# REPORT TO CONGRESS

# NORTHWEST SALMON RECOVERY

## Integrating Habitat, Hydropower, Harvest and Hatchery Programs with State/Federal/Local Recovery Efforts

**U.S. Department of Commerce**
**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**
**NATIONAL MARINE FISHERIES SERVICE**

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# Introduction

Pacific salmon and steelhead have suffered broad declines over the past century. Recovering this national treasure will take resources and time. There are three principal ingredients to success. First, comprehensive recovery plans are needed that include recovery goals, a clear-eyed assessment of factors that stand in the way of the goals, and a schedule for addressing those factors. Second, on-the-ground integrated actions are needed in each of the so-called H's - habitat, hydropower, harvest and hatcheries. Finally, actions and their results must be monitored to ensure the most important problems are being fixed and investments of time and money are done wisely. This report describes the extensive work that has been done to address all the H's, and explains the partnerships, commitments and coordination that are contributing to all aspects of Pacific salmon and steelhead recovery. [Note: throughout this report, the term "salmon" is generally used to refer to salmon and steelhead (salmonids) in the Northwest.]

This report to Congress was prepared in response to the Conference Report accompanying the Consolidated Appropriations Act, 2004 (H. Rpt. 108-401) which incorporates the Senate Appropriations Committee statement on Pacific salmon funding shown below.

> Senate Report 108-144 states: "Pacific Salmon Funding – The Committee remains concerned that it lacks assurances that funding provided for Pacific Salmon will contribute to the recovery of species listed under the Endangered Species Act [ESA]. The Committee has continually noted that the Secretary could potentially face severe adverse legal consequences for failure to make progress under the ESA, and that just providing funding for habitat restoration was not enough. For a plan to have at least a modicum of certainty of success, it must address the `four H's'--habitat, hatcheries, hydropower, and harvest--and section 6 agreements that would set forth commitments by the Secretary, States, Treaty Tribes, and other relevant entities. Unfortunately, the Committee's warnings have been underscored by the recent district court decision finding that the Secretary's Pacific salmon recovery plans for the Columbia River, which rely solely upon off-site habitat and hatchery programs--only two of the `four H's' that play a part in salmon recovery--did not provide any certainty of success. In concluding NOAA failed to comply with the ESA, the court specifically noted `the absence in the record of any binding commitments by the States, Treaty Tribes, and private parties to fund or implement the responsibilities devolved upon them by NOAA as well as the lack of certainty as to the range-wide off-site mitigation actions.' The Committee takes this caution seriously. Consequently, the Committee directs the National Marine Fisheries Service [NMFS] Administrator to provide no funding for any recovery program for ESA-listed salmon unless that program can be shown to be part of an effort to address the `four H's' and section 6 agreements. The Committee directs the NMFS Administrator to report to the Committees on Appropriations on each proposal for which funding is provided detailing what steps the proposal includes addressing habitat, hatcheries, hydropower, and harvest issues relating to the recovery of the stock for which the proposal has been submitted."

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is the federal agency responsible for recovering Pacific salmon and steelhead under the Endangered Species Act (ESA). However, to succeed in achieving recovery, state and local governments and Indian tribes must also bring their authorities and resources to the task. NMFS uses the "ESA Salmon Recovery" line item in the annual appropriations to implement its many responsibilities under the ESA. This funding provides salaries, benefits and support for more than

300 employees directly involved in implementing the ESA for Pacific salmon; it is not used for grants. Grants to states and tribes for salmon recovery are through the Pacific Coastal Salmon Recovery Fund (PCSRF). A total of $128M was allocated for the ESA salmon recovery programs shown below ($38M for internal NMFS programs and $90M in PCSRF grants). *[Note: this $128M is exclusively ESA salmon recovery funds; it does not include NMFS funding whose purpose is optimizing yield in salmon fisheries such as Pacific Salmon Treaty implementation funds or Mitchell Act funding for Columbia River hatcheries that produce fish for harvest.]*

**NMFS ESA Salmon Programs**

REGULATORY, RISK MANAGEMENT and RECOVERY PROGRAM - This program provides ESA status reviews and listings; critical habitat designation; protective rules under ESA Section 4(d) ("take" regulations); Section 7 consultations with federal agencies; development of habitat conservation plans and Section 10 permits; assistance to local entities in developing and implementing recovery plans; and, cooperative work with the states, tribes and local authorities.

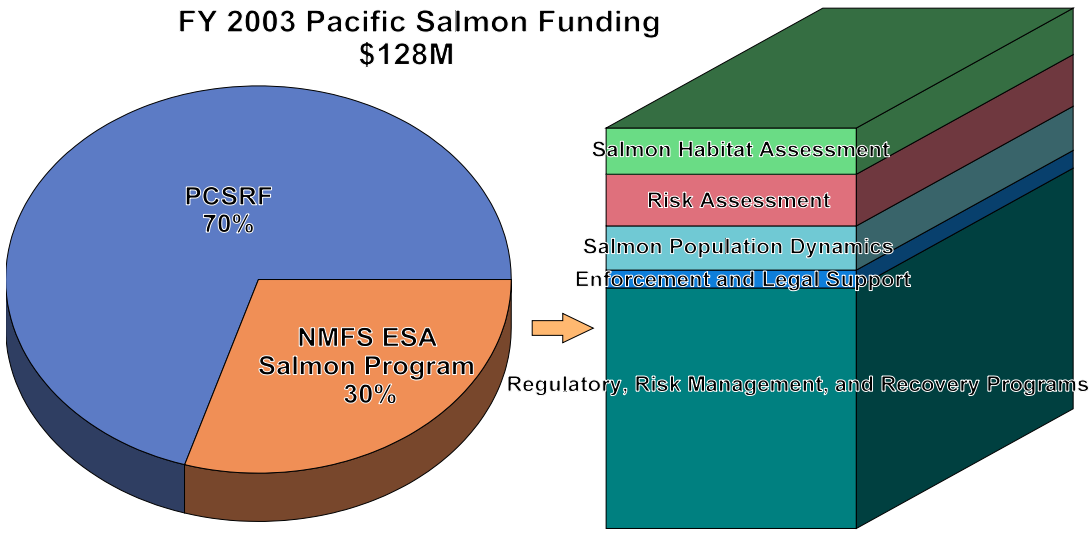
RISK ASSESSMENT - This is research and technical support for assessing risk factors for listed salmon; evaluating conservation efforts (including habitat restoration efforts); analyzing cost-effectiveness of recovery measures; and, developing scientific objectives and delisting criteria for recovery plans.

