opportunity to avert a disaster that has befallen the Midwest. The pursuit of maximum yield and agricultural profit in that region has had catastrophic effects on the social fabric of agricultural communities. We should work now to avoid further economic and social dislocation in the Northwest due to overharvest of natural resources and a lack of attention to the fabric of society.

CONCLUSIONS

Rivers are in many ways the lifeblood of human society. They provide water for domestic and industrial uses, they serve as transportation corridors, they provide food, recreation and scenic beauty. In addition to their direct importance to human society, their status is indicative of the health of the surrounding landscape in the same way that blood samples provide important insight about the health of humans.

Our future depends on our ability to create positive, long-lasting solutions. The two most important components of that effort will be 1) protection and restoration of natural resource systems and 2) diversification of the regional economic base. We can no longer exploit and alter the landscape as if it is infinitely resilient to human actions.

An initiative that combines a watershed planning perspective with a watershed restoration initiative provides the central organizing principles that are fundamental to long-term success. Water's mobility, integrative qualities, and importance to all biological systems makes examination of the status of water resources a practical approach for assessing the condition of the landscapes upon which humans depend for their long-term "health."

APPENDIX 1 - TESTIMONY OF JAMES R. KARR MARCH 9, 1993

TABLE 1. EXAMPLES TO ILLUSTRATE THE STATUS OF U.S. RIVERS AND THEIR FLOODPLAINS

- ¶ Of 3.2 million miles of rivers in the continental United States, only 2% are healthy enough to be considered high quality and worthy of protection (Benke 1990).
- ¶ Only one large river (greater than 600 miles long), the Yellowstone, has not been severely altered.
- ¶ Of medium sized rivers (between 120 and 600 miles long), only 42 studied in the National Rivers Inventory have not been dammed.
- ¶ 60-80% of riparian corridors have been destroyed throughout the U. S. (Swift 1984)
- ¶ Over 70% of the original floodplain forests in the U. S. has been converted to urban and agricultural use (Hunt 1988).

TABLE 2. EXAMPLES TO ILLUSTRATE THE STATUS AND TRENDS IN THE AQUATIC BIOTA OF THE UNITED STATES, WITH SPECIAL EMPHASIS ON RIVERS.

- ¶ A larger proportion of aquatic organisms is classed as rare to extinct (34% of fish, 75% of unionid mussels, and 65% of crayfish) than is true for terrestrial organisms (birds, mammals and reptiles from 11 to 14% - Master 1990).
- ¶ 20% of native fishes of western U. S. are extinct or endangered (Miller et al. 1989).
- ¶ 32% of Colorado River native fish are extinct, endangered or threatened (Carlson and Muth 1989).
- ¶ In the Pacific Northwest, 214 native, naturally spawning Pacific salmon and steelhead stocks face "a high or moderate risk of extinction, or are of special concern" (Nehlsen et al. 1991).
- ¶ Since 1910, naturally spawning salmon runs in the Columbia river have declined by over 95% (Ebel et al. 1989).
- ¶ During this century, the commercial fish harvests of major U. S. rivers have declined by over 80% (Missouri and Delaware Rivers), over 95% (Columbia River), and 100% (Illinois River) -- see Hesse et al. 1989, Patrick 1992, Ebel et al. 1989, and Karr et al. 1985).
- ¶ In 1910, over 2,600 commercial mussel fishermen operated on the Illinois River while virtually none remain today.
- ¶ Since 1850, many fish species have declined or disappeared from rivers in the United States (Maumee River, Ohio - 45%, Illinois River, Illinois 67% - Karr et al. 1985; California rivers 67% - Moyle and Williams 1990). That combined with the introduction of exotics has homogenized the aquatic biota of many regions (An average of 28% of the fish species in major drainages of Virginia are introduced - Jenkins and Burkhead in press).
- ¶ Since 1933, 20% of molluscs in the Tennessee River system have been lost (Williams et al. 1989). 46% of remaining molluscs are endangered or seriously depleted throughout their range (Jenkinson 1981).
- ¶ 38 states reported fish consumption closures, restrictions, or advisories in 1985 (Moyer 1986). 47 states in 1992. Contaminated fish pose a health threat to wildlife and people (Colborn et al. 1990, Cunningham et al. 1990). That threat includes intergenerational consequences such as impaired cognitive functioning in infants born to women who consume contaminated fish (Jacobson et al. 1990).

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Testimony of Bob Doppelt
Executive Director, Pacific Rivers Council
before the House Merchant Marine Committee
March 9, 1993

The degradation of The Pacific Northwest's riverine ecosystems and the extinction of salmon and other forms of riverine-riparian biodiversity have reached alarming levels. Not one river system in the region has been spared. Fisheries, healthy water quality and quantity produced by watershed ecosystems, and entire aquatic food chains are at risk.

For the past two years the Pacific Rivers Council has been involved with a major project to assess the capability of the region's (and nation's) riverine system and biodiversity conservation strategies and policies to address this crisis. The project has involved over 35 top scientists, economists and community development specialists nationwide. We conclude that the region's existing policies have failed. 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 EXTENT OF THE CRISIS: To realize the breadth of the problems one must first have a template of healthy ecosystems and biodiversity. Healthy river ecosystems in the Northwest are characterized by a number of factors including: 1) Water quality: All salmonids require high water quality for spawning, rearing and migration. Cool, well oxygenated water (generally <68 degrees F) free of excessive amounts of sedimentation and other pollutants is required year round, 2) Water quantity: adequate flows are critical at specific times in life cycles for spawning, rearing and migration. A natural flow regime that includes high flows is necessary to maintain channel complexity and to transport sediments, 3) Channel Characteristics: The most productive stream systems for most salmonids have gradients of <5 percent. These are lowland habitats composed of constrained canyons and gorges and unconstrained broad valleys which are generally sites of high fish densities. Good habitats maintain a balance between high quality pools, riffles, glides and side channels. Cover features such as large woody debris, boulders, undercut banks, overhanging vegetation, deep water and surface turbulence are abundant in good habitats. Substrates consist of a variety of particle sizes ranging from silts to boulders with low percentages of fine sediments to accommodate the spawning and rearing needs of all species. Channels are free of obstructions that interfere with migration of adult or juvenile fish; 4) Riparian Vegetation: Riparian areas regulate the exchanges of nutrients and materials from upland forests to the stream and maintain favorable microclimates. Large conifers or a mixture of old growth and hardwoods are found in riparian areas along all streams in the watershed, including non-fish bearing streams. Root systems in stream banks stabilize banks and protect them during high flows, 5) The condition of the stream is a function of the characteristics of the entire watershed. Healthy watersheds have upland portions that are well-vegetated and free of chronic and catastrophic sedimentation and other forms of disturbances that affect flow regimes, water quality and the delivery of large wood to the stream.

By the same token, healthy biodiversity requires a wide diversity and abundance of species and organisms, not just the presence of few key species.

However, whether measured by the health of riverine species, or by physical parameters, the current status of the Pacific Northwest's riverine ecosystems and fisheries is one of widespread degradation.

Loss of Fish Species: At least 106 populations of West Coast salmonids (salmon, trout, steelhead and char) have been driven to extinction and over 210 salmon populations are currently at risk of extinction according to the American Fisheries Society. The Sacramento River winter chinook salmon, and the sockeye and fall, spring, and summer chinook salmon of the Snake River basin are among the Pacific Northwest fishes listed as protected species under the Endangered Species Act. Petitions have been filed for sturgeon, bull trout, Columbia River coho salmon, Illinois River winter steelhead, and other fishes, whose listing could have widespread consequences for the region. Hundreds of other freshwater and anadromous fishes probably qualify for, and could receive, federal protection in the near future.

However, more than just salmon are at risk. The endangered salmon are just symbolic of a range of riverine and riparian biodiversity losses occurring across the Pacific Northwest. For example, at least 132 species of riparian associated animals, including 3 birds, 4 mammals, 12 amphibians, 45 mollusks, 34 arthropods and over 700 out of 1100 native fishes (estuarine, resident etc) on 348 streams were found to be at risk of extinction within the range of the Northern

Spotted Owl from the Cascade Mts. to the ocean (Northern Spotted Owl recovery Plan, Appendix D). Similar patterns and levels of depletion can be found in arid and semi-arid biomes throughout the region.

The economic and social impacts of degraded riverine systems and lost fisheries and biodiversity are severe. Just a few examples are necessary to depict the impacts. Since 1910, annual salmon and steelhead runs of the Columbia river system have declined from approximately 10-16 million to 2-2.5 million. Yet, the fishery still produces over \$1 billion a year in income and supports 60,000 jobs regionwide (using 1988 figures). How many jobs and economic benefits could a healthy fishery produce? Further, diminished and polluted water supplies produced by the regions watersheds are affecting irrigation and municipal water supplies and threaten public health.

In short, almost every segment of society has been affected by and pays heavy direct and indirect ecological, financial, and job-related costs for the degradation of the regions riverine systems, fisheries and riverine biodiversity, whether they are aware of it or not.

