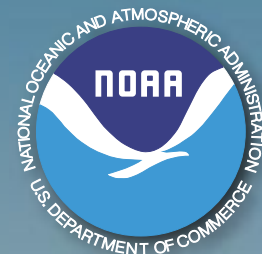




2006 Report to Congress

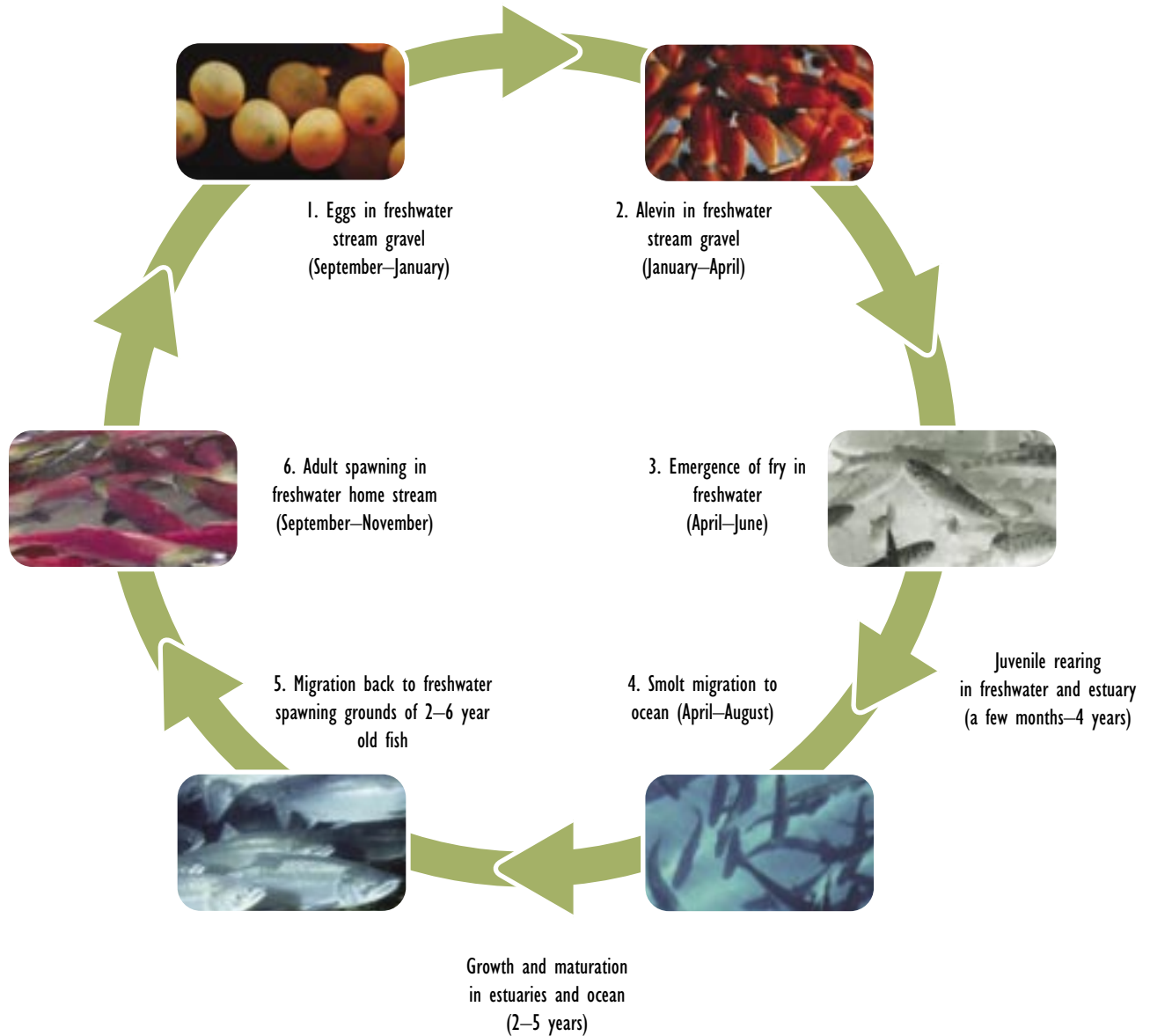
Pacific Coastal Salmon Recovery Fund

FY 2000–2005



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

The Life Cycle of Pacific Salmon



Notes:

- » Timing and length of any given stage vary among species of salmon (e.g., Chinook, sockeye)
- » Timing is depicted for fall runs (e.g., spawn in fall, eggs hatch in spring)—reversed for spring runs
- » Estuaries provide a mix of freshwater and saltwater
- » Adults die after spawning; deteriorating carcasses provide essential nutrients to stream
- » Disturbances at any stage can impact survival (e.g., obstructions to migration, floods, drought)

Photo credits:

- » 1, 2, and 5—courtesy of Alaska Department of Fish & Game
- » 3 and 6—courtesy of Northwest Indian Fisheries Commission

2006 Report to Congress

Pacific Coastal Salmon Recovery Fund

FY 2000–2005

August 2006

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An online version of this Report is available at <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/Index.cfm>.

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Executive Summary

This 2006 Annual Report to Congress on the Pacific Coastal Salmon Recovery Fund (PCSRF) provides information on PCSRF accomplishments from FY 2000 through FY 2005. Additionally, it describes development of a Performance Reporting Framework and progress in meeting the salmon and steelhead restoration and conservation goals outlined in the Framework. This Report provides a summary of projects based on the efforts of states and tribes in salmon restoration and conservation using the PCSRF funds. This Report also provides an update on the status of Endangered Species Act (ESA) listed salmon and steelhead and the development of recovery plans.

The PCSRF was established by Congress in fiscal year 2000 to contribute to the restoration and conservation of Pacific salmon populations and their habitat. The Administration continues to support the PCSRF program. From 2000 to 2005 the President has requested \$570M for the PCSRF program and Congress has appropriated \$525M. Congressional appropriations for the PCSRF are provided to the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) for allocation to the states of Washington, Oregon, California, Idaho, and Alaska, and the Pacific Coast and Columbia River tribes. The states and tribal commissions distribute their funds in accordance with memoranda of understanding with NMFS for salmon recovery and conservation projects to local governments, individual tribes, public partnerships, watershed councils, soil and water conservation districts, and other organizations and entities. The PCSRF has played an important role in leveraging additional funding and in-kind contributions (e.g., volunteer participation in salmon recovery from local and private sources), with most states providing significant amounts of matching funds.

The states and tribes are investing in priority activities to address conservation needs and identified factors limiting salmon recovery. They have used PCSRF funding to protect and restore salmon habitat; conduct watershed



assessments to determine factors limiting salmon productivity; develop plans to address limiting factors; develop resource management plans; conduct salmon enhancement and supplementation activities; monitor and evaluate recovery actions and outcomes; and conduct research and monitoring on salmon populations. Over 5,700 PCSRF projects have been funded to date, with habitat restoration projects (over 3,000) accounting for the largest number, followed by over 1,300 watershed/species assessments and subbasin planning projects.

States and tribes working with NMFS recently developed a Performance Reporting Framework to report progress on six major goals. Three of these goals are achievable in the short-term (< 5 years), including: enhanced availability and quality of habitat, improved management practices, and major habitat limiting factors addressed for ESA-listed salmon. Two of the goals are mid-term (5-15 years) and include improved status of ESA-listed salmon (e.g., naturally spawning populations increased) and maintained healthy salmon populations. The goal

that will be addressed in the longer term (>15 years) is the overall sustainability of Pacific salmon. For each of these goals, performance indicators have been identified and are described and quantified within this Report. For example, toward the goal of increased availability and quality of habitat, nearly 2,000 acres of wetlands have been created and more than 14,000 acres treated. Cumulatively, including riparian, estuarine, wetland, and upland efforts, nearly 290,000 acres of habitat have been treated and restored. Increases in population numbers have been shown in 16 of the Pacific salmon Evolutionarily Significant Units (ESUs) and steelhead Distinct Population Segments (DPSs).

Pacific salmon ESUs and steelhead DPSs have been grouped into geographic recovery domains. These provide a regional approach to identify the recovery needs and implement the actions necessary for multiple ESUs in an area. The development of recovery plans varies across the region, with five draft interim regional recov-

ery plans, one final interim plan, and two proposed ESA recovery plans currently available. Major factors limiting recovery for each ESU and DPS and activities underway to address recovery needs in the domains are described in this Report. Based on the Performance Reporting Framework, nearly 60 percent of PCSRF project activities within the recovery domains are addressing habitat limiting factors.

The PCSRF is making important contributions to systematic and cumulative efforts to improve the quality of salmon habitat, increase knowledge about salmon and steelhead life cycles and requirements, and prioritize conservation and recovery actions. While the PCSRF projects are improving the quality of salmon habitat in streams and watersheds across the region and there are signs of increased salmon abundance in some areas, continued commitment and collaboration are needed to achieve the common goal of full recovery and sustainability of Pacific salmon and steelhead populations.

Chapter 1: Introduction

Background

The Pacific Coastal Salmon Recovery Fund (PCSRF) supports the restoration and conservation of Pacific salmon and their habitat in Washington, Oregon, California, Alaska, and Idaho. The PCSRF was established by Congress in response to the listings of Pacific salmon and steelhead¹ populations under the Endangered Species Act (ESA) in the 1990s, and the impacts of the 1999 Pacific Salmon Treaty Agreement between the United States and Canada. Since FY 2000, the PCSRF has supported state, local, and tribal efforts to restore and protect salmon habitat critical to the various stages of the salmon lifecycle. Additionally, the PCSRF is used to conduct watershed assessments; develop recovery and restoration plans at a variety of scales; enhance salmon populations; educate constituencies; and conduct research to monitor, evaluate, and support salmon restoration and conservation efforts. The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) oversees the administration of the PCSRF and distributes the Congressional appropriations to states and

tribes in the Pacific Coast region. Congressional appropriations for FY 2000–2006 are shown in Exhibit I-1.² Idaho was added to the PCSRF program in FY 2004.

Salmon Restoration and Conservation

Pacific salmon and steelhead are anadromous fish that spawn and rear in freshwater but spend much of their adult life in the ocean (see the salmon life cycle diagram on the inside front cover of this Report). Their habitat ranges from the inland watersheds draining into the region's rivers and streams, through coastal estuaries, to the Pacific Ocean. Salmon return to spawn in their birth

¹ Throughout this Report, unless otherwise specified, the word "salmon" is generally used to also refer to steelhead.

² Authorization for appropriations through FY 2003 was provided in the FY 2001 Appropriations Act (P.L. 106-553). Congress authorized the FY 2004 appropriation in P.L. 108-199 and the FY 2005 appropriation in P.L. 108-447. The amounts in Exhibit I-1 are after rescissions and other reductions.

Exhibit I-1: Congressional Appropriation of PCSRF Funds (in millions)

| | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | FY 2006 |
|------------------------|---------|---------|---------|---------|---------|---------|---------|
| Washington | \$18.0 | \$30.2 | \$34.0 | \$27.8 | \$26.0 | \$24.6 | \$24.7 |
| Alaska | \$14.0 | \$19.5 | \$27.0 | \$21.9 | \$20.6 | \$23.2* | \$21.7 |
| California | \$9.0 | \$15.1 | \$17.0 | \$13.9 | \$13.0 | \$12.8 | \$6.4 |
| Oregon | \$9.0 | \$15.1 | \$17.0 | \$13.9 | \$13.0 | \$12.8 | \$6.4 |
| Idaho | • | • | • | • | \$4.9 | \$4.4 | \$2.2 |
| Pacific Coastal Tribes | \$6.0 | \$7.4 | \$11.0 | \$8.9 | \$8.4 | \$7.9 | \$3.9 |
| Columbia River Tribes | \$2.0 | \$2.5 | \$4.0 | \$3.0 | \$3.1 | \$2.5 | \$1.2 |
| Total | \$58.0 | \$89.8 | \$110.0 | \$89.4 | \$89.0 | \$88.2* | \$66.5 |

* Does not include \$500K (pre-rescission) that Congress transferred to a vessel buy-back program.

stream leading to genetically distinct populations that have evolved over time based on geography and other factors. These population groups are referred to as Evolutionarily Significant Units (ESUs) for salmon and Distinct Population Segments (DPSs) for steelhead. There are 37 salmon ESUs and 15 steelhead DPSs (52 total) within the Pacific Coast region (not including Alaska). Of these, 16 ESUs and 10 DPSs are currently listed as threatened or endangered under the ESA. The ESUs and DPSs are organized into seven recovery domains. A map showing the recovery domains and ESA-listed ESUs/DPSs can be found on the inside back cover of this Report.

Many human-caused and natural factors have contributed to the decline of salmon over the past century. Activities such as urban development, logging, grazing, hydro-power, and agriculture can alter important spawning and rearing habitat. Past harvest and hatchery practices have also affected salmon abundance and left populations more susceptible to fluctuations in the natural environment, such as changing ocean conditions, predators, droughts, fires, and floods. Many of these activities and conditions continue to threaten salmon and their habitat, even as programs such as the PCSRF seek to restore endangered and threatened salmon and prevent other salmon populations from becoming threatened with extinction.

The actual benefits of restoration activities can take years to realize due to the significant time lag between investment and project activity, activity and physical habitat changes, and habitat changes and biological response. This time lag makes it all the more important to ensure that funds used for salmon restoration and conservation address the highest priority needs and that the results of recovery actions are monitored and evaluated over time. Accordingly, the PCSRF supports watershed assessments and recovery planning efforts to identify the key factors that limit salmon recovery (limiting factors) for different ESUs and DPSs and to identify and prioritize recovery actions based on those limiting factors. The PCSRF also provides resources for projects that monitor the health and status of watersheds and salmon stocks, providing information needed to evaluate whether habitat restoration projects and recovery actions are appropriate and effective.

PCSRF Performance Goals and Measures

The overall purpose of the PCSRF is to contribute to the restoration and conservation of salmon and steelhead populations. Over the last several years, NMFS and its state and

tribal partners have worked together to identify short-, mid-, and long-term goals and performance indicators that can be used to assess progress being made toward those goals. For more information on goals, see the *Pacific Coastal Salmon Recovery Fund Performance Goals, Measures and Reporting Framework* at <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/upload/PCSRF-Perf-Framework.pdf>. The goals of the PCSRF are as follows:

Short-Term

- » Enhance the availability and quality of habitat
- » Improve management practices
- » Address major habitat limiting factors for ESA-listed salmon and steelhead

Mid-Term

- » Maintain healthy salmon populations
- » Improve the status of ESA-listed salmon

Long-Term

- » Ensure overall sustainability of naturally-spawning Pacific salmon.

NMFS and the states and tribes have developed a Performance Reporting Framework that provides an evolving mechanism to track progress. Development of the indicators in the Framework focused on the specific investments being made with the PCSRF, recognizing that there are other variables that affect salmon recovery. Other variables include biological constraints inherent in the salmon lifecycle and factors such as climate and ocean conditions. The Performance Reporting Framework (Exhibit 1-2) outlines the “inputs” into the program (e.g., funding, in-kind contributions), “outputs” (e.g., number of projects, number of acres/miles treated), and “outcomes” (e.g., improved habitat, fish populations). The PCSRF tracks and reports on performance at two different spatial scales—region-wide and recovery domain level. Indicators that provide measures of progress relative to outputs and outcomes are identified in the following sections and chapters.

Exhibit 1-2: Performance Reporting Framework

| Inputs | Reporting Categories | Outputs | PCSRF Goals (Outcomes) | | |
|--|--|--|--|---|--|
| | | | Short-Term (<5 years) | Mid-Term (5-15 years) | Long-Term (>15 years) |
| PCSRF funding to state and tribal governments through grants and contracts | » Habitat Restoration | » Instream habitat projects | Enhanced availability and quality of habitat | Improved status of ESA-listed salmon (naturally spawning populations increased) | Overall sustainability of Pacific salmon |
| | » Habitat Protections | » Wetland habitat projects | | | |
| | » Habitat Access | » Estuarine habitat projects | | | |
| | » Water Quality | » Land acquisition projects | Improved management practices | | |
| | » Water Quantity | » Riparian habitat projects | | | |
| | » Hatcheries/Enhancement | » Upland habitat projects | Habitat limiting factors addressed for ESA-listed salmon | | |
| | » Harvest Management | » Fish passage projects | | | |
| | » Watershed/Species | » Hatchery fish enhancement projects | Maintained healthy salmon populations | | |
| | » Planning and Assessment | » Watershed/species planning and assessment projects | | | |
| | » Recovery Plan Development and Implementation | » Research, monitoring, and evaluation projects | | | |
| » Research, Monitoring and Evaluation | | | | | |
| » Outreach, Education and Technical Assistance | | | | | |
| State direct match resources | | | | | |
| State, tribal, and other indirect contributions | | | | | |

Distribution of Funding for Salmon Restoration and Conservation

NMFS administers the PCSRF program and shares implementation with the states and tribes in the Pacific Coast region. Congressionally appropriated PCSRF funds are distributed by NMFS to the states and tribes, who subsequently distribute them to various partners to carry out activities that address the PCSRF goals. Final recipients of the PCSRF and matching state funds include state, local, and tribal governments; private landowners; conservation districts; local watershed groups; and many other organizations. NMFS has established memoranda of understanding (MOUs) with the states of Washington, Oregon, California, Alaska, and Idaho as well as three tribal commissions on behalf of 28 tribes³. The MOUs establish criteria and processes for funding priority projects.

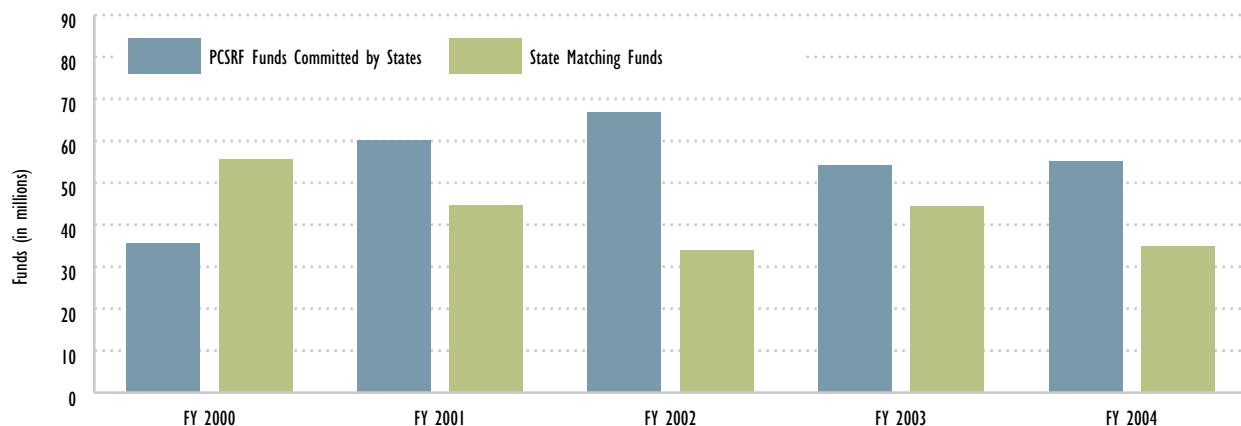
States provide funds to match the PCSRF distributions through their grant distribution processes. Tribes are not required to provide matching funds. The PCSRF and

state matching funds are, in turn, supplemented by private and local contributions at the project level, including additional resources, volunteer time, and other in-kind donations. Local support for salmon restoration and conservation activities that has occurred as a result of the implementation of collaborative PCSRF projects is difficult to quantify. Exhibit 1-3 shows the total amounts of PCSRF and state matching funds for salmon recovery (not including local and sponsor match) by fiscal year.

The PCSRF funds were awarded to the states and tribes as appropriations became available, which typically occurred well after the October 1 start of the federal fiscal year. States and tribes must submit grant applications to NMFS each year, and those grant awards are followed by state and tribal processes for screening and selecting priority projects and distributing the funds. Washington, Oregon, California, and Idaho each conduct a competitive grant process, which normally takes 4 to 12 months to complete. Many of the PCSRF funds are committed to projects in the year following the availability of appropriations due to these competitive funding cycles. Actual project completion can take several additional years because of construction windows, the seasonal nature of salmon work, permitting delays, and processes required to issue contracts for the work to be done. Evaluating progress toward the PCSRF goals of improved habitat and sustainable salmon requires multiple years of monitoring. The PCSRF grantees must target 10 percent of funds for monitoring and evaluation to ensure the program's ability to measure desired outcomes. Since the FY 2003 funding cycle, NMFS has required the PCSRF grantees to report information and metrics on project activities into a common database using a consistent set of performance indi-

³ The Northwest Indian Fisheries Commission (NWIFC) on behalf of 20 western Washington treaty tribes, the Klamath River Inter-Tribal Fish and Water Commission (KRITFWC) on behalf of the four Klamath River basin tribes, and the Columbia River Inter-Tribal Fish Commission (CRITFC) on behalf of four Columbia River basin treaty tribes. The first two Tribal Commissions are discussed as "Pacific Coastal" tribes in this Report.