SALMON POPULATION DYNAMICS - This is research on stock abundance and distribution; life history modeling; genetic studies; population viability analyses; and, population monitoring.

SALMON HABITAT ASSESSMENT - This is research on survival and productivity of salmon in their freshwater, estuarine and ocean habitats.

ENFORCEMENT AND LEGAL SUPPORT - This is funding support for NMFS enforcement used exclusively for ESA salmon compliance investigations, and for NOAA General Counsel for legal reviews and litigation support for ESA salmon cases.

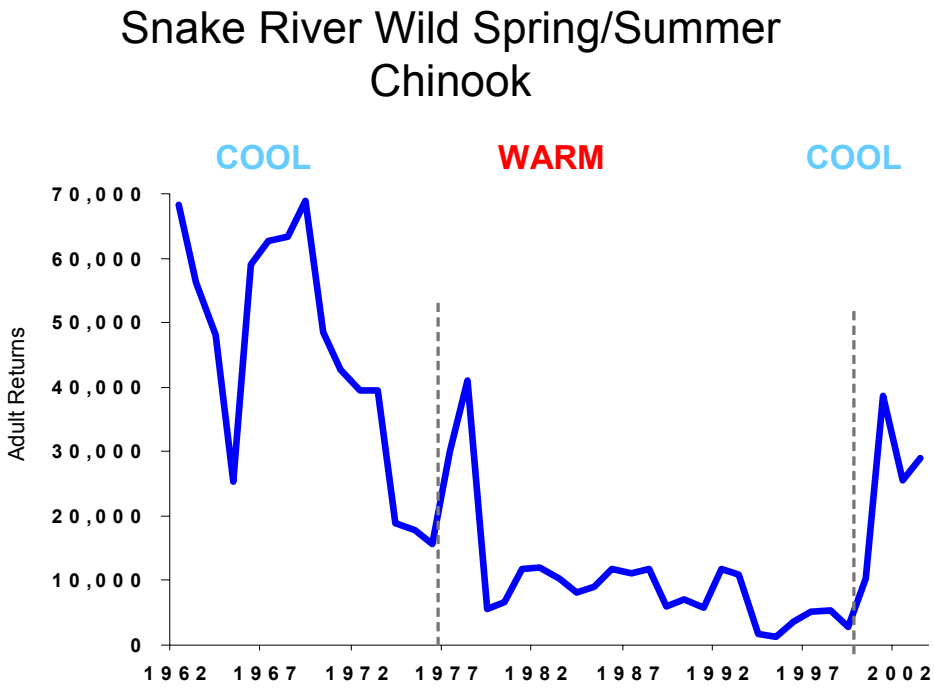
PACIFIC COASTAL SALMON RECOVERY FUND - The PCSRF provides grants to the states and tribes to assist state, tribal and local salmon conservation and recovery efforts.



## Making the Most of Improved Ocean Conditions

Many salmon runs have increased dramatically over the past few years as the below graph of Snake River spring/summer chinook salmon depicts. While improved ocean conditions corresponding with cooler ocean temperatures are likely a major contributor to this increase, the capacity of any salmon population to benefit from improved ocean conditions will depend on upriver freshwater habitat conditions and the extent to which the population is affected by harvest and hatchery actions. Past efforts to protect and restore habitat, reduce harvest, reform hatchery practices, and improve inriver migration conditions all have played a role. For example, Snake River spring/summer chinook benefitted during the past two decades from sharp reductions in harvest and from improvements in inriver migration conditions. Without these management actions, Snake River spring/summer chinook might not have been able to benefit from improved ocean conditions as much as they have.

The recent improvement in ocean conditions offers the ideal opportunity to improve conditions in freshwater habitat, so that when ocean conditions eventually decline again (as they almost certainly will), freshwater conditions will buffer the effects.



# Importance of Recovery Planning

Each salmon and steelhead population is different and faces a unique set of threats. A recovery plan identifies the recovery goal, what threats to salmon stand in the way of achieving that goal, which are most severe, and what actions will best address those threats. It also includes estimates of the schedule and costs for completing those actions. Recovery plans provide the best framework for accountability. Completion of recovery plans is a high priority for NMFS. The actions called for in a recovery plan are most likely to be implemented if they enjoy public support. For that reason, NMFS includes substantial public participation in recovery planning, working to create policy teams made up of regional and local stakeholders to develop recovery plans.

NMFS believes salmon recovery plans will be more solid, and public confidence will be greater, if the plans are based on sound science that is openly developed. NMFS has established and chairs seven science teams (Technical Recovery Teams (TRT)). Each TRT identifies the population structure of each listed salmon or steelhead unit, and identifies viability levels for those populations. The TRTs then work with and advise the stakeholder-based recovery planning teams. The States of Oregon and Washington have both used funds from the Pacific Coastal Salmon Recovery Fund to help set up and support the stakeholder-based recovery planning teams.

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## TWO REGIONAL RECOVERY PLANNING EFFORTS

**Columbia Basin.** In the Columbia/Snake River basin, federal agencies are working closely with the Northwest Power and Conservation Council to integrate federal hydropower operations and mitigation programs with local recovery efforts developed through sub-basin planning. In May 2004, draft sub-basin plans, developed by local groups, were completed and made available for review. In August 2004, the Independent Scientific Advisory Board reviewed and made recommendations on 45 plans covering 58 sub-basins. NMFS considered actions that will be taken by BPA, the Corps of Engineers, and the Bureau of Reclamation in accordance with these sub-basin plans when it developed the final revised Biological Opinion on operation of the Federal Columbia River Power System (FCRPS). In addition, the states have created regional boards to develop larger-scale recovery plans for the major regions within the basin.

**Puget Sound Shared Strategy.** The Puget Sound Shared Strategy includes the business and agricultural communities, timberland owners, fishing communities, federal and state agencies, local governments, Indian tribes, and citizen-led watershed planning groups. This diverse group is working closely with the NMFS Technical Recovery Team to establish recovery goals and a plan of action for each watershed. Fifteen watershed groups participate in identifying actions needed to recover salmon and securing the commitments needed to achieve them. Draft watershed plans were developed in June 2004 with the next step to integrate science and social policy into a regional recovery plan.