THE CAUSES OF THE PROBLEMS: Although the media has generally focused the problems on mainstem Columbia dams, these types of broad ranging problems cannot be blamed exclusively on dams, nor on excessive fishing, or on predators such as sea lions. Over 175 of the 214 at risk salmonids spawn outside of the Columbia basin, most in coastal rivers unaffected by dams. Most of these species are not subject to commercial harvest. Poor ocean conditions, dams and overharvest would not explain the vast number of riparian species or resident fish such as Bull Trout that are at risk.

The cumulative degradation of watershed ecosystems and the loss of riverine habitat is the single most consistent contributor to the decline of the region's fisheries and riverine biodiversity.

The cumulative result of the many human impacts on riverine systems has been called "ecosystem simplification": huge reductions in the life-supporting complexity and diversity of watershed and riverine ecosystems and habitats.

In brief, riverine ecosystem and habitat simplification relates to: 1) changes in water quantity or flow due to irrigation and other withdrawals, 2) the modification of channel and riparian ecosystem morphology caused by damming, reservoirs, channelization, drainage and filling of wetlands, and dredging for navigation, 3) excessive nonpoint-source pollution, including erosion and sedimentation caused by damaging land-use practices, including agriculture, forestry, and urbanization, 4) the deterioration of substrate quality or stability, 5) the degradation of chemical water quality through the addition of point-source contaminants, 6) the decline of native fish and other species from overharvest and intentional or accidental poisoning, and, 7) the introduction of exotic species.

Loss of Physical habitat: Many scientists have linked the future of the region's native fishes directly to the changes in the management of federal forests and other lands across the region. Loss of physical complexity in lowland rivers which primarily flow through private lands is extensive. Virtually all lowland rivers throughout the region have been universally degraded through channelization, diking, leveeing, revetting and riprapping and excessive water withdrawals, thereby disconnecting the rivers from their floodplains and groundwater systems. An estimated 70-90% of natural riparian (streamside) vegetation, vital to maintaining the integrity of riverine ecosystems and biodiversity, has already been lost due to human activities. Seventy percent of the region's rivers have been impaired by flow alteration.

Loss of private land lowland habitats has placed much of the burden of maintaining the health of both riverine ecosystems and biodiversity on the federal forest lands in the region. While federal forest habitats have also been degraded, the best remaining habitats are found in the federal forests primarily in unroaded, steep watersheds dominated by old growth forests.

Even on the federal forests river reaches are degraded. Recent research has documented that fish habitat on National Forests and other lands currently has fewer pools, higher fine sediments in spawning gravels and fragmented riparian vegetation than is healthy. For example, the number of large deep pools in many tributaries of the Columbia river have decreased in the past 50 years in resurveys completed between 1989 and 1992 by Forest Service researchers. Overall there has been a 30 to 70 percent reduction in the number of large, deep pools (>6ft. deep and > 50 yd surface area) on National Forests within anadromous fish in the past 50 years. A similar trend has been found in streams on private lands in coastal and eastern Oregon, Washington, and Idaho where large deep pools have decreased by 60-80 percent. Large pools are important for anadromous fish as holding areas for adults for spawning, refuge from drought and winter icing, maintenance of fish community biodiversity and juvenile fish rearing areas.

The primary reasons for these losses are increased sediments, loss of stream sinuosity by channelization and loss of woody debris and other pool forming structures. Only in a few watersheds are exceptions to this trend: the Methow and Wenatchee rivers in Washington both of which contain large roadless areas.

THE NEEDS THAT MUST BE ADDRESSED

THE ECOLOGICAL NEEDS: Numerous scientific panels have confirmed that only a few pockets of healthy habitats and ecosystems remain regionwide (Scientific Panel on late Successional Forests, 1992 and American Fisheries Society, 1993 in press). These "key watersheds" act as physical refuges for fisheries and biodiversity and as a source of species to recolonize degraded areas once restored. These areas also are the key to maintaining the existing levels of health for the systems, and hence are the "anchors" for watershed restoration programs. It is imperative that these best remaining key watersheds be quickly identified and protected at the watershed level to provide a basis to maintain and restore the region's riverine systems and biodiversity. In addition, ecologically based riparian and floodplain protections must be immediately implemented across the landscape on federal lands.

Once protected, the key watersheds must be "secured" which means threats to the remaining healthy areas must be defused or eliminated.

Watershed level restoration plans should then be crafted and implemented. Each plan should be based on a watershed level analysis of the specific needs and varying conditions of the watershed. Long term monitoring is vital to insure that the restoration treatments are successful and to provide feedback for strategic changes in restoration goals and strategies over time. It is important to note that there are no quick fixes available. Restoration is a long term process. What needs doing immediately is to stop the hemorrhaging of the systems by identifying, protecting and securing the remaining healthy watersheds and riparian areas. Restoration efforts will provide more effective if built around the healthier areas.

THE POLICY NEEDS: The National Problem: In part, the problem is symbolic of problems nationwide. For example, the United States has no national goal to protect or restore riverine ecosystems or riverine-riparian biodiversity and no national policies that mandate coordinated federal, state, and private management and conservation of whole riverine systems. Traditional river assessments have been biologically ineffective. 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 job creation and community revitalization.

Internal reviews by the Forest Service concede that maintenance of physical riverine habitat on national forest lands cannot be assured under current management direction.

Federal Land Management Policies and Guidelines are Inadequate: Despite the need to quickly identify, protect and secure the best remaining habitats, and to implement watershed level restoration strategies, current federal land management policies, standards and guidelines fail to address these needs.

A complete exposition on the failures of federal land management laws to protect riverine ecosystems and fish habitat at the watershed level is beyond the scope of this testimony. Suffice it to say that the problem is not that federal land managers lack some of the authority to protect these resources. The majority of the problem is that existing authority leaves too much to agency discretion. Some policy gaps do exist however, including legislative mandates to align agency missions, goals and management policies within watersheds. We know that the agencies have not used the power they clearly have to provide an adequate level of protection and to compel restoration. We conclude that they will not take decisive action without stronger, clearer statutory guidance requiring specific actions to address the current crisis facing river ecosystems and fish habitat on federal lands. A few examples of existing authority which has not been fully exercised follow:

(1) The National Forest Management Act (NFMA) prohibits timber harvest where "watershed conditions" will be "irreversibly damaged" or where "water conditions or fish habitat" will be "seriously" or "adversely affected." The Act also requires the identification of marginal lands deemed "unsuitable for timber production," such as where "resource protection or reforestation cannot be insured." In practice, neither of these provisions has prevented timber harvests which significantly degrade water quality and fish habitat.

(2) NFMA also requires that the agency develop planning guidelines which "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives . . . " a provision which has been interpreted in regulations to require: "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." 36 CFR U 219.19. The agency has acknowledged its general duty to maintain a level of biodiversity "at least as great as that which would be expected in a natural forest" where "appropriate" and "practicable", but has not developed a policy which requires the use of those indicator species most sensitive to land management activities on a regional basis. 36 CFR U 219.27(g). Nor has the agency failed to adequately distinguish between species and populations (stocks) in determining its viable populations requirements. Litigation is currently underway which could result in judicial clarification of the scope of the Forest Service's duties.

The agency has also generally utilizes individual habitat criteria such as water temperatures to evaluate the health of streams. These criteria are woefully inadequate. As previously stated, the health of a stream is determined by the combination of a multitude of factors.

(3) The BLM's primary management statute, the Federal Lands Policy and Management Act, directs the BLM to "take any action necessary to prevent unnecessary or undue degradation of the [public] lands," but there is no statutory definition of unnecessary and undue degradation, and it is left entirely up to the agency to determine what actions are "necessary." Rather, the BLM may, but is not required, to protect biologically significant "areas of critical environmental concern" in developing and revising land use plans. To date, this mechanism has not been widely used to protect critical riverine habitat.

(4) Both agencies are subject to "multiple-use, sustained-yield principles," which require that listed resources, including watershed and fish habitat, to be managed for long-term productivity. These principles give the agencies clear authority to reject economic optimality as the primary decision making criterion. These principles do not, however, provide any hard constraints on land managers, and require that agencies merely give "due consideration" to the various competing uses.

(5) The Clean Water Act requires the maintenance and preservation of the biological integrity of the nation's waters, but, to date, the Act has failed to prevent the massive landslides and stream sedimentation associated with logging in unstable watersheds -- despite the use of "Best Management Practices."

A Word On Enforceability: We do not overlook the fact that each of the agencies has developed guidance of various kinds which applies to the management of rivers and riparian areas. However, except for those few forests or districts with specific riparian management language in their land management plans, most riparian management guidelines which do exist appear as text in agency manuals and handbooks, provisions or technical guides, none of which is binding on the agency or legally enforceable by affected parties.

For example, the Willamette National Forest has promulgated a technical guide entitled "Riparian Management Guide." This is generally acknowledged to contain the most contemporary, scientifically defensible riparian protection standards in the Forest Service. However, this document does not itself contain any directives which are binding on the agency. Rather, it is an informally promulgated document, not subject to the notice and comment procedures of the Administrative Procedures Act, and not, therefore, enforceable against the agency in a court of law. See e.g. *Lumber Prod. & Indust. Workers Log Scalers Local 2058 v. United States*, 580 F. Supp. 279 (1984) (forest service manual provisions not binding because not promulgated by Secretary of Agriculture under a specific statutory provision and APA procedures); *United States v. Fifty-three Eclectus Parrots*, 685 F. 2d 1131 (1982) (agency pronouncement must be legislative in nature to have the force and effect of law, and be promulgated under a "specific statutory grant of authority" in conformance with Congressionally imposed procedural requirements).

