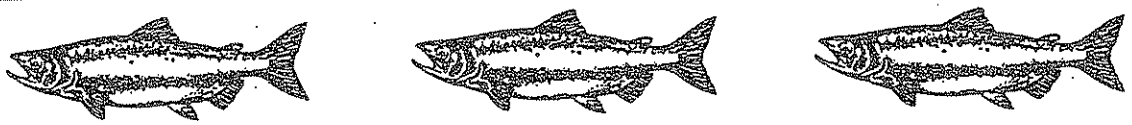

Ocean and Coastal Law Memo

OCEAN AND COASTAL LAW CENTER - SCHOOL OF LAW - UNIVERSITY OF OREGON - EUGENE 97403

Issue 43 June 1995

Update and Commentary on Columbia-Snake River Salmon Recovery*

by

Mara A. Brown, Law Clerk, Utah Supreme Court
J.D. 1995, University of Oregon
1994 National Sea Grant Fellow

TABLE OF CONTENTS

* This memo is the result of research sponsored in part by Oregon Sea Grant with funds from NOAA Office of Sea Grant, Department of Commerce, under Grant No. NA36RG0451 (Project R/PPA-38). The author gratefully acknowledges the research assistance of Andrea Coffman and the manuscript assistance of Nancy Farmer. Comments on this memo's analysis and conclusions are welcomed at the address above.

I. Introduction

In the past year there have been major developments stimulated by federal court decisions in the plans of federal, regional, state, tribal, and nongovernmental entities for the recovery of weak Columbia-Snake River salmon stocks, especially the three Snake River species listed as endangered under the federal Endangered Species Act (ESA).

In Idaho Dept. of Fish & Game v. National Marine Fisheries Service, 850 F. Supp. 886 (D. Oregon 1994), federal district Judge Marsh held that the National Marine Fisheries Service's (NMFS's) finding of "no jeopardy" to those listed species from power operations on the Columbia River was arbitrary and capricious. Marsh found the effort to save the three listed salmon species "seriously, 'significantly,' flawed because it is too heavily geared towards a status quo that has allowed all forms of river activity to proceed in a deficit situation--that is, relatively small steps, minor improvements and adjustments--when the situation literally cries out for an overhaul." Marsh continued, "[W]here stability ends and recovery begins is a crucial question which must be fully explored by the federal defendants in examining what changes can be made to river operations to avoid what many commentators believe will be the inevitable extinction of these species." Since Judge Marsh's 1994 opinion, federal agencies have returned to the table with revised proposals for managing the Columbia River in such a way that will not jeopardize the continued existence of salmon.

Issue 41 of the Ocean and Coastal Law Memo, Legal Aspects of Columbia-Snake River Salmon Recovery, provided a detailed analysis of the major federal statutes applicable to salmon recovery, including the Northwest Power Act (NPA) and the ESA (Hildreth and Thompson 1994). In December 1994, the U.S. Fish and Wildlife Service proposed to permanently reclassify the Snake River spring/summer chinook and the Snake River fall chinook from threatened to endangered along with the Snake River sockeye based on projections for further decline (59 Fed. Reg. 66784 (1994)). NMFS had previously issued an emergency rule reclassifying these Snake River chinook as endangered (59 Fed. Reg. 42529 (1994)). However, NMFS turned down a petition to list the mid-Columbia River summer chinook as an endangered species (59 Fed. Reg. 54840 (1994)).

This memo will provide an update of the litigation impacting Columbia-Snake River salmon recovery, as well as review the major provisions of the most recent agency attempts to protect the salmon. These new documents include the Northwest Power Planning Council's (NPPC's) 1994 Columbia River Basin Fish and Wildlife Program, the NMFS 1995 Proposed Recovery Plan for Snake River Salmon, and the NMFS 1995 Biological Opinion on the Reinitiation of Consultation on 1994-1988 Operation of the Federal Columbia River Power System and Juvenile Transportation Program.

Nongovernmental salmon strategies have also been proposed but will not be addressed in depth by this memo. For example, an Environmental Defense Fund analysis shows that "dry year leasing and basin-wide fallowing to acquire water for transfer to river flow enhancement are the two most cost-effective salmon recovery projects under a wide range of analytic assumptions" (Diamant and Willey 1995). The Confederated Tribes of the Umatilla Indian Reservation has proposed a salmon restoration policy "that would place 'stringent new controls' on irrigation water for surplus crops. The plan also calls for sharply increased river flows, an end to salmon barging and a freeze on issuing new water rights" (Greenwire, March 21, 1995). The Columbia River Inter-Tribal Fish Commission (CRITFC), representing four tribes with treaty fishing rights on the Columbia River, is developing a plan which emphasizes "sustainability for

future generations." The recommendations of the Columbia River Treaty Tribes include addressing passage, habitat, harvest, and production in a watershed approach. Specifically, the passage recommendations include providing for "river flows that are similar in size and duration to historic flows" through "permanent drawdowns to spillway created at the John Day, McNary, Wanapum, and Snake River dams." Habitat recommendations include protecting "all remaining fish habitat from further degradation" and protecting "roadless and wilderness areas until the majority of degraded habitats improve." Production recommendations include refocusing hatchery programs and protecting genetic diversity (CRITFC 1995). Issue 41 of the Ocean and Coastal Law Memo discusses the impact of both the NPA and the ESA on treaty fishing rights in the Columbia River.

II. Recent Litigation Impacting Columbia-Snake River Salmon Recovery

Six months after Judge Marsh sent NMFS back to reconsider its biological opinion on Columbia River operations, Judge Tang found the NPPC's 1992 Strategy for Salmon to be arbitrary and capricious with respect to the mandates under the NPA (Northwest Resource Information Center v. Northwest Power Planning Council, 35 F.3d 1371 (9th Cir. 1994)). Judge Tang found that the NPPC "failed to explain a statutory basis for its rejection of recommendations of fishery managers and it has failed to evaluate proposed program measures against sound biological objectives." Echoing Judge Marsh's opinion, Judge Tang also found that "the Council's approach seems largely to have been from the premise that only small steps are possible, in light of entrenched river user claims of economic hardship. Rather than asserting its role as a regional leader, the Council has assumed the role of a consensus builder, sometimes sacrificing the [NPA's] fish and wildlife goals for what is, in essence, the lowest common denominator acceptable to power interests and [Direct Service Industries]." Rejection of both the NMFS 1993 Biological Opinion and the NPPC's 1992 Strategy for Salmon sent a strong signal to federal agencies that maintaining the status quo was not an acceptable salmon recovery strategy.