These regional consensus processes will ensure that recovery plans ultimately reflect local needs and priorities while NMFS will assure that plans meet ESA requirements. The plans also will ensure that habitat, hatchery, hydropower and harvest management complement each other to restore naturally sustainable salmon populations to harvestable levels.

# Integrated Efforts - The All-H Approach

Following its first salmon listings in 1991, NMFS convened a blue-ribbon science team to develop a recovery plan for Snake River basin salmon. Their 1994 recovery plan recommendations highlighted the complex life cycle and migratory range of salmon. As salmon migrate through small mountain streams, agricultural and urban rivers, estuaries and the ocean, they face many perils - habitat degradation and blockage, hydropower development, predation, harvest, and interactions with hatchery fish. The recovery team observed that "there is no silver bullet" for salmon recovery. That observation remains true today. Recovering Pacific salmon means addressing all the risks throughout their life cycle - all the H's - in a way that coordinates federal, state, local and tribal efforts.

## Habitat

Habitat loss and degradation are the leading causes of salmon declines. Salmon habitat has been degraded by urban development, forestry, grazing, road-building and a host of other activities. Recovering Northwest salmon will require protection of remaining habitat, and restoration of degraded habitat. Federal efforts are crucial, but are not by themselves sufficient.

### Federal Habitat Actions

Under Section 7 of the ESA, federal agencies must ensure their actions are not likely to jeopardize the continued existence of listed salmon or adversely modify their critical habitat. Federal agencies manage land, fund activities and programs, and permit private activities. All of these federal actions can affect salmon habitat and require ESA Section 7 consultations. Federal agencies have contributed significantly to protecting and restoring salmon through their various authorities. Some of the significant accomplishments are shown in the table below.

| Federal Consultation | Type of Action | Benefits |
|---|---|---|
| Northwest Forest Plan | Land Management | Manages 22 million acres of federal habitat (primarily forest land) |
| Federal Columbia River Power System | River Operations and Funding | Directs ratepayer funds to off-site habitat mitigation |
| Clean Water Act Section 404(d) Programmatic | Permitting | Corps of Engineers requires best management practices for 15 categories of instream actions |
| Rice Island - Caspian Tern Nesting | River Management | Corps of Engineers has largely succeeded in re-locating tern colony to reduce salmon predation |
| Mitchell Act - Diversion Screens | Funding | NMFS has screened 1,000 irrigation diversions using Mitchell Act funds |
| Habitat Improvement Program Programmatic | Funding | Reviews proposed projects under 27 habitat improvement activities funded by BPA |

## Non-Federal Habitat Actions

Sections 10 and 4(d) of the ESA provide tools for local governments and private landowners to carry out normal economic activities that may "take" listed salmon, without fear of legal penalty, as long as they make adequate efforts to protect affected salmon. NMFS has concluded a number of Habitat Conservation Plans (HCPs) for salmon protection.

### Simpson Timber Company HCP

This multi-species HCP for 50-year watershed management on more than 261,000 acres of commercial forest lands in southwest Washington is the first in the nation to blend the ESA and the Clean Water Act. These lands have approximately 1,400 miles of streams and associated wetlands that provide habitats for ESA-listed salmon.

### Cedar River (City of Seattle) HCP

The Cedar River watershed south of Seattle is a natural area of 90,500 acres. It is the region's primary water supply and provides the majority of clean water to more than 1.3 million residents of King and Snohomish counties in Washington State. The HCP called for the entire watershed to be declared an ecological reserve. Along with aggressive restoration activities to improve salmon habitat, commercial timber harvesting and use of logging roads is restricted. The HCP is divided into three general categories: watershed management, Landsburg Dam mitigation, and instream flows. Within each of these categories there are a number of projects, and research and monitoring efforts. In 2003, the City of Seattle restored salmon access to about 17 miles of high-quality habitats in the Cedar River above Landsburg Dam as part of its HCP commitments.

### Green River (City of Tacoma) HCP

The Green River in western Washington State is the primary source of water for about 84,000 Tacoma City residents. Under this HCP, adult salmon and steelhead will be re-introduced into the river above the Corps of Engineers' Howard Hanson Dam, and juvenile fish will have a bypass facility at the dam. The City of Tacoma will manage flows downstream of its diversion facilities to better protect fish; provide watershed forest management; and place gravel and wood from the upper watershed downstream to improve fish habitat. The HCP and ESA Section 10 permit will assure that Tacoma Water operates in full compliance with the ESA, while allowing the utility to continue to withdraw water from the Green River for public health and safety, homes and businesses.

### Lemhi River Flows

NMFS is negotiating a long-term salmon and steelhead conservation agreement for the Lemhi River basin in eastern Idaho, addressing flows and habitat improvement. The river had experienced periods of de-watering because of irrigation withdrawals. This lack of water threatened ESA-listed salmon and steelhead. NMFS, the State of Idaho, Lemhi Irrigation District, and water districts in the sub-basin signed an interim agreement which specified interim flows in the river until a long-term HCP can be implemented. Similar negotiations are underway in the upper Salmon basin. Landowners have entered into a short-term conservation program with NMFS and the U.S. Fish and Wildlife Service while the provisions of a long-term agreement are worked out.

# Hydropower

Many, but not all, Northwest salmon populations are affected by dams. Storage dams without fish ladders can cut off access to tributary spawning habitat and affect downstream flows important to spawning, rearing and migration. Mainstem dams impede passage for migrating juveniles and adults, often increasing mortality of juvenile fish. Where dams are licensed by the Federal Energy Regulatory Commission (FERC), NMFS has worked with FERC and the dam owners to improve fish passage (by removing or retrofitting aging or obsolete dams), provide flows, or contribute mitigation in the form of habitat and hatchery actions. Where federal dams are involved, such as in the Snake and Columbia Rivers, NMFS consults directly with the federal agencies responsible for maintaining and operating the dams to evaluate fish passage survival and any proposed off-site mitigation.