Consistency: Not only do the BLM and the Forest Service have different riparian policies, the agencies are not internally consistent. For example, internal reviews in Forest Service Region 6 reported disparate standards and guidelines among forest plans for fishery resource protection, concluding that none of the plans reviewed ensure the continued viability of salmonid populations. (Heller et. al., 1991). As one investigator discovered, "planning criteria, indicators for measuring resource values, modeling assumptions, and analytic procedures varied substantially among forests, such that direct quantitative comparisons between plans are of only limited value." (Frissell, 1992). Likewise, standards and guidelines for riparian management varied considerably among forests: the Willamette (Oregon) and

Shasta-Trinity (California) National Forests have adopted a no-cut buffer averaging 100 to 200 feet wide, and ranging up to 400 feet, on all class I, II and III streams, while the Mt. Baker-Snoqualmie and Olympic National Forests (Washington) allow extensive logging in all riparian areas, with a few restrictions to prevent total stand removal. Few plans provide any protection at all for Class IV tributaries and fewer still protect riparian areas along headwater streams, despite their important contributions to the downstream environment.

An example of new authorities needed: 1) Inter-Agency Policy Consistency and Alignment to Manage at the Watershed level.

Although a number of federal statutes speak to inter-agency coordination, agencies are still authorized to act based on their own statutory goals and mandates and internal agency priorities. Legislation which defines common missions and goals, and aligns agency management policies of riverine-riparian ecosystems and biodiversity is needed to provide watershed level coordination and consistency.

CONCLUSION: PRC believes that new policies is needed to provide uniform watershed protection and restoration directives for all federal land management agencies. These policies must include riparian management directives directly from Congress, elevating important issues of riparian policy from the lowest levels of administrative authority to the highest level of government.

THE NORTHWEST POWER ACT AND THE COLUMBIA BASIN

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 ("Northwest Power Act") rejected project-by-project evaluation of environmental impacts in favor of a program which must, to the greatest extent possible, address the entire 258,000 square miles of the thirty-one watersheds in the Columbia River basin. 16 U.S.C. §§ 839-839(h). In order to achieve this goal, the Act created an independent regional planning body, the Northwest Power Planning Council ("the Council"). In addition to energy conservation and efficiency goals, the Council was required to "protect, mitigate and enhance" the fish and wildlife damaged by the hydrosystem, with specific emphasis on the improvement of flows and on providing bypass systems at major dams.

The Act's history indicates that Congress intended the Council to consider fish and wildlife resources "on a par" with other river uses as a "co-equal partner" with hydropower. The Council is also required to choose energy resources that minimize the total cost of providing energy services, with environmental costs included in the calculation of total cost. Positive biological results are given priority over economic considerations: minimum economic cost alternatives are favored only where biological goals are also attained, and the fish and wildlife agencies' and tribes' recommendations must be given "due weight" in making programmatic decisions.

The Council has proved ineffectual in forcing drastic changes to the hydrosystem and in changing federal land management practices. It was anticipated that the Council planning process would require federal dam operators, the states, the numerous river users and affected interests to act collectively to improve the condition of the Columbia -- primarily by providing the instream flows necessary to ensure passage of juvenile fish to the ocean. To date, however, the Council's Columbia Basin Fish and Wildlife Program, now in its fourth phase of development, has failed to resolve the "fish-power" conflict in a way that significantly benefits fish. It now appears that courts will ultimately be responsible for doing what the Council has not, in the context of pending lawsuits under the Northwest Power Act, the Endangered Species Act and other applicable law.

This is not to say the Council hasn't tried. For example, in 1988 the Council approved the creation of its "Protected Areas Program," which designated 44,000 miles of stream reaches on which future hydroelectric development is now severely restricted. These areas were designated based on the Council's determination that hydropower development would cause unacceptable harm to critical fish spawning grounds or wildlife habitat. Unfortunately, the legal effect of the Program to prohibit future hydroelectric development is limited by the Federal Power Act, which requires only that federal agencies such as FERC give the program "due consideration" "to the fullest extent practicable." The Program is also limited to the extent that it designates stream reaches outside the Columbia Basin, where FERC, the BOR and the Corps are not subject to the Northwest Power Act.

Numerous reasons have been posited for the Council's failure to force the necessary drastic changes in the operation of the Columbia River hydrosystem. Some believe that the Council's ineffectiveness could be cured by aggressive support from all four state Governors. Others believe that Congressional amendments to the Act are required because the Act's enforcement provisions are ambiguous, a circumstance which has prevented the Council from aggressively enforcing its Program, particularly with regard to flows. To date, the Council's authority to enforce its own Program has not been tested, and federal dam operators tend to pick and choose which provisions of the fish and wildlife program they will implement. These and other problems with the existing regional planning process indicate that Congressional action may be required to save the anadromous fish resources of the Columbia river system. (Blumm & Simrin, *The Unraveling of the Parity Promise: Hydropower, Salmon and the Endangered Species Act*, 21 *Env'tl. L.* 657 (1991)).

What should be done? Although the Northwest Power Act theoretically puts fish and wildlife on a par with hydroelectric and other values of the Columbia River system, even assuming that fish and wildlife habitat were actually accorded the parity it was intended to receive under the Act, there is no clear mandate to protect and restore river ecosystem functions as a priority over other uses. Although there are changes which can be made to operation of the hydrosystem which will vastly improve the odds for anadromous fish, flow alteration and improved fish passage facilities will not change the fact that the Columbia River system is so heavily developed with hydropower that it is unlikely ever to be restored to any semblance of its natural state.

Perhaps more importantly, changes in hydrosystem operation will not stop degradation of river ecosystems on the federal lands. It now appears that new legislation will be required which clearly recognizes that federal lands managers have a

responsibility to note drastic changes in their land practices which directly affect over fifty percent of the Basin's remaining fish habitat. Drastic action is required to stop logging-related sedimentation and loss of large woody debris that has caused an average 60 percent loss of large pools on streams in national forests over the past fifty years. Likewise, decisive grazing reforms are critical -- particularly in areas such as the Snake River Basin, where analysts believe grazing practices are the single greatest source of habitat degradation.

THE FAILURE OF TRADITIONAL WATERSHED RESTORATION APPROACHES

A recent American Fisheries Society report found that "In the past 10 years, many millions of dollars have been spent on stream habitat management in Western North America. We find little documented evidence of increased abundance of salmonids associated with these massive expenditures."

Traditional approaches to stream habitat and ecosystem restoration can be characterized as "band-aid" approaches that have several distinguishing features. First, the identification and diagnosis of habitat problems tends to be focused on finding patches of habitat that are amenable to predetermined, generic techniques. For example, many past and current programs rely heavily on installation of log weirs to construct pools in streams. Planning for these projects generally focuses on identifying reaches of stream that do not meet water temperature standards or with gradient and bank structure suited physically to the installation of such devices, and that happen to be accessible to the heavy equipment needed to do the work. There is little consideration whether the fish community, or the watershed as a whole, are suited to the kinds of changes of habitat these structures are intended to induce. It is commonly assumed that all fish benefit equally from the plunge pool sequences created by such devices, and that the construction of weir pools will compensate for all of the diverse changes in the ecosystem caused by human disturbance.

Some evaluations of these projects indicate serious shortcomings. For example, where log weirs and other artificial structures achieve their physical objectives, their effects on native fish can be insignificant, or even negative. In other cases, they may stay in place, but have unintended and damaging physical side effects, such as severe bank erosion or blockages to juvenile fish migration. Finally, in many cases, such structures suffer a high incidence of outright physical failure. The results of numerous studies suggest that the effects of such projects are inconsistent and difficult to predict. Conditions in the watershed as a whole appear to be more important than structure design in determining whether structures will function or fail. Failure rates are especially high in severely damaged watersheds or stream reaches where disturbances are ongoing. Furthermore, in some watersheds fish populations are so widely depleted by extensive habitat degradation and other factors that few or no fish are available to colonize artificially created habitats. Finally, the vast majority of streams are not accessible to heavy equipment or are otherwise unsuited to structural modification. Put simply, traditional techniques fail to address the root biological and physical causes of habitat deterioration and population decline, and often aggravate, complicate, or add to existing problems.

Priorities for traditional "band-aid" restoration approaches are typically determined by identifying the worst-degraded or ugliest-looking sites, and spending all available resources treating these areas with generic and largely cosmetic structural techniques to "bring them up to standards." Once the desired improvements have been made, further habitat-disturbing activities in the watershed can be allowed to proceed.

The result of the "band-aid" strategy is predictable: disturbances are maximally dispersed across the landscape, and virtually all sites across the landscape are homogeneously degraded. The worst sites may be partially "fixed," but meanwhile disturbance-sensitive species have likely been lost through the entire stream system. As road networks and logging units are dispersed across the landscape, virtually every tributary and stream reach becomes vulnerable to management-accelerated disturbance from sedimentation and other effects when the next large storm strikes. Because no effort is made to identify and protect key watershed refugia, the most productive and diverse habitats are subject to continued disturbance, while the most severely degraded areas (inherently the least amenable to structural improvement, and therefore the most likely sites of project failure) receive all the restoration resources. In other words, this strategy is a recipe for the degradation of the remaining healthier watersheds and other kinds of secure ecological refugia-- leading predictably to the cumulative extirpation of formerly abundant, but sensitive species over large areas.