Several other court cases enjoined federally permitted activities on federal lands in Oregon and Idaho pending U.S. Forest Service (USFS) consultation with NMFS under section 7(a)(2) of the ESA. In Pacific Rivers Council v. Thomas, 30 F.3d 1050 (9th Cir. 1994), *cert. denied*, No. 94-1332 (April 24, 1995), the 9th Circuit held that future as well as ongoing activities in the Wallowa-Whitman and Umatilla National Forests in Oregon must stop pending section 7(a)(2) consultation. The 9th Circuit upheld part of an earlier district court opinion (854 F. Supp. 713 (D. Oregon 1993)) enjoining new activities, but it reversed the district court's failure to enjoin ongoing activities and remanded the decision to the district court "to reconsider whether the ongoing and announced timber, range and road projects are irreversible and irretrievable commitments of resources which must be enjoined during consultation. . . ." An appeal of the district court's injunction issued on remand is pending before the 9th Circuit. In the meantime, the injunction on timber operations in Oregon's Wallowa-Whitman and Umatilla National Forests was recently lifted.

Shortly after the 9th Circuit opinion, a federal district court in Idaho enjoined both ongoing and new timber sales, range activities, mining activities, or road building projects in national forests in Idaho pending ESA section 7(a)(2) consultation between the USFS and NMFS (Pacific Rivers Council v. Thomas, 873 F. Supp. 365 (Idaho 1995)).

In other litigation, the 9th Circuit upheld Judge Marsh's decision in Pacific Northwest Generating Cooperative v. Brown denying standing to companies purchasing power from the Bonneville Power Administration (BPA) to challenge the NMFS 1992 Biological Opinion with

respect to Columbia River power operations (822 F. Supp. 1479 (D. Oregon 1993), *aff'd*, 38 F.3d 1058 (9th Cir. 1994)). The 9th Circuit opinion found that the plaintiffs lacked constitutional standing based on their failure to show a causal connection between the alleged economic injury and the defendant's actions, and their failure to show that their injury is redressable. The 9th Circuit did find, however, that the plaintiffs satisfied the "prudential 'zone of interest'" standing limitations established by Lujan v. Defenders of Wildlife, 112 S.Ct. 2130 (1992): "[T]hey are asserting their own rights; they are not litigating a merely abstract question; and what they complain of falls within the zone of interest protected by the Endangered Species Act."

The 9th Circuit also upheld Judge Marsh's opinion with respect to the incidental take of endangered salmon that occurs in commercial salmon fisheries. The ESA permits the taking of endangered species "incidental" to a permitted activity (16 U.S.C. § 1536(b)(4)). The plaintiffs had argued that "purposeful fishing which cannot distinguish among the salmon taken should not be characterized as merely 'incidental' taking of the endangered species." Judge Marsh concluded, and the 9th Circuit affirmed, that permitting the "incidental" take of a few endangered salmon during the course of commercial fishing was consistent with the ESA. The 9th Circuit also rejected the plaintiffs' claim that transporting and trading captured endangered salmon after harvesting them along with nonendangered salmon violates the ESA's prohibition on "trade or transportation of members of an endangered species" (16 U.S.C. § 1538(a)(1)). The 9th Circuit accepted the defendant's argument that it would be impossible to enforce this prohibition as to the few incidentally caught endangered salmon. "It was not the intention of the [ESA] to ban all salmon fishing or to place upon the federal defendants an enforcement burden that no one could accomplish."

In Douglas County v. Babbitt, 48 F.3d 1495 (9th Cir. 1995), the 9th Circuit held that the National Environmental Policy Act's environmental impact statement (EIS) process does not apply to critical habitat designations under the ESA such as the extensive critical habitat designated in the Columbia-Snake River Basin for the three endangered salmon species. Also, in U.S. Dept. of Commerce v. FERC, 36 F.3d 893 (9th Cir. 1994), the 9th Circuit held that in licensing and relicensing hydroelectric facilities under the Federal Power Act, the Federal Energy Regulatory Commission's jurisdiction includes the facilities' impacts on the spawning of anadromous fish.

III. NMFS Proposed Recovery Plan for Snake River Salmon

A. Background

In early March 1995, NMFS released its Proposed Recovery Plan for Snake River Salmon (NMFS 1995b). NMFS utilized an "adaptive" recovery strategy:

> [I]t places higher priority on actions that are most likely to provide the most immediate benefits, the greatest long-term benefits, and the best opportunity to identify those factors limiting recovery. The strategy ensures that the recovery plan remains dynamic, allowing actions to be added, deleted, or refined following an adaptive management approach based on evolving scientific information and analysis. (Id. at I-9)

The Recovery Plan follows the general approach outlined in the NMFS Recovery Plan guidelines, establishing priorities to tasks as follows:

Priority 1: An action required to help avoid extinction;

Priority 2: An action required to prevent significant decline in population numbers [and] habitat quality, and help achieve rebuilding;
Priority 3: Actions required to help ensure sustained recovery. (NMFS 1995b, at I-10)

Issue 41 of the Ocean and Coastal Law Memo provides a more thorough discussion of the NMFS Recovery Plan guidelines. The Recovery Plan states a commitment to the NPPC "to coordinate implementation and planning efforts." The Plan also includes a "Statement of Federal Policy Concerning the ESA and Indian Treaty Fishing Rights in the Pacific Northwest." The Recovery Plan states:

> In administering the ESA with respect to Indian treaty fishing in the Pacific Northwest all agencies of the Federal government should be guided by conservation necessity principles in addressing all sources of salmon mortality. In accordance with this policy, the Federal Government will not impose restrictions on the exercise of treaty-reserved and other Federally recognized Indian fishing rights which result in the incidental take of listed Snake River salmon stocks unless:
>
> 1. the restrictions are reasonable and necessary for the conservation of the fishery resource;
> 2. the restrictions are the least restrictive measures available to achieve the conservation purpose;
> 3. the restrictions, either as stated or as applied, do not discriminate against treaty activities;
> 4. the restrictions are necessary because the conservation purpose cannot be achieved through reasonable regulation of non-treaty activities; and
> 5. the restrictions are necessary because voluntary tribal conservation measures are not adequate to achieve the conservation purpose. (NMFS 1995b, at I-13 to I-14)

The main section of the Recovery Plan addresses "operational tasks for recovery" and focuses on tasks for the tributary ecosystem, mainstem habitat, harvest management, artificial propagation, and enforcement. Implementation of the Recovery Plan will be overseen by a Salmon Recovery Implementation Team. The Recovery Plan also utilizes two federal agency coordinating structures established by a Memorandum of Agreement (MOA) between the Director of the Council of Environmental Policy, the Secretaries of Commerce, Interior, Army, Energy, and Agriculture, and the Administrator of the Environmental Protection Agency (EPA). The MOA established a Secretary-level Pacific Salmon Task Force, as well as a regional Pacific Salmon Coordinating Committee. The Implementing Team will monitor the recovery efforts coordinated by the federal agencies (NMFS 1995b, at III-6). In addition, the Recovery Plan calls for the creation of a Scientific Advisory Panel, as well as other committees and work groups.

The Recovery Plan also establishes "delisting criteria" to "recover naturally reproducing populations of [listed species of salmon] to levels where protections under the ESA are unnecessary." NMFS describes its approach as a "holistic life cycle approach," and one that involves adaptive management, with flexibility to take new information into consideration. General delisting guidelines include improved spawning and rearing habitat, permanent and immediate improvement of migration conditions for juvenile and adult salmon, and controlling ocean and river harvest impacts on listed stocks. Specific delisting criteria include achieving a natural cohort replacement rate greater than one (indicating that the population is self-sustaining) and achieving numerical escapement goals set for each listed species (NMFS 1995b, at IV-1 to IV-4).

B. Main Elements of Recovery Plan--Operational Tasks for Recovery

1. Tributary Ecosystem

The Recovery Plan takes an ecosystem or watershed approach to managing tributary salmon habitat that incorporates recommendations of the Forest Ecosystem Management Assessment Team and recommends changes to the objectives established by PACFISH, the Departments of Agriculture and Interior's "Interim Strategy for Managing Anadromous Fish-Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho, and Portions of California" (60 Fed. Reg. 11655 (1995)). The Recovery Plan states "[however], the [USFS Land and Resource Management Plans] and the [Bureau of Land Management (BLM) Land Use Plans], even including [previous] PACFISH adjustments, do not identify a network of well-distributed watersheds containing high quality and readily restorable spawning and rearing habitats. Nor do they provide adequate direction in minimizing impacts on these habitats, prioritizing restoration, planning activities and conservation strategies based on landscape-scale analysis, or continued monitoring. The NMFS short-term strategy is designed to address these shortcomings" (NMFS 1995b, at V-1-16). The Recovery Plan establishes an "anti-degradation" standard for all watersheds and establishes specific riparian management objectives (RMOs) for federal land management activities (Id. at V-1-18).

Following the "three level priority approach" established by the NMFS Recovery Plan guidelines, specific biological objectives for avoiding extinction include (1) preserving remaining listed salmon populations by identifying and protecting important habitat and (2) reducing loss of listed species at water withdrawal sites. Biological objectives to begin recovery include (1) restoring habitat, (2) providing adequate instream flows, and (3) improving fish passage at barriers. Biological objectives to sustain recovery include (1) reducing losses of listed species associated with poor water quality and (2) reducing impacts on salmon from recreational activities.

The Plan calls for a Habitat Committee to coordinate with current efforts by the USFS and the BLM to develop an EIS for the Columbia River Basin, as well as with the BPA and the NPPC to identify historical salmon habitat. The report will include an evaluation of existing habitat quality and make recommendations for improvements. The efforts will be coordinated using a geographical information system database. In order to restore and protect habitat, NMFS recommends a "comprehensive short-term strategy for Federal lands," which includes

1) set[ting] ecological goals for aquatic/riparian area conditions;
2) set[ting] specific riparian management objectives (RMOs);
3) establish[ing] riparian habitat conservation areas (RHCAs);
4) protect[ing] RHCAs from further degradation in any watershed containing designated critical habitat;
5) provid[ing] for a network of well-distributed watersheds containing high quality spawning and rearing habitat and having the best potential for restoration (Priority Watersheds);
6) manag[ing] Priority Watersheds in a manner that minimizes risk to existing physical and ecological conditions;
7) set[ting] restoration priorities in Priority Watersheds to help ensure that the next generation of high quality habitat evolves and that high quality habitats expand and reconnect;

8) requir[ing] that land management be planned only after analysis of the best available information on watershed processes and functions is complete;
9) develop[ing] baseline information and monitor[ing] the effects of land management to maintain consistency with implementation requirements and to achieve Ecological Goals and RMOs; and
10) begin[ning] gathering information for developing options for long-term, ecosystem-based recovery strategies. (NMFS 1995b, at V-1-15 to V-1-16)

NMFS specifically recommended several changes to PACFISH for priority watersheds. NMFS added an RMO for substrate sediment which limits stream surface fine sediment to less than 20 percent in spawning habitat. NMFS also added specific recommendations for cobble embeddedness, width/depth ratio, and streambank stability.

The enforceability of the RMOs is not clear. NMFS states that RMOs are not intended to be management requirements, but general "benchmark[s] that the USFS and BLM managers should aim toward until such time as watershed analysis supports establishment of more specific objectives" (NMFS 1995b, at V-1-24).