Exhibit I-3: PCSRF and State Matching Funds Committed for Salmon Recovery in Washington, Oregon, and California, FY 2000-2004*



* FY 2004 includes Idaho.

cators (see <http://webapps.nwfsc.noaa.gov/pcsrp>). This database is now the source of information that is used in the Performance Reporting Framework to track progress toward the PCSRF goals.

The state processes for allocating the PCSRF and state matching funds complement existing state procedures and processes. These processes include rigorous reviews of the scientific and technical merit of proposals, public and stakeholder input, and mechanisms to ensure that selected projects include measures to provide for performance reporting and accountability in the use of public funds.

Report Organization

The remainder of this Report is organized into four chapters. Chapter 2 summarizes region-wide progress toward the PCSRF goals. The discussion focuses on outputs in the Performance Reporting Framework. Chapter 3 presents the most current information available about the status of ESA-listed salmon populations in Washington, Oregon, California, and Idaho and highlights progress toward the goals in each of the recovery domains. Much of the information presented in Chapter 3 represents outcomes that are derived primarily from sources outside of the PCSRF program. Chapter 4 describes the program's accomplishments at the state and tribal level. Chapter 5 offers concluding remarks about the PCSRF contributions to salmon restoration and conservation.



Chapter 2: Regionwide Pacific Coastal Salmon Recovery Fund Performance

Projects and activities funded through the PCSRF and implemented by states and tribes contribute to progress in restoring and conserving Pacific salmon. The Performance Reporting Framework described in the previous chapter provides a structured means to begin to examine where and how this progress is occurring. The activities and projects undertaken with FY 2000-2005 PCSRF funds comprise the cumulative region-wide contributions of the PCSRF toward salmon sustainability. The outputs and outcomes reported in this chapter serve as the preliminary performance measures for overall program results. Because of the varied and intricate lifecycles of salmon, ascertaining results from completed restoration activities and projects requires several years. The following information presents a cumulative summary of funded and completed projects to protect and restore Pacific salmon from the PCSRF inception in FY 2000 through FY 2005.

Performance Progress

The region-wide output indicators describe progress toward short-term, mid-term, and long-term outcomes, reflecting the goals of the PCSRF. Exhibit 2-1 summarizes the indicators of outputs identified in the Performance Reporting Framework. The outputs of activities and projects completed serve as a first level indicator of state and tribal efforts toward outcomes.

Cumulatively, including riparian, estuarine, wetland, and upland efforts, nearly 290,000 acres of habitat have been

treated and restored, nearly 4,300 acres of wetland and estuarine habitat have been created, and more than 4,200 stream miles treated and restored from program inception in 2000 through December 2005. Additionally, over 100,000 acres of habitat have been protected through acquisition, easement, or lease. Overall, PCSRF funding has improved approximately 410,000 acres of habitat for salmon and steelhead. The outputs represented by these various habitat restoration efforts encompass the many environments used by salmon during the different stages of their life cycle and migration. Upland, riparian,

Oregon Coastal Coho Assessment Project

The state of Oregon, in partnership with NMFS, established the Oregon Coastal Coho Assessment in 1998 to assess state efforts to conserve and rebuild coastal coho salmon populations. One of the key components of the Oregon Coastal Coho Project and Coho Assessment is evaluating the effectiveness of conservation efforts and outcomes in salmon populations. To support the effort several types of data and indicators are collected and assessed, including identification of limiting factors and measurements of changes in those factors such as physical habitat conditions supporting stream complexity, water quantity and quality, and assessment of fish populations. The Coastal Coho Assessment serves as a critical baseline to inform restoration planning and to ensure appropriate allocation of restoration funds. See <http://northcoastexplorer.info/story/story.aspx> for additional information.

Exhibit 2-1: Performance Reporting Framework

| Outputs | Regionwide Performance Indicators | Short-Term (<5 years) Outcomes | Mid-Term (5-15 years) Outcomes |
|--|--|--|--|
| Instream habitat projects | 985 stream miles treated | Enhanced availability and quality of habitat | Improved status of ESA-listed salmon (naturally spawning populations increased) |
| Wetland habitat projects | 1,911 acres created | | |
| | 14,517 acres treated | | |
| Estuarine habitat projects | 2,385 acres created | | |
| | 3,020 acres treated | | |
| Land acquisition projects | 102,096 acres acquired/protected 369 stream bank miles acquired or protected | | |
| Riparian habitat projects | 3,197 stream miles treated | | |
| | 12,511 acres treated | | |
| Upland habitat projects | 267,660 acres treated | Improved management practices | Maintained healthy salmon populations |
| Fish passage projects | 1,697 barriers removed | | |
| | 3,707 stream miles opened 544 fish screens installed | | |
| Hatchery fish enhancement projects | 277,482,842 fish marked for management strategies | Improved management practices | Maintained healthy salmon populations |
| Watershed/species planning and assessment projects | 236 assessments completed | | |
| Research, monitoring, and evaluation projects | 32,677 miles of streams monitored | Habitat limiting factors addressed for ESA-listed salmon | Improved status of ESA-listed salmon (naturally spawning populations increased) Maintained healthy salmon populations |
| | 25 of 26 ESA-listed ESUs and DPSs have identified factors limiting recovery | | |
| | 59% of all projects across recovery domains addressed major habitat limiting factors ⁴ | | |
| | Increased salmon populations in 16 out of 20 ESA-listed ESUs/DPSs⁶ | | |
| | Data not available for all locations. Alaska maintained escapement goals for 247 out of 250 stocks or stock groups over the last five years ⁵ | | |

⁴ This does not include projects in the Oregon Coast Restoration Area.

⁵ Alaska established escapement goals on salmon stocks or stock groups in each of its four commercial fisheries regions. These stocks or stock groups serve as important indicators for the management of salmon in the respective regions.

⁶ Only 20 of the 26 ESA-listed ESUs/DPSs have sufficient data within the last ten years to assess trends. The trends for the remaining ESUs/DPSs will be assessed when sufficient data are available.

and instream habitat projects provide erosion control, improve instream flow and streambed conditions, and enhance water quality and quantity, all of which are essential for salmon migration, reproduction and juvenile rearing within the watersheds. Outputs affecting estuarine and wetland conditions protect and improve habitat critical for juvenile migration, rearing and transition to the open ocean.

Removal of barriers in streams and rivers inhibiting salmon migration has been an essential component in improving salmon status and condition in the Pacific Coast region. Removal of stream barriers and replacement of ineffective culverts are providing fish access to previously unavailable habitat and increasing overall watershed productivity for salmon. More than 3,700 additional stream miles have been made accessible to fish. In total, nearly 1,700 barriers to salmon habitat have been removed since inception of the PCSRF.

The watershed assessments continue to contribute to the understanding of the factors limiting salmon recovery. Since 2004, factors limiting recovery for 25 of the 26 ESA-Listed ESUs/DPSs have been identified by NMFS. Assessments continue to contribute to site-specific information on watershed and habitat conditions that affect recovery such as poor water quality, inadequate instream conditions, and inadequate canopy cover and vegetation along streambanks. Based on analysis of projects within recovery domains, approximately 60 percent of project activities are addressing habitat factors that are limiting salmon recovery. More detailed data by recovery domain and ESU/DPS are presented in the following chapter.

Monitoring and fish marking programs help to track fish abundance within watersheds and manage hatchery efforts, contributing to understanding restoration status and more informed management practices throughout the region. Additionally, work is being done to maintain all salmon populations at sustainable levels.

The outputs and outcomes discussed in this chapter quantify the activities and projects enacted by states and tribes toward salmon recovery. Salmon habitat restoration efforts and other activities require several years for results in fish returns to be realized. These summary output and outcome measures indicate current progress in habitat availability and condition that contribute to salmon recovery. State and tribal accomplishments and additional progress toward outcomes are discussed in Chapters 3 and 4.

California North Coast Watershed Assessment Program

The California North Coast Watershed Assessment Program (NCWAP) was established in 1999 as an interagency effort to develop consistent scientific data and information on watershed habitat across California's north coast. The program involves multiple state agencies that develop baseline information about watershed conditions, guide watershed restoration and stewardship programs, and establish cooperative approaches to implementation of state and federal laws to protect fish, including anadromous populations of salmon and steelhead. Data are developed on a number of factors, including pollutants, stream characteristics, habitat conditions, and limiting factors. See <http://rap.cdf.ca.gov/projects/esu/esumapframes.html> for additional information.

Washington State Intensively Monitored Watersheds

The Washington State Salmon Recovery Funding Board (SRFB) established "intensively monitored watersheds" in 2004 in four areas of the state to answer the question "Are restoration actions actually creating more salmon within the watersheds where restoration projects are being funded?" Preliminary results are expected by 2007. This project is part of the validation monitoring requested by Congress and OMB to test the effectiveness of restoration actions. The program compares the changes in salmon abundance in streams where projects are occurring to streams where no restoration actions are ongoing. The goals are to evaluate changes in salmon production and to identify needs for future restoration projects. This is a collaborative effort among state and federal agencies, tribes, and the private sector. For more information see: <http://www.ecy.wa.gov/programs/eap/imw/>.



Assessment of Juvenile Chinook Survival in the Skagit River Delta

Tribal biologists from the Skagit River System Cooperative are conducting innovative research to identify the habitat factors limiting the survival of juvenile Chinook in the Skagit River delta and estuary in Puget Sound. The six populations of spring, summer, and fall Chinook exhibit diverse juvenile life histories in the Skagit River, rearing for variable periods in freshwater or tidal delta areas before migrating to marine waters. Many of the fish inhabit the diverse and productive habitat in the tidal delta for several months, attaining rapid growth that predisposes higher marine survival. But the Skagit delta has been radically altered in the last 100 years, and the area and quality of habitat available to juvenile salmon has been substantially reduced.

Sampling of juvenile Chinook during the estuarine/delta rearing phase has yielded valuable information about life history, diet, and habitat usage. The duration of rearing in freshwater, the tidally-influenced delta, and the nearshore marine area can be determined from detailed patterns of growth recorded on tiny otoliths (ear bones). Results indicate that survival to adulthood in the marine environment is much higher for juveniles that rear longer in the delta habitat. Survival is lower for fry that migrate directly to the marine environment. The research has immediate relevance to planning the recovery of Skagit River Chinook. First, it demonstrates the production potential for existing habitat, and identifies the habitat limiting factors that constrain increased production. Second, habitat restoration and production efforts can be focused to improve delta habitat and alleviate carrying capacity limitations. Similar research is underway in other systems in Puget Sound to demonstrate the key limiting factors and recovery pathways for other stocks.



Chapter 3: Status and Recovery of ESA-Listed Salmon and Steelhead

PCSRF restoration and recovery efforts are directed at restoring Chinook, coho, sockeye, and chum salmon and steelhead. There are 16 salmon Evolutionarily Significant Units (ESUs) and 10 steelhead Distinct Population Segments (DPSs) that are listed as threatened or endangered. These designations identify species populations that are in danger of extinction or likely to become so in the foreseeable future, requiring attention and protection to reach self-sustaining and genetically diverse levels. The distribution of salmon ESUs and steelhead DPSs along the Pacific Coast is displayed in Exhibit 3-1.

Recovery Domains

The 26 ESA-listed salmon ESUs and steelhead DPSs discussed in this chapter are grouped into seven geographic recovery domains, as shown inside the back cover. This chapter also includes a discussion about one restoration area that was previously designated as a recovery domain. The grouping by recovery domain allows an ecosystem approach to identifying recovery needs and needed actions for multiple ESUs/DPSs in a geographic area.

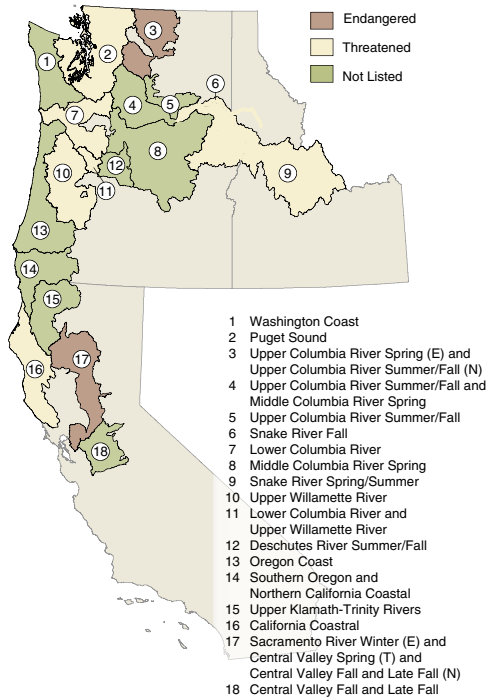
Abundance and Major Factors Limiting Recovery

The following pages present a picture of current knowledge, including abundance and factors limiting recovery of salmon and steelhead by recovery domain. The graphics show estimates of adult returns (including percentages of wild and hatchery fish where known), estimates of historical population size, and major factors limiting recovery. The major limiting factors listed represent the set of conditions that inhibit recovery. The relative impact of various factors, however, can change over time. In general, if the major limiting factors are not addressed, the ESA-listed salmon and steelhead are not likely to recover. The PCSRF project activities that address these factors are also included in this chapter.

The primary goal of PCSRF is to improve the overall condition of Pacific Coast salmon through habitat protection and restoration to sustain the species when external conditions produce high and low population cycles. The habitat factors that PCSRF can address tend to be linked, and efforts to improve habitat are cumulative, meaning that the habitat value for salmon is increased as each limiting factor is addressed systematically.

Exhibit 3-1: Distribution of Salmon ESUs and Steelhead DPSs

Chinook



Steelhead



Sockeye



Chum



Coho

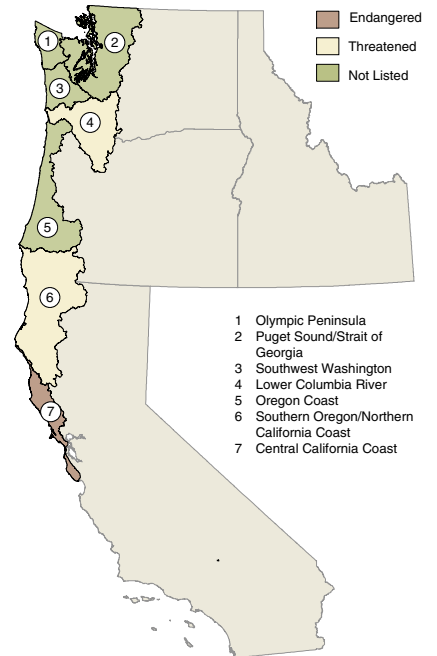
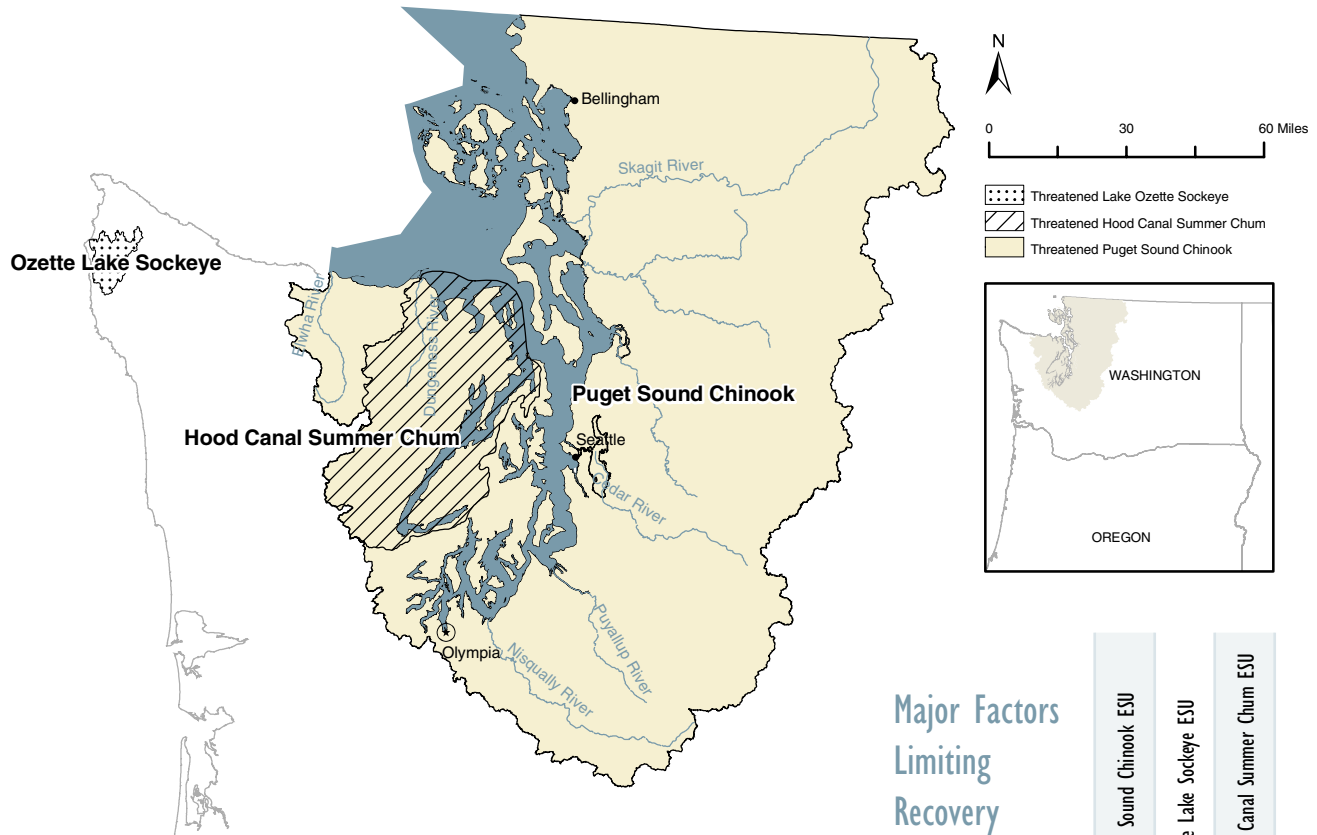


Exhibit 3-2: Puget Sound Recovery Domain



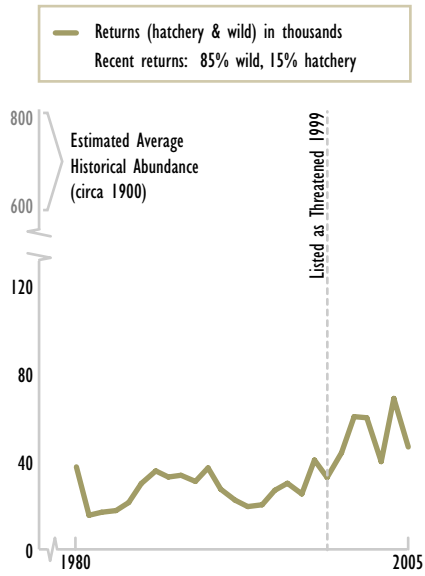
PCSRF Activities in the Recovery Domain

- » Restored 81 stream miles of instream habitat
- » Restored 92 acres of upland habitat and reduced impacts from 197 miles of road
- » Restored 855 acres and 94 stream miles of riparian habitat
- » Restored 109 acres and created 41 acres of wetland habitat
- » Restored 2,034 acres and created 1,022 acres of estuarine habitat
- » Protected 7,947 acres and 79 stream miles of habitat through land acquisition, easement, or lease
- » Treated 177 acres of riparian habitat for invasive species
- » Treated 1,088 acres of estuarine habitat for invasive species
- » Removed 78 barriers to fish passage opening 182 stream miles

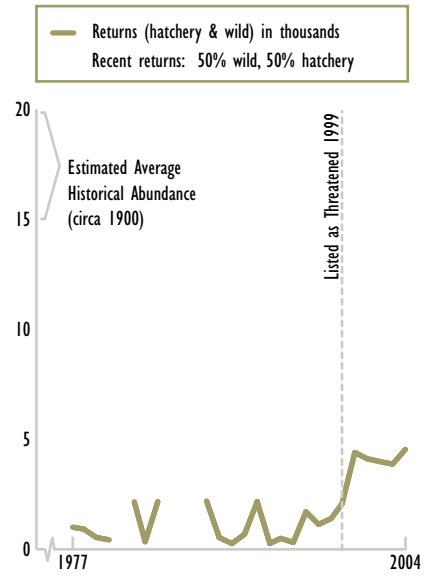
Major Factors Limiting Recovery

| | Puget Sound Chinook ESU | Ozette Lake Sockeye ESU | Hood Canal Summer Chum ESU |
|---|-------------------------|-------------------------|----------------------------|
| Degraded floodplain and in-river channel structure | ● | | ● |
| Riparian area degradation and loss of in-river large woody debris | ● | ● | ● |
| Degraded tributaries/river habitat conditions | | ● | |
| Degraded estuarine conditions and loss of estuarine habitat | ● | | ● |
| Excessive sediment in spawning gravels | ● | ● | ● |
| Degraded water quality | ● | | ● |
| High water temperature | ● | | |
| Reduced streamflow in migration areas | | | ● |
| Predation on adults by otters or seals | | ● | ● |
| Project Activities Addressing Habitat Limiting Factors | 62% | 100% | 72% |