Past and present approaches to the management of watersheds and riverine-riparian have not only allowed the present crisis to develop, they have indeed exacerbated it. For example, the intense fisheries generated during periods when hatchery stocks are productive have often driven wild stocks into decline and local extinction. Perhaps worse, reliance on increasingly costly, heavily subsidized artificial production of hatchery salmon has facilitated the decline of natural

populations, by temporarily masking their loss. As even the most successful hatchery populations suffer the inevitable collapse from disease, genetic depletion, or technological failure, natural populations remain the only sufficient seed source to restore artificial production.

After a century of experimentation, there is little scientific support for the notion that salmon hatcheries are sustainable over the long term in the absence of wild, natural populations, or that hatchery technology can work to supplement or restore remnant wild populations without seriously harming them. Each wild population of salmon and trout is uniquely and subtly adapted to its environment, in ways that are not fully understood by scientists. These adaptations can be quickly lost in the hatchery environment or in the presence of large numbers of stray fish of hatchery origin. Therefore the viability of the species remains dependent on the conservation of the diversity of its wild populations and their habitats. Beyond this, wild populations adapted to marginal or disturbed habitats could in the future be the only source of suitable colonists for re-establishment of populations in an environment where, despite efforts toward restoration, human impacts will remain pervasive.

RECOMMENDATIONS FOR A COMPREHENSIVE WATERSHED RESTORATION PROGRAM

To protect and restore the Northwest's riverine systems, fisheries and biodiversity, we recommend a new approach founded on principles of watershed dynamics, ecosystem function, and conservation biology -- a community and ecosystem-based strategy that maintains and restores riverine processes and biodiversity at the watershed level. The new approach integrates ecologically and economically sustainable restoration strategies in a scientifically defensible and conservative way, emphasizing principles of the physical and ecological functions of watersheds and key spatial and temporal aspects of aquatic ecology. Simple in concept and pragmatic in application, this new approach provides a means for prioritizing protection and restoration policies and interventions and for creating more-rapid and cost-effective biotic recovery. This program would involve three interconnected components:

- 1) The program begins with a comprehensive effort designed to identify and protect the remaining relatively healthy headwaters, key biotic refuges, benchmark watersheds, riparian areas, floodplains, and the network of biological hot spots found in patches throughout entire river systems on federal lands. This cost-efficient approach places the emphasis on preventing further degradation rather than on attempting to control problems after they occur.
- 2) Following the protection of these areas, watershed level restoration programs should be developed. Restoration treatments should focus initially on "securing" or "storm proofing" the relatively healthy areas on federal lands stated above. After these areas have been secured, restoration would focus on providing better management between the protected areas and eventually linking and expanding the healthy areas. Private lands would be brought into the program to develop river system wide restoration strategies.
- 3) Finally the program calls for the active participation of local communities and citizens in implementing the restoration program. Without support from local communities and citizens, any policy will fail. To help generate support, local jobs in restoration technologies including the "storm proofing" of the key watersheds, and community revitalization projects must be created. These projects are needed to restore riverine systems, and they offer the benefit of providing jobs and economic benefits. Floodplain open space preservation and such economic conversions as new crops that are less water- and energy-intensive, and the protection of undeveloped floodplains must also be encouraged. Incentives and technical assistance must be provided to encourage local involvement in taking these steps and in designing and implementing watershed level restoration action plans.

Necessary Federal Steps:

To implement the new restoration approach, a coordinated strategic watershed restoration initiative is required. We recommend that the federal government establish the following:

- * A coordinated strategic watershed protection and restoration initiative in the Northwest. The program must be a top-level national priority.
- * A single department with clear policymaking authority to coordinate and implement the watershed protection and restoration program. Federal land management agencies can align their own policies. We recommend that

the watershed level program that includes private lands be operated by the Environmental Protection Agency (provided EPA is given cabinet status and its performance is greatly improved.)

- * Uniform, consistent riparian, floodplain and habitat protection and restoration standards for all federal land management agencies.
- * Ecosystem and watershed-level planning by all federal agencies.
- * A comprehensive ecosystem-based watershed protection program for all federal land-management agencies. This includes the creation of a regional (and nationwide) system of "Watershed (Riverine) Biodiversity Management Areas" and "Benchmark Watersheds".
- * A comprehensive ecosystem-based watershed restoration program that focuses initially on securing, linking, and expanding the remaining relatively healthy ecosystems and habitats.
- * Coordinated private land and watershed restoration programs that generate local jobs and community revitalization projects, and support appropriate economic conversions.
- * A moratorium on new dam construction, a national "protected river" program, and a process to prioritize, remove, and alter the most damaging dams and water projects within river systems.
- * Stable long-term funding and sufficient financial and tax incentives for watershed restoration.
- * Amendments to the existing federal land management agency rules, standards and guidelines so that they support the protection and restoration strategies, goals, and policies outlined in this testimony.

IMPLEMENTATION POLICIES: To implement the proposed goals and strategies, we recommend two immediate policy steps: the *Watershed and Salmon Habitat Restoration Act* and *The National Watershed Registry*.

The Federal Lands Strategy: We propose that the strategies and policies proposed in this testimony be immediately implemented on federal lands through a *Watershed and Salmon Habitat Restoration Act* in the Pacific Northwest. Over 200 anadromous salmonids (trout, steelhead, char, and salmon) are at risk of extinction, and watershed ecosystems are highly degraded regionwide. At the same time, the region is certain to soon protect critical habitat for the Northern Spotted Owl and other species. Implementing the new federal land riverine policies in conjunction with the impending protection for these species will provide a more structured and integrated land protection and management scheme.

This Act will also provide a short term infusion of much needed jobs in rural communities. For example, a draft estimate of the costs of securing 137 key public-land watersheds in the Pacific Northwest indicates that between 7,000 and 11,000 family-wage jobs would be created over the period of implementation. Much of this would involve heavy bulldozer and excavator equipment work to remove, upgrade or otherwise alleviate sedimentation problems caused by forest roads.

Ultimately, we recommend that these changes be made on federal land *nationwide* through a new *Federal Lands Riverine Management Act*: a comprehensive, uniform policy that would be applied to all federal lands and that mandates watershed-level, ecosystem-based protection and restoration. One uniform federal policy is needed to cut across the many conflicting policy fragments that exist today concerning riverine systems and biodiversity on federal lands. Federal lands are critical to the health of the nation's rivers: much of the remaining natural ecological capital and much of the remaining biodiversity is found on federal lands, especially in the West. These systems must be protected quickly to prevent further degradation and to provide the fundamental building blocks for long-term restoration.

The Private Lands Strategy: We propose the concurrent establishment of a National Watershed Registry to support existing programs and initiate new voluntary, non-regulatory state and local efforts to recover riverine systems on private lands. The National Watershed Registry is needed to support the many ongoing state and local efforts that have sprouted across the region but that currently are limited in effectiveness. It should also stimulate the growth of many new local efforts regionwide. The NWR would establish non-profit local watershed council on priority riverine systems that would

develop and implement, from the bottom-up, Watershed Restoration Action Plans. The federal government would provide grants, funding and technical assistance to these programs. The NWR would focus stimulating appropriate economic benefits to local communities in three ways: local jobs and restoration technologies, appropriate community revitalization projects, and economic conversions such as agricultural changes to less water and energy intensive crops.

A complete description of these proposals is found in our recently released report to Congress: Entering the Watershed: An Action Plan To Restore America's River Ecosystems and Biodiversity.

THE IMPERATIVE OF CHANGE

Although we evaluated numerous federal and state riverine policies and programs in preparation for this testimony, we have not spent a great deal of time recommending improvements for each. We believe that improving existing policies, although important to do, will still not provide the strategies, policies and incentives needed to initiate an era of comprehensive riverine restoration nationwide. No existing policies appear to be based on contemporary scientific assumptions or knowledge, or effective implementation strategies and mechanisms. Until new policies are enacted, most efforts in improving, properly applying, or enforcing existing policies will remain primarily "rear guard" actions. That is, they may (but likely will not) maintain the existing levels of health for some riverine systems for a short time. However, they are certain to fail to maintain riverine health in the long run or lead to comprehensive recovery. New federal restoration goals, strategies, and policies are needed.

We hope to see the region and nation turned toward new strategies and policies that will protect and restore riverine systems, fisheries and biodiversity. New approaches are certainly needed. Riverine systems are the life-support system of our nation. These systems offer important sources of food, timber, fiber, water, and many other products that provide both jobs and sustenance. From the remaining healthy riverine systems will come vital genetic resources to recolonize the environment for future generations. And it is the natural beauty and recreational opportunities of our region's and nation's rivers that uplift the human spirit.

It is in our self-interest to protect and restore the Northwest's and America's riverine systems and biodiversity. It is also our moral responsibility.