2. Mainstem and Estuarine Ecosystem Recovery Tasks

Arguably the most controversial elements of recovery are those measures which affect mainstem power operations. The Plan emphasizes that mainstem efforts follow the adaptive management and ecosystem approaches. Alluding to litigation involving both deference to agency opinions as well as criticism that NMFS has maintained the status quo in the past, the Recovery Plan states: "NMFS must use its professional judgment, based on the best information available, to recommend measures that will benefit listed salmon. Once implemented, those measures must be monitored and evaluated to the extent possible to determine whether they provide a benefit. There is no implicit assumption in this Recovery Plan that the status quo is acceptable" (NMFS 1995b, at V-2-9).

Steps to avoid extinction include reducing loss of juvenile fish by (1) flow augmentation and improved water management, (2) increased spill at mainstem dams, (3) structural and operational improvements of bypass facilities and dams, (4) improving transportation, and (5) using reservoir drawdowns. Steps to avoid extinction also include (6) reducing loss of adult fish by improving structural and operational passage facilities at dams and (7) reducing listed species loss at water withdrawal sites.

Steps to sustain recovery include (1) reducing loss of listed species to predators and competitors, (2) reducing the loss of listed fish resulting from elimination and disruption of shallow water habitat, (3) reducing loss of listed species associated with poor water quality, and (4) expanding the knowledge of salmonid biological requirements to better manage for the recovery of listed Snake River salmon.

Recognizing that flow levels that approach natural river conditions will likely provide the best chance for recovery, NMFS includes in its flow augmentation approach increased flows during the spring and summer salmon migration. Flow augmentation will be achieved through a combination of changing reservoir operations so that water will be available when needed for salmon migration and managing water "through a real-time, flexible in season management process." NMFS has established target flows for summer and spring at the Snake River's Lower Granite Dam and the Columbia River's McNary Dam. In-season management relies on the Army

Corps of Engineers (COE), the Bureau of Reclamation (BOR), and the BPA to operate the Federal Columbia River Power System (FCRPS) for optimal fish survival. This includes ensuring that reservoirs are at flood control levels at the beginning of the migration season; recommending that BOR secure additional water from Oregon and Idaho to increase flow of the upper Snake River; and recommending that the BPA and COE negotiate with Canada to store additional water in Canadian reservoirs to increase the likelihood that target flow levels can be met in the Columbia River in low water years. NMFS also recommends that BOR identify unauthorized water spreading activities and stop all instances of water spreading on Reclamation projects by April 1996. The Plan also recommends study of the relationship between increased flow and salmonid survival in the ocean. In particular, increased flow may impact the structure of the Columbia River plume, which may play a critical role in juvenile salmon survival.

While recognizing the risk to smolts through elevated levels of dissolved gas (TDG) in their bloodstreams, NMFS nonetheless recommends increased spill at mainstem dams. NMFS recommends that the long-term exposure to TDG does not exceed 115 percent. This is above the EPA's recommended limit of 110 percent but below the level of 120 percent recommended by state and tribal entities. NMFS acknowledges that the spill program is still experimental and that it requires more information about the TDG levels resulting from different levels of spill at each dam and the impact of lethal and sublethal effects of TDG on fish. Because nitrogen levels are regulated by the states under the federal Clean Water Act, spills require the approval of Oregon and Washington. The Oregon Environmental Quality Commission has expressed continuing concern about such water quality effects of spills requested by NMFS and hatchery operators to aid downstream migrants.

The most controversial element of the mainstem changes is the recommendation for reservoir drawdowns. Consistent with the NPPC's recommendations in the Columbia River Basin Fish and Wildlife Program, NMFS recommends a drawdown of the John Day reservoir to increase water velocities. The drawdown will be to a level within one foot of the minimum operating pool, with continued study on the option to drawdown the reservoir to spillway crest--an intermediate level which increases velocity and further decreases smolt travel time. A drawdown to the natural river level would eliminate mortality associated with reservoir and dam passage. An August 1994 Columbia River System Operation draft EIS released by the BPA, COE, and BOR, concludes that salmon migrations would be helped most by such drawdowns to near natural river levels. A final EIS is expected in 1995.

However, NMFS has not chosen to recommend the drawdown of Snake River reservoirs at this time (NMFS 1995b, at V-2-57). This is a significant difference between the NMFS Recovery Plan and the NPPC proposal, which recommends an immediate drawdown to near spillway crest of the Lower Granite pool, followed by a Little Goose reservoir drawdown in 1999 if biologically prudent. The NPPC strategy may lead to the drawdown of all four lower Snake River reservoirs by 2002. As discussed in Ocean and Coastal Law Memo Issue 41, NMFS preliminary recovery strategies also recommended studying the effectiveness of drawdowns to spillway crest before implementing such a strategy. NMFS is primarily interested in comparing the improved smolt survival from drawdowns with survival resulting from improved smolt transportation around dams. NMFS's approach with respect to drawdowns is described further in Section V.

3. Harvest Management Recovery Tools

Management of ocean and in-river salmon harvest is complicated by the fact that management falls under a variety of jurisdictions and frameworks, from the agreement between

Washington and Oregon in the Columbia River Compact, to court-supervised tribal and nontribal in-river fishing pursuant to the Columbia River Fisheries Management Plan (CRFMP), to ocean salmon management by the Pacific Fishery Management Council, to the international salmon treaty between the United States and Canada. Thus tribal and nontribal commercial and recreational fishermen as well as consumers have an interest in salmon harvest management.

Harvest management tasks to avoid extinction include (1) increasing adult escapement for Snake River fall chinook by modifying existing ocean harvest management rules and (2) increasing adult escapement for all listed species by modifying existing in-river harvest management rules. Tasks to sustain recovery include (1) protecting all listed species by developing harvest management rules to account for future fisheries, (2) protecting all listed species through development of alternative harvest methods, and (3) protecting all listed species through reduction in harvest capacity.