Puget Sound Chinook ESU



Ozette Lake Sockeye ESU



Hood Canal Summer Chum ESU

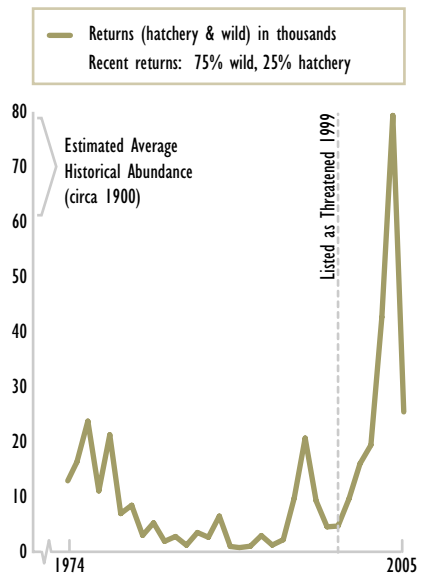
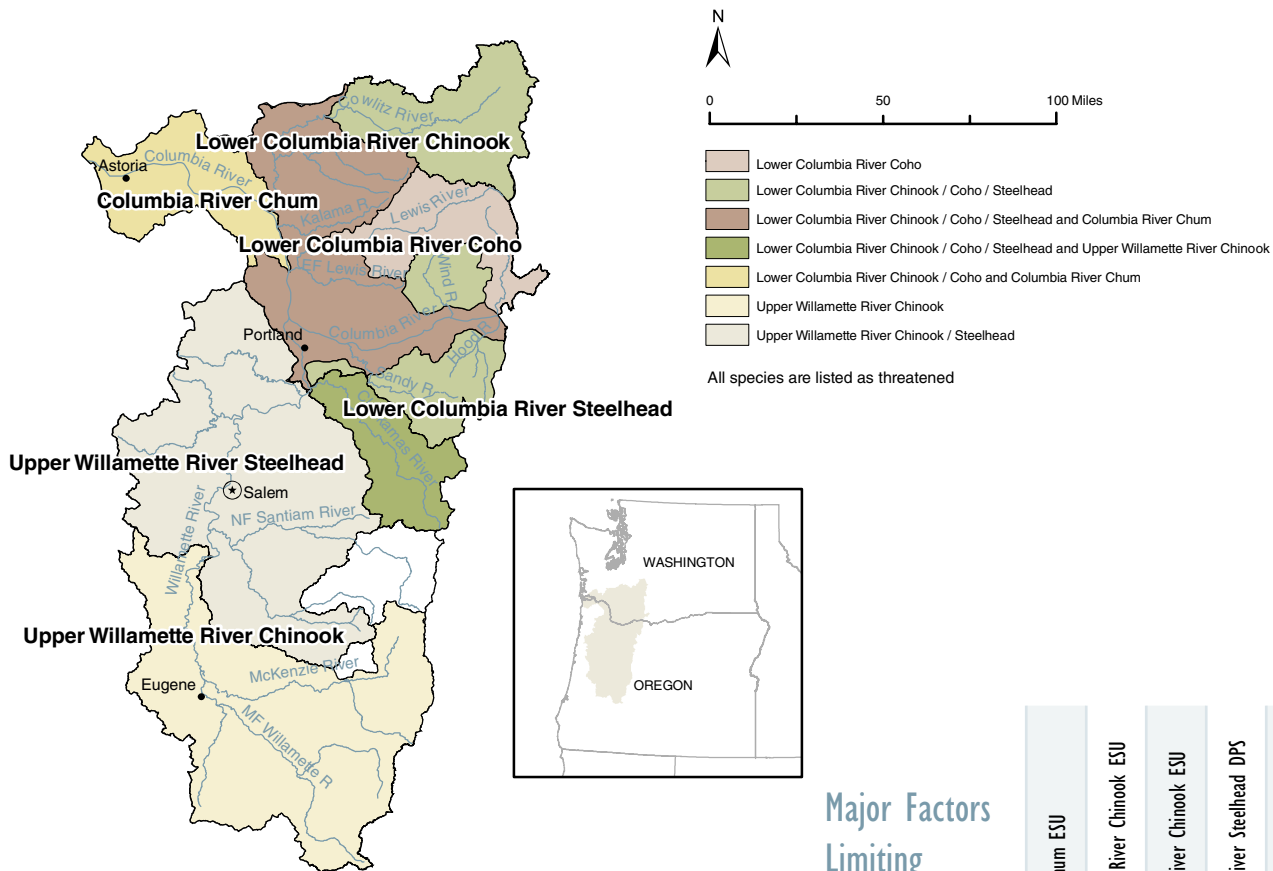


Exhibit 3-3: Willamette/Lower Columbia Recovery Domain



PCSRF Activities in the Recovery Domain

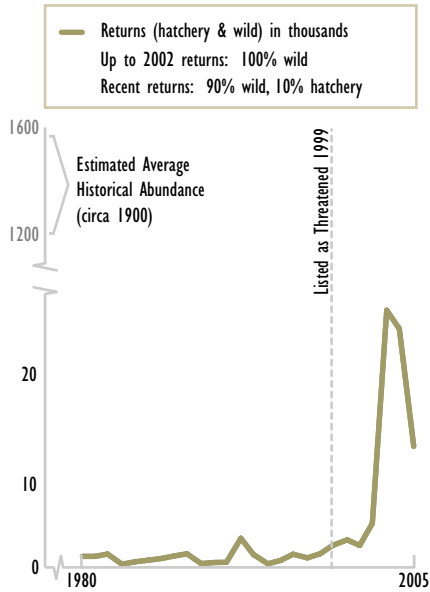
- » Restored 75 stream miles of instream habitat
- » Restored 760 acres of upland habitat
- » Restored 1,123 acres and 211 stream miles of riparian habitat
- » Restored 2,440 acres and created 35 acres of wetland habitat
- » Restored 659 acres and created 1,286 acres of estuarine habitat
- » Protected 1,843 acres and 25 stream miles of habitat through land acquisition, easement, or lease
- » Treated 492 acres of riparian habitat for invasive species
- » Removed 131 barriers to fish passage opening 416 stream miles

Major Factors Limiting Recovery

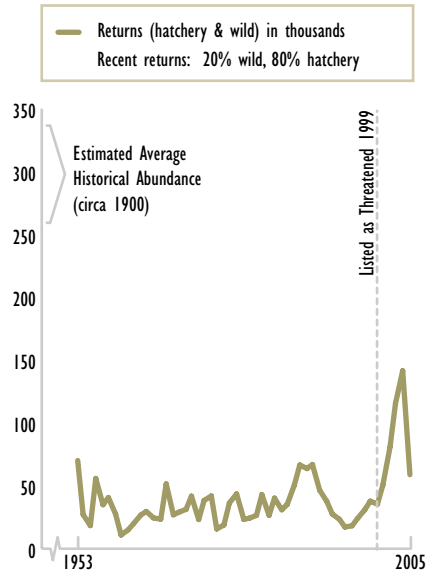
| | Columbia River Chum ESU | Upper Willamette River Chinook ESU | Lower Columbia River Chinook ESU | Lower Columbia River Steelhead DPS | Upper Willamette River Steelhead DPS | Lower Columbia River Coho ESU* |
|--|-------------------------|------------------------------------|----------------------------------|------------------------------------|--------------------------------------|--------------------------------|
| Altered channel morphology and stability | ● | | ● | ● | | |
| Lost/degraded floodplain connectivity and lowland stream habitat | | ● | | ● | ● | |
| Loss of habitat diversity | ● | | ● | | | |
| Excessive sediment | ● | | ● | ● | | |
| Degraded water quality | | ● | | | ● | |
| High water temperature | | ● | ● | ● | ● | |
| Reduced streamflow | ● | ● | | ● | ● | |
| Reduced access to spawning/rearing habitat | | ● | ● | ● | ● | |
| Harassment of spawners | ● | | | | | |
| Harvest impacts | | | ● | | | |
| Project Activities Addressing Habitat Limiting Factors | 58% | 61% | 62% | 67% | 54% | • |

* Limiting factors have not been identified.

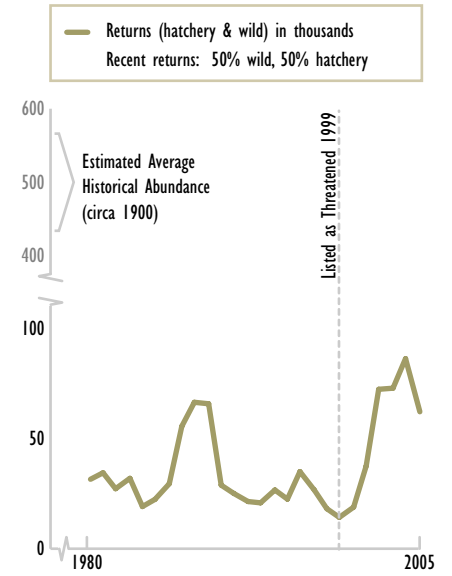
Columbia River Chum ESU



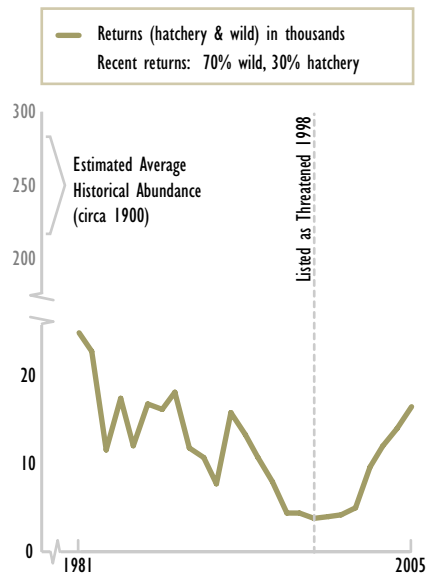
Upper Willamette River Chinook ESU



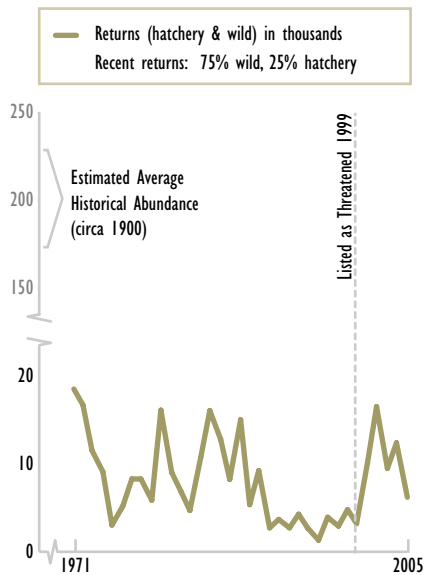
Lower Columbia River Chinook ESU



Lower Columbia River Steelhead DPS



Upper Willamette River Steelhead DPS



Lower Columbia River Coho ESU

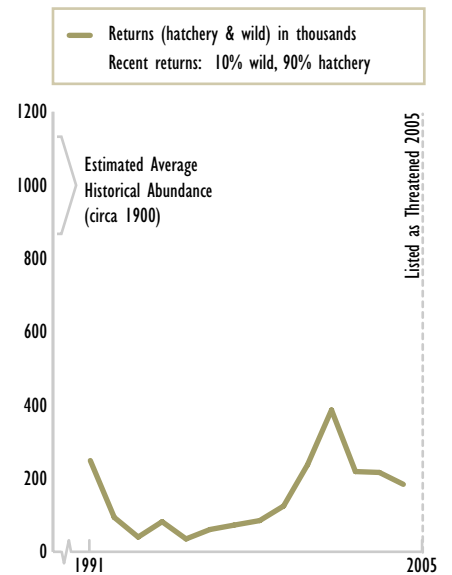
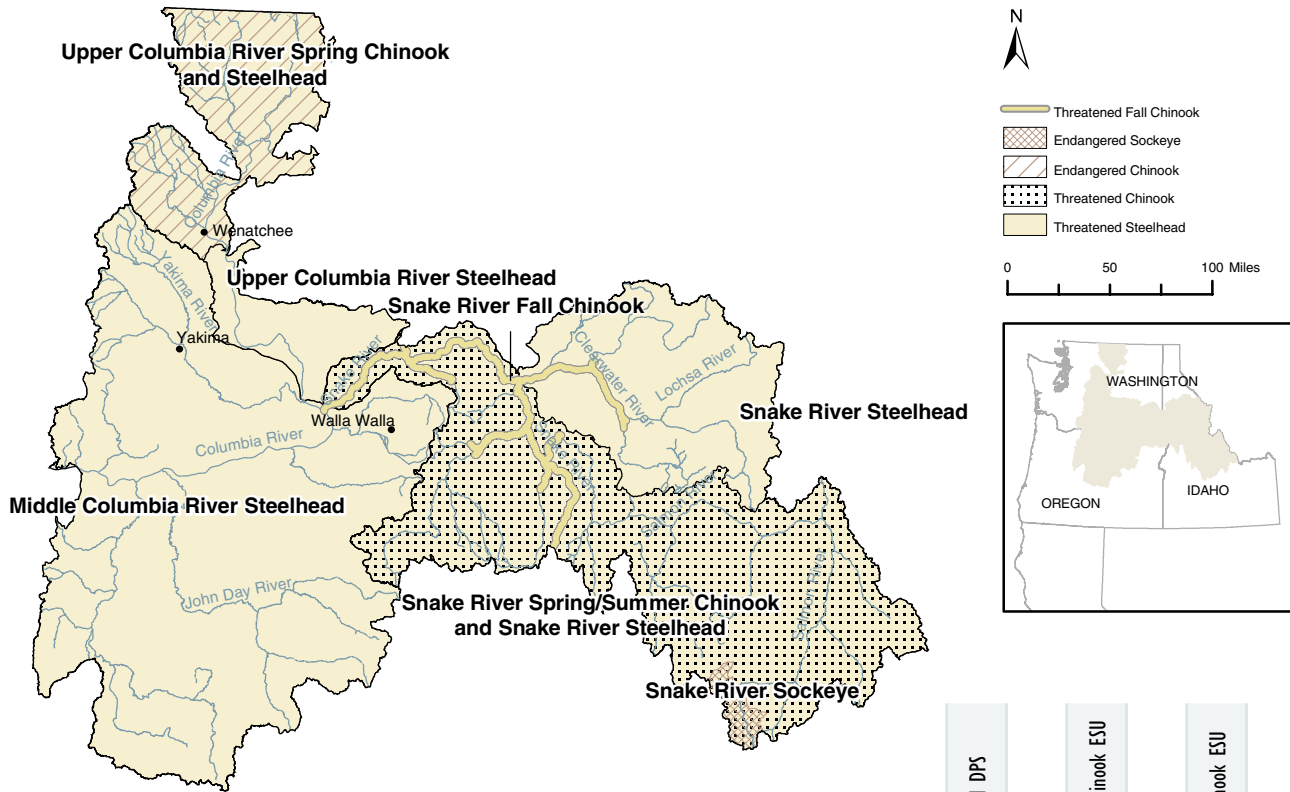


Exhibit 3-4: Interior Columbia Recovery Domain



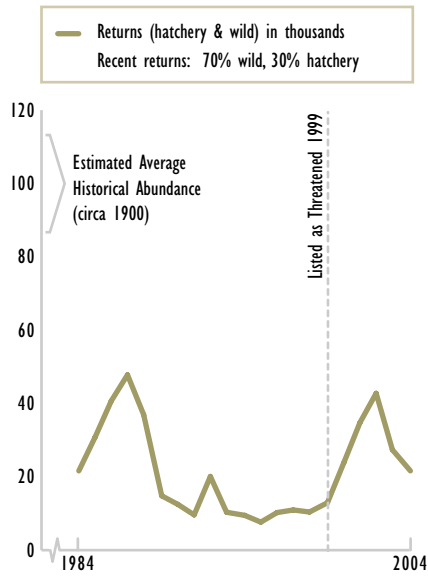
Major Factors Limiting Recovery

PCSRF Activities in the Recovery Domain

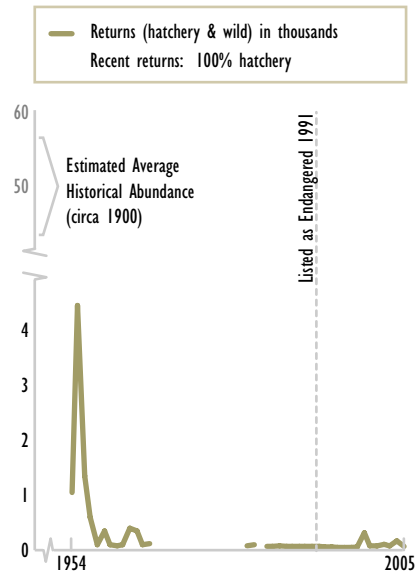
- » Restored 281 stream miles of instream habitat
- » Restored 76,391 acres of upland habitat and reduced impacts from 123 miles of road
- » Restored 2,824 acres and 455 stream miles of riparian habitat
- » Restored 1,145 acres of wetland habitat
- » Protected 49,328 acres and 198 stream miles of habitat through land acquisition, easement, or lease
- » Treated 651 acres of riparian habitat for invasive species
- » Removed 194 barriers to fish passage opening 1,391 stream miles
- » Installed 432 fish screens
- » Returned 714 cubic feet per second of water to instream flow

| | Middle Columbia River Steelhead DPS | Snake River Fall Chinook ESU | Upper Columbia River Spring Chinook ESU | Snake River Sockeye ESU | Snake River Spring/Summer Chinook ESU | Snake River Steelhead DPS | Upper Columbia River Steelhead DPS |
|--|-------------------------------------|------------------------------|---|-------------------------|---------------------------------------|---------------------------|------------------------------------|
| Altered channel morphology and flood plain | ● | | ● | ● | ● | ● | ● |
| Riparian degradation and loss of in-river large woody debris | | | ● | | | | ● |
| Excessive sediment | ● | | | | ● | ● | ● |
| Reduced spawning/rearing habitat | | ● | | | | | |
| Degraded water quality | ● | ● | | | ● | ● | ● |
| Reduced streamflow | ● | | ● | ● | ● | ● | ● |
| Impaired passage | ● | | ● | ● | | | |
| Hydropower system mortality | ● | ● | ● | ● | ● | ● | ● |
| Harvest impacts | | ● | ● | | | ● | ● |
| Hatchery impacts | | | | | | ● | ● |
| Project Activities Addressing Habitat | 91% | 33% | 63% | 0% | 79% | 78% | 58% |
| Limiting Factors | | | | | | | |