AMERICAN FISHERIES SOCIETY

HUMBOLDT CHAPTER

P.O. Box 210, Arcata, CA 95521

March 1, 1993

Honorable Gerry E. Studds
Chairman, Merchant Marine and Fisheries Committee
U.S. House of Representatives
Room 1334, Longworth House Office Building
Washington D.C. 20515-6230

Dear Mr. Studds,

It is an honor and a privilege to address your committee on the status of Pacific salmon stocks in northwestern California and how taking an ecosystem approach to river management might help to restore them. My comments are offered as those of the Humboldt Chapter of the American Fisheries Society for which I served as principal author of Factors Threatening Northern California Stocks With Extinction (Higgins et al. 1992). This work characterized the risk of stock extinctions of chinook salmon, coho salmon, steelhead and coastal cutthroat trout in rivers from the Russian River north to the Oregon border, including the Klamath and Trinity Rivers and their tributaries. I also rely on my experience as a consulting fisheries biologist in helping to write the Long Range Plan for the Klamath River Basin Fisheries Conservation Area (USFWS 1991). This plan takes a watershed approach to preserving biodiversity and guides your \$40 million, twenty year effort to restore anadromous fisheries to that river (Higgins and Kier 1992). I will offer comments only on river systems for which I have direct knowledge. The text will be in response questions that I received in preparation for my testimony on March 9, 1993 before your committee.

1) *What is your assessment of the condition of the river systems in the Pacific Northwest under the present management regime?*

In my work for the U.S. Fish and Wildlife Service (1991) on the Klamath River, I characterized it as "severely ecologically stressed." The lower river has been filled in by 20-30 feet of sediment, flows have been reduced by dams which decreases the river's ability to flush itself, and river temperatures in late summer exceed 75 degree F. The source of the river in southern Oregon is Upper Klamath Lake which has deteriorated to the point that it has experienced massive fish kills and some of its endemic fish fauna are going extinct. The South Fork of the Trinity River is the largest Wild and Scenic River basin in California without a dam, yet it is in a similar condition to the Klamath. Chronic problems with high sediment delivery keep riparian zones from recovering, inhibit production of invertebrates which reduces available food for juvenile salmonids, and result in unstable spawning gravels. Maximum summer water temperatures in the lower South Fork Trinity in 1991 reached 81 degrees F, which is lethal for salmonids.

All other major river systems in our area, with the exception of the Smith River, have similar problems to those described above. The Eel River is the fourth largest salmon and steelhead producer in California, but there is some prospect that these species may be lost from the river. Erosion problems in the Eel watershed are immense, with an estimated 60 feet of material deposited over the old river bed from past flood events. According to U.S. Fish and Wildlife Service reports, the main stem of the Eel River as recently as 1959 could support 140,000 pairs of spawning salmon but today the main stem of the river is no longer suitable for spawning. The river relied primarily on its healthy tributaries to support anadromous fish after past floods, but those have recently been severely damaged by logging.

All smaller coastal river basins in the region have had similar problems with sedimentation due to extremely unstable geologic conditions in our region coupled with disturbances related to industrial timber practices. The high sediment load of almost all northwestern California Rivers has caused estuaries to fill. The estuary of the Eel River for example has shrunk by over 50 percent since 1950 (Higgins 1991). These important habitats serve as nursery areas for salmonid juveniles, such as chinook salmon, and marine species such as Dungeness crab.

The ecological changes in the rivers of our region result in conditions under which introduced exotic, warm water fish species may thrive. Green sunfish were found to be successfully reproducing in the South Fork of the Trinity River during the recent, prolonged drought. There is some evidence that these fish are predating upon juvenile steelhead. Sacramento squawfish were introduced to the Eel River a decade ago and have since spread throughout the entire river basin. These fish are predacious and have experienced almost an exponential cycle of growth. Plunging salmon and steelhead populations in areas of the basin first colonized by squawfish suggest that they have had a devastating impact.

In areas further south or in interior river basins, impacts may come largely from agricultural activities. The Shasta River, which has always been a substantial contributor to Klamath chinook salmon production, is now almost unsuitable for these fish. Lack of riparian cover and depletion of flows for irrigation have caused the river to rise to 90 degrees F in summer. Lack of riparian fencing also allows livestock direct access to the river resulting in excessive nutrient loading. Dissolved oxygen in summer has been measured at 2.4 ppm, which is lethal to salmonids. The Russian River to the south has a complex set of problems related to flow depletion for farming and vineyards, sub-urban development, and excessive gravel extraction.

2) *What are the essential attributes of healthy watersheds and fish habitat? What is role that riparian areas play in promoting "ecosystem health" as well as providing high quality fish habitat?*

Since I will be addressing your committee with such scholars as Dr. James Sedell, I will only offer my assessment of what healthy watersheds remain in my region. Those rivers that flow from Wilderness or Roadless Areas on U.S. Forest Service lands such as Smith River, Wooley Creek, Dillon Creek, Clear Creek, upper Blue Creek, lower Hayfork Creek, New River, and the North Fork of the Trinity River are the only systems that possess high quality fish habitat at this time. The attributes that all these watersheds share are: no or few roads or if they are roaded then roads are well designed, diverse vegetative cover including lots of older age conifers, sufficient large woody debris adjacent to streams to provide for natural recruitment, and the absence of large numbers of livestock or heavy mining activity.

I am sure that the role of healthy riparian zones in forested lands will also be covered by the testimony of Dr. Sedell, but I would like to make sure that such attributes are not overlooked on streams through alluvial valleys, such as the Shasta River. Undercut banks beneath root masses of riparian trees provide the best fish habitat in these valley streams which were once the most productive of fish habitats. Stream side trees provide shade to these rivers, moderating stream temperatures, and prevent bank erosion which preserves valuable agricultural land. Open access for cattle to stream side areas for over 100 years has destroyed riparian vegetation. This often leads to down-cutting of streams which can result in a drop in the local water table and a reduction in the productivity of the land.

3) *Are existing management regimes on state, federal, and private land adequate to prevent further degradation of watersheds and fish habitat? If not, are there statutory or administrative barriers that would hinder changes in management regimes for rivers? Are there other barriers (economic, social, or political) that might also create problems?*

Current management regimes have almost completely failed to prevent watershed and stream degradation and further damage is likely without fundamental change. Some barriers to sound management require administrative changes while others necessitate legislative action.

Public Forest Lands: While the U.S. Forest Service has shown increasing recognition of the problems leading to decline of fisheries resources, implementation of meaningful change to prevent future damage varies from one forest to another. Six Rivers National Forest has been under scrutiny by an active environmental community and has therefore implemented some very progressive policies with regard to timber harvest on erodible terrain. Adjacent forests, where local communities were primarily interested in timber extraction, have shown less sensitivity in the past to fisheries and wildlife issues.

All National Forests have been caught in the conflict of "getting the cut out" to generate revenue, knowing that the last

patches of merchantable timber are on increasingly steep and unstable ground. Past practices have lead to over-cutting which means that a period of light timber extraction and re-investment in the productivity of the land must begin. The USFS must move away from token fisheries projects such as channel manipulations and move toward a more sound ecological approach. The primary barrier to better management on USFS lands seem to be administrative but the fundamental changes needed may be difficult without major changes in staff. Specific legislative protection of the best Pacific salmon refugia is necessary at this time, however.

Private Forest Lands: Current logging practices on private land in California completely ignore concerns for cumulative effects. Recent disturbances on private timber lands have set the stage for substantial degradation to stream habitats which will be triggered by the next major storm event. While Six Rivers National Forest has withdrawn all its lands from timber harvest in Grouse Creek (South Fork of the Trinity), all timber harvest plans on private land continue to be approved. Some watersheds with unstable geologic conditions have experienced disturbance levels from 60-80 percent in a decade despite warnings from scientists of extreme risk of soil loss associated with such practices.

The California Department of Forestry has allowed clear cut timber harvesting in steep, inner gorge areas that pose greatest risk of sedimentation to stream channels. Large coniferous trees are often removed from riparian zones when steep slopes or deciduous trees provide shade to streams; only stream temperature was considered when current rules were formulated. Humboldt AFS has appraised the California Board of Forestry, both at hearings and in writing, about the potential loss of stocks of salmon in streams effected by industrial timber practices. Our requests that watersheds harboring stocks at risk be designated as Sensitive Watersheds under Forest Practices Rules have received no response. Other aquatic species in our region, such as tailed frogs (Asclepius truei) and Olympic salamanders (Rhyacotriton olympicus) are also at risk of extinction but CDF has no plan to protect them.

California Forest Practices Rules have failed several times over the course of a decade to be approved as Best Management Practices under the Clean Water Act. Currently, the EPA delegates authority over control of non-point source pollution to the California State Water Resources Control Board. Humboldt AFS additions of streams impacted by non-point source pollution to the list of impaired water bodies in 1988 showed that the system of delegation is not working. The SWRCB failed to include many of these water bodies in their data base without justification but the EPA then forced them to reconsider. Most of the streams were ultimately included. It seems that a stronger, direct enforcement role for the U.S. Environmental Protection Agency in oversight of timber harvest should be considered during the re-authorization of the Clean Water Act.