After the initial strict harvesting regimes imposed to increase escapement, NMFS recommends that the parties to the CRFMP as well as the state of Idaho and the Shoshone-Bannock Tribes incorporate management rules that eventually allow for increased harvest (NMFS 1995b, at V-3-23). Additionally, NMFS recommends development of harvest management plans by January 1999 consistent with long-term recovery objectives (Id. at V-3-24). NMFS also recommends that the Salmon Technical Team of the Pacific Fishery Management Council and the Technical Advisory Committee to the CRFMP evaluate selective harvest methods and eventually recommend changes in mesh size consistent with increased salmon productivity (Id. at V-3-25). Finally, NMFS recommends that Oregon and Washington initiate a vessel and permit buy-back program designed to reduce the Oregon and Washington commercial troll fishery by 50 percent and to eliminate the nontreaty gillnet fishery in the mainstem Columbia River by 2002 (Id. at V-3-28).

4. Artificial Propagation

Steps to avoid extinction include (1) conserving remaining Snake River salmon gene pools through implementation of captive broodstock/supplementation/gene bank programs, (2) protecting listed species from excessive genetic introgression, and (3) minimizing impacts on listed salmon from interactions between Columbia Basin hatchery salmon and natural salmon. Tasks to begin recovery include (1) improving survival of Columbia River Basin anadromous salmonids by improving the quality of fish released from hatcheries, (2) reducing adverse interactions (predation, competition) between listed salmon and hatchery steelhead, and (3) minimizing interactions (predation, competition) between listed salmon and hatchery trout. Tasks to sustain recovery include (1) restoring listed chinook salmon by reintroducing them into historic habitat and (2) conducting research to facilitate management that optimizes hatchery production and conserves natural populations (NMFS 1995b, Chapter V, Section 4).

5. Enforcement

Tasks to avoid extinction and prevent loss of listed salmon include (1) increasing the law enforcement presence throughout their range, (2) enforcing existing federal regulations, and (3) creating a cohesive and effective enforcement strategy by coordinating with all existing law enforcement entities involved in salmon recovery efforts.

Existing fisheries enforcement on the Columbia and Snake Rivers is coordinated through the Columbia Basin Law Enforcement Council. The Council has created a Salmon Enforcement

Team to protect endangered salmon. NMFS calls for increased patrolling of river areas "to identify unreported and illegal activities detrimental to salmon survival" (NMFS 1995b, at V-5-2). The Recovery Plan also calls for NMFS and the U.S. Fish and Wildlife Service to "adopt Federal regulations consistent with existing state regulations," as well as "Federal regulations which will provide for effective enforcement of the ESA" (Id. at V-5-4).

IV. NPPC 1994 Columbia River Basin Fish and Wildlife Program

A. Introduction

In response to the decision in Northwest Resource Information Center v. Northwest Power Planning Council, the NPPC began further consultation with fishery managers to redevelop a salmon strategy. The 1994 Columbia River Basin Fish and Wildlife Program (NPPC 1994) incorporates changes on the basis of comments on the earlier salmon strategy, as well as recommendations from fishery managers.

B. Recommendations for Salmon Recovery

1. Juvenile Salmon Migration

The NPPC recommendations for juvenile salmon migration focus on increasing flow and velocity of the Columbia and Snake River systems, based on a "positive characterization" of the "relationship between flow, migration speed and salmon survival" (NPPC 1994, at 5-4). The Fish and Wildlife Program calls for immediate mainstem survival actions, including (1) an expedited program to improve fish bypass at mainstem dams through the use of surface bypass systems and, until these and other bypass improvements are in place, additional spill to levels that do not exceed state-defined levels of nitrogen gas supersaturation; (2) improvements in spill efficiency; (3) improved Snake River flows through acquisition of water; (4) improved flows in the Columbia River through modified operation of the Grand Coulee and Albeni Falls Dams and negotiations for additional water from Canadian storage reserves; (5) enhanced velocity in the Snake and Columbia Rivers through drawdown of the Lower Granite and Little Goose reservoirs; (6) an emphasis on in-river juvenile salmon migration in all but the worst water conditions; and (7) an intensified effort to control predators and reduce competition with depressed salmon stocks. The Program also calls for evaluation of additional mainstem actions, including (1) additional upstream storage reservoirs to hold water in good years and make it available in dry years and (2) additional velocity improvements including additional drawdowns to spillway or natural river levels.

Like NMFS, the NPPC has adopted an "adaptive management" approach. The NPPC proposes that river operations over the next several years deal with uncertainty in the effects of transportation, flow, and velocity augmentation on salmon survival by "spreading the risk." The NPPC proposes an experimental approach to compare survival between two groups of salmon: those that were transported past the mainstem dams and those that migrated in the river with the enhancements called for by the NPPC. A Fish Operations Executive Committee will review the experiment and its implementation. The NPPC also calls for coordination between the NPPC and NMFS and the convening of a technical committee to provide technical coordination and experimental design.

2. Adult Salmon Migration

Increased spills to improve downward migration of juvenile salmon may impede adult salmon returning upriver to spawn. The NPPC recommends that the "Corps of Engineers implement all spill and operating criteria for mainstem adult fish passage facilities." The NPPC also recommends that juvenile fish screens remain on longer to prevent adult salmon from falling into the powerhouse. Finally the NPPC recommends that COE study ways to improve passage and survival of adult salmon and calls on more "research on fish disease at passage facilities" (NPPC 1994, at 6-1).

3. Coordinated Salmon Production and Habitat

The NPPC recommends an ecosystem approach to habitat management with "close coordination of habitat and production measures." The NPPC recommends a "subregional" process that draws from local, private, and government initiatives. The NPPC calls for "immediate efforts to gather data on wild and naturally spawning stocks, review impacts of the existing hatchery system and coordinate supplementation activities." The NPPC also calls for "changes in land and water management, water diversion screening, habitat priorities and an expedited funding process" (NPPC 1994, at 7-1).

4. Salmon Harvest

Specific NPPC objectives include (1) development of management goals and escapement objectives that consider weak stocks; (2) adoption of more conservative exploitation rates; (3) development of alternative harvest opportunities through improved selective harvest techniques; (4) improvement of stock identification, including genetic identification and marking of hatchery fish; and (5) other harvest measures such as seeking changes in sport fishing regulations, improving enforcement of incidental takes, including Idaho and Indian Tribes in the Columbia River Compact, and modifying international treaty provisions to reduce Canadian interception of Columbia River salmon (NPPC 1994, Section 8).