## FERC Licensed Non-Federal Dams

NMFS works with dam owners, states, tribes and other federal agencies to determine what actions are needed to recover salmon populations affected by a particular dam, ranging from decommissioning and removing dams to installing fish ladders, increasing water releases, improving juvenile fish passage, or mitigating for the unavoidable impacts of dams by improving habitat or hatcheries. The scale of some projects, such as installing fish ladders or screens that keep juvenile salmon away from turbines, is significant. The following table provides some examples of the investment Northwest dam owners are making to recover Pacific salmon (types of actions, numbers of projects, and the benefits expected from their investments).

| Action | No. | Names of Projects | Benefits |
|---|---|---|---|
| New Fish Passage | 6 | Umpqua, Leaburg-Walterville, Albany, Pelton-Round Butte, Lewis, Waterstreet | Access to more than 240 miles, improve passage, reduce injury and mortality |
| Improved Fish Passage | 14 | Willamette Falls, Mid-Columbia*, Clackamas, Albany, Upper & Lower Bennet, Klickitat, Cowlitz, Pringle, White River | Improve passage, reduce injury and mortality |
| Improved Habitat | 8 | Wells, Rocky Reach, Rock Island, Priest Rapids, Umpqua, Carmen-Smith, Pelton-Round Butte, Lake Chelan | More than $46 million committed to improve habitat as mitigation for dams |
| Improved Hatchery | 5 | Mid-Columbia*, Pelton-Round Butte | Improvements to hatchery facilities |
| Flow Measures | 6 | Leaburg-Walterville, Albany, Pelton-Round Butte, Lake Chelan | Commitments to release water to improve flows or provide minimum flows |

| Action | No. | Names of Projects | Benefits |
|---|---|---|---|
| Decommission/ Remove | 2 | Bull Run, Powerdale | Opened access to habitat, improved passage, reduced injury and mortality |
| Decommission | 2 | Blue Heron Paper Co. | Improve passage, reduce injury and mortality |

* Mid-Columbia is the Chelan/Douglas Projects (Wells, Rocky Reach and Rock Island dams) and Priest Rapids and Wanapum dams.

*Showcase*

### Habitat Conservation Plans

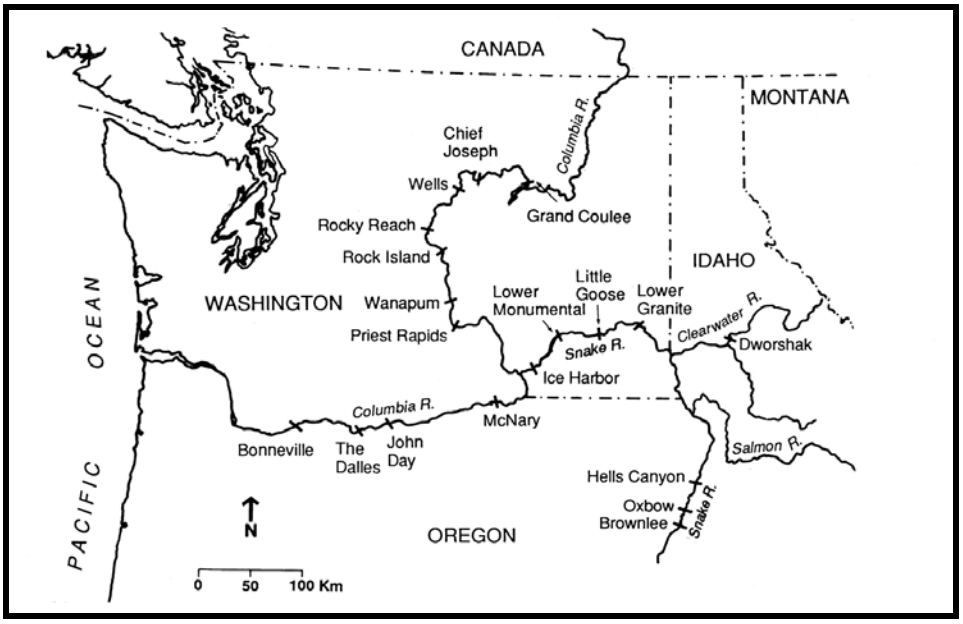
### Chelan and Douglas County Public Utility Districts

In 2003, NMFS approved historic HCPs with the Chelan County and Douglas County Public Utility Districts (PUD). These HCPs are for three hydropower projects covering more than 100 river-miles on the main stem of the mid-Columbia River: Chelan County PUD's Rocky Reach and Rock Island dams, and Douglas County PUD's Wells Hydroelectric Project. The public utility districts worked cooperatively with various state and federal fisheries agencies, including NMFS, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and the Colville Tribes, to develop the first hydropower HCPs for salmon and steelhead. The HCPs commit the two utilities to a 50-year program to ensure that their projects minimize harmful impacts on mid-Columbia salmon and steelhead runs. This will be accomplished through a combination of fish bypass systems, spill at the hydro projects, off-site hatchery programs and evaluations, and habitat restoration work in mid-Columbia tributary streams. These HCPs, initiated in 1994, were recognized by President George W. Bush during his August 2003 visit to Washington State.

The survival improvements expected at the dams covered by these HCPs contribute significantly to recovery of upper Columbia salmon and steelhead.

## Federal Dams

In the Snake and Columbia River basin (shown below), there are eight federal dams and five non-federal dams that ESA listed salmon and steelhead pass through on their journey to the Pacific Ocean. There are also other federal, Canadian, and FERC-licensed storage dams that affect flows for Columbia basin fish.




Map of Columbia/Snake River basin showing federal and non-federal dams

NMFS has worked for many years with the Bonneville Power Administration, the Corps of Engineers, and the Bureau of Reclamation to improve survival of Columbia/Snake River basin salmon migrating through the federal hydropower system. The agencies developed a comprehensive plan in December 2000 that included the NMFS Biological Opinion and a Basin-wide Salmon Strategy. In those documents, NMFS concluded that further improvements in migration conditions, in addition to substantial improvements made at the dams over the last ten years, were needed to avoid jeopardy for eight ESA listed salmon populations. In June 2003, a federal district court invalidated and remanded the 2000 Biological Opinion to NMFS to remedy several provisions the court ruled were not reasonably certain to occur. In response, NMFS updated its scientific data and analyses, and released a final revised Biological Opinion on November 30, 2004. The revised Biological Opinion analyzes a set of updated and improved hydro actions proposed by BPA, the Corps of Engineers, and the Bureau of Reclamation. The updated actions include plans to install improvements at the dams designed to boost juvenile fish passage and survival with more efficient spill. The NMFS analyses show that significant opportunities for improving productivity of Columbia/Snake River salmon occurs in their first year of life (spent in freshwater streams) and in the transition to salt water (which occurs in the estuary). Accordingly, the revised plans include

