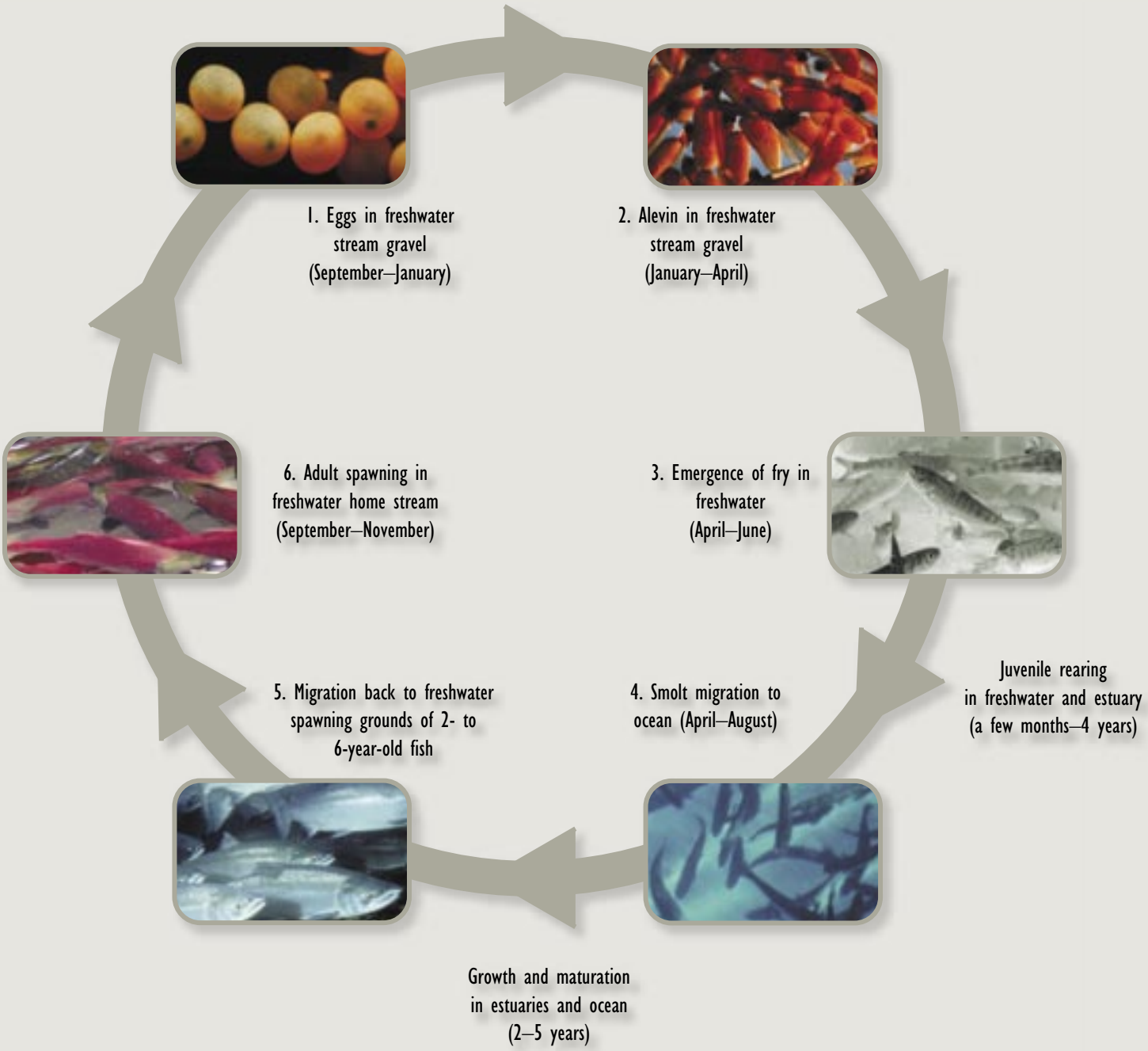
2007 Report to Congress

Pacific Coastal Salmon Recovery Fund

FY 2000–2006

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.