5. Changes in the NPPC

No court challenges to the validity of the NPPC's revised salmon recovery strategy are pending. Since the revised strategy was unveiled in December, however, the composition of the NPPC has changed. New Idaho Governor Phil Batt has appointed two new members to the NPPC who may change the voting balance on critical components of the NPPC strategy. Because of the economic impact of reservoir drawdowns on Idaho irrigators, tourism, and hydropower operations, the current NPPC strategy requiring drawdowns of lower Snake River reservoirs may no longer have much support on the NPPC. The spring 1995 issue of Northwest Energy News, a newsletter of the NPPC, states: "Specifically, the Council will investigate the science underlying the fish-survival benefits of increased flow and water velocities in the Snake and Columbia rivers, spill at dams, barge transportation of juvenile fish, and reservoir drawdowns in the lower Snake and at John Day Dam on the Columbia." In short, the entire NPPC salmon strategy may be back on the table.

V. NMFS Biological Opinion on the Reinitiation of Consultation on 1994-1998 Operation of the Federal Columbia River Power System and Juvenile Transportation Program

In response to the opinion in Idaho Dept. of Fish & Game v. National Marine Fisheries Service, NMFS reinitiated section 7(a)(2) consultation on the effects of FCRPS operations on endangered salmon. As a result of this new consultation, NMFS has determined that the operations of the FCRPS will jeopardize the endangered salmon species (NMFS 1995a). NMFS's analysis of the effect of river operations is based primarily on two life cycle models, each of which offers a different result when predicting the outcome of management actions. "One model suggests that increased flows through reservoir drawdowns has the best chance of ensuring species survival, while a strategy that relies on transportation is likely to lead to extirpation. The other suggests that increased and improved transportation has the best chance of ensuring species survival, while a strategy that relies on drawdown is likely to lead to extirpation." Because of the tension between these models, NMFS recognizes that "there is great risk to the survival and recovery of the listed stocks of any management option that relies solely and conclusively on any single set of assumptions" (Id. at 84).

As a result of the jeopardy finding, the Biological Opinion provides a "reasonable and prudent alternative" to the FCRPS proposal, which includes "immediate survival improvements," "major structural modifications," and "immediate planning and evaluations to address potential system modifications" (NMFS 1995a, at 91). The proposed alternative in the Biological Opinion essentially mirrors the Recovery Plan requirements for the mainstem and estuarine ecosystem and calls for improved flows in the Columbia and Snake Rivers through flow augmentation, increased spills at the Columbia and Snake River projects, and measures to improve bypasses and improve transportation of juvenile salmon. Thus pending court challenges to the Opinion could have major implications for the validity of the Recovery Plan. The Biological Opinion calls for COE to complete design and engineering work to allow drawdown of Snake River reservoirs by 2000 and requires COE to test surface collection technology at the Lower Granite and The Dalles Dams by June 1996.

Because of the economic impact of reservoir drawdowns on hydropower operations, tourism, and irrigators and the persistence of uncertainty about the benefits to salmon of drawdowns, this portion of the salmon recovery strategy has been the most controversial.

VI. Analysis of Ecosystem Management and Recovery Plan Guidelines

In response to a mandate by President Clinton, the USFS and the BLM are currently drafting a Scientific Framework for Ecosystem Management in the Interior Columbia River Basin (Eastside Ecosystem 1994). The ecosystem approach that is being developed by federal land management agencies has a goal to reflect new scientific information that challenges traditional resource management and changes in societal values, as well as a goal to maintain "ecosystem integrity" (Id. at v). While this approach to management was prompted by the need to protect the northern spotted owl, the same principles of ecosystem management are being applied to Columbia River salmon recovery.

The Framework identifies four principles of ecosystem management to be taken into consideration by forest managers. First, "ecosystems are dynamic and evolutionary." Management implications of this principle include "Management must be site-specific. . . .

Management practices should consider historical and potential disturbance regimes and their resultant patterns and effects. . . . Natural resource managers should be able to predict the consequences of management activities and consider their influence on ecosystem development including the possible change in developmental pathways. Measurement variable and methods should be selected to evaluate changes in ecosystem structures and functions" (Eastside Ecosystem 1994, at 9). The second principle of ecosystem management is that "it is useful to view ecosystems as being organized within a hierarchy, with each level having a variety of time and space scales." The scientists recommend that "[m]anagement decisions should be integrated recognizing different spacial and temporal scales and a variety of socially defined outputs." In addition, "[m]onitoring at frequencies and scales appropriate to disturbance events and rates of change can help management understand ecosystem development" (Id. at 10). Under the third principle that "[e]cosystems have biophysical and social limits, [d]ecisions in a ecosystem management context should consider intergenerational equity and tradeoffs" (Id. at 12). Finally, the fourth principle of ecosystem management that "[t]here are limits to the predictability of ecosystem patterns and processes; conditions and events may be predictable at some scales but not at others," leads to the recommendation that adaptive management principles be used (Id. at 13).

The modified PACFISH strategy being applied to the habitat component of the NMFS Recovery Plan is one way in which the Recovery Plan utilizes the ecosystem approach. The focus on adaptive management for the other components of the Recovery Plan strategy also follows an ecosystem approach.

VII. Discussion

A. Adaptive Management and Biodiversity Conservation Strategies

The NMFS Recovery Plan and the NPPC salmon strategy take the same approach in that they are both adaptive management strategies that adhere to ecosystem management principles. The primary differences between the two (NMFS favoring juvenile salmon transportation, while the NPPC takes bolder steps to modify in-river conditions) may be relatively minor when seen as part of an "adaptive" experimental framework.

Adaptive management "provides a framework within which measures can be evaluated systematically as they are carried out" (Lee and Lawrence 1986). The NPPC adopted an adaptive management approach in 1984 and arguably has been conducting a salmon management "test" since that time, making changes, developing new hypotheses, and modifying the Columbia River Basin Fish and Wildlife Program throughout that time. In the past 10 years, the experimental approach has not led to improvements in salmon survival, and, as indicated by the elevation of the status of Snake River chinook from threatened to endangered, salmon populations are continuing to decline.