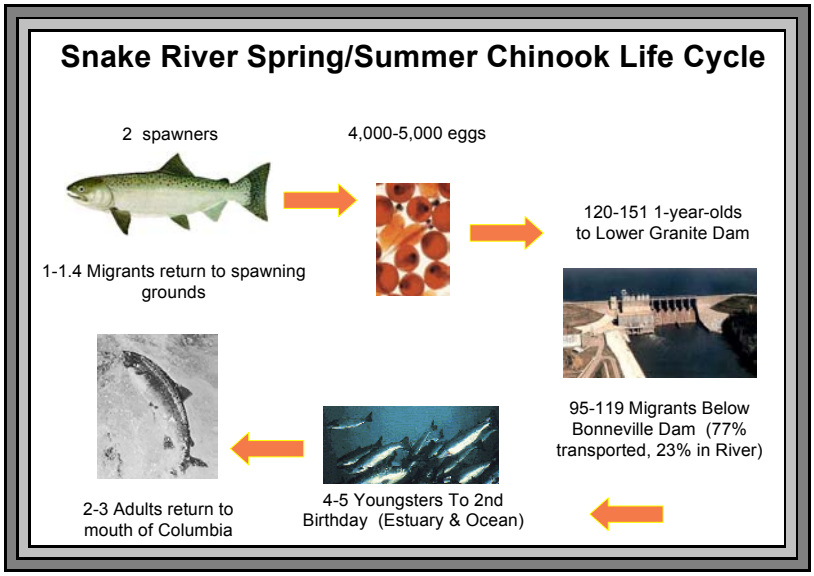
mitigation measures to improve survival during the life stage where the greatest benefit can be anticipated - in freshwater rearing areas and in the estuary. Sub-basin assessments are underway to evaluate the feasibility of improvements in these areas. The revised plans also seek increased flexibility and certainty for salmon recovery actions through performance-based measures included in annual implementation plans that will strive to meet clear goals.

The federal agencies' annual expenditures for Columbia River basin-wide salmon funding represents a substantial commitment of resources. Together, the Corps of Engineers, the Environmental Protection Agency, and the Departments of Interior, Commerce and Agriculture spend over $300 million per year on a wide array of programs in the Columbia and Snake Rivers for species conservation, restoration, facilities, operations and maintenance, and other assistance to entities for salmon activities. In addition, the Bonneville Power Administration provides a significant amount of ratepayer funding to support salmon. The following table displays BPA's estimate of how rate-payer funds were allocated in 2003 (the funding shown is for BPA's entire fish and wildlife program, not just those projects devoted to ESA listed salmon).

| **BPA Program Element** | **FY2003 Cost (in millions)** |
|---|---|
| Fish & Wildlife Direct Program | $139.0 |
| Treasury Repayment for Past Capital Investments | $56.7* |
| Operations and Maintenance (for fish) | $33.4 |
| Lower Snake River Comp. Plan Hatcheries | $15.1 |
| Power Planning Council | $4.0 |
| Transmission (attributable to fish and wildlife) | $34.7 |
| Total | $282.9 |

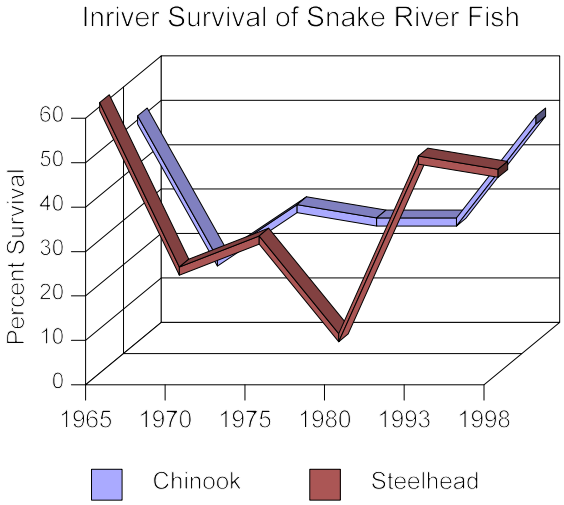
*This amount represents depreciation, amortization and interest on fish and wildlife capital investment, both for past Congressional appropriations of approximately $85 million annually for Corps of Engineers capital improvement at dams, and for the capital portion of BPA Fish and Wildlife program (for example, to construct hatcheries), funded by Treasury bonds.

The federal plan for the Federal Columbia River Power System (FCRPS) includes a two-pronged commitment: 1) Improve survival of juvenile and adult migrants through capital investments and operational measures at dams; and, 2) Improve survival in other phases of the life cycle through habitat and estuary improvements, predation control, and hatchery and harvest reforms. These commitments are commensurate with where the needs are greatest as shown in the below salmon life cycle.




## Benefits of Capital Investments and Operational Measures

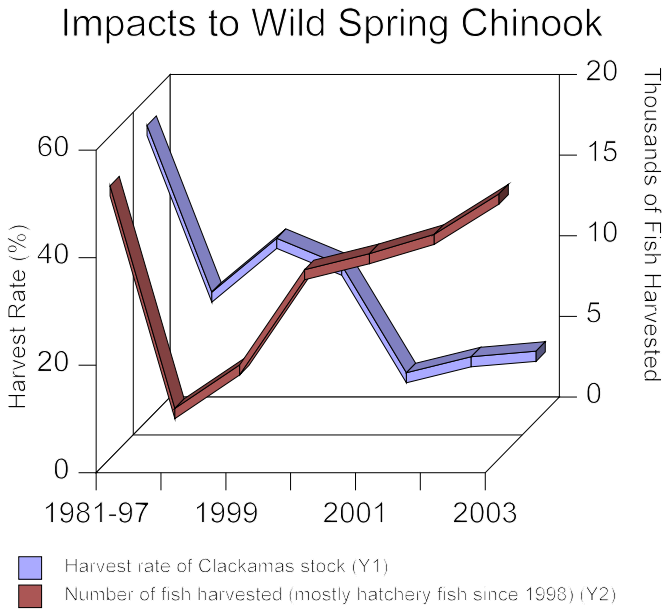
Federal dam operators have significantly improved survival of migrating fish through capital investments and operational measures. Capital investments include such things as screens, bypasses, collectors and spillway deflectors. Operational measures include spill at dams (so juvenile fish migrate over dams and not through turbines) and increased flows. Since the mid-1970's, when the Snake River dams were first completed, these actions have resulted in rates of inriver survival for Snake River salmon almost as high as those during the 1960's, a time when Snake River runs were considered more robust. Capital improvements include a removable spillway weir at Lower Granite Dam, a corner collector at Bonneville Dam, and a planned spillway wall at The Dalles Dam.