Private Agricultural Lands: Stream degradation due to agricultural practices and flow depletion have both administrative and statutory barriers. The California State Water Resources Control Board has the authority to prevent water users from wasting water but actions are only initiated when a complaint is filed. Any riparian land owner in California may begin to extract water without any permit from the SWRCB at any time. This antiquated water law needs revision if we are to maintain fisheries resources in the face of increasing development in the state. Ground water extraction is almost completely unregulated in the state, yet if aquifers are drawn down, streams may dry up and riparian zones may die. I am unaware of any statutes that prevent over-grazing that leads to stream degradation due to loss of riparian vegetation. Non-point source pollution from stock may be a violation of the Clean Water Act but no enforcement action has been initiated in our area.

There is a misperception at present in rural communities that private property rights reign supreme over public trust resources. These local interests groups see only short term economic gains or losses and are reluctant to entertain more sustainable land use practices. Thinking people, however, are recognizing that we must change. A major economic engine for over-cutting of our forests is an almost unlimited international market for wood products. In the past, when markets were primarily domestic, recessions led to decreased demand for wood products and a slow down in the rate of logging on public and private land. Free market economics can no longer be relied upon as a moderating influence on forest harvest.

4) What management techniques are available to maintain and restore high quality watersheds that will sustain harvestable, naturally spawning fish populations?

I support the watershed approach to fisheries and river restoration currently being advanced by Mr. Robert Doppelt of Pacific Rivers Council, who joins me on this panel. A similar approach is endorsed in the Klamath Plan (USFWS 1991). The most cost effective method of restoring streams impacted by sedimentation is to stabilize upland areas and allow streams to flush during subsequent high flows. While implementation of such a strategy should move forward on public lands immediately, there is a great need for similar activities on private lands as well. No public money should be spent on private lands, however, until there is fundamental reform of timber harvest practices.

Because the landscape is so fragmented at this point and rivers in such bad ecological health, I believe it is prudent to place the watersheds which serve as refugia for the last viable Pacific salmon populations in permanent reserves. No restoration will be possible in the future if the last gene resources that exist in lightly impacted or undisturbed watersheds are lost. We must also develop long term strategies based on desired future conditions of riparian areas so that stream health can be restored.

Widespread implementation of water conservation measures is needed throughout California. Leaky irrigation ditches, often in use since before the turn of the century, lead to a tremendous waste of water. If efficiency of water use were increased by implementation of water conservation measures, we could maintain agricultural productivity and regain public trust resources such as fish and water quality. Riparian restoration in agricultural lands is essential if we are to restore salmon and steelhead. Although many times fish are spawned and rear in steep areas above alluvial valleys, they must successfully migrate through these valley reaches if they are to complete their life cycle. Restoring riparian zones only requires cattle exclosures and tree planting. Federal programs should be made available to farmers and ranchers who willingly participate in such programs.

The marshes surrounding Upper Klamath Lake must be restored if we are to reverse the condition of the lake and prevent the extinction of its fishes. If water quality problems in the lake are not reversed, the entire Klamath River restoration program is jeopardized. Water conservation measures and riparian restoration on tributaries feeding the lake also must be implemented.

I am currently helping to put together a model program for the Klamath River basin, using the EPA Reach File, to make information on fisheries and water quality readily available to professionals as well as the interested public. When the Klamath EPA Reach file is complete, fisheries biologists from any agency will be able to access information in minutes before consultations on a land use project that now takes several hours or several days of research. Agencies or individuals will be able to access information on the history and problems in a watershed to better understand potential impacts of a project they are proposing. To succeed in restoring the ecological health of all our water bodies, we must begin to take a more systematic approach to managing and sharing information.

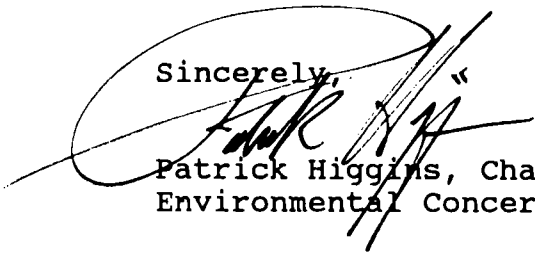
5) *Are there economic benefits to managing rivers on an ecosystem basis, compared to our current piecemeal approach?*

It is difficult to gauge the worth of preserving self-perpetuating salmon, steelhead and trout stocks. When these fish return to healthy watersheds, they reproduce at no cost to the public. Estimates by the Pacific Fisheries Management Council in 1983 showed that 1,225,000 chinook salmon alone should be produced by natural spawning in the Pacific Northwest. If properly managed, this should lead to a harvestable surplus of twice that number of chinook salmon annually in perpetuity. Because this economic pulse is sustainable, the value of all Pacific salmon species when one considers direct value of fisheries and tourism related to fishing is immense. Our large river systems suffered tremendous impacts in the past from hydraulic mining yet they were producing tremendous bounties of fish after recovery was allowed.

There is also economic benefits to making a transition to sustainable land and water management. Soil resources are the basis of all silvicultural productivity. By acting to prevent tremendous soil losses, we will maintain the future productivity of our forests. If we move to help farmers and ranchers invest in increased efficiency of water use, they can meet their water needs while allowing more water for fish and other public benefits. With the specter of continuing drought cycles, it is prudent that we make this investment regardless. Healthy riparian zones can reduce the risk loss of valuable agricultural land during future floods as well as playing an integral part in fisheries restoration.

We are now faced with the very real prospect of widespread extinction of Pacific salmon stocks. As a nation, we are all concerned about our current budget deficit and what portion of that debt we will leave to our children. If we fail to act decisively to save Pacific salmon, what will be the economic and cultural deficit that we leave to future generations? Continuing our haphazard approach will most certainly lead to the demise of these fish. The public recognizes the value of Pacific salmon and healthy river systems and will support sound solutions. The time for leadership has arrived.

Sincerely,



Patrick Higgins, Chairman
Environmental Concerns Committee

References

- Higgins, P.T. 1991. The Habitat Types of the Eel River Estuary and Their Associated Fishes and Invertebrates. Performed under contract for Oscar Larson and Assoc. Eureka, Calif.
- Higgins, P.T. and W.M. Kier. 1992. Using the Long Range Plan for the Klamath River Basin Fisheries Conservation Area as a tool for preserving biodiversity. In R. Harris (ed.): Proceedings of Conference on Preserving Biodiversity in the Klamath Bioregion. Univ. of Calif. Press. Berkeley, Calif.
- Higgins, P.T., D. Fuller and S. Dobush. 1992. Factors Threatening Stocks With Extinction in Northwestern California. Humboldt Chapter of the Amer. Fisheries Soc. Arcata, Calif.
- U.S. Fish and Wildlife Service. 1991. Long Range Plan for the Klamath River Basin Fisheries Conservation Area. USFWS Klamath Field Office, Yreka, Calif.

Congress of the United States
House of Representatives
Washington, DC 20515-3701

January 26, 1993

President Bill Clinton
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20500

Dear President Clinton:

I was asked by members of your transition team to offer my suggestions for the process and content of the Forest Summit. I am extremely interested in the success of the Forest Summit and in participating in its design.

Initially, we must acknowledge that the interested parties in this conflict have experienced years of confrontation, speeches in public forums, distrust of government, demonstrations and litigation. This problem, however it is defined, did not arise overnight and will not be solved in any one meeting. It will require a commitment of resources and a commitment to a long-term solution. In the shortrun, however, I believe two events should occur in 1993.

The first one, a Convenors' meeting, should be scheduled for the Spring of 1993. The Forest Summit itself should be scheduled before the end of 1993. In planning the Convenors' meeting I would recommend the following:

CLEARLY STATED GOAL:

The Pacific Northwest has been through two recent experiences that are largely perceived as failures--the Timber Summit of 1989 and the Salmon Summit. The Forest Summit provides an opportunity to restore confidence in government leadership and community problem solving. In order for this to happen, however, we must have clearly communicated goals that are politically and legally realistic and a process that achieves the goals.

The goal of the Forest Summit should be proposed legislation, revised administrative rules and Executive Orders and a process for addressing forest and forest related issues in the future.

LEADERSHIP:

I would recommend that the Vice President provide the Executive branch leadership for the Convenors' meeting and the Forest Summit. He should work with five Convenors in planning the specifics of the Forest Summit.

CONVENORS:

The Convenors should be the following individuals:

1. The Secretary of Interior
2. The Secretary of Agriculture
3. The Secretary of Labor
4. The Secretary of Commerce
5. Former President Jimmie Carter

CONVENORS' JOB DESCRIPTION:

1. The Convenors should work with the Vice President to assimilate information from the Professional Advisors (see below) and design the Forest Summit.
2. The Convenors should represent the best interests of human, plant and animal life in the Pacific Northwest for current and future generations.

PROFESSIONAL ADVISORS:

The following teams of professional advisors should be chosen with input from the Congressional Delegations.

1. Scientists: Forest and fish biology, etc.
2. Economists: Forest economics; economic conversion, etc.
3. Legal/Political: Environmental laws, court cases, treaties with Indians, previous legislation, political considerations, etc.
4. Process: Professionals in community dispute resolution, mediation, arbitration, and multi-party negotiation techniques.

STAFF:

There should be adequate staff support for the V.P., the Convenors and the Professional Advisors.