While the NMFS Proposed Recovery Plan also embraces the adaptive management strategy, because past attempts to preserve Columbia-Snake River salmon have not been successful, it may be useful to compare the general approaches of the NMFS and NPPC strategies to other recommendations for conserving aquatic biodiversity. This section will compare the NMFS and NPPC strategies with the general conservation strategy proposed by Reed Noss and Allen Cooperrider (1994). Although Noss and Cooperrider's recommendations for restoring aquatic biodiversity are not site-specific, the approach is broadly applicable to the Columbia River salmon in that the causes of salmon degradation--habitat loss (including water

diversion), hatcheries, hydropower operations, and overfishing--are not unique to the Columbia River, but are among the threats to aquatic biodiversity everywhere.

Noss and Cooperrider have examined the problems of conserving aquatic biodiversity and concluded that they largely mirror threats to terrestrial biodiversity at a landscape level, including habitat fragmentation and loss of genetic variation. Landscape design principles, when applied to watershed-level restoration, require zoning the watershed into reserves and buffers around reserves with increasing human use, with corridors between reserves. "More progressively, however, the aquatic network must be viewed as inherently imbedded in a matrix of land with which it interacts in complex ways. Thus, aquatic and terrestrial zoning need to be accomplished in an integrated and coordinated way" (Noss and Cooperrider 1994, at 283). Past management strategies have focused on single species (game fish), and fragmented agency jurisdiction between fisheries management and riparian land management has led to an inability to manage on an integrated watershed level. To mask loss of wild fish populations, hatchery production has been a large component of fishery management. Noss and Cooperrider describe this as a "halfway technology" that has done more damage to fish preservation than it has prevented. Hatcheries produce fish without taking into consideration that the environment in which they are being placed is no more suitable for hatchery fish than it is for wild fish. "Furthermore, hatcheries are expensive, they cause genetic problems when hatchery fish breed with wild fish adapted to local conditions, they encourage overfishing of mixed stock fisheries, and most importantly, they hide or mask the real problem of habitat degradation" (Id. at 285). Another problem with historical aquatic ecosystem management practices is the lack of accurate models for both habitat evaluation and instream flow determination (Id. at 286-87).

Noss and Cooperrider's strategy for conserving aquatic biodiversity incorporates such principles as watershed-level management, utilization of historical flow patterns as a baseline for management and evaluation, integration of land and water management, establishing reserves, and restoration that focuses on "underlying process" rather than "halfway technologies" (Noss and Cooperrider 1994, at 288-89). The aquatic conservation strategy includes recommending coordinated planning and management, classification and zoning of the watershed, reserve management, management of nonreserve areas for multiple use, and restoration. More specific guidelines for watershed management include (1) zoning reserve areas to exclude incompatible human activities, (2) maintaining or mimicking historic flows to the greatest extent possible, (3) expanding enforcement of antipollution laws, (4) prohibiting new floodplain development, (5) prohibiting new dam construction and removing existing dams over time, and (6) prohibiting introduction or transplants of exotic species and eliminating nonnative species where possible (Id. at 294-95). Further guidelines for restoration include (1) prioritize restoration for areas "of high species richness or high native species productivity," (2) design restoration to "restore natural functions of aquatic systems," (3) restore polluted areas that may become more damaging in the future, (4) determine "cost/benefit or other economic or ecological analysis at the appropriate scale," (5) "work from the headwaters down," and (6) exercise caution in restoration activities. In particular, reintroducing endangered fish requires caution, and Noss and Cooperrider recommend following guidelines developed by the American Fisheries Society (Id. at 295-97).

The adaptive management framework used by the NMFS and NPPC strategies is consistent with a conservation strategy that emphasizes monitoring and incorporation of new scientific information into the management strategy. However, the success of adaptive management strategies depends on the strength of management directives and on the scientific assumptions built into experimental design and monitoring. In general, both NMFS and the NPPC have addressed the key components necessary for salmon recovery, but neither plan takes bold steps

that are more likely to result in actual salmon recovery. Specifically, although the PACFISH strategy that was expanded on and incorporated into the NMFS habitat strategy takes some steps to protect riparian habitat conservation areas, neither NMFS nor the NPPC call for the prohibition of destructive activities such as mining, salvage timber harvest, road building, and grazing. While PACFISH recommends that scheduled timber harvest not occur in riparian habitat conservation areas, it does not recommend prohibition on "salvage" timber harvest (NMFS 1995b, at V-1-28). Rather than promoting a "reserve" concept for priority watersheds and prohibiting all activities, the NMFS approach is to allow activities that only have a "de minimis" risk of adversely impacting salmon habitat. Agencies permitting activities in riparian habitat conservation areas will have to give NMFS "a clear demonstration, based on both watershed and site-specific analyses, how these actions will avoid adverse effects and how they will not retard or prevent attainment of ecological goals. . . " (Id.).

The actions proposed by NMFS with respect to mainstem recovery differ from a conservation strategy that emphasizes restoring or mimicking flows at historic levels. Although more study may be needed on the comparative benefits of barging fish versus drawing down reservoirs to spillway crest levels, a more aggressive experimental strategy could compare transportation benefits to benefits from drawdowns to natural river levels.

B. Implementation

Two remaining issues are whether the Recovery Plan can be implemented and whether enforcement of the plan, especially with regard to habitat impacts, will be successful. The enforcement mechanism called for in the Recovery Plan relies heavily on the promulgation of new regulations for ESA enforcement. But new regulations promulgated to implement the Recovery Plan may have to clear new statutory hurdles included in proposed ESA amendments pending before Congress.

This memo has not addressed the costs to implement the Recovery Plan in terms of both federal funding for administrative actions and lost economic opportunities for existing river users and treaty and nontreaty salmon harvesters. In a report to NMFS, a University of Washington study concludes that recovery costs without major hydropower changes will amount to nearly $1 billion; changes to the hydropower system are estimated to be over $167 million (Huppert and Fluharty 1995). "A major weakness in both the recovery effort and the available cost assessment is the lack of a well-designed river/habitat/fish monitoring system to support adaptive management. Whether the Pacific Northwest region learns how to preserve salmon populations or simply spends lots of money on politically popular 'solutions' over the next decade will depend upon the careful design and monitoring of adaptive steps. In the long run, the most costly program of salmon recovery is one that vacillates between ill-considered 'emergency' measures without accumulating the wisdom to preserve the habitats of endangered species in a cost effective manner" (Id.).