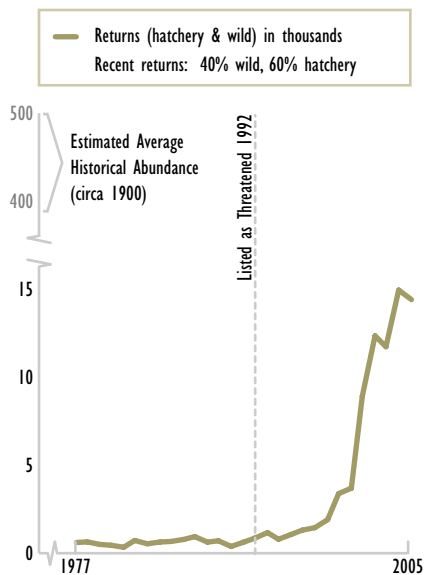
Middle Columbia River Steelhead DPS



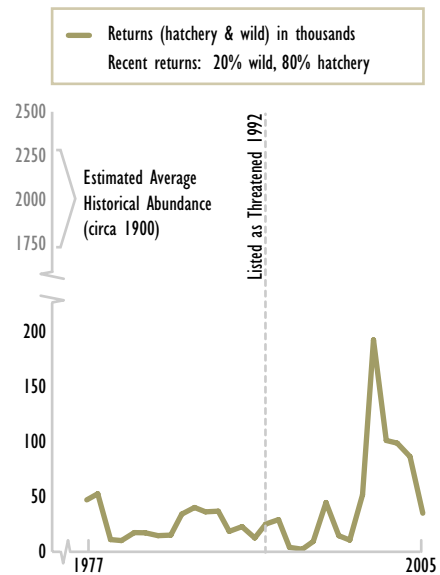
Snake River Sockeye ESU



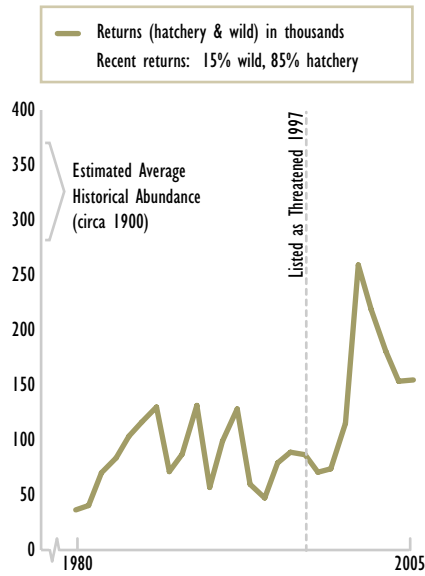
Snake River Fall Chinook ESU



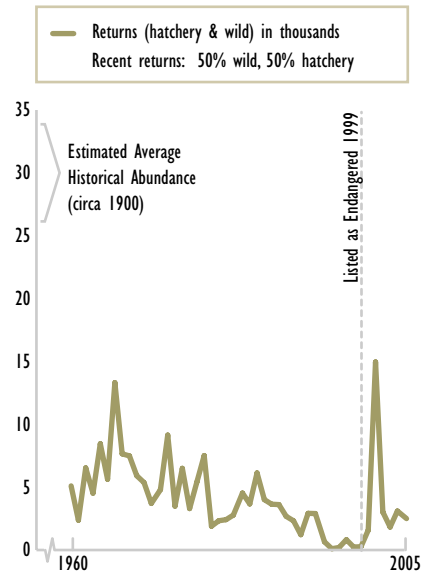
Snake River Spring/Summer Chinook ESU



Snake River Steelhead DPS



Upper Columbia River Spring Chinook ESU



Upper Columbia River Steelhead DPS

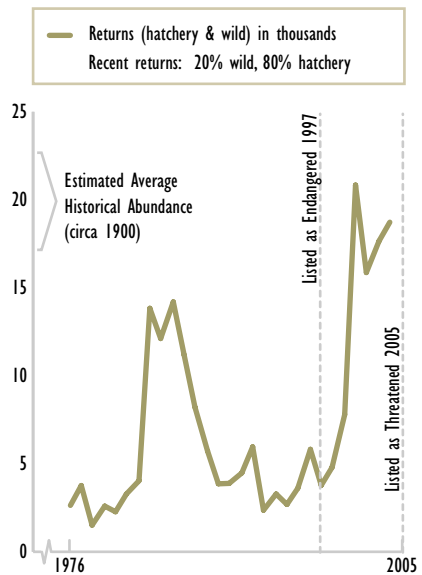
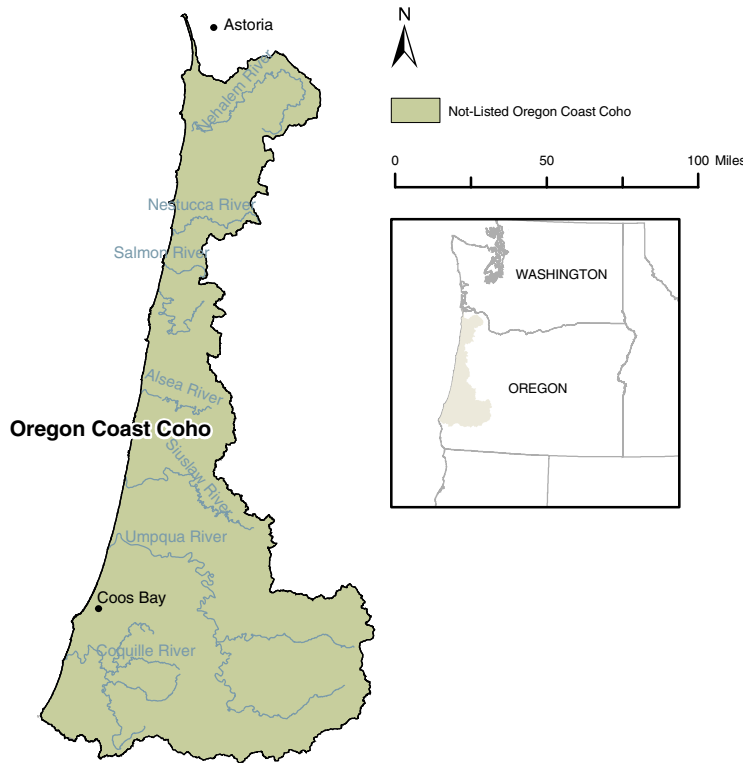


Exhibit 3-5: Oregon Coast Restoration Area*



Habitat Factors

| Habitat Factors | Oregon Coast Coho ESU |
|---|-----------------------|
| Altered stream morphology and complexity | ● |
| Reduced habitat capacity | ● |
| Loss of over-wintering habitat | ● |
| Excessive sediment | ● |
| High water temperature | ● |
| Variation in ocean conditions | ● |
| Project Activities Addressing Habitat Factors | 70% |

PCSRF Activities in the Restoration Area

- » Restored 147 stream miles of instream habitat
- » Restored 110 acres of upland habitat and reduced impacts from 66 miles of road
- » Restored 1,010 acres and 229 stream miles of riparian habitat
- » Restored 57 acres of wetland habitat
- » Protected 1,294 acres of habitat through land acquisition, easement, or lease
- » Removed 342 barriers to fish passage opening 338 stream miles
- » Installed 15 fish screens

* Previously designated a recovery domain when Oregon coast coho were listed.

Oregon Coast Coho ESU

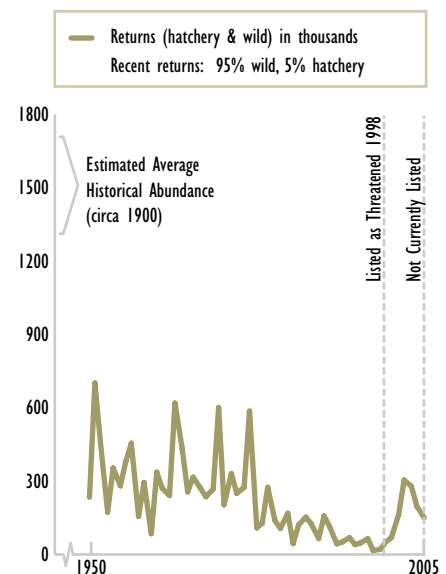
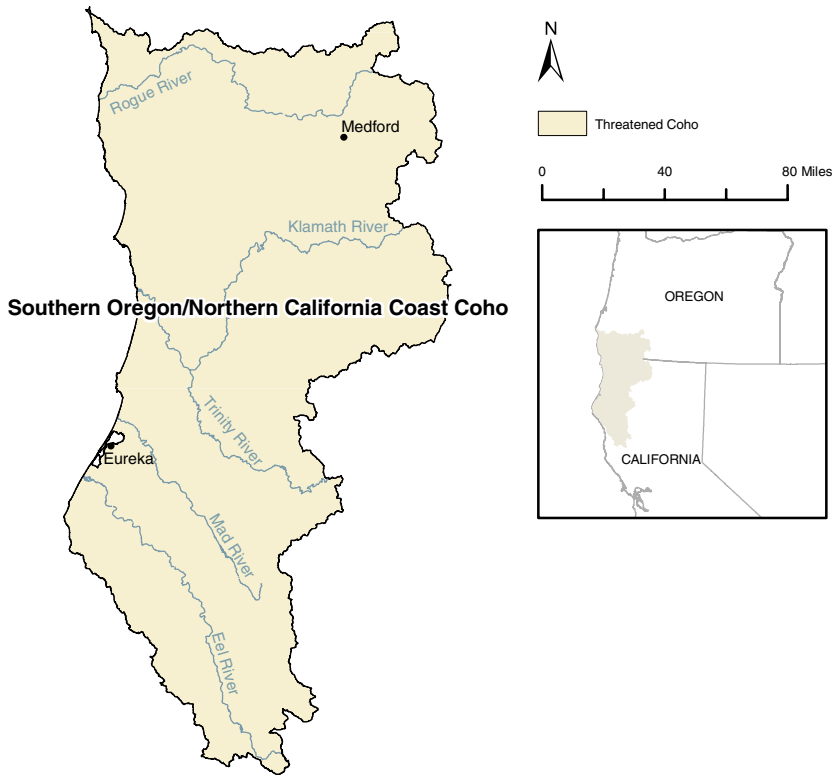


Exhibit 3-6: Southern Oregon/Northern California Coast Recovery Domain

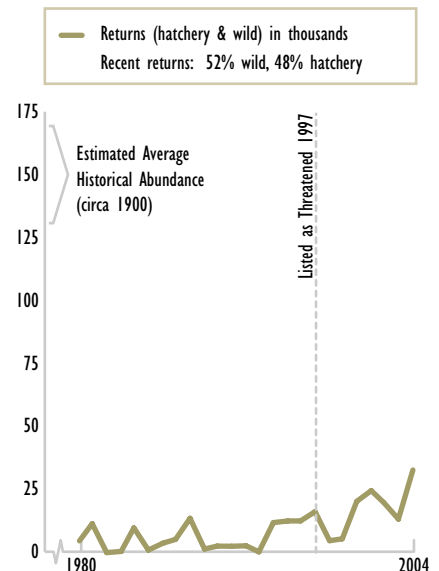


| Major Factors Limiting Recovery | Southern Oregon/Northern California Coast Coho ESU |
|--|--|
| Loss of channel complexity | ● |
| Loss of estuarine and floodplain habitat | ● |
| Loss of riparian habitat | ● |
| Loss of in-river wood | ● |
| Excessive sediment | ● |
| Degraded water quality | ● |
| High water temperature | ● |
| Reduced streamflow | ● |
| Unscreened water diversions | ● |
| Structures blocking fish passage | ● |
| Project Activities Addressing Habitat Limiting Factors | 78% |

PCSRF Activities in the Recovery Domain

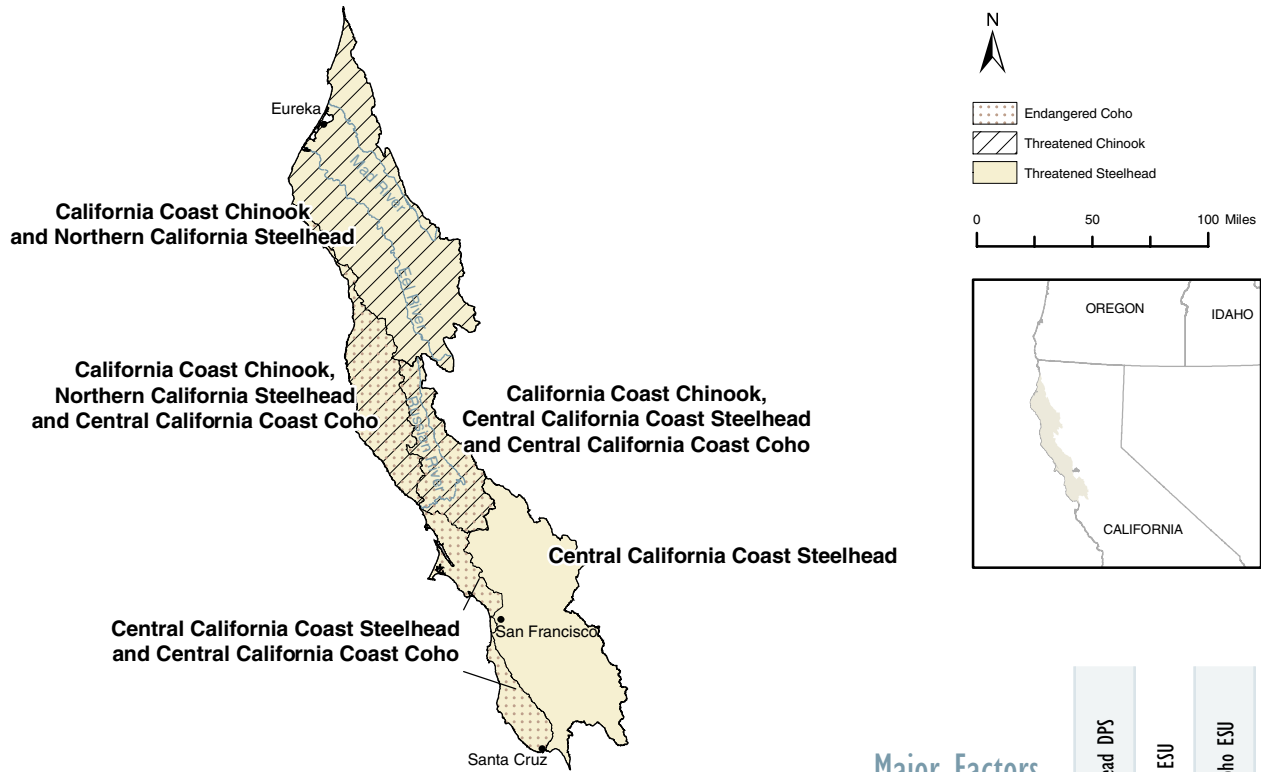
- » Restored 30 stream miles of instream habitat
- » Restored 1,490 acres of upland habitat and reduced impacts from 598 miles of road
- » Restored 375 acres and 132 stream miles of riparian habitat
- » Protected 25,206 acres of habitat through land acquisition, easement, or lease
- » Removed 201 barriers to fish passage opening 226 stream miles
- » Installed 74 fish screens
- » Returned 40 cubic feet per second of water to instream flow

Southern Oregon/Northern California Coast Coho ESU*



* Note: The data set represents the Rogue River basin, providing information for only a portion of the ESU.

Exhibit 3-7: North-Central California Coast Recovery Domain



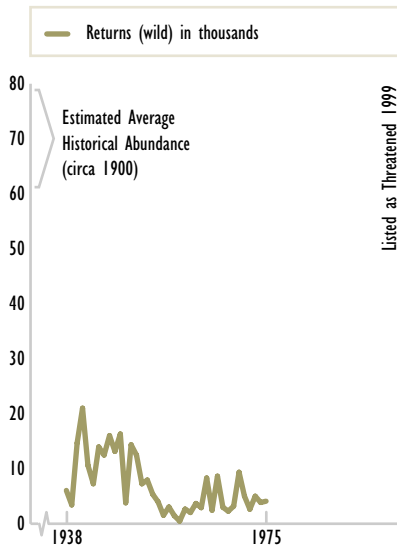
PCSRF Activities in the Recovery Domain

- » Restored 35 stream miles of instream habitat
- » Reduced impacts from 267 miles of road in upland habitat
- » Restored 24 stream miles of riparian habitat
- » Removed 83 barriers to fish passage opening 159 stream miles

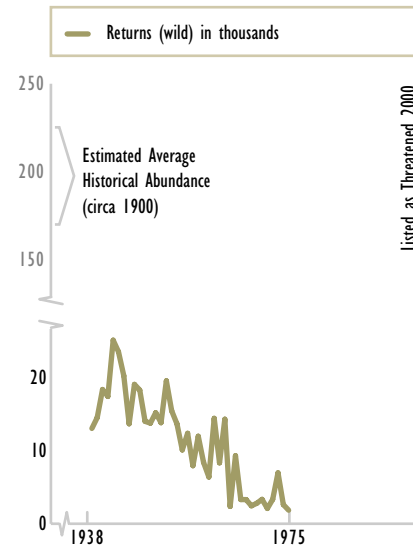
Major Factors Limiting Recovery

| | Northern California Steelhead DPS | California Coastal Chinook ESU | Central California Coast Coho ESU | Central California Coast Steelhead DPS |
|---|-----------------------------------|--------------------------------|-----------------------------------|--|
| Loss of channel complexity | ● | ● | ● | ● |
| Urbanization | | | ● | ● |
| Excessive sediment | ● | ● | ● | ● |
| Loss of floodplain and estuarine habitats | ● | ● | ● | ● |
| Loss of riparian habitat | ● | ● | ● | ● |
| Degraded water quality | ● | ● | ● | ● |
| Reduced access to spawning and rearing habitat | ● | ● | ● | ● |
| Unscreened water diversions | ● | ● | ● | ● |
| Project Activities Addressing Habitat Limiting Factors | 83% | 84% | 79% | 82% |

California Coastal Chinook ESU*



Northern California Steelhead DPS*



Central California Coast Steelhead DPS

No abundance time series data are available.

- » Listed as Threatened 1997
- » Historical estimate: 94,000
- » Current estimate: 14,100

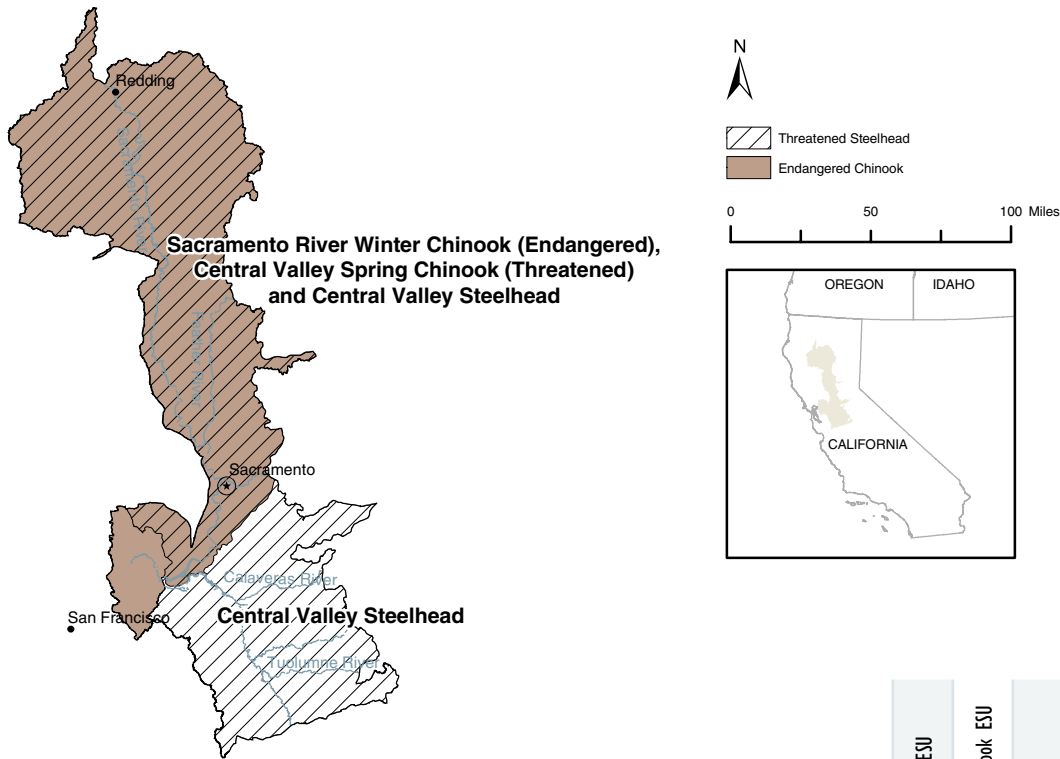
Central California Coast Coho ESU

No abundance time series data are available.

- » Listed as Threatened 1996
- » Status changed to Endangered 2005
- » Historical estimate: 56,100
- » Current estimate: 6,160

* Data from dam counts on the South Fork Eel River from 1938–1975 represent the best available for the California Coast Chinook ESU and the Northern California Steelhead DPS and are shown here. There are no abundance time series data available after 1975.

Exhibit 3-8: Central Valley Recovery Domain*



Activities in the Recovery Domain

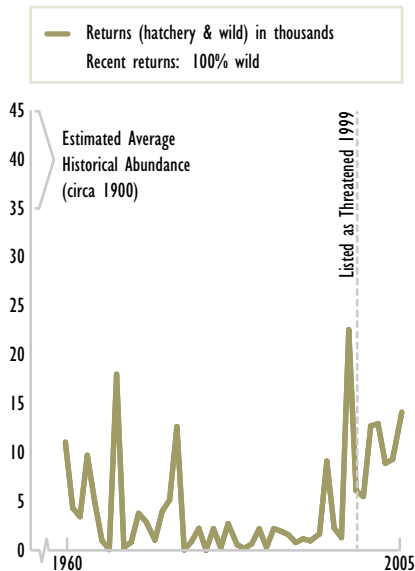
- » Evaluating termination of the captive broodstock hatchery program for Sacramento Winter Chinook
- » Increasing water releases from dams
- » Improving water quality and water supply through cooperative efforts by CALFED
- » Modifying dams to improve habitat, temperature, and flow
- » Screening water diversions
- » Enhancing efforts to reduce illegal harvest
- » Planning Battle Creek dam removal program
- » Improving stream flows

Major Factors Limiting Recovery

| | Central Valley Spring Chinook ESU | Sacramento River Winter Chinook ESU | Central Valley Steelhead DPS |
|--|-----------------------------------|-------------------------------------|------------------------------|
| Altered and degraded habitat | ● | ● | ● |
| Reduced streamflow | | ● | |
| Degraded water quality | ● | | ● |
| High temperature | ● | ● | ● |
| Reduced access to spawning and rearing habitat | ● | ● | ● |
| Unscreened water diversions | | | ● |
| Hatchery impacts | ● | | ● |
| Single population in low abundance | | ● | |

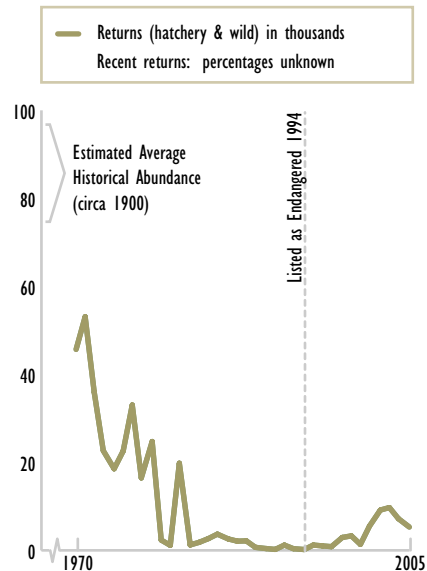
* PCSRF funds were not allocated to projects in this recovery domain.