CONGRESSIONAL DELEGATIONS: I would suggest that the Convenors and the Vice President consider input from members of the Congressional Delegations, but that it not control their decisions.

PREMISES:

1. Geographic scope of summit: I would suggest that the following geographic areas be included in the Forest Summit: Oregon, Washington, the west and east side of each, and Northern California.
2. Ownership: I would suggest that the the following lands be included in the Forest Summit: Federal, State, Tribal and corporate private owners.

3. Location of Forest Summit: I would suggest that the Forest Summit be held in Portland, Oregon.

ISSUES FOR CONVENORS TO ADDRESS:

1. Subject matter scope of Forest Summit: Although the subjects I am suggesting are numerous, I believe that we must look at the eco-systems of the forest and the economy of the Pacific Northwest as an integrated whole. I would suggest that the Vice President and the Convenors give serious consideration to including each of the following subjects in the Forest Summit:

a. Impact of timber harvest levels on species--spotted owl, all other listed species, all late successional species, salmon and other fish species, entire biological community.

b. How much protection for each species is enough, how to measure protection, and for how long.

c. Monitoring the impact of harvest on species. Who does it? Independent scientists? Agencies?

d. Forest Management Plans for the short term (1-2 years) and the long term.

e. The economic consequences of timber harvest levels on jobs, tourism, schools, etc.

f. The economic conversion options for timber dependent communities.

g. Worker retraining.

h. Restoration of forests, watersheds and habitat.

i. Local government revenue replacement.

j. Wood products policy--raw log exports, secondary wood products, balance of trade and treaty issues.

k. Effects of timber harvest levels on big game habitat, tourism, recreation, water quality and visual quality.

l. Plants with known and potential medicinal uses (e.g. taxol).

2. Media: The Vice President and the Convenors should consider the best use of the media in furthering the goals of the Forest Summit. Will the Forest Summit be a media event like the Economic Summit? Will parts of it be private? Should it be broadcast on Cable T.V.? Will the parties speak individually or through spokespersons?

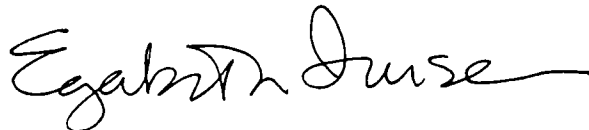
3. Process: I cannot overemphasize the importance of a well designed process. It may include a manageable group of decision makers (12-15), larger work groups and caucuses with defined roles. It may include a combination of dispute resolution techniques, such as negotiation, mediation, arbitration, med/arb and fact-finding. I anticipate that the Professional Advisors would be extremely helpful in advising the Vice President and the Convenors on the last two decades of environmental dispute resolution in our country, the successes and failures, and the optimal process for achieving the defined goal of the Forest Summit.

4. Participants: Who will be invited to the Forest Summit? What role will the participants each be asked to play? Again, I would suggest that the Congressional Delegations provide input on this subject but that it not be controlling.

5. Budget: How much will the chosen process cost and how will it be funded? The Forest Summit will not be inexpensive. However, given the resources that are poured into litigating forest related issues, the cost to our people and to other forms of life resulting from the mismanagement of our forests, I believe we must invest now in a real solution.

The issues relating to the health of our forests and economy are enormous and complex. I am interested in participating in a creative and constructive way to solve these problems. I look forward to working with you and hope this letter will be the beginning of an ongoing dialogue about the future of the Pacific Northwest forests and related issues.

Sincerely,

A handwritten signature in cursive script, reading "Elizabeth Furse". The signature is fluid and elegant, with a long horizontal flourish extending to the right.

ELIZABETH FURSE
Member of Congress

BARBARA ROBERTS
GOVERNOR



OFFICE OF THE GOVERNOR
STATE CAPITOL
SALEM, OREGON 97310-0370
TELEPHONE: (503) 378-3111

January 25, 1993

Mr. James R. Lyons
Mr. E. Thomas Tuchmann
Forest Summit Office, Room 1247
Office of Presidential Transition
1120 Vermont Avenue, NW
Washington, DC 20270

Dear Mr. Lyons and Mr. Tuchmann:

Thank you for the opportunity to comment on the structure of the "forest summit" proposed by President Clinton to resolve the forest management crisis in the Pacific Northwest.

Unless we intend to repeat again and again the disruptions of the past few years, we must recognize that this is not simply a spotted owl or a timber supply problem. It is a long-term forest management problem that must be addressed at the ecosystem level. Management implications for a full range of issues, including wildlife, fish, old-growth forest protection, water quality and quantity, timber supply, county revenues, and community stability must be considered.

Forest and watershed restoration should be addressed. Restoration projects have the potential to create significant forest-related jobs and bring degraded ecosystems back to yield a high-quality environment for Oregon communities, recreation and businesses, and a sustainable level of commodity production.

The need to resolve the forest management crisis in the Pacific Northwest is urgent. However, I believe we can set the course for necessary long-term change in management of our federal forest lands only through a deliberate, broad-based, iterative process to define the desired future condition of this national resource.

Mr. Lyons and Mr. Tuchmann
January 25, 1993
Page 2

The near-term resolution that Oregon and Northwest forest communities so desperately need should not wait for the necessary long-term change in management of our federal forests.

Therefore, I recommend a two-stage attack. The first decision point should convene to forge a short-term strategy to provide a timber supply at a level that is not vulnerable to serious legal challenge. The short-term strategy should include the identification of restoration jobs and actions to improve the watershed conditions, and provide economic relief to timber-dependent rural communities.

In addition to setting a short-term course, the initial summit meeting should set in motion a process to define the desired future condition of our forests. That process should involve the managing agencies, all interest groups, and scientific and other expertise. Once an array of alternative futures has been generated and the recommendations of all the parties are available, the summit decision participants should reconvene to select a course and create mechanisms for reaching the desired future condition.

I recommend the time line be laid out so that the first decision point is reached in April 1993 and the second by October 1993.

Success of the summit requires careful preparation. The decision-making participants should be briefed on the best scientific and economic information available. Decision-makers need to have a common scientifically credible information base as well as an understanding of current forest management problems and conflicts. I have already requested preparation of background papers from experts at Oregon State University. In late March, I will also have available a draft report laying out the needs and opportunities for forest restoration in the Pacific Northwest, together with identification of the jobs it could produce.

Preparation for the summit should include structured information- and opinion-gathering from all interested parties. I suggest that, in consultation with the governors, the Administration create a working team that includes public representatives, scientists, and agency expertise, and that reflects both Northwest and national perspectives. That working team should tap the knowledge and recommendations of representatives from the forest products industry, state and local governments, environmental groups, organized labor and interested citizens. The working team would then formulate options and recommendations for action by the decision-makers.

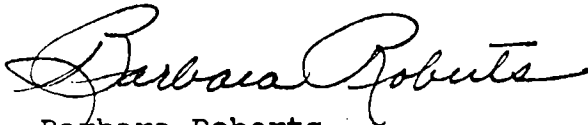
Mr. Lyons and Mr. Tuchmann
January 25, 1993
Page 3

The decision-making participants in the summit should be limited to representation from each of the Congressional delegations, the two governors, and representatives from the Clinton Administration.

Working meetings in preparation for the summit should be in the Northwest. Many individuals from this region will be asked to participate at one level or another. The location of the actual decision meetings may depend on President Clinton's or other participants' schedules.

I look forward to working with President Clinton in an effort to build a process for a successful forest summit.

Sincerely,

A handwritten signature in cursive script that reads "Barbara Roberts". The signature is fluid and elegant, with the first name and last name clearly distinguishable.

Barbara Roberts
Governor

BR:rdw

6/1/93
THE WHITE HOUSE

WASHINGTON

February 24, 1993

Dear Representative Furse:

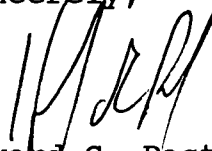
Thank you very much for your letter to President Clinton concerning the proposed Forest Summit.

I have shared your letter with Katie McGinty, Director of the Office of Environmental Policy and we will be back in touch when more information is available.

Please do not hesitate to contact my office if we may be of further assistance.

With best wishes,

Sincerely,



Howard G. Paster
Assistant to the President
for Legislative Affairs

The Honorable Elizabeth Furse
House of Representatives
Washington, D.C. 20515

**Office of the President-Elect
and Vice President-Elect**

TO: ALL NORTHWEST PACIFIC HOUSE AND SENATE MEMBERS
FROM: SUSAN BROPHY, DIRECTOR, CONGRESSIONAL RELATIONS
DATE: DECEMBER 18, 1992

RE: PROPOSED TIMBER SUMMIT

Following is a press release from President-Elect Clinton on his proposed timber summit.

Please take note of the invitation to submit suggestions on the summit to the presidential transition office. The address is provided.

If you have any questions, please call me or Karen Hancox at 973-1100.

**For Immediate Release:
December 18, 1992**

**Contact: Max Parker
(501)-399-7175**

Clinton Outlines Transition Process For Pacific Northwest Forest Summit

Little Rock, AR -- President-Elect Bill Clinton today outlined a transition process designed to facilitate all comments, inquiries and recommendations for a proposed Pacific Northwest Forest Summit.