Other stumbling blocks include congressional overrides such as Senator Gorton's amendment to the congressional appropriation's "Recision Bill" allowing "salvage" timber cutting without preparation of an EIS (H.R. 1158). Appeals of timber sales would be permitted only if they are made within 15 days of the initial advertisement of the challenged timber sales. If enacted, this congressional mandate may severely affect salmon habitat in Columbia River Basin forests east of the Cascade Range.

The latest salmon recovery strategies proposed by NMFS and the NPPC arrive during intense controversy over the effectiveness of the ESA, as well as congressional efforts to modify

and weaken the ESA, in particular with respect to the perceived restraints the ESA places on development and private property owners. Congress has already passed legislation temporarily prohibiting new listings under the ESA. Whether the U.S. Fish and Wildlife Service's proposed reclassification of the two Snake River chinook species from threatened to endangered will be affected remains to be seen.

The U.S. Supreme Court should be releasing its opinion shortly on whether the U.S. Fish and Wildlife Service correctly implemented the ESA when it promulgated regulations preventing private land owners from modifying habitat that would "harm" an endangered species. The District Court for the District of Columbia upheld the regulation, but the Circuit Court for the District of Columbia reversed the district court (Sweet Home v. Babbitt, 17 F.3d 1463 (D.C. Cir. 1994), *cert. granted and oral argument held*). The outcome of this decision will likely impact the salmon recovery strategy, in particular the enforcement of riparian habitat measures designed to protect salmon.

VIII. Conclusion

After years of disjointed management of the Columbia-Snake River system, federal agencies have been forced into a new management approach to comply with the mandates of the ESA and NPA. The salmon recovery strategies that emerged after federal judges rejected previous attempts to comply with the ESA and NPA move in a direction that integrates management of the river system with riparian land use practices, and river management with ocean harvest activities and ocean conditions. Endangered salmon are serving as indicator species for restored ecosystem health in the Pacific Northwest, with the ESA serving as the primary driving force for reversing adverse trends and federal courts as the system coordinator.

If new barriers prevent ESA-based recovery strategies from being effectively implemented, Columbia River stakeholders, and Indian tribes in particular, may want to refocus on broader alternative measures such as the NPPC's program and a tribal claim that the federal government's trust responsibility to tribes includes a mandate to conserve salmon important to the tribes. Both of those measures encompass salmon species not yet listed under the ESA.

The ESA recovery process for Columbia-Snake River salmon also foreshadows what may occur for other weak West Coast salmon stocks whose ESA status is currently under review by NMFS. Their recovery will be the focus of future issues of this memo.

REFERENCES AND BIBLIOGRAPHY

Big river news: A quarterly publication of the Northwest Water Law and Policy Project. Portland, OR: Northwestern School of Law of Lewis and Clark College. Various issues.

Columbia River Inter-Tribal Fish Commission (CRITFC). 1995. Restoring salmon to the Columbia River watershed: A tribal perspective. Portland, OR.

Diamant, Adam, and Zach Willey. 1995. Water for salmon: An economic analysis of salmon recovery alternatives in the lower Snake and Columbia Rivers. Environmental Defense Fund.

Eastside Ecosystem Management Project. Science Integration Team. 1994. Scientific framework for ecosystem management in the interior Columbia River Basin. Working draft, version 2. Walla Walla, WA: The Project.

Hildreth, Richard, and Jeanne Thompson. 1994. Legal aspects of Columbia-Snake River salmon recovery. Ocean and Coastal Law Memo, issue 41. Eugene, OR: Ocean and Coastal Law Center, University of Oregon School of Law.

Huppert, Daniel D., and David L. Fluharty. 1995. Economics of Snake River salmon recovery: A report to the National Marine Fisheries Service. Seattle: School of Marine Affairs, University of Washington.

Lee, Kai N., and Jody Lawrence. 1986. Adaptive management: Learning from the Columbia River Basin Fish and Wildlife Program. Environmental Law 16:431-460.

Northwest Power Planning Council (NPPC). 1994. Columbia River Basin Fish and Wildlife Program. Portland, OR.

Noss, Reed F., and Allen Y. Cooperrider. 1994. Saving nature's legacy: Protecting and restoring biodiversity. Washington, DC: Island Press.

U.S. Department of Agriculture. National Forest System. Forest Service Research. 1993. Eastside forest ecosystem health assessment. Vol. 1, Executive Summary. N.p.

U.S. National Marine Fisheries Service (NMFS). 1995a. Endangered Species Act section 7 biological opinion on the reinitiation of consultation on 1994-1998 operation of the federal Columbia River Power System and juvenile transportation program. Seattle, WA.

U.S. National Marine Fisheries Service (NMFS). 1995b. Proposed recovery plan for Snake River salmon. N.p.

ABBREVIATIONS AND ACRONYMS

BLM - Bureau of Land Management

BOR - Bureau of Reclamation

BPA - Bonneville Power Administration

COE - Corps of Engineers

CRFMP - Columbia River Fisheries Management Plan

CRITFC - Columbia River Inter-Tribal Fish Commission

EIS - Environmental Impact Statement

EPA - Environmental Protection Agency

ESA - Endangered Species Act

F. - Federal Case Reporter

FCRPS - Federal Columbia River Power System

Fed. Reg. - Federal Register

MOA - Memorandum of Agreement

NMFS - National Marine Fisheries Service

NPA - Northwest Power Act

NPPC - Northwest Power Planning Council

RHCA - Riparian Habitat Conservation Areas

RMO - Riparian Management Objectives

USFS - U.S. Forest Service

University of Oregon
Ocean and Coastal Law Center
School of Law
1221 University of Oregon
Eugene, OR 97403-1221

ADDRESS CORRECTION REQUESTED