Central Valley Spring Chinook ESU



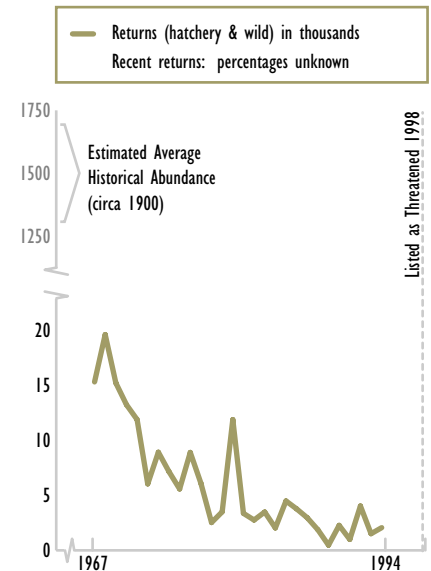
Note: For the purpose of data continuity between years, carcass counts officially recognized by tribes and state and federal agencies are not included in the abundance figures.

Sacramento River Winter Chinook ESU



Note: For the purpose of data continuity between years, carcass counts officially recognized by tribes and state and federal agencies are not included in the abundance figures.

Central Valley Steelhead DPS



Note: The data set represents dam counts from 1967–1994 at the Red Bluff Diversion Dam fish ladders, providing information on only a representative portion of the DPS.

PCSRF Planning

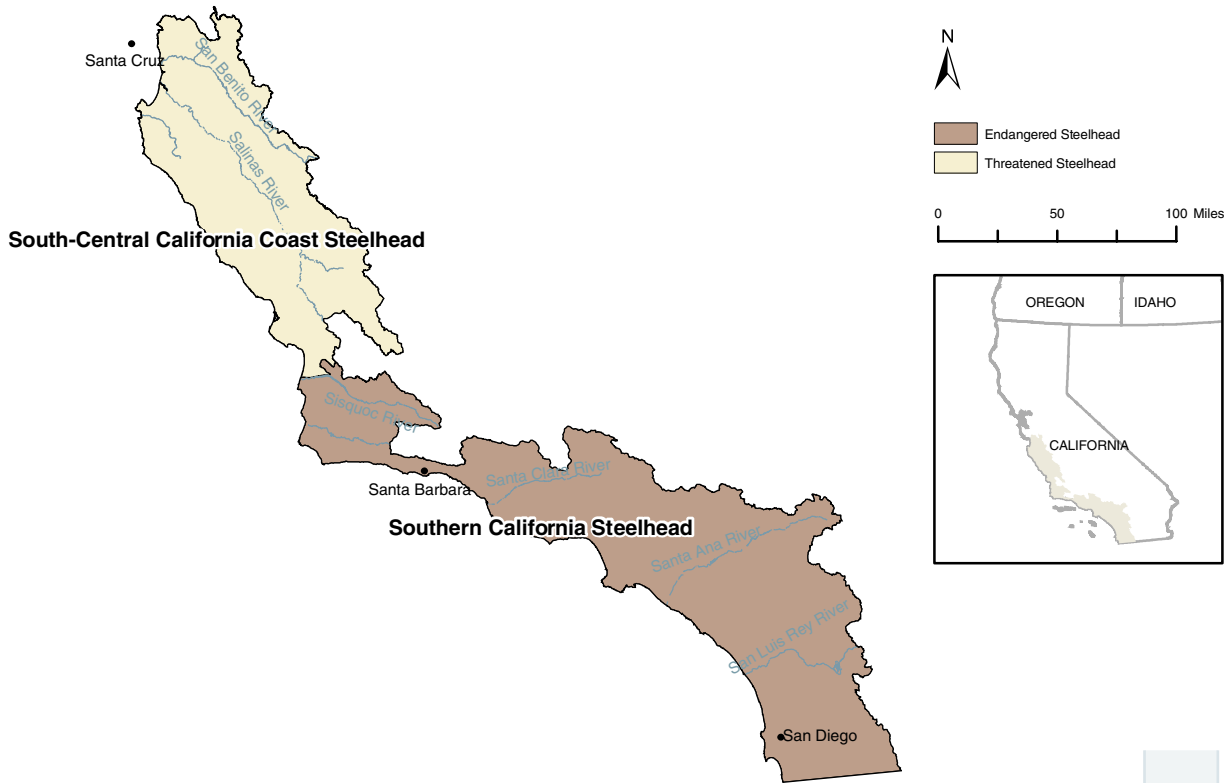
Recovery planning involves multiple and diverse activities, including plan development and establishing funding priorities and requirements. States and tribes not only contribute to the development of recovery plans, but also participate in setting priorities and performance requirements for funding sources such as the PCSRF. NMFS has reviewed and assessed PCSRF recovery project outputs and found that PCSRF funds can and do effectively contribute to the recovery needs of ESA-listed salmon and steelhead.

NMFS has established Technical Recovery Teams (TRTs) for each recovery domain to advise recovery planners on the relationships between habitat and fish productivity (number of returning adults produced by the parent spawner), the spatial distribution of fish and their habitats, and aspects of diversity including the expression of different life history traits (run timing, relative habitat use, age structure, size).

These four elements—abundance, productivity, spatial distribution, and genetic diversity—must be considered when developing recovery plans and determining whether a species is recovered. These elements are also essential in the planning and review of the effectiveness of PCSRF-funded projects in addressing the recovery needs of each ESU. For more information see: <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/ESA-Recovery-Plans/Draft-Plans.cfm>.



Exhibit 3-9: South-Central/Southern California Coast Recovery Domain



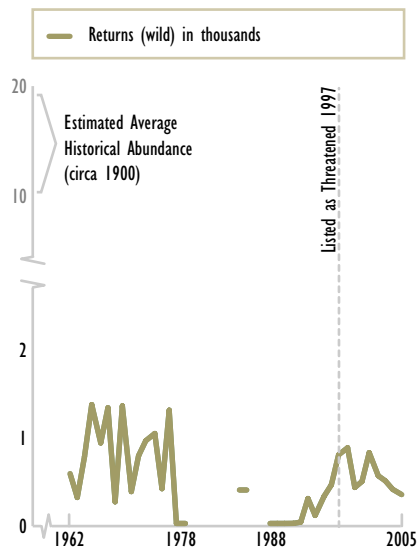
PCSRF Activities in the Recovery Domain

- » Reduced impacts from 29 miles of road in upland habitat
- » Protected 1,191 acres of habitat through land acquisition, easement, or lease
- » Removed 32 barriers to fish passage opening 167 stream miles

Major Factors Limiting Recovery

| | South-Central California Coast Steelhead DPS | Southern California Steelhead DPS |
|---|--|-----------------------------------|
| Altered channel morphology and floodplain | ● | ● |
| Sedimentation of spawning and rearing habitat | ● | ● |
| Degraded water quality | ● | |
| Alteration of natural streamflow patterns | ● | ● |
| Physical impediments to fish passage | ● | ● |
| Hatchery impacts | ● | ● |
| Exotic species | ● | ● |
| Recreational angling | ● | ● |
| Project Activities Addressing Habitat Limiting Factors | 83% | 96% |

South-Central California Coast Steelhead DPS



Note: The data set represents dam counts at the San Clemente Dam fish ladder on the Carmel River, providing information for only a portion of the ESU. Fish count methodology changed in 1980. No records exist for 1978–83 and 1985–87. It is also estimated that between 10–50% of steelhead spawn below the dam.

Southern California Steelhead DPS

No abundance time series data are available.

- » Listed as endangered 1997; range extended 2002
- » Historic estimate 32,000–46,000
- » Current estimate <100 fish

Recovery Planning

Recovery plans are required for species listed under the ESA. Recovery plans provide a framework for identifying the recovery and restoration actions necessary to address the key factors limiting the species. Each recovery domain has a Technical Recovery Team (TRT) charged with providing the technical basis for the recovery plans. In the region, NMFS and the TRTs have worked cooperatively with the multiple entities within recovery domains, including government agencies, landowners, and other interested parties involved in salmon recovery, to ensure the development of recovery plans that can be implemented.

In the first years of the PCSRF, several projects focused on planning and watershed assessments. These projects were critical first steps in identifying the factors limiting recovery to provide the basis for ensuring resources for restoration projects are targeted appropriately. Recovery plans help to prioritize implementation of recovery actions.

As salmon recovery planning has progressed, these locally developed plans have been aggregated at different levels, depending on the recovery domain, and submitted to NMFS to meet the requirements of the ESA. Recovery plans within the Pacific region are in varying stages of development as summarized in Exhibit 3-10.

Ongoing monitoring is an important component of recovery planning to assess with scientific certainty whether recovery actions are appropriate. The PCSRF is supporting planning, assessment, and monitoring activities in all domains. Additionally, as was described in Chapter 2, other monitoring programs are being established to ensure that resources are invested where and when needed to support restoration and recovery of salmon and steelhead populations.

Exhibit 3-10: Status of Recovery Plans by Recovery Domain

| | Statewide Recovery Strategy | Draft Interim Regional ESA Recovery Plan | Final Interim Regional ESA Recovery Plan | Proposed ESA Recovery Plan | Final ESA Recovery Plan |
|---|-----------------------------|--|--|----------------------------|-------------------------|
| Puget Sound Recovery Domain | | | | | |
| Puget Sound Chinook | WA Strategy ⁷ | | | ● | ○ |
| Hood Canal Summer Chum | WA Strategy ⁷ | | | ● | |
| Ozette Lake Sockeye | WA Strategy ⁷ | ◐ | | | |
| Willamette/Lower Columbia Recovery Domain | | | | | |
| Lower Columbia Chinook and Steelhead; Columbia Chum | | | | | |
| Washington Lower Columbia Management Unit | WA Strategy ⁷ | | ● | | |
| Oregon Lower Columbia Management Unit | OR Plan ⁸ | | | | |
| Upper Willamette Chinook and Steelhead | OR Plan ⁸ | | | | |
| Interior Columbia Recovery Domain | | | | | |
| Upper Columbia Steelhead and Spring Chinook | WA Strategy ⁷ | ◐ | | | |
| Middle Columbia Steelhead | | | | | |
| Eastern Washington Lower Snake Management Unit | WA Strategy ⁷ | ● | | | |
| Washington Yakima River Management Unit | WA Strategy ⁷ | ● | | | |
| Oregon Management Unit | OR Plan ⁸ | | | | |
| Washington Columbia Gorge Management Unit | WA Strategy ⁷ | | | | |
| Snake River Sockeye, Fall and Spring Chinook, and Snake River Basin Steelhead | | | | | |
| Eastern Washington Lower Snake River Management Unit | WA Strategy ⁷ | ● | | | |
| Oregon Snake River Basin Management Unit | OR Plan ⁸ | | | | |
| Idaho Snake River Basin Management Unit | | | | | |
| Southern Oregon/Northern California Coast Recovery Domain | | | | | |
| CA Strategy ⁹ | | | | | |
| North-Central California Coast Recovery Domain | | | | | |
| CA Strategy ⁹ | | | | | |
| Central Valley Recovery Domain | | | | | |
| South-Central/Southern California Coast Recovery Domain | | | | | |

⁷ *Statewide Strategy to Recover Salmon—Extinction Is Not an Option*, 1999, <http://www.governor.wa.gov/gdro/publications/strategy/summary.htm>.

⁸ *Oregon Plan for Salmon and Watersheds*, 1999, <http://cgov.oregon.gov/OPSW/>.

⁹ *Recovery Strategy for California Coho*, February 2004, <http://www.dfg.ca.gov/nafwb/CohoRecovery/RecoveryStrategy.html>.

● = Completed
 ◐ = Initial Draft Completed
 ○ = Expected in late 2006

Chapter 4: State and Tribal Efforts

State and tribal partners receiving PCSRF funding have conducted a multitude of on-the-ground projects aimed at restoring and maintaining healthy salmon populations. The states and tribes leverage PCSRF funds to support staff that plan, design, and implement habitat restoration activities on a large scale. Under their MOUs with NMFS, Washington, Oregon, California, and Idaho are required to provide a 25% state match on PCSRF funds. All have done so, with Washington, Oregon and California providing close to or more than a 50% state match since program inception. Funds have been allocated to projects focused on enhancing the availability and restoring the quality of salmon habitat, improving management practices, and maintaining healthy and sustainable salmon stocks.

This chapter provides an overview of the activities and accomplishments of states and tribes to restore and conserve salmon populations. The following sections describe the types, numbers, and locations of projects and funding allocated. Additionally, examples of state and tribal activities using the PCSRF resources and the differences they are making are described in sidebars.

Washington

The state of Washington distributes its PCSRF funds and state matching funds through the Washington Salmon Recovery Funding Board, using a competitive grant distribution process based on assessed needs and priorities for salmon recovery. The majority of Washington's PCSRF and state match funds are allocated to habitat protection and restoration projects. Exhibit 4-1 depicts the distribution of funds by objective for projects in the state from FY 2000–2005.

Washington committed more than \$140 million in PCSRF funds toward salmon recovery projects as of March 2006. These federal funds were supplemented by nearly \$69 million in state salmon conservation and restoration funds (49% state match on PCSRF funds). Through the projects implemented with the PCSRF and state matching funds since 2000, Washington has accomplished the following:

- » Removed 180 fish passage barriers opening 240 stream miles through culvert removal and 256 stream miles through other barrier removal
- » Restored 126 miles of instream habitat
- » Installed 421 fish screens
- » Treated 234 miles of road and restored 9,721 acres of upland habitat
- » Restored 123 stream miles and 1,646 acres of riparian habitat
- » Restored 292 acres and created 41 acres of wetland habitat
- » Restored 2825 acres and created 2,385 acres of estuarine habitat
- » Restored 317 acres of riparian habitat and treated 1,099 acres of estuarine habitat for invasive species
- » Protected 12,128 acres and 147 stream miles through land acquisition, easement, or lease

The locations of state and tribal PCSRF projects in Washington are shown in Exhibit 4-2. More information about Washington's salmon conservation and restoration efforts is available from the Governor's Salmon Recovery Office at <http://www.governor.wa.gov/gsro/> and from the Salmon Recovery Funding Board at <http://www.iac.wa.gov/srfb/>.

Exhibit 4-1: Washington Distribution of PCSRF and State Matching Funds FY 2000-2005

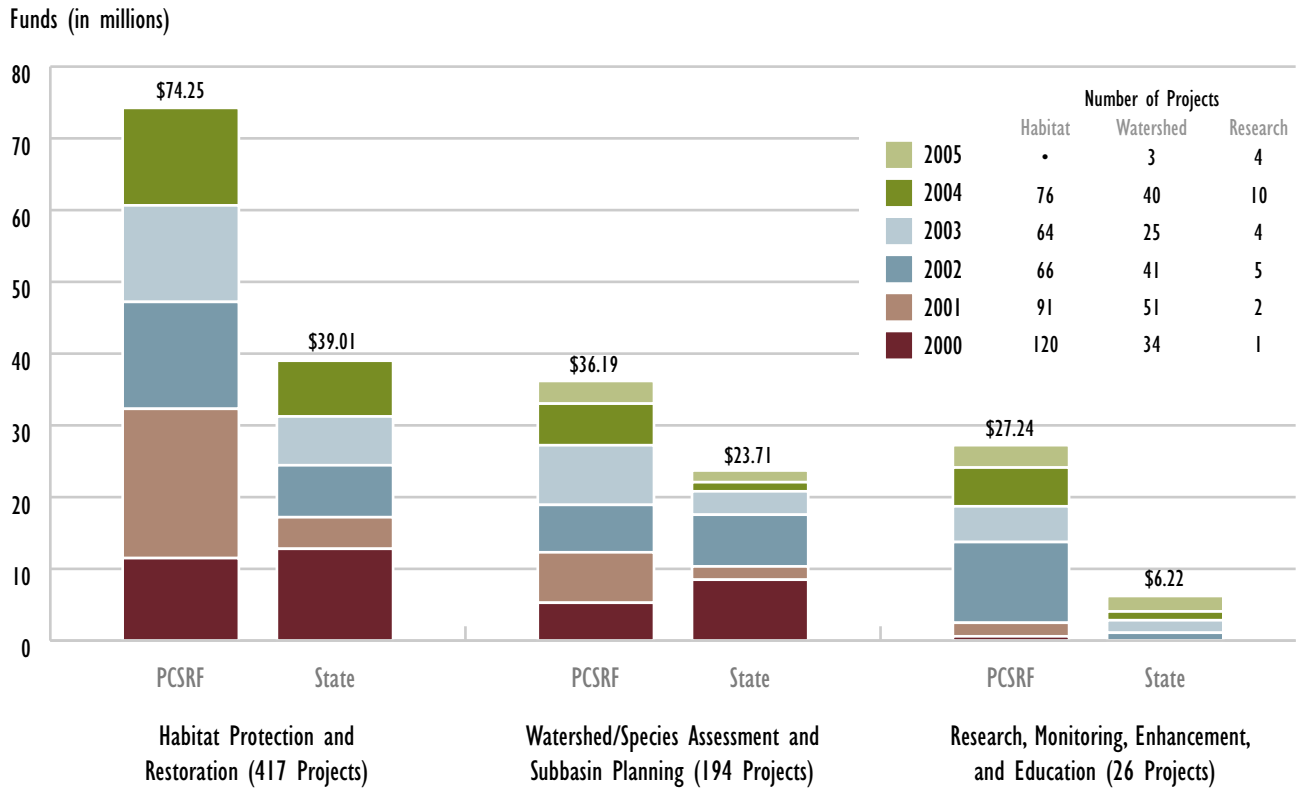
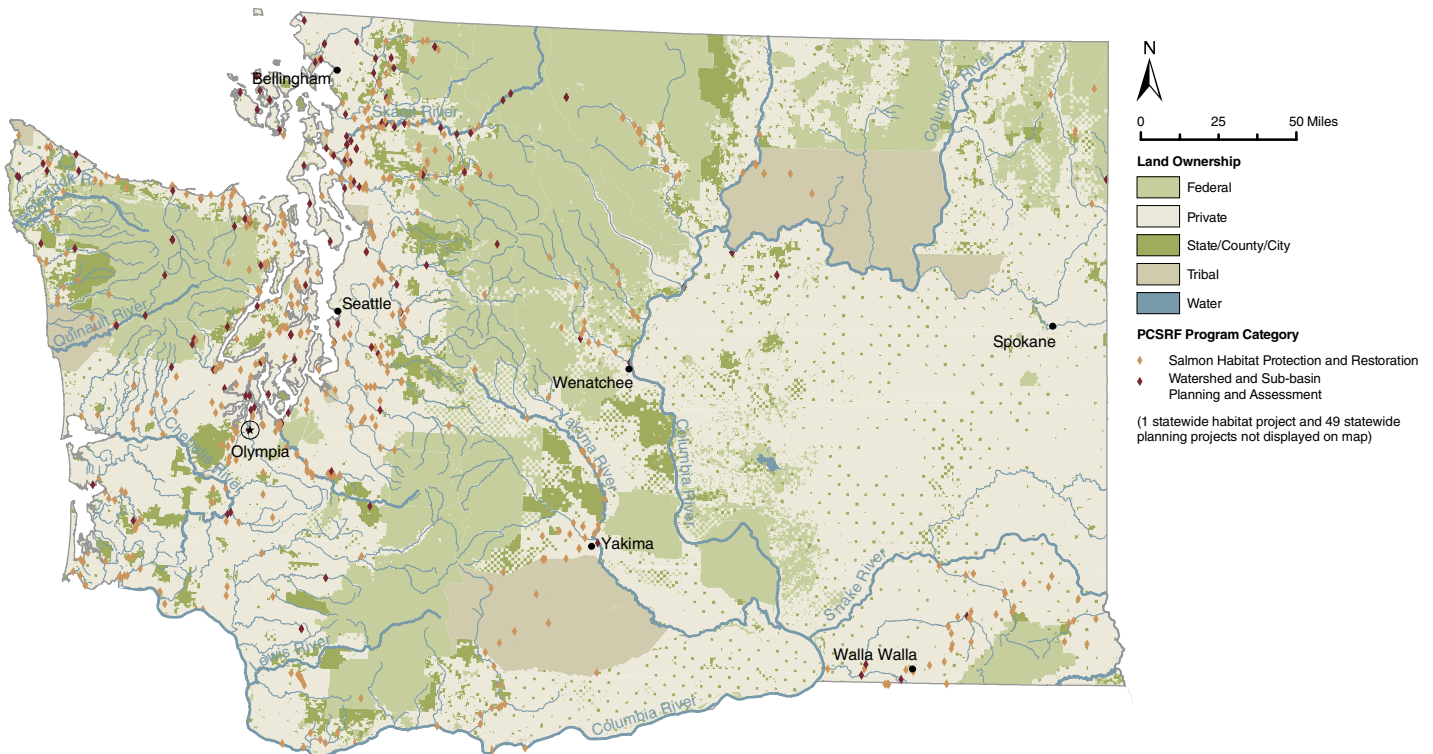


Exhibit 4-2: Locations of PCSRF Projects in Washington



Washington: Asotin Creek Instream Habitat Restoration

Asotin Creek is a tributary to the Snake River and drains approximately 325 square miles of Asotin and Garfield counties in southeastern Washington. Through PCSRF funds distributed by the Washington State Salmon Recovery Funding Board, the Asotin County Conservation District restored 25 acres of instream habitat in Asotin Creek that had been degraded by years of erosion and flooding. Completed in 2005, the restoration activities entailed recreating sinuous channels and natural meanders in the streambed and planting native vegetation along the streambank to create suitable habitat for salmon and steelhead. The restored areas will help support salmon spawning, migration, and juvenile rearing by controlling instream flows and future erosion.