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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

The 2007 Pacific Coastal Salmon Recovery Fund (PCSRF) Annual Report to Congress (Report) presents the PCSRF activities and achievements accomplished from program inception in Fiscal Year (FY) 2000 to November 30, 2006. This Report provides a detailed account of program funding allocation to state and tribal grantees and annual performance as measured with the *Pacific Coastal Salmon Recovery Fund Performance Goals, Measures, and Reporting Framework* (Framework). The Framework was developed to track progress toward objectives for salmon recovery and conservation and to help track the effects of completed projects on salmon conservation and recovery.

The PCSRF was created by Congress in FY 2000 to address the need to protect, restore, and conserve Pacific salmon, and steelhead, and their habitat in the states of Washington, Oregon, California, Idaho, and Alaska. From FY 2000 to FY 2006 Congress has appropriated over $590 million to the PCSRF. The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) administers annual appropriations allocating PCSRF federal funds to the five states in the region as well as the Pacific Coast and Columbia River tribes. The states and tribal entities each have a Memorandum of Understanding with NMFS for distributing their PCSRF federal funds to projects for salmon and salmon habitat conservation and recovery. The PCSRF also leverages significant state-matching funds and in-kind contributions such as volunteer participation for salmon restoration projects.

Through the PCSRF, the states and tribes have invested in priority activities for salmon recovery identified through state and federal limiting factor assessments and conservation planning. Projects include salmon habitat protection and restoration; watershed and species assessments to determine limiting factors for salmon recovery; recovery plan development; salmon enhancement and supplementation; outreach, education, and technical assistance; and research, monitoring, and evaluation of status and outcomes of recovery actions. Over 6,300 projects have been funded, with the majority involving habitat protection and restoration efforts.

Over the past few years, NMFS and the states and tribes worked to develop and implement the Framework to assess the PCSRF performance and progress on six short-, mid-, and long-term program goals. The goals of the Framework are outlined in Chapter 1. These goals support the recovery of Endangered Species Act (ESA)-listed salmon Evolutionarily Significant Units (ESUs) and steelhead Distinct Population Segments (DPSs).

Goals

Long-term (more than 15 years)
- Overall sustainability of Pacific salmon

Mid-term (5-15 years)
- Improved status of ESA-listed salmon (naturally spawning populations increased)
- Maintained healthy salmon populations

Short-term (less than 5 years)
- Enhanced availability and quality of habitat
- Improved management practices
- Major habitat limiting factors addressed

Performance

From the inception of the PCSRF, data have been collected and measures developed to provide indicators of progress toward the program goals. Significant progress has been made in habitat protection and recovery since program inception. While some salmon populations are showing signs of improvement, it could be several salmon generations (3–5 years) before the effects of habitat changes through PCSRF will show as increasing salmon populations. Some indicators of performance through 2006 are as follows:

Mid-term
- 16 ESA-listed salmon ESUs/DPSs show stable or increased population trends

Short-term
- More than 532,000 acres of habitat improved or made available, including
  - more than 401,000 acres of habitat treated and restored
    - more than 21,600 acres of riparian
    - more than 379,800 acres of upland
  - more than 9,000 acres of wetland and estuarine habitat created
    - more than 7,500 acres of wetland
    - more than 1,500 acres of estuarine
  - more than 17,000 acres of wetland and estuarine treated
    - more than 14,700 acres of wetland
    - more than 2,800 acres of estuarine
  - more than 104,000 acres of habitat protected through acquisition, easement, or lease
- Nearly 11,000 stream miles improved or made accessible
  - more than 5,000 miles opened
  - 4,200 miles treated (riparian)
  - 1,600 miles treated (instream)
- All fish harvests managed to conserve wild populations
- 76 percent of all habitat projects address major habitat limiting factors

Progress toward achieving goals outlined in the Framework is described in Chapter 2. Additional performance indicators for the six goals are further described and quantified in Exhibit 2-1. NMFS and the state and tribal grantees are also entering a second phase of performance reporting to develop a more rigorous monitoring and evaluation effort for program outcomes. This phase will encompass information sources beyond the PCSRF project reporting to better assess regional progress toward maintenance and sustainability of healthy salmon populations and their habitat.