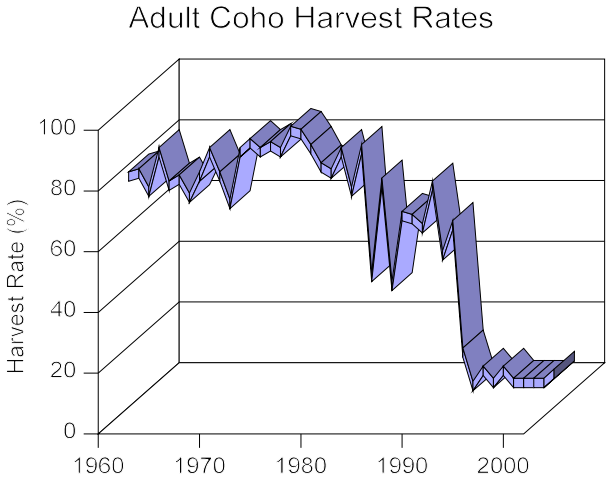


# Harvest

Harvest reductions and selective fisheries allow more ESA-listed salmon adults to escape and spawn. State and tribal harvest managers have reduced harvest of natural stocks (those whose parents bred in the wild) dramatically over the past decade. In some cases entire fisheries have been curtailed, and in other cases selective harvest of marked hatchery fish has reduced the number of natural fish harvested in sport and commercial fisheries. Two successes in particular, as shown below, stand out.

In the case of Willamette spring chinook, mass marking has dramatically limited the harvest of wild fish, while allowing harvest of hatchery fish to increase. This has provided a major benefit to wild fish, and to the economy of the Northwest.




In the case of Oregon coast coho salmon, overall ocean harvest has been significantly reduced to allow more wild fish to escape and spawn.

In addition to the above noteworthy accomplishments, NMFS has worked across the board with harvest managers to decrease the effect of fisheries on wild salmon while continuing to allow economically important fisheries to continue. A few examples are highlighted as follows.

| Action | Benefit |
|---|---|
| Pacific Salmon Treaty | Reduced harvest of Columbia River and Puget Sound salmon in Canadian fisheries**.** |
| Columbia River fall season fisheries - **ESA Section 7 consultations** | Harvest rates of Snake River fall chinook and Snake River steelhead have been sharply reduced**.** |
| Columbia River spring season fisheries consultations | NMFS has continued to promote experimental fisheries with gear that would allow the harvest of hatchery fish while limiting impacts to wild fish. |

## Hatcheries

Hatcheries can help or hinder salmon recovery, depending on their practices. Even before the ESA listings of Pacific salmon, hatchery managers had begun to improve operations. Since the listings, NMFS has worked with state, tribal and federal hatchery managers to develop management plans and improve operations throughout the Northwest. Improvements include using local broodstock, preventing disease in hatchery fish, improving release methods so hatchery fish are less likely to compete with natural fish, and marking hatchery fish to allow for selective harvest. The following tables show the commitment being made by state, federal and tribal agencies to address recovery of ESA listed salmon in their hatchery programs.

| **Commitments in Place to Integrate Hatchery Programs and Salmon Recovery** | | |
|---|---|---|
| **Location** | **Species Covered** | **Number** |
| Upper Columbia River, Washington | Endangered chinook and steelhead, and other chinook, sockeye and coho salmon. | 20 |
| Ozette Lake, Washington | Threatened sockeye | 1 |
| Hood Canal, Washington | Threatened summer chum | 8 |

| **Commitments Under Development to Integrate Hatchery Programs and Salmon Recovery** | | |
|---|---|---|
| **Location** | **Species Covered** | **Number** |
| Columbia Basin | Basin-wide effort to analyze existing programs and identify modifications | 175+ |
| Puget Sound | Threatened chinook, and steelhead ,coho and chum salmon | 122 |
| Oregon Coast | Threatened coho and other chinook salmon and steelhead | 32 |

Funds for hatchery reform have come from Northwest ratepayers through the Bonneville Power Administration's fish and wildlife program, and from appropriated funds such as Mitchell Act funding. Mitchell Act appropriations also have funded about $3.3 million each year to screen irrigation diversions to protect juvenile salmon and to provide fish passage to important habitats. Also, more than $1 million of federal funds has been provided each year to mark hatchery fish to allow for harvest while protecting ESA listed species.

## Showcase

### Hatchery Efforts

**Cle Elum Supplementation and Research Facility:** This hatchery is a state-of the-art facility, funded by BPA and co-managed by the Yakama Indian Nation and the State of Washington. Its purpose is to test the assumption that artificial production can increase natural production and improve harvest opportunities, while maintaining the long-term genetic fitness of the native salmon populations and keeping adverse ecological interactions within acceptable limits. After years of chronically depressed spring chinook returns averaging just 2,000-3,000 fish per year, the Yakima basin spring chinook return has jumped to greater than 15,000 fish per year since 2000, with more than 23,000 spring chinook estimated to have returned in 2001. While much of this increase is attributed to natural factors such as better inriver and ocean conditions, project biologists estimate that the Cle Elum supplementation project has boosted populations of upper Yakima spring chinook by about 90 percent in 2001, and by about 70 percent in 2002, over what returns would have been without the innovative hatchery.

**Washington State Hatchery Reform Project:** This project was created by Congress in 2000 with the support of Washington State's governor and congressional delegation. The legislation established the Hatchery Scientific Review Group (HSRG), a committee of independent scientists whose objective was "to assemble, organize and apply the best available scientific information to provide guidance to policy makers who are implementing hatchery reform." The HSRG final report was released in April 2004.

# States, Tribes and Local Governments Are Key Partners

States and tribes have traditionally managed salmon and steelhead in the Northwest. State and local governments have important authorities for managing land use, safeguarding clean water, and managing public resources. Although the Senate Appropriations Committee report focuses on Section 6 agreements as the vehicle for states to make commitments about their contribution to protecting habitat and fixing the other H's, NMFS has sought partnerships through memoranda of agreement, ESA Section 4(d) rules, Section 10 HCPs and permits, and recovery planning. Regardless of how the commitments are memorialized, NMFS believes that Pacific salmon will not be recovered without the important contributions of state and local governments and tribes.