During



Before



After

Oregon

The state of Oregon distributes its PCSRF and state matching funds through a competitive grant program administered by the Oregon Watershed Enhancement Board (OWEB). Under Oregon state law, the majority of state salmon recovery funding must be allocated to habitat restoration and protection projects in Oregon. As a result, OWEB designates most of its PCSRF funds to associated activities complementing habitat restoration and recovery efforts. Projects and programs supported through the PCSRF include recovery planning; watershed councils; watershed assessments; and monitoring of fish populations, habitat conditions, and the effectiveness of restoration activities.

As of March 2006 Oregon committed approximately \$73 million in PCSRF funds and \$104 million in state matching funds for salmon recovery efforts (142% state match). Exhibit 4-3 shows the distribution of funds in Oregon from FY 2000-2005. The locations of state and tribal PCSRF projects in Oregon are shown in Exhibit 4-4.

State and PCSRF resources supported the following salmon recovery achievements contributing to the overall improvement of habitat conditions in Oregon necessary for the survival of salmon:

- » Restored 433 miles of instream habitat
- » Removed 1,049 fish passage barriers opening 939 stream miles through culvert removal and 1,173 stream miles through other barrier removal

Exhibit 4-3: Oregon Distribution of PCSRF and State Matching Funds FY 2000-2005

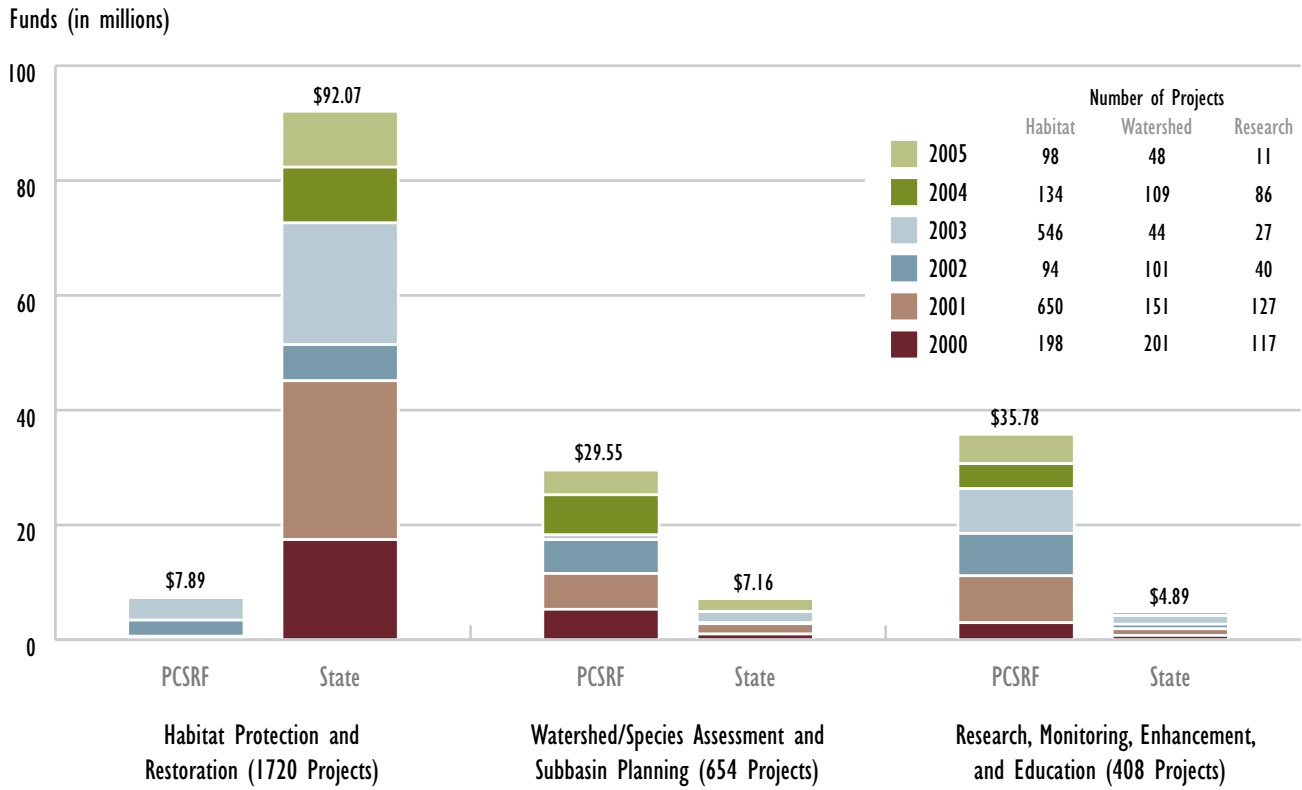
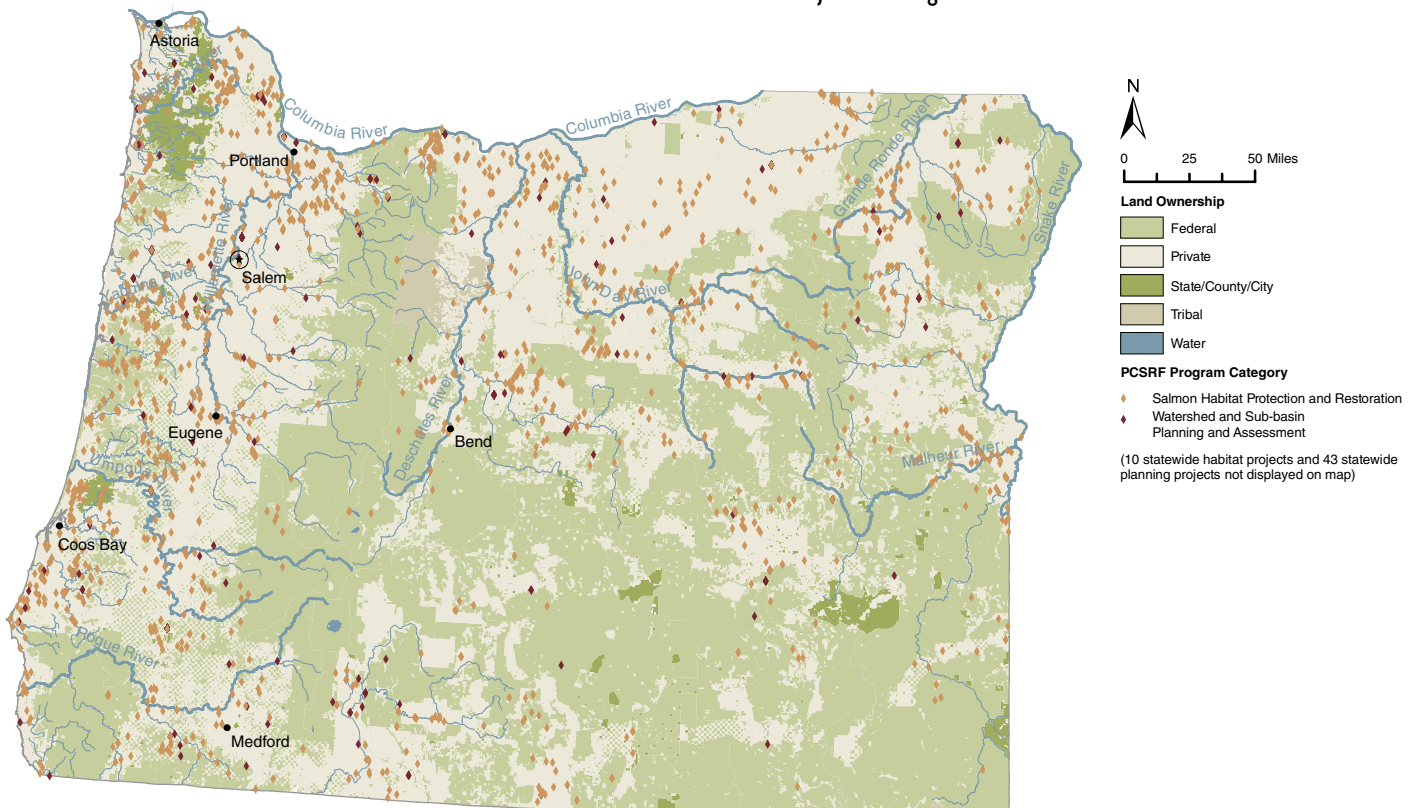


Exhibit 4-4: Locations of PCSRF Projects in Oregon



- » Returned 424 cubic feet per second of instream flow to rivers and streams in the state
- » Restored 254,704 acres of upland habitat and treated 21,206 miles of road
- » Restored 8,366 acres and 2,551 stream miles of riparian habitat
- » Restored 10,221 acres and created 1,870 acres of wetland habitat
- » Treated 6,889 acres of riparian habitat for invasive species
- » Protected 49,589 acres and 146 stream miles through land acquisition, easement or lease

More information about Oregon's salmon conservation and restoration efforts is available at the Oregon Plan for Salmon and Watersheds Website at <http://www.oregon-plan.org/> and from OWEB at <http://oregon.gov/OWEB/>.



Oregon: Technical Assistance Projects

One of Oregon's unique uses of the PCSRF funds is the provision of technical assistance to grant applicants to enhance the quality of restoration projects. During FY 2004–2005 Oregon allocated about 25% of its PCSRF funding to provide local technical assistance. Since 2000, the state allocated approximately \$7.4 million in PCSRF funds toward activities such as project design, engineering and construction plans. The technical assistance ensures projects are of high quality and possess a high likelihood of success. The technical assistance function has helped Oregon move a larger number of projects through the grant funding cycle. Continued growth of the state's primary capital project fund source—the Oregon Lottery—has provided the opportunity to increase the number and size of on-the-ground projects. Typical projects benefiting from technical assistance include urban impact reduction, stream corridor rehabilitation, fish passage improvement, and riparian, instream and wetland improvements.

Technical Assistance: Scappoose Bay Fish Passage Project



Before



After

California

California distributes its PCSRF funds together with state matching funds through a competitive grant program managed through the California Department of Fish and Game (CDFG). The majority of PCSRF and state matching funds for California are directed to habitat restoration and protection projects primarily in the coastal regions of the state because they are critical to salmon survival and productivity.

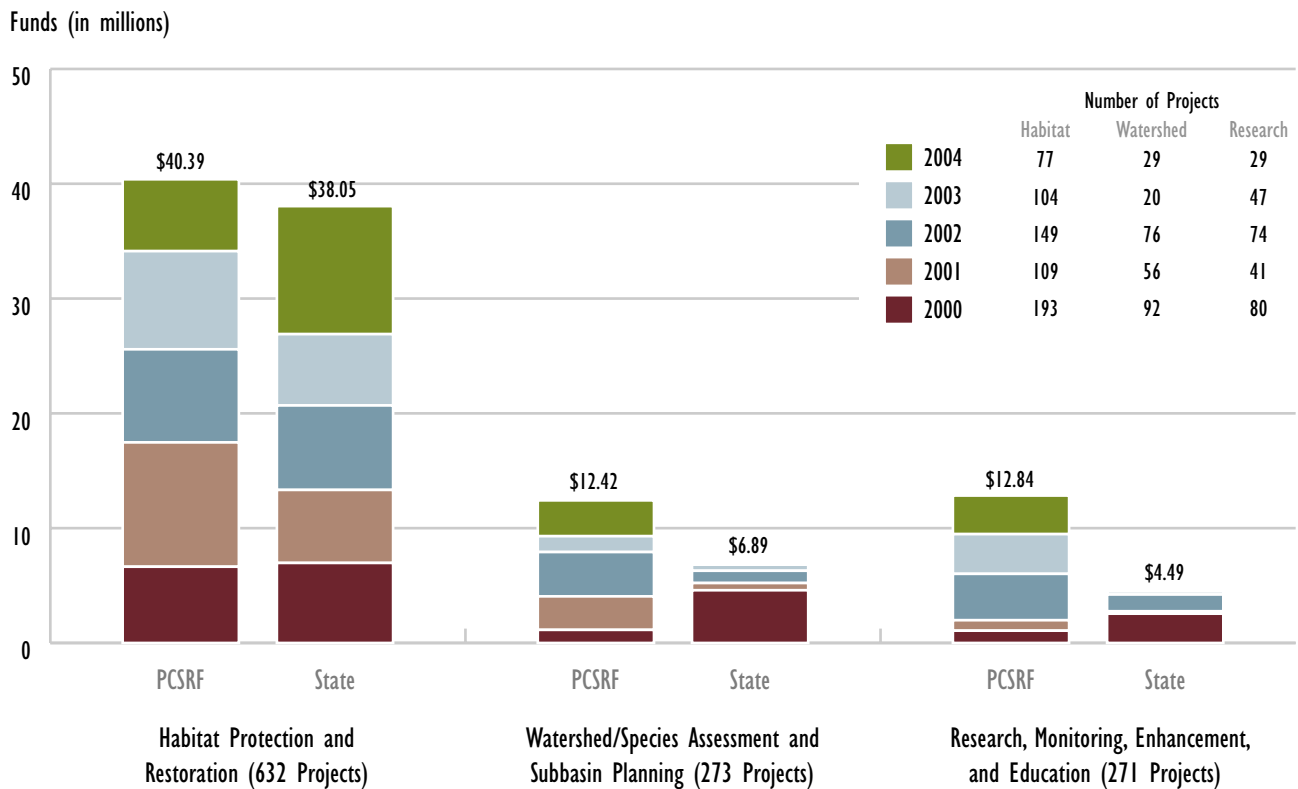
Exhibit 4-5 shows that approximately \$65 million in PCSRF funds and \$49 million in state match funds from FY 2000-2004 were committed to salmon conservation and restoration activities (60% state match). California's competitive grant distribution process ends in June of the year following receipt of PCSRF funds. The FY 2005 fund commitments are not included in this Report. California initiated the committing of FY 2005 PCSRF funds in February 2006, and will complete the process in June 2006.

Since FY 2000, through the programs and activities enacted through PCSRF and state funds, California has accomplished the following in its efforts to increase and improve salmon habitat:

- » Removed 294 fish passage barriers opening 389 miles through culvert removal and 75 miles through other barrier removal
- » Restored 57 miles of instream habitat
- » Treated 874 miles of road and restored 659 acres of upland habitat
- » Restored 273 acres and 130 stream miles of riparian habitat
- » Protected 26,258 acres through land acquisition, easement or lease

Exhibit 4-6 shows the location of state and tribal projects funded by PCSRF and state matching funds in California.

Exhibit 4-5: California Distribution of PCSRF and State Matching Funds FY 2000-2004



California: Van Duzen River Riparian Habitat Restoration

In 2003, the California Department of Fish and Game (CDFG), with a collaboration of governmental agencies, watershed groups, and private companies, used PCSRF funds to address and restore a 600-foot long by 18-foot high rapidly eroding bank along the Van Duzen River owned by Humboldt County Parks. Members of the collaborative stakeholder group included Humboldt County Parks, the Eel River Watershed Improvement Group, Pacific Lumber Company, Environmental Restoration Services, California Department of Fish and Game, California Conservation Corps, and the Natural Resources Conservation Service.

The degraded bank contributed to excessive sediment in the river, concentrating instream flow on a length of river bank that lacked natural vegetation. This in turn resulted in repeated riverbank failure and loss of old growth redwoods, further deteriorating the watershed.

The restoration efforts along the riverbank involved securing large wood and positioning boulders to slow water velocities and trap sediment. Since completion, trapped sediment is rebuilding the once eroding bank and providing substrate for native riparian plant and tree species. The secured logs have promoted the scouring of deep pool habitat which is utilized by both adult and juvenile salmonids as they migrate up and downstream. In 2005, additional boulder work was completed to protect the upstream end of the bank and help retain critical large instream wood.

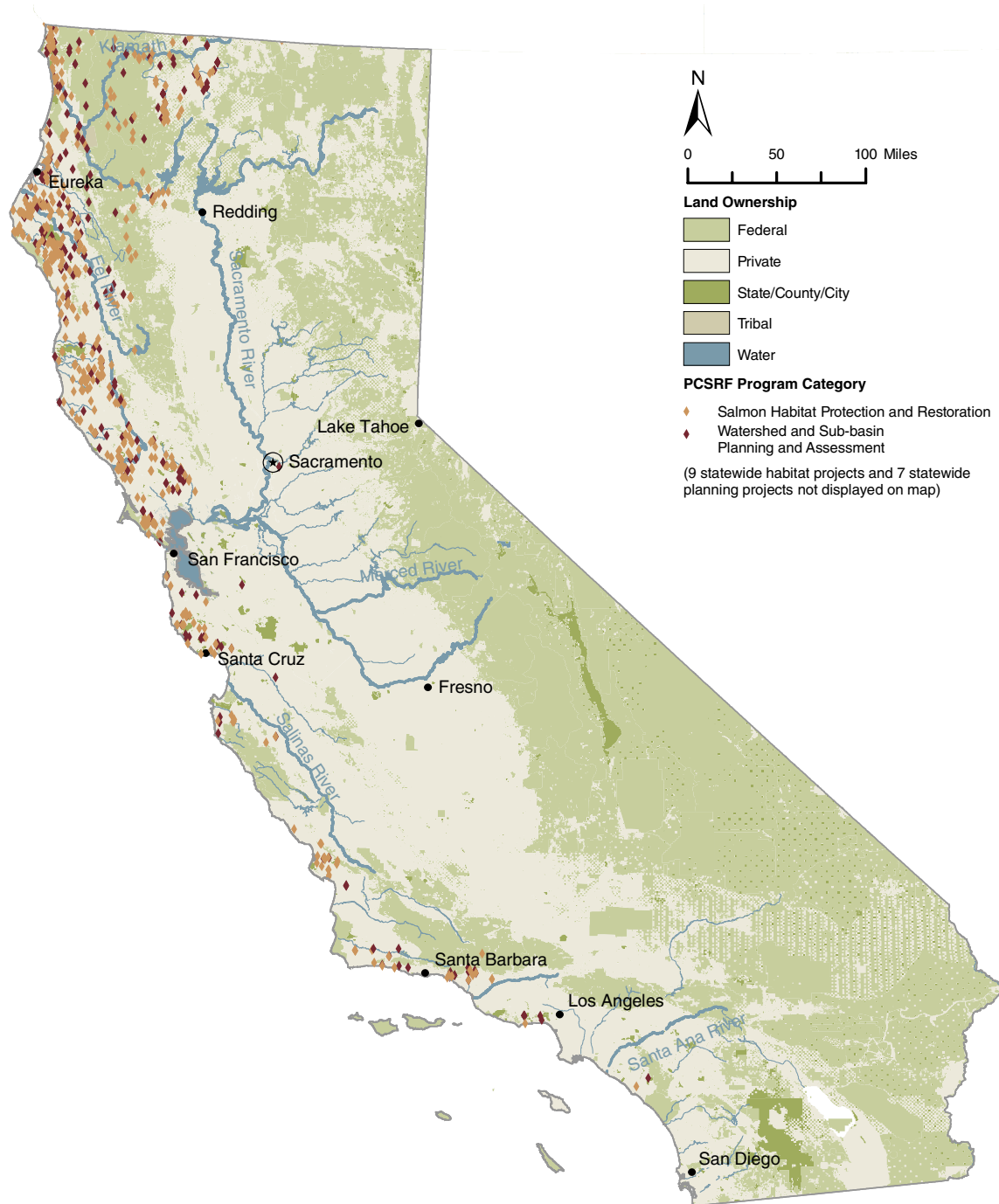


The photo on the left was taken in April 2003 showing the eroding stream bank and lack of riparian vegetation. The photo on the right was taken in December 2005 showing increased riparian vegetation.