"I want to assure all parties interested in the resolution of the Pacific Northwest Forest dispute that Al Gore and I plan to fulfill our pledge to work to resolve this issue," said Clinton. "To that end, during the transition period and until all relevant Administration officials are in place in the Clinton/Gore Administration, I have established a process and designated transition staff to begin to handle this important issue. I encourage all interested parties to send their comments to my Washington, D.C. transition office."

"This Administration is dedicated to listening to all sides of this issue and bringing people together," continued Clinton. "As I pledged, early in my Administration Senator Gore and I will undertake a process designed to reach a solution. Early groundwork during the transition will greatly help facilitate the summit process."

-30-30-30-

All interested parties should send information regarding the summit to the Presidential Transition Summit Office, Room 1247, 1120 Vermont Ave. NW Washington, D.C. 20270. Telephone: 202-973-1720.

Kate

January 4, 1993

Ingt through 22nd 1-7 1:30
pers. / 14th - KK/Susa
call 973-1720

TO: CLINTON TRANSITION TIMBER SUMMIT TEAM
FROM: ELIZABETH FURSE

RE: FOREST SUMMIT CONTACTS

Chuck McGinnis
First Interstate Bank of Oregon
1300 SW Fifth
Portland, OR 97204
225-2376
Citizen advocate for wilderness protection on federal lands for
past 25 years.

Gail Achterman
Stoel Rives Boley Jones & Gray law firm
900 SW Fifth
Portland, OR 97204
294-9132

Gail is widely knowledgeable on natural resource issues, represents
clients with federal and state natural resource interests,
including PacifiCorp, one of the largest utilities in the pacific
northwest. She served as natural resource advisor to Governor Neil
Goldschmidt and was active in the 1989 congressional timber summit
and development of the state's alternatives to the USFS forest
plans.

Thane Tienon
First Interstate Bank Tower, Suite 3500
Portland, OR 97201
224-4100
Attorney representing natural resource based industries.

Ted Strong
Executive Director
Columbia River Inter-Tribal Fish Commission
729 NE Oregon St., Suite 200
Portland, OR 97232
238-0667

The commission represents the Yakima, Warm Springs, Umatilla and
Nez Perce tribes in upholding the 1855 fishing treaties. The
commission has considerable research and technical expertise under
a \$6 million budget and has proposed significant public land
management reform programs.

Bob Eaton
Executive Director
Salmon for All
PO Box 56
Astoria, OR 97103
Advocates for commercial salmon fisheries including gillnetters.

David Moskowitz

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Executive Director
Association of Northwest Steelheaders
PO Box 22065
Milwaukee, OR 97222
653-4176

Association of Northwest Steelheaders is membership based, grassroots organization of anglers and sportsmen with 25 chapters in Oregon and Washington. Their main focus is on preserving recreational fishing opportunities and wild runs of steelhead, salmon and trout.

Bill Bakke
Resource Conservation Director
Oregon Trout
5331 S.W. Macadam Ave., Suite 228
Portland, OR 97219
222-9091

Oregon Trout is a statewide organization with approx. 2,900 members. Its mission is to protect and restore wild salmon, trout and steelhead runs and their habitat.

Andy Kerr
Conservation Director
Oregon Natural Resource Council
522 SW 5th
Portland, OR 97204
223-9001

ONRC is an association of about 50 conservation organizations throughout Oregon. They are strong advocates for the preservation of natural environments, particularly old growth timber stands. They have been active in wilderness and other natural resource legislation. Have made extensive use of litigation to press their agenda and are a party to the major court decisions impacting northwest timber sales.

Randy Fisher
Director
Oregon Department of Fish and Wildlife
PO Box 59
Portland, OR 97207
229-5403

Ann Squires
Assistant to the Governor for Natural Resources
State Capitol
Salem, OR 97310
378-3111

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Bob Doppelt
Executive Director
Oregon (Pacific) Rivers Council
PO Box 309
Eugene, OR 97440
345-0119

ORC is both an association and membership based organization with an emphasis on preserving natural river ecosystems. The organization was instrumental in advocating for the passage of Oregon's landmark state and federal omnibus river protection laws. ORC is currently advocating greater protection for in stream salmon habitat. They have considerable research capability for an organization of this size.

Ward Armstrong
Executive Director
Oregon Forest Industries Council
PO Box 12519
Salem, OR 97309
371-2942

OFIC is membership based industry advocacy organization with a focus on small to medium timber firms. They generally lobby on the state level but are also concerned with the impact of federal law on their members, particularly in the area of endangered species protection.

Larry Tuttle
Oregon Director
The Wilderness Society
610 SW Alder
Portland, OR 97205
248-0452

The Wilderness Society has urged greater protection of old growth, spotted owl habitat and wilderness generally. The society took the lead in "nationalizing" the debate over public land management in the pacific northwest.

Jacquie Bonomo
Regional Executive
National Wildlife Federation
519 SW Third Ave., Suite 606
Portland, OR 97204
222-1429

Active on forestry, grazing, mining, wetlands and other related natural resource issues. Northwest Representative of the nation's largest conservation organization.

Dave Mazza
Oregon Chapter President
Sierra Club
1413 SE Hawthorne
Portland, OR 97214
238-0442

Sierra Club has approx 35,000 members in the four northwest



4-7

chapters.

Mike Saltsgiver
Natural Resources Staff
Senator Mark O. Hatfield
121 SW Salmon
Portland, OR 97204
326-3386

Mike has been Senator Hatfield's chief natural resources staffer for many years. Mike has served as the delegation staff leader on most of the major federal lands legislation impacting Oregon over the last seven years.

Pat Amadeo
Bogel & Gates law firm
KOIN Tower
222 SW Columbia
Portland, OR
222-1515 97201

Pat's firm represents many of the small to medium sized wood products firms (under 350 employees). She served as natural resource advisor to former Governor Vic Atiyeh.

Bob Warren
Governor's Forest Planning Team
155 Cottage St., NE
Salem, OR 97301
378-8127

Bob was formerly chief natural resource staffer for Congressman Peter DeFazio. He now serves as the lead staff for the state's forest planning effort. He is very well versed on the on the ground impacts of forest management.

Brian Greeber
Oregon State University
Corvallis, OR 97331
737-2221

Brian is the lead researcher on timber availability and market and industry dynamics at Oregon State University. He helped author the seminal timber supply study dubbed the "Buter Report" and has continued to provide the best substantive information on supply and industry dynamics.

Tom Imeson
PacifiCorp
920 SW Sixth Ave.
Portland, OR 97204
731-2155

Tom was formerly chief natural resources staffer to Senator Hatfield, worked extensively on the 1986 wilderness act and was a major player in the 1989 congressional timber summit. He also served as chief of staff to Governor Neil Goldschmidt. He now works for PacifiCorp, one of the largest public utilities in the northwest.

6-7

Audubon has 45 chapters in the pacific northwest and has been a party to all major spotted owl, ESA and old growth suits.

Pete Williamson, Director
Port of St. Helens
PO Box 598
St. Helens, OR 97051
397-2888

Pete is an innovative manager of Columbia County's major industrial port. Lumber, pulp and wood products are an important part of their base.

Jeff Adams
International Longshoremen & Warehousemen's Union
491 Industry St.
Astoria, OR 97103
325-2271

Log exports comprise a large percentage of the revenue generated by the Port of Astoria.

Tom & Audrey Simmons
Water Watch of Oregon
921 SW Morrison, Suite 438
Portland, OR 97205
295-4039

Water Watch is a public interest organization dedicated to achieving a balance between the private and public uses of the state's water resources.

Nina Ball, Executive Director
Northwest Environmental Advocates
133 SW 2nd Avenue
Portland, OR 97204
295-0490

Grass roots environmental advocacy group focusing on water quality issues in the lower Columbia and Willamette drainage.

Ed Barnes, Secretary-Treasurer
International Brotherhood of Electrical Workers
4317 NE Killingsworth
Portland, OR 97218
284-4805

Al Wright, Executive Director
Pacific Northwest Utilities Conference Committee
101 SW Main, Suite 810
Portland, OR 97204
223-9343

Represents the three major customer groups of Bonneville: public utilities, investor-owned utilities and direct service industries (such as aluminum).

Ron Fortune, Secretary-Treasurer
Northwest Oregon Labor Council

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1125 SE Madison, Suite 103A
Portland, OR 97214
235-9444
Oregon's largest AFL-CIO labor council.

Al Kirnak
11680 SW Lanewood
Portland, OR 97225
644-4786
Timber worker with years of experience and insight into federal
management of public timber lands.

Ray Ramsey, Administrator
Oregon Housing Agency
1600 State St., Suite 100
Salem, OR 97310
378-4343

Ray Calica, Sr. Chair
Confederated Tribes of the Warm Springs Reservation
PO Box C
Warm Springs, OR 97761
553-3257

Mark Mercier, Chair
Confederated Tribes of the Grand Ronde
9615 Grand Ronde Rd.
Grand Ronde, OR 97347
879-5211

Elwood Patawa, Chair
Confederated Tribes of the Umatilla Indian Reservation
PO Box 638
Pendleton, OR 97801
276-3095

Marilyn & Jerry Wilson
Soloflex, Inc.
570 NE 53rd
Hillsboro, OR 97124
640-8891
Environmental activists and entrepreneurs.