*Showcase*

State and Local Efforts

**Washington - Forest and Fish Report**

The State of Washington, private timberland owners, Indian tribes and federal agencies negotiated an agreement for new forest practices intended to protect and create functioning habitat for ESA listed fish and aquatic invertebrates. The practices were endorsed by the Washington State Legislature and adopted as rules by the Washington State Forest Practices Board. Under the agreement, more than 60,000 miles of both fish-bearing and non-fish bearing streams will be surrounded by no- and limited-harvest buffers that will restore riparian conditions upon which fish rely. Also, all forest roads will meet new standards within 15 years that address concerns about stream crossings, sediment input, and landslides caused by previous road construction and use.

The agreement, known as the Forest and Fish Report, is being incorporated into a proposed Habitat Conservation Plan covering more than 10 million acres of commercial forest land in Washington. NMFS and USFWS intend to issue a Draft Environmental Impact Statement on the proposed HCP by the end of this year.

State and local government cooperation is essential to protecting habitat on state and private lands. Some protection can be achieved with funding (such as purchasing conservation easements), some with regulation (such as land management), and some with enforcement of existing regulations (such as requirements to screen water diversions). Some of the most impressive examples of conservation in the Northwest result from partnerships between state and local governments and the affected community.

The Pacific Northwest has invested millions of dollars from federal and state funding sources and Bonneville Power Administration ratepayers to recover Pacific salmon and steelhead. State and federal taxpayer dollars are allocated by state funding bodies such as the Oregon Watershed Enhancement Board in Oregon and the Salmon Recovery Funding Board in Washington. Ratepayer dollars are allocated by the Northwest Power and Conservation Council. NMFS has worked closely with the Council and the states to develop a method for monitoring and reporting progress. NMFS has made significant strides in implementing standardized reporting systems with the states and tribes on performance indicators for the Pacific Coastal Salmon Recovery Fund.

## Showcase

### State and Local Efforts

**Idaho - South Fork Salmon River Initiative**

The Idaho Department of Environmental Quality programed $700,000 in 2003 to help improve spawning habitat on the East Fork of the South Fork of the Salmon River by improving water quality and riparian habitat in a 7.5 mile section of the river. This area is spawning habitat for the South Fork population of chinook which historically was nearly half of the chinook production in Idaho and half of the spring chinook production for the Columbia basin. It is one of only three watersheds in Idaho managed for natural production of steelhead. Idaho continues to seek funding to improve access to this spawning habitat.

**Oregon - Routine Road Maintenance**

The Oregon Department of Transportation (ODOT) long realized the important relationship between routine road maintenance activities and stream health. Shortly after salmon were listed, ODOT began working with NMFS to bring its practices further in line with salmon conservation. Ultimately the ODOT Transportation Maintenance Management System Water Quality and Habitat Guide was incorporated into the ESA Section 4(d) rule, which made sure that ODOT employees who undertake road maintenance activities in compliance with the ODOT guide can do so without fear of legal penalty. The program provided a model for local jurisdictions in Oregon, and for other state and local transportation departments, which are starting to adopt their own guidelines and seeking approval through the 4(d) rule.

# Pacific Coastal Salmon Recovery Fund

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established in FY2000 to provide grants to the states and tribes to assist state, tribal and local salmon conservation and recovery efforts. The PCSRF supplements existing state, tribal and federal programs to foster development of federal-state-tribal-local partnerships in salmon recovery and conservation and to promote efficiencies and effectiveness in recovery efforts.

The goal of the PCSRF is to make significant contributions to the conservation and restoration of Pacific salmon and their habitats. The five program areas designed to achieve this goal are:

1. Salmon habitat protection and restoration
2. Watershed and sub-basin planning and assessments
3. Salmon enhancement
4. Salmon research, monitoring and evaluation
5. Public outreach and education.

Recovery of sustainable salmon populations will likely take decades and require a substantial investment over many salmon life cycles. Nonetheless, it is important to track the work accomplished by current investments, and to measure activities and changes on a regular basis. Thus, a standardized performance reporting system for the PCSRF was developed by NMFS in conjunction with the states and tribes.

In May 2003, a comprehensive performance indicator system for the PCSRF was developed in response to requests by OMB and Congress for program accountability. MOUs between NMFS and the states and tribes, which established criteria and goals for prioritizing PCSRF funds to projects designed to conserve and restore Pacific salmon, were amended to include reporting of standardized performance indicators. The states and tribes committed to collecting standardized performance indicators under a performance management system that will over time demonstrate the significant contributions that the PCSRF is making toward salmon conservation and recovery.

The PCSRF has funded more than 1,500 successful salmon habitat restoration projects—many of which are beginning to show direct benefits to salmon stocks. Although the majority of these funds have been spent on salmon habitat restoration, PCSRF funds have also been used for more than 600 planning and assessment, salmon enhancement, and monitoring and research activities supporting salmon recovery. The fund has been appropriated by Congress at levels between $58 million and $110 million each year since 2000. The PCSRF has become a vital component of the Administration's overall commitment to Pacific salmon recovery.

Rather than pursue ESA Section 6 agreements with the states on salmon recovery, NMFS has negotiated MOUs with each of the west coast states and tribal commissions. The MOUs establish specific criteria, priorities and processes for distributing the PCSRF to scientifically sound projects that will contribute to the conservation and recovery of Pacific salmon. These MOUs are an efficient and workable approach for the PCSRF, and ESA Section 6 Agreements are not necessary at this time. NMFS notes that H.R.1945, the Pacific Salmon Recovery Act, which passed the House Resources Committee in 2003, endorsed the use of MOUs for purposes of providing PCSRF funding to the states and tribes.

## Research, Monitoring, Evaluation and Adaptive Management

Three types of monitoring are important in the effort to recover Pacific salmon. The first is monitoring and evaluating program implementation - how funds have been invested? This report has emphasized the considerable investment of federal, ratepayer, state and other funds in salmon recovery. Those who have used the funds in restoration efforts must report on how those funds were spent and what was accomplished. This aspect of monitoring is discussed in more detail in the above section on the Pacific Coastal Salmon Recovery Fund.

The second type of monitoring is effectiveness monitoring - did actions have the expected biological outcome? Effectiveness monitoring must occur at different levels and on different scales. For example, a prevalent hypothesis is that opening habitat currently inaccessible because of failed culverts will increase salmon runs. When a failed culvert is replaced, it is important to monitor whether fish then use the stream reach that has been opened - a fairly straightforward proposition, but an expensive one if implemented everywhere. It is also important to monitor whether and how much the action increased fish runs. Monitoring this is much harder since so many different factors affect the size of salmon runs from year to year. Salmon returns to that particular area might increase dramatically in subsequent years for reasons entirely unrelated to the increase in stream habitat.