The photo on the left was taken in April 2003 showing vulnerable bank and cover habitat provided by the logs. The photo on the right was taken in December 2005 showing more stabilized banks.

Exhibit 4-6: Locations of PCSRF Projects in California



Idaho

The state of Idaho administers the PCSRF funds for salmon recovery projects through the Office of Species Conservation (OSC). Since inception in FY 2004, the Idaho OSC has committed approximately \$8.7 million in PCSRF funds and \$3.1 million in state matching funds to PCSRF projects (36% state match). The majority of funds have been directed toward salmon habitat protection and restoration projects in Idaho. Exhibit 4-7 depicts the distribution of funds in Idaho from FY 2004-2005.

Idaho PCSRF projects have achieved the following to improve the quality and quantity of habitat available to salmon:

- » Removed 40 fish passage barriers opening 139 stream miles through culvert removal and 159 stream miles through other barrier removal
- » Returned 234 cubic feet per second of instream flow to stream and rivers in the state
- » Treated 66 miles of road and restored 1,525 acres of upland habitat
- » Restored 450 acres of riparian habitat
- » Protected 1,800 acres of habitat through land acquisition, easement, or lease

The location of state and tribal projects in Idaho is shown in Exhibit 4-8. More information about Idaho's salmon and steelhead recovery efforts is available at http://osc.idaho.gov/list/salmon_steelhead.html.

Exhibit 4-7: Idaho Distribution of PCSRF and State Matching Funds FY 2004-2005

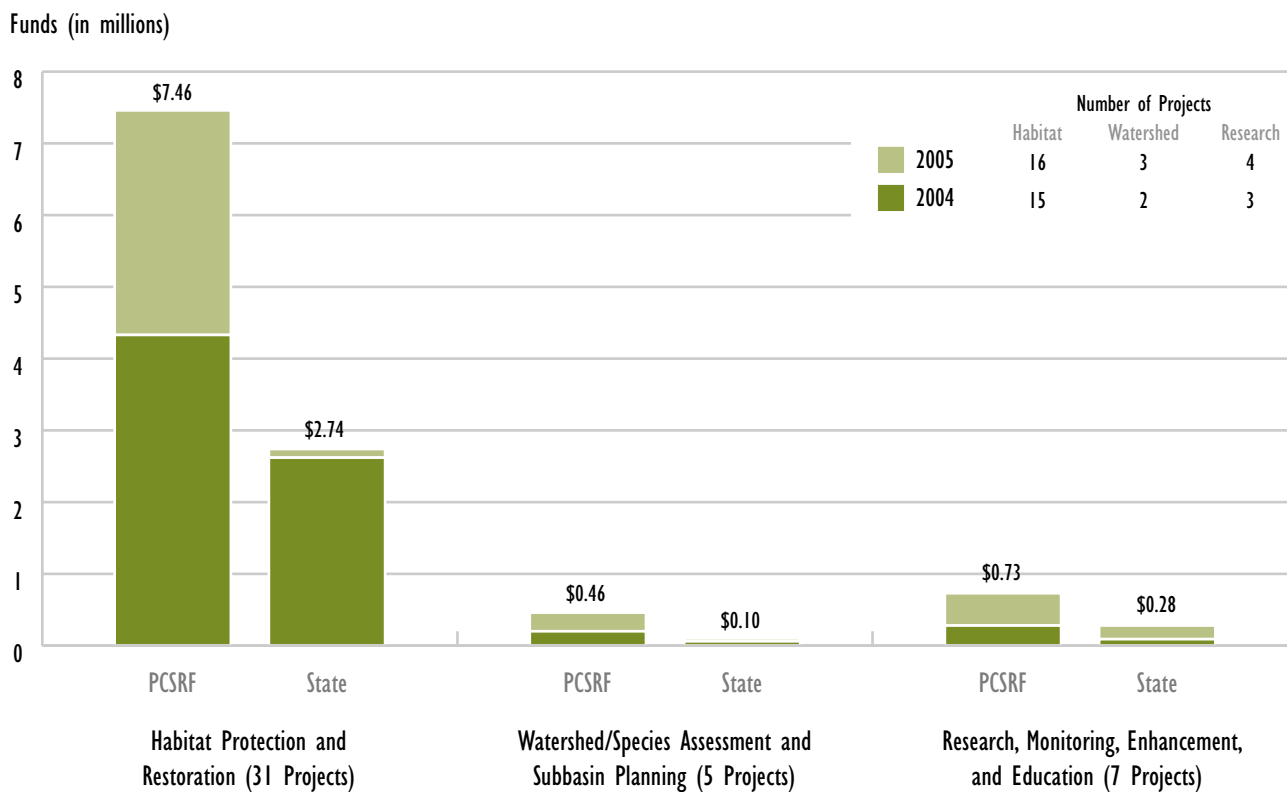
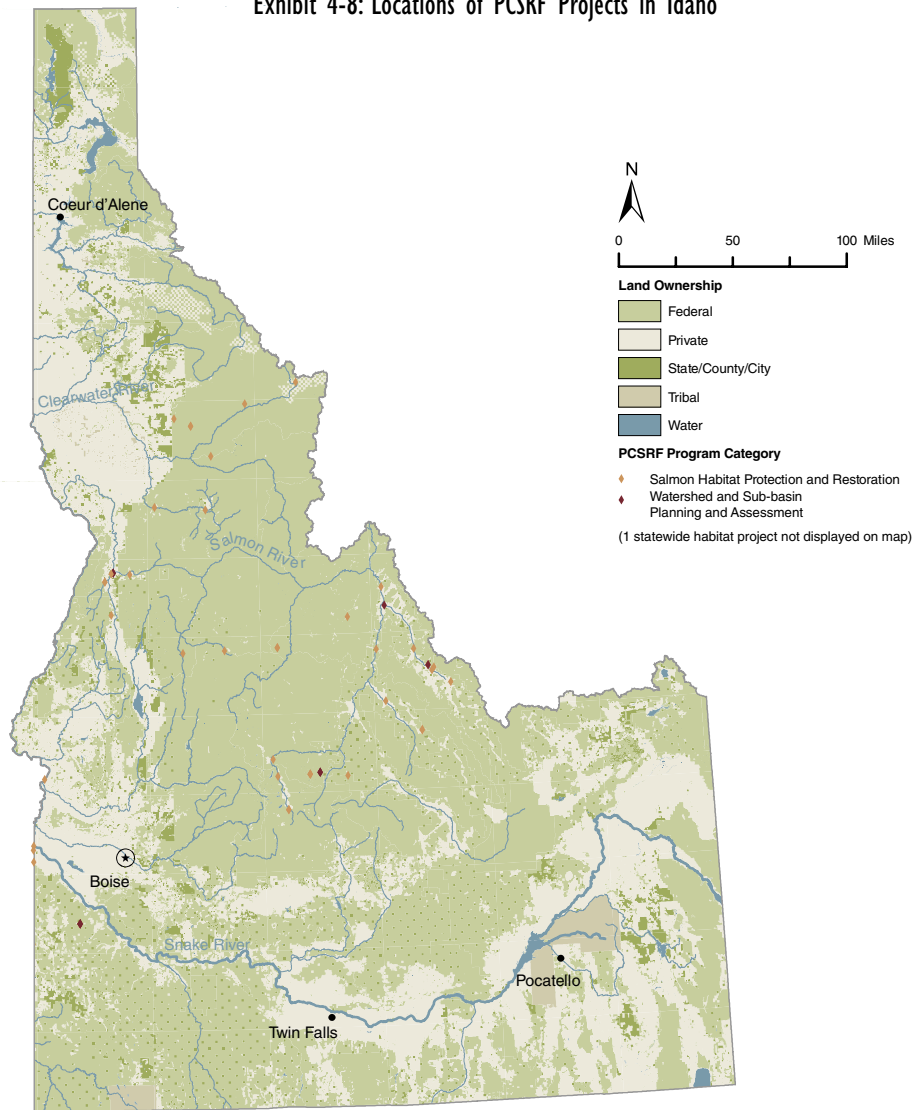


Exhibit 4-8: Locations of PCSRF Projects in Idaho



Idaho: Pahsimeroi River Watershed

With PCSRF support, The Nature Conservancy (TNC) purchased a 1,800 acre ranch in the Pahsimeroi Valley to protect a vital stretch of river, where approximately 40% of the Pahsimeroi's Chinook salmon spawning currently occurs. The Idaho Office of Species Conservation provided \$1,300,000 of PCSRF funds to TNC toward the acquisition of the \$3,350,000 ranch. The grant acted as the catalyst to create a partnership with the Idaho Department of Fish and Wildlife which secured a \$640,000 grant from the US Fish and Wildlife Service to purchase 200 acres of riparian habitat on the ranch. The various partners, including private ranchers, are working together to provide public access, manage grazing allotments, and promote the health of the river corridor by removing fish migration barriers, implementing water conservation measures, protecting sensitive riparian areas, and preventing habitat fragmentation. The project demonstrates how fish habitat conservation can be compatible with a viable family agricultural operation.



Alaska

The state of Alaska, through the Alaska Department of Fish and Game (ADFG), allocates the PCSRF funds and the state matching funds primarily toward research, monitoring, enhancement, and education projects. There are no ESA-listed salmon populations in Alaska, so PCSRF projects are established to help provide for the sustainability of Alaska's salmon resources and salmon habitat. This includes support for salmon-dependent communities in Alaska.

Many of Alaska's PCSRF funds have been Congressionally earmarked and directed toward specific projects that have included education, watershed assessment and planning, habitat restoration, research and monitoring, and stock enhancement. From FY 2000-2005, ADFG committed approximately \$97.3 million in PCSRF funds and \$10.6 million in state matching and in-kind funds. The distribution of funds is shown in Exhibit 4-9.

Projects funded with FY 2000-2005 PCSRF and state matching funds in Alaska have contributed to maintaining sustainable fisheries and improving management practices. Projects have:

- » Restored 3,877 acres of wetland habitat
- » Monitored 7,180 stream miles through research, monitoring, and evaluation projects.
- » Marked 188 million hatchery fish for stock management
- » Incorporated 481 research findings to make Pacific Salmon Treaty abundance-based management decisions.

The location of projects throughout Alaska is shown in Exhibit 4-10. More information about Alaska's salmon recovery efforts is available at <http://www.adfg.state.ak.us/special/sssf.php>.

Exhibit 4-9: Alaska Distribution of PCSRF and State Matching Funds FY 2000-2005

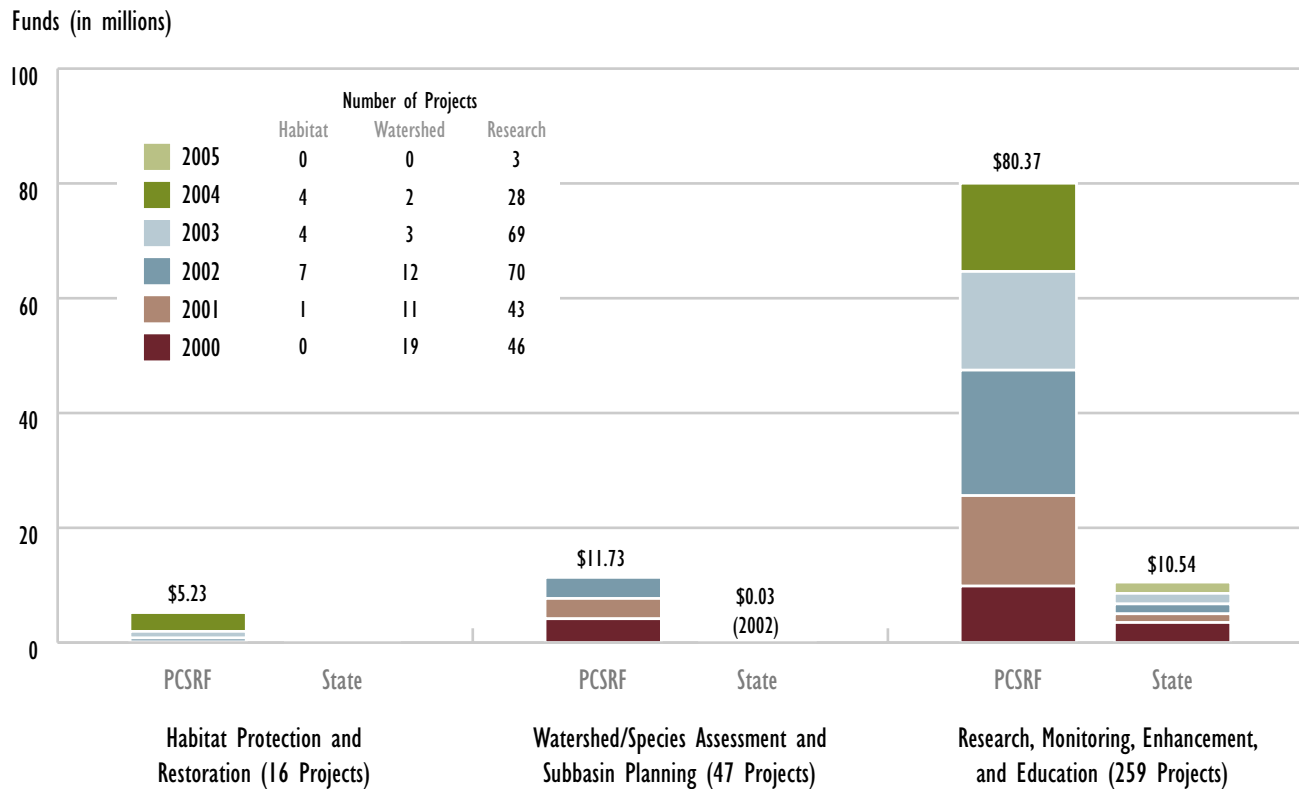
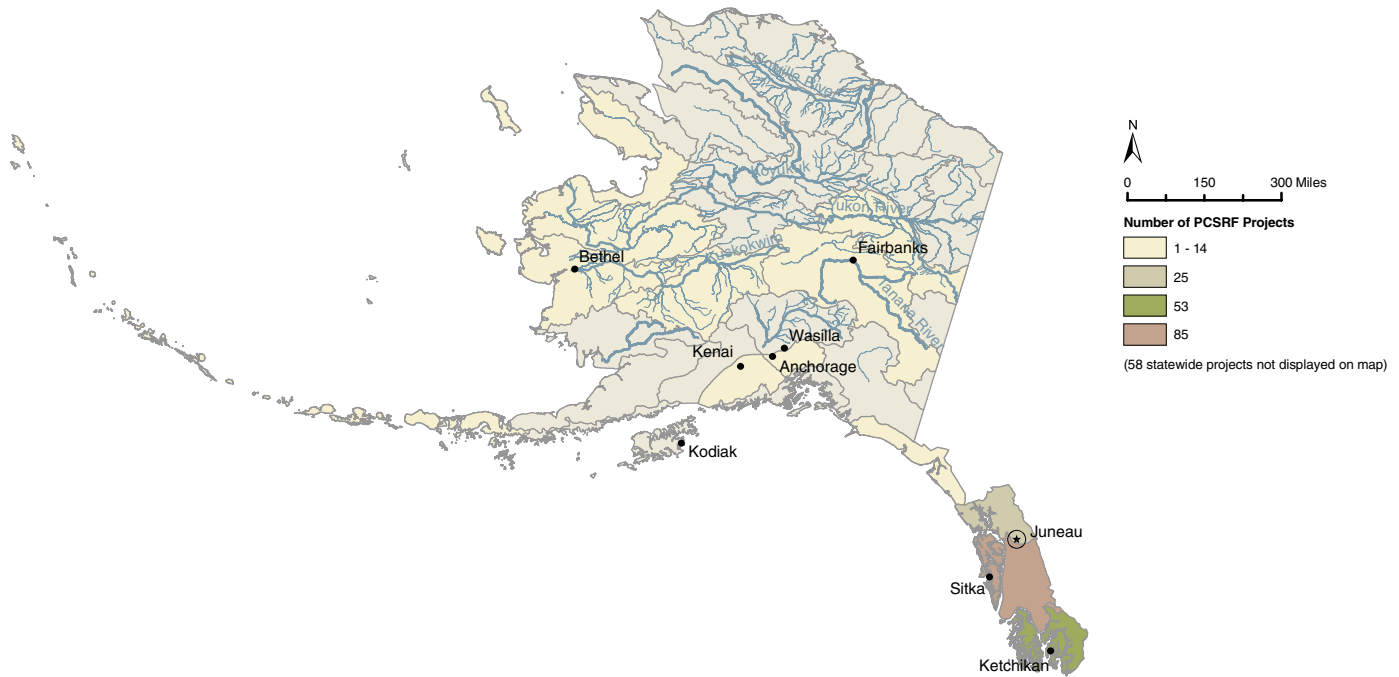


Exhibit 4-10: Locations of PCSRF Projects in Alaska



Alaska: Wild Salmon Education

The publication "Alaska's Wild Salmon" is the centerpiece for the Alaska Department of Fish & Game aquatic and salmon education program. The publication is an educational tool appropriate for middle and high school students; media, policy makers, salmon fishery organizations, and other stakeholders both within and outside of Alaska. The comprehensive publication provides a thorough understanding of Alaska's sustainable salmon resources and their long-standing importance to the culture, economy, communities, ecosystems, and health of Alaskans. The publication includes chapters on salmon biology, salmon habitat, salmon management and research, and the harvest and use of salmon resources.

"Alaska's Wild Salmon" was completed in the fall of 2002. A total of 50,000 copies were produced in two printings, with approximately 70% distributed to educators. All Anchorage School District high school students are using the publication as part of the mandatory Alaska Studies curriculum. A Teachers Guide, completed in 2004, is posted online and is used by educators to accompany the book. The guide is available at <http://www.sf.adfg.state.ak.us/statewide/AquaticEd/adfgteacherguide/home.html>.



Columbia River Tribes

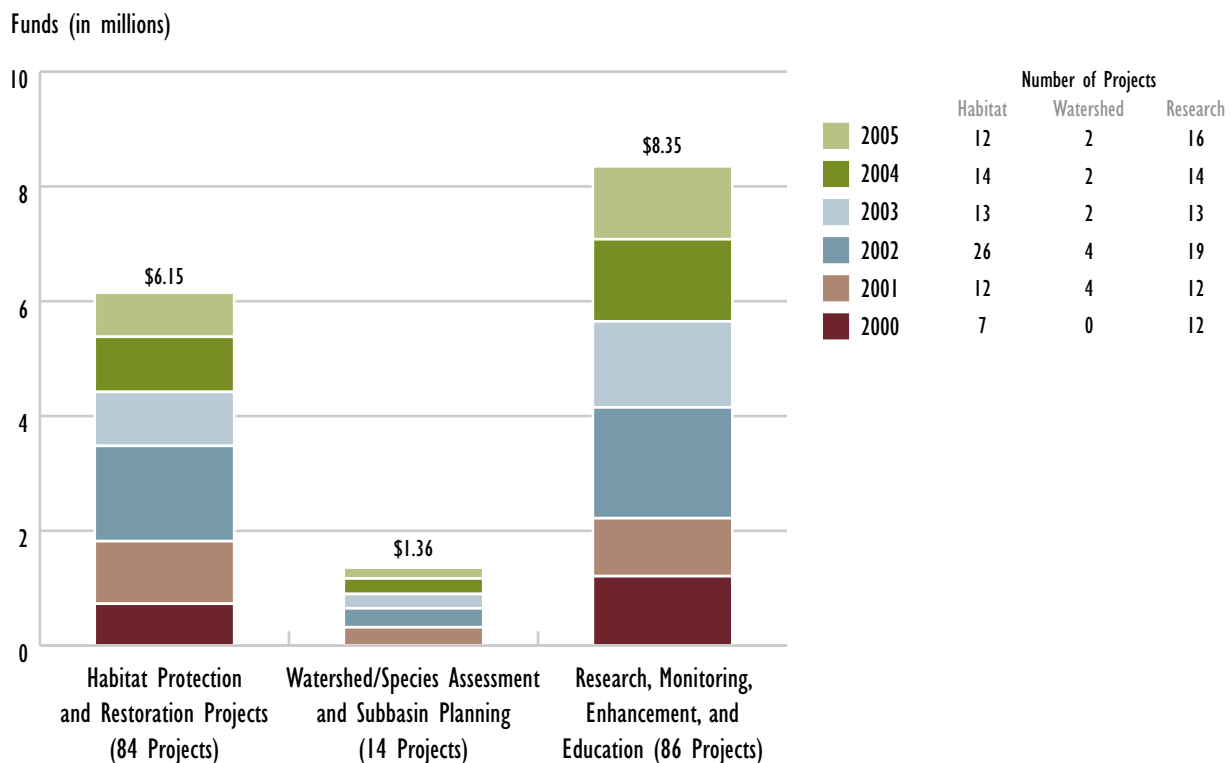
PCSRF provides direct funding to Columbia River tribes including four Columbia River Inter-Tribal Fish Commission (CRITFC) member tribes, the Colville Confederated Tribes, and the Shoshone-Bannock Tribes. CRITFC acts as a technical support and coordinating agency and administers PCSRF funds for the Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation.

As of March 2006, the Columbia River tribes have committed approximately \$15.8 million in PCSRF funds, with projects split about equally between habitat protection and restoration projects and research, monitoring, enhancement, and education projects in the Columbia River basin. Exhibit 4-11, displays the distribution of PCSRF funds for the Columbia River tribes in Washington, Oregon, and Idaho.

The Columbia River tribes have conducted the following activities to improve habitat conditions for salmon through the PCSRF funded projects since FY 2000:

- » Removed 34 fish passage barriers opening 103 stream miles through culvert removal and 146 stream miles through other barrier removal
- » Restored 74 miles of instream habitat
- » Restored 1,030 acres and 251 stream miles of riparian habitat
- » Restored 100 acres of wetland habitat
- » Treated 425 acres of riparian habitat for invasive species
- » Protected 12,033 acres of habitat through land acquisition, easement or lease

Exhibit 4-11: Columbia River Tribes Distribution of PCSRF Funds FY 2000-2005



Columbia River Tribes: Nason Creek Wetlands Acquisition Project

The Confederated Tribes and Bands of the Yakama Nation, one of the Columbia River Inter-Tribal Fish Commission (CRITFC) tribes, allocated PCSRF funds for the purchase of a 26-acre beaver dam wetlands complex of the Nason Creek floodplain within the Wenatchee River Subbasin in Washington. The acquisition will allow the Yakama Nation Fisheries personnel to protect, enhance and manage the site to provide for salmon passage to spawning areas and over-winter rearing habitat for coho salmon, steelhead, and ESA-listed spring Chinook salmon. Due to the development of the river corridor, the loss of off-channel habitat has been identified as a limiting factor to these ESA-listed fish in the Wenatchee Sub-basin Plan.

No beaver dams will be removed in the project area. Through management of the beaver dams and water levels, adult migration through the property at appropriate times will be possible. Alternative methods such as notches, culverts, fish ladders, and weirs will allow upstream access. Approximately 3 miles of spawning and rearing habitat will be made accessible.

In coordination with the cooperating agencies of Washington Department of Fish and Wildlife and the Chelan Public Utility District, stream channel and riparian habitat monitoring and evaluation (M&E) will be conducted by Yakama Nation Fisheries personnel over the length of the entire site. Spawning ground surveys of returning adult salmon utilizing the new habitat started in the fall of 2005. Data collection beginning in mid 2006 will include snorkel surveys to estimate juvenile salmonid populations.



Pacific Coastal Tribes

The PCSRF funds for Pacific Coastal tribes have been distributed to 29 tribes and their tribal commissions along the Pacific Coast in Washington, Oregon, and California. The PCSRF funding has been distributed to the Northwest Indian Fisheries Commission (NWIFC) on behalf of 20 western Washington treaty Indian tribes¹⁰; to the Klamath River Inter-Tribal Fisheries and Water Commission (KRITFWC) on behalf of four Klamath River Basin tribes (Hoopa Valley Tribe, The Karuk Tribe of California, Yurok Tribe, and The Klamath Tribes); and to the Round Valley Indian tribes in the Eel River Basin in California; the Confederated Tribes of the Chehalis Reservation in Washington; the Coquille Indian Tribe in Oregon; the Confederated Tribes of Grand Ronde in Oregon; and the Confederated Tribes of the Siletz Indians of Oregon.

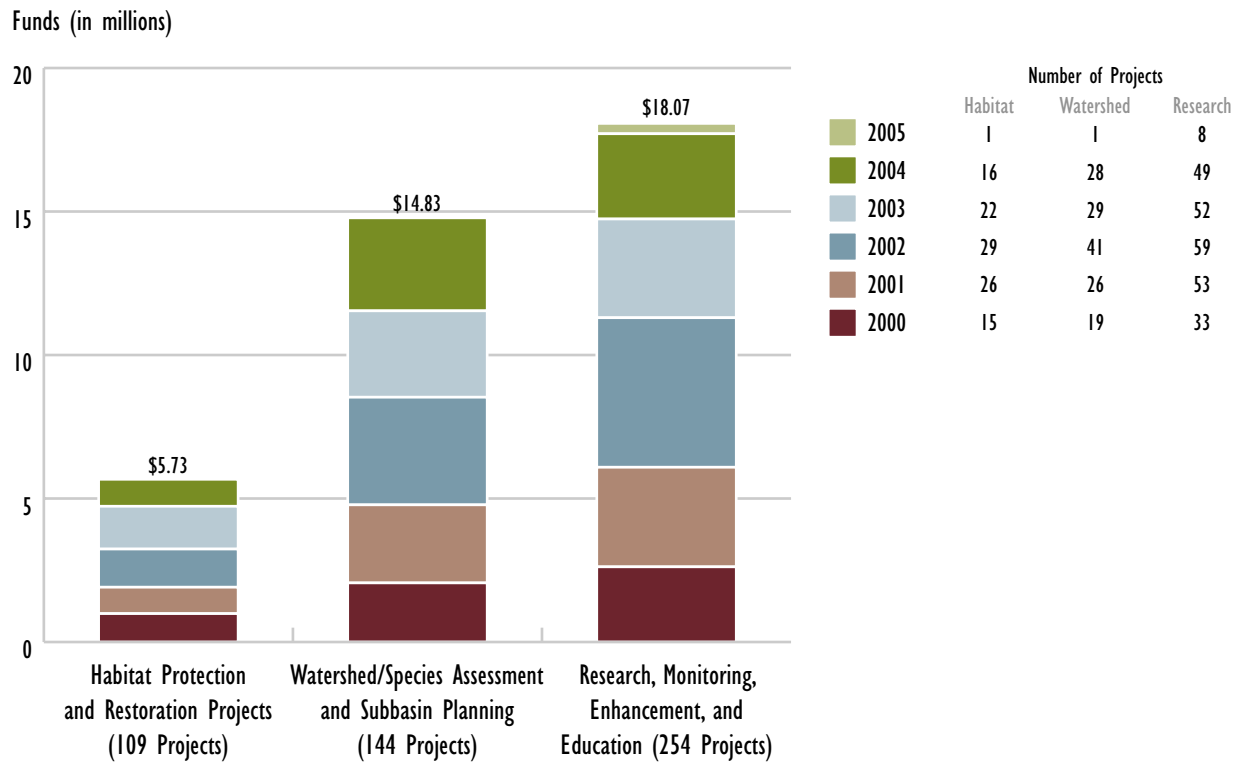
The Pacific Coastal tribes committed approximately \$38.6 million in PCSRF funds toward salmon conservation and recovery as of March 2006. Most of the funds were allocated toward research, monitoring, enhancement, or outreach projects in Puget Sound and the Klamath River basin. Coordination, planning, and research and monitoring conducted by the tribes with PCSRF resources are essential elements of successful habitat restoration efforts. The distribution of funds is displayed in Exhibit 4-12.

The Pacific Coastal tribes have contributed the following to improve habitat conditions for salmon through PCSRF funded projects since FY 2000

- » Removed 79 fish passage barriers, opening 47 stream miles through culvert removal
- » Restored 282 miles of instream habitat
- » Treated 42 miles of road and restored 92 acres of upland habitat
- » Restored 747 acres and 113 stream miles of riparian habitat
- » Restored 129 acres of estuarine habitat
- » Protected 288 acres of habitat through land acquisition, easement, or lease.

¹⁰ Nisqually, Squaxin Island, Puyallup, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam, Skokomish, Swinomish, Sauk-Suiattle, Upper Skagit, Tulalip, Makah, Stillaguamish, Muckleshoot, Suquamish, Nooksack, Lummi, Hoh, Quinalt, and Quileute tribes.

Exhibit 4-12: Pacific Coastal Tribes Distribution of PCSRF Funds FY 2000-2005



Pacific Coastal Tribes: Jimmy Come Lately Creek Restoration

The PCSRF and the Washington State Salmon Recovery Funding Board (SRFB) have supported planning and design, land acquisition, and construction for the restoration of Jimmy Come Lately Creek and its South Sequim Bay Estuary led by the Jamestown S'Klallam Tribe through a cooperative, multi-agency effort.

Located on the Olympic Peninsula in Washington State, Jimmy Come Lately Creek and South Sequim Bay Estuary faced significant land and stream channel alterations, contributing to increased flooding and declining salmon populations. Project implementation started with the acquisition of 25 acres of land at the mouth of the creek. Creek restoration entailed excavation of a new sinuous channel to relocate the riverbed into a historic channel, construction of a new Hwy 101 bridge, and re-vegetation of riparian areas with native trees and shrubs. Estuary restoration included removal of a log yard, two roads, and fill and structures from three other properties that constricted natural streamflow and tidal processes. These efforts will allow for the regrowth of natural eelgrass beds and salt marshes critical for salmon survival. Major construction was completed in 2005.

With the natural floodplain and salt marsh connection restored, Jimmy Come Lately Creek will provide essential freshwater and marine habitat for coho salmon, steelhead, and ESA-listed summer chum salmon. PCSRF funding will also support continued monitoring of the project to quantify the increase in local salmon abundance and ensure the effort produces the intended results.





Chapter 5: Conclusions

Pacific salmon bring considerable ecological, economic, and cultural value to the watersheds and regions they inhabit along the west coast of the United States. Through their unique life cycle and migration, salmon contribute to the balance of ecosystems, providing valuable food resources for harvest by humans and wildlife. Vibrant salmon runs are also strongly tied to the culture and heritage of many people, especially Native American tribes. For these reasons, and the intrinsic value of the species, the PCSRF has supported state, tribal, and local partners to help reverse the declining trends experienced in salmon populations over the past several decades.

Since program inception in 2000, the PCSRF has been focused on the goal of restoring and conserving salmon habitat, conducting assessments, developing recovery plans, monitoring, educating, and developing more effective management practices to help overall sustainability of the species, both ESA-listed and non-listed salmon. Exhibit 5-1 shows the allocation of funds, including state matching funds, by program category to over 5,600 state and tribal projects. Exhibit 5-2 depicts the distribution of these various projects throughout the PCSRF region.

In concert with implementing projects and activities to restore salmon, the PCSRF has been developing and improving measures for assessing program performance. As described earlier, NMFS and the states and tribes have developed a Performance Reporting Framework to provide a means to track results of the PCSRF investments and progress toward the desired outcomes of salmon restoration and conservation. Next steps will include expanded monitoring and evaluation (M&E) efforts and further collection and organization of the M&E data in the Pacific Coast region that contribute to assessing both region-wide and recovery domain-specific measures. This may include information such as the following:

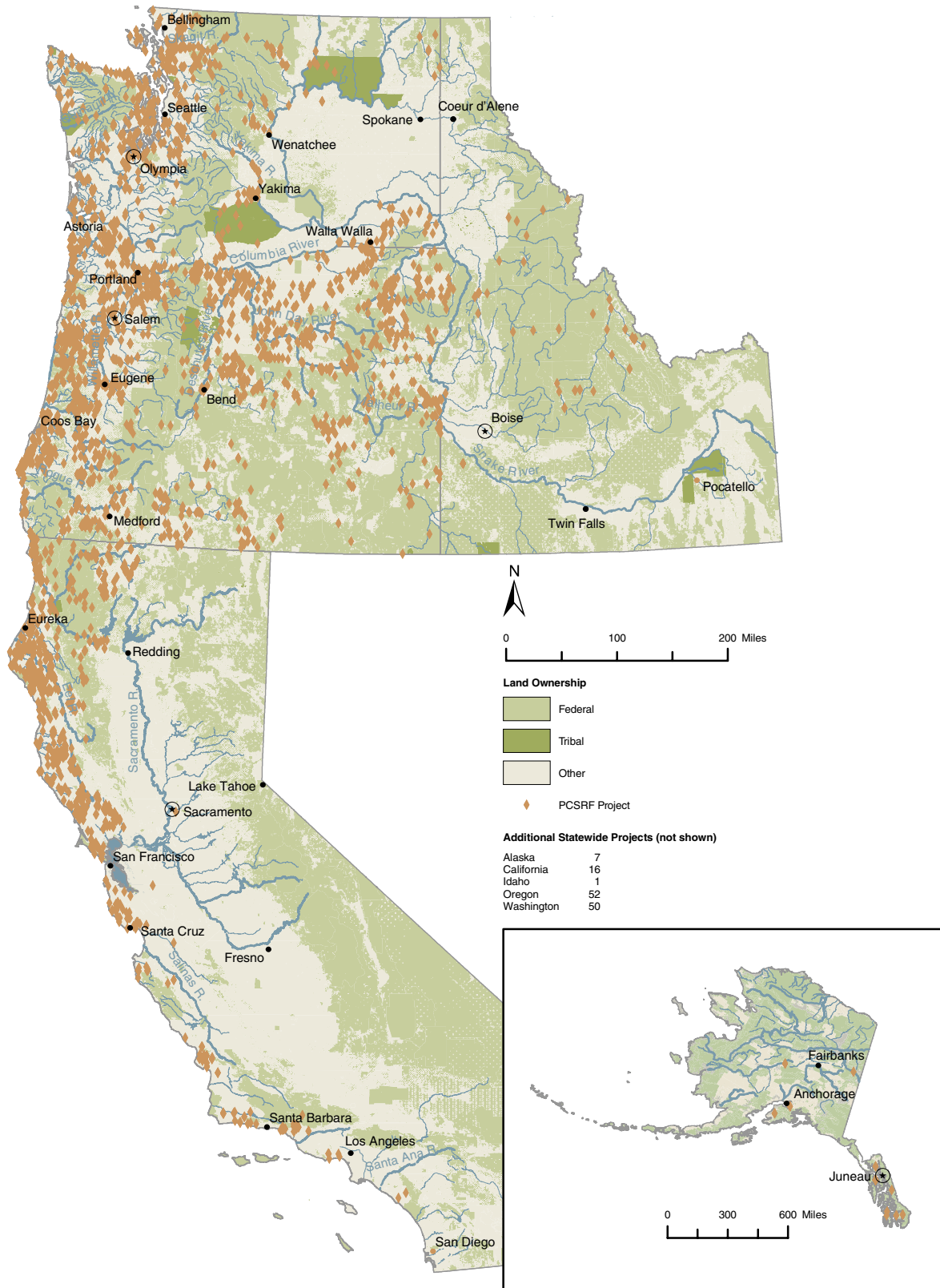
- » Trends in land use conversion and land use/land cover
- » Trends in instream flow and water temperatures
- » Trends in riparian vegetation and canopy cover
- » Miles of newly inhabited spawning ground

On-going improvements and refinements in program performance measures will assist in improving allocation of the PCSRF and state resources to further overall goals of the effort. NMFS, states, and tribes are committed to making this effort and sustaining Pacific Coast salmon populations.

Exhibit 5-1: PCSRF and State Funds Committed by Program Category (in millions)

| | Habitat Protection & Restoration (3,009 projects) | Watershed Assessment & Subbasin Planning (1,331 projects) | Research, Monitoring, Enhancement, & Education (1,320 projects) |
|--------------------------------------|--|--|--|
| Washington | \$74.25 | \$36.19 | \$27.24 |
| Oregon | \$7.89 | \$29.55 | \$35.78 |
| California | \$40.39 | \$12.42 | \$12.84 |
| Idaho | \$7.46 | \$0.46 | \$0.73 |
| Alaska | \$5.23 | \$11.73 | \$80.37 |
| Columbia River Tribes | \$6.15 | \$1.36 | \$8.35 |
| Pacific Coastal Tribes | \$5.73 | \$14.83 | \$18.07 |
| Total PCSRF Funds | \$147.10 | \$106.54 | \$183.38 |
| Total State Matching Funds | \$171.87 | \$37.89 | \$26.41 |
| Total PCSRF & State Funds | \$318.97 | \$144.43 | \$209.79 |

Exhibit 5-2: PCSRF Projects Throughout the Region

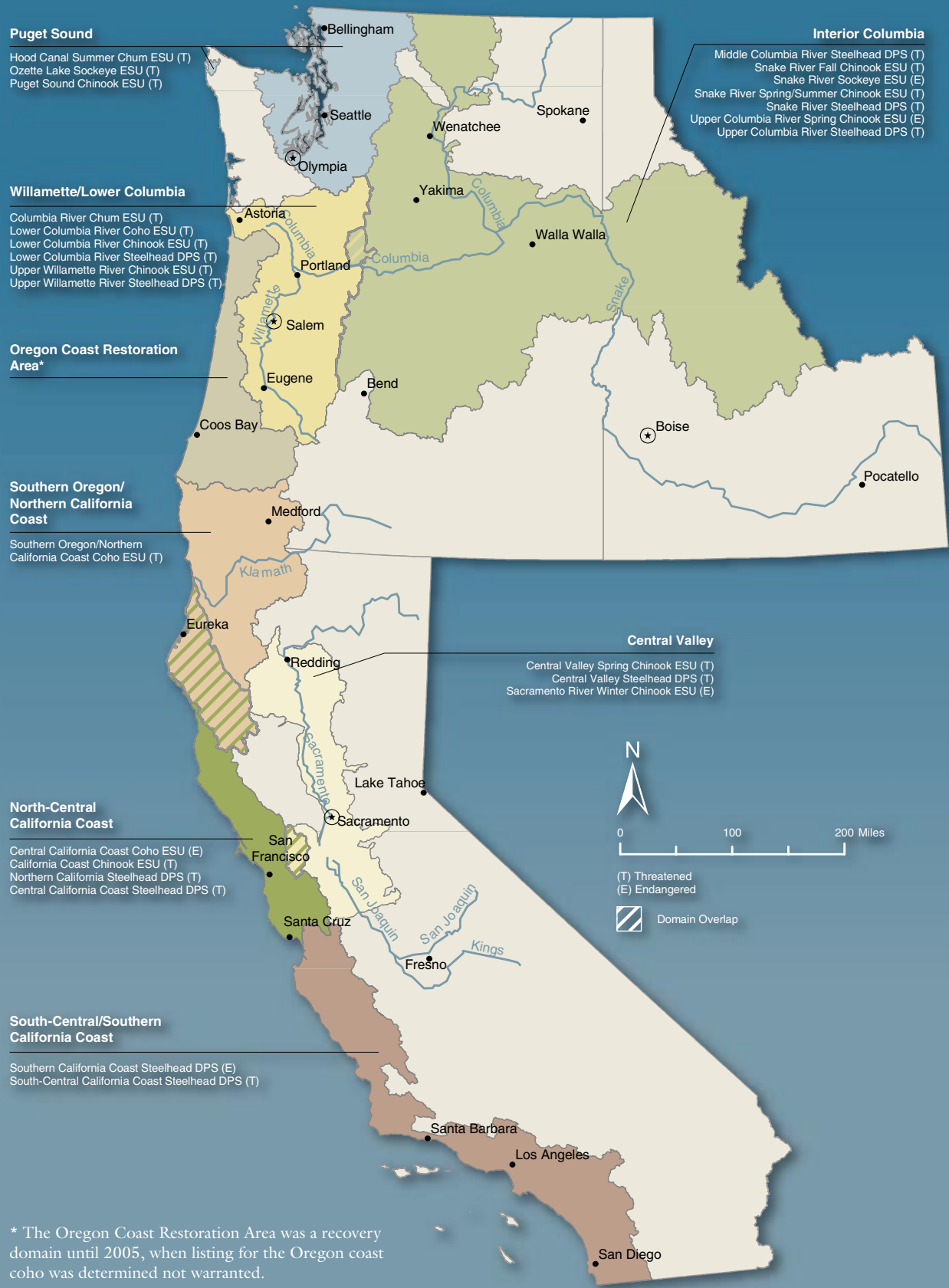




NMFS is fully committed to continuing cooperation with the states and tribes to improve PCSRF program performance, and to develop and implement recovery plans that provide the “roadmap” for effective use of PCSRF funds in achieving recovery and restoration of Pacific salmon populations. Federal government support for the PCSRF program goals is evident by the Administration’s requests totaling \$570M for the PCSRF program through FY 2005, and Congressional appropriations totaling \$525M in response.

The Administration continues its support of the PCSRF program requesting \$66.8M for FY 2007, approximately the same level as FY 2006. The President’s FY 2007 Budget request for PCSRF directs that the FY 2007 funds be used “for projects necessary for restoration of salmon and steelhead populations that are listed as threatened or endangered, or identified by a State as at-risk to be so-listed, for maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing, or for conservation of Pacific Coastal salmon and steelhead habitat, based on guidelines to be developed by the Secretary of Commerce.”

Pacific Salmon and Steelhead Recovery Domains



* The Oregon Coast Restoration Area was a recovery domain until 2005, when listing for the Oregon coast coho was determined not warranted.