Because so many factors affect salmon productivity, and because there is so much natural variation in productivity from year to year, it will be important to monitor over a long period of time. The example of culvert replacement is straightforward compared to most management actions. Another hypothesis is that leaving forested buffers along salmon streams will increase salmon productivity. Monitoring for this response will be complicated.

The final type of monitoring is baseline monitoring. Much of what we know about salmon is because managers have for so many years measured the size of different salmon runs in different areas. This monitoring was done primarily to inform harvest decisions. Different rules apply for monitoring aimed at understanding population dynamics, long-term trends, local trends and large-scale trends. Like effectiveness monitoring, baseline monitoring will require a commitment of resources over a long period of time.

Progress has been made on all three types of research, monitoring, and evaluation (RM&E) efforts. The results are being used for "adaptive management" – where actions affecting salmon are modified as new information from research, monitoring and evaluation becomes available. The following are examples of some of the RM&E efforts underway.

**Pacific Coastal Salmon Recovery Fund (PCSRF)** NMFS has implemented extensive monitoring requirements with the PCSRF participants to track specific results. Reporting includes how many activities have been funded in identified categories, and results are measured in terms of stream miles affected by various project actions. Effectiveness monitoring is the next component to be built.

**U.S. Forest Service/Bureau of Land Management: Effectiveness of Management Plans.** NMFS collaborated in the development and implementation of the Aquatic/Riparian Effectiveness Monitoring Program which is determining if the Northwest Forest Plan is restoring and maintaining aquatic and riparian ecosystems to desired conditions on federal lands west of the Cascade mountains. East of the Cascades, NMFS participates in a cooperative monitoring effort that is determining if key biological and physical attributes, processes, and functions of watersheds are

being degraded, maintained or restored.

**Federal Caucus** NMFS and eight other federal agencies have developed a monitoring program to provide information that will allow for assessment of how well federal and other efforts are meeting recovery goals in the Columbia River basin. Regional coordination of research, monitoring and evaluation will be integrated at the local watershed levels through the Northwest Power and Conservation Council's sub-basin plans. Funding has been provided by BPA to implement pilot studies in the Wenatchee, John Day, and Salmon River watersheds.

**Washington Salmon Recovery Funding Board (SRFB)** The SRFB has funded intensive monitoring in selected watersheds in Puget Sound and the Lower Columbia River in order to demonstrate the causal relationships between habitat projects and fish abundance in those watersheds.

**Oregon Watershed Enhancement Board (OWEB)** OWEB functions as the agency responsible for coordinating monitoring efforts conducted in support of the Oregon Plan for Salmon and Watersheds. In this role, OWEB provides leadership and support for monitoring activities conducted by the Oregon Departments of Fish and Wildlife, Environmental Quality, Forestry, and Agriculture. OWEB also provides funds for watershed assessments and monitoring projects carried out by watershed-based organizations. These projects typically focus on evaluation of the effectiveness of specific restoration actions.

**Pacific Northwest Aquatic Monitoring Partnership (PNAMP)** PNAMP is an emergent effort to enhance technical and policy coordination across existing federal, state and tribal monitoring programs implemented across the region. The intent of PNAMP is to coordinate and guide monitoring strategies or plans in order to reduce redundancy, increase efficiency, and help meet the goals and objectives of the various entities involved in monitoring. PNAMP is also intended to provide an effective coordination mechanism for refinement of aquatic monitoring and support programs, and for coordinated analyses and reporting of results.

**NMFS - Northwest Fisheries Science Center Restoration Project Tracking** NMFS has initiated a collaborative action-tracking project between the Northwest Fisheries Science Center and federal, state, tribal and local entities. This effort is collating information from available sources on restoration actions implemented across the region in order to develop an understanding of the effectiveness of individual projects and classes of projects (i.e., riparian restoration, habitat access) on salmon populations.

# Conclusion

Recovery of Pacific salmon and steelhead will be a long-term and complicated process. Some populations have been declining for decades and although there have been some increased numbers in recent years, it will take many more years to build them back up. There is no single factor in their decline, and no single remedy will restore them. There is also no single entity with sufficient authority to bring about needed change. NMFS and its state and federal partners have made progress in the three key areas needed to bring about salmon recovery - a development of goals and the factors that limit our ability to achieve them, on-the-ground actions, and monitoring. This report has detailed that progress, and identified where more work needs to be done.

The Senate Appropriations Committee expressed particular concern about whether the Northwest is addressing all the H's. This report detailed how federal agencies, states, tribes, local governments and private citizens are taking actions in habitat, hydropower, hatcheries and harvest to improve salmon survival and productivity. The Committee also expressed its concern that states were not making firm commitments to salmon recovery. Northwest states are on the front lines of the effort to recover Pacific salmon and this report documents just some of that effort. As recovery plans are developed, they will establish what actions are needed to conserve salmon and steelhead. NMFS expects the states will continue to make firm commitments to needed actions as they are identified. Meanwhile, NMFS will continue to work with the states through memoranda of understanding to ensure that PCSRF funds are well spent on priority restoration areas.

The Committee also expressed concern about the Federal Columbia River Power System Biological Opinion litigation. NMFS, together with the Corps of Engineers, the Bonneville Power Administration, and the Bureau of Reclamation, is integrating measures to increase salmon passage survival through hydroelectric dams, improve hatcheries, limit salmon harvest, restore salmon habitat and control predators that feed on young salmon. The agencies have identified actions to prevent extinction, and strategies and specific actions for the four H's that will make federal, state and local actions more aggressive and more effective. The agencies seek increased flexibility and certainty for salmon recovery through performance-based measures that will be included in annual implementation plans for the Biological Opinion. The final revised FCRPS Biological Opinion was released on November 30, 2004. The revised Biological Opinion addressed the court's concerns, and included updated science and promoted solid biological benefits to listed salmon.

NMFS is using all statutory and regulatory tools provided under the ESA and by Congress, including those in ESA sections 4(d), 7, and 10, and other recovery planning provisions under section 4(f). If these efforts are complemented by state, local government and tribal programs and voluntary efforts, NMFS is confident that the investment in salmon recovery will reap a valuable return for the people of the Northwest and of the nation.