Chapter 3 of this Report updates the status of recovery planning in each recovery domain and provides current trends and abundance for each ESA-listed salmon ESU and each steelhead DPS. The major factors limiting recovery for each ESU/DPS are highlighted and activities underway to address recovery needs in the respective recovery domains are described in this report. The grouping by recovery domain provides a regional focus on identifying recovery needs and implementing necessary actions for multiple ESUs/DPSs within an area.

Since program inception, the PCSRF has been used effectively by the states and tribes to recover declining salmon populations and improve deteriorated salmon habitat in streams and watersheds throughout the Pacific Coast region. Their activities are described in Chapter 4. Habitat conservation and restoration, improved knowledge and understanding of salmon viability, and prioritization of recovery actions are contributing to effective results. Through the PCSRF and efforts and contributions of state and tribal partners, progress is being made in the overall recovery of Pacific salmon. Chapter 5 summarizes the contributions and depicts the distribution of PCSRF projects. There are specific signs of improvement in salmon habitat and populations, but continued commitment and collaboration are required to achieve the overarching goal of full recovery and sustainability of Pacifi c salmon and steelhead.

Chapter 1: Introduction

Background

Congress created the Pacific Coastal Salmon Recovery Fund (PCSRF) in FY 2000 to address the listings of Pacific salmon[1] and steelhead populations under the Endangered Species Act (ESA), as well as the effects of the Pacific Salmon Treaty Agreement between the United States and Canada. Since program inception, an average of approximately $84 million per year has been appropriated for Washington, Oregon, Idaho, California, Alaska, and tribes to undertake salmon restoration and conservation activities in these states. The fund supports state, local, and tribal projects aimed at restoring and protecting salmon habitat critical to the various stages of the salmon life cycle (see inside front cover). The PCSRF is used not only to protect and restore salmon habitat, but also to conduct watershed assessments, plan restoration and recovery at various levels; enhance salmon populations; provide salmon education and technical assistance for constituencies; and conduct research, monitoring, and evaluation efforts. The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) administers the PCSRF and distributes the Congressional appropriations to the states and tribes in the Pacific Coast Region. The Congressional appropriations for FY 2000-2006 are displayed in Exhibit 1-1.

Salmon Restoration and Conservation

Both human and natural factors have contributed to the decline of Pacific salmon over the past century. Activities such as urban development, logging, grazing, hydropower, and agriculture have altered 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

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

Exhibit 1-1: 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

Note: PCSRF authorizations and appropriations have been provided by Congress in Public Law 109-108 (FY 2006), Public Law 108-447 (FY 2005), Public Law 108-199 (FY 2004), and Public Law 106-553 (FY 2001) which authorized funds through FY 2003.

conditions continue to threaten salmon and their habitat, even as programs such as the PCSRF seek to restore endangered and threatened salmon and protect other salmon populations from the threat of extinction.

Pacific salmon and steelhead are anadromous fish, meaning they spawn and rear in freshwater and spend their adult life in the open ocean. The habitat required by Pacific salmon through various life-stages includes the inland watersheds of rivers and streams leading to the sea, coastal estuaries and wetlands, and the Pacific Ocean. At the end of their life cycle, salmon return to spawn in their birth stream, thus isolating them into genetically distinct populations that have evolved over time based on geography and other factors. These individual populations are grouped into Evolutionarily Significant Units (ESUs) for salmon and Distinct Population Segments (DPSs) for steelhead that represent distinct genetic stocks. 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 listed as threatened or endangered under the ESA. The ESUs and DPSs are organized into seven recovery domains discussed in more detail in Chapter 3. A map showing the recovery domains and ESA-listed ESUs/DPSs can be found on the inside back cover of this Report.

A major PCSRF program objective is to contribute to the ongoing salmon recovery and conservation efforts, and salmon habitat restoration efforts throughout the region. The program actively funds and supports projects aimed at protecting and restoring habitat critical to salmon productivity and viability, removing barriers to salmon migration, and ensuring healthy populations are maintained. The overarching goals of the multitude of projects enacted through the PCSRF are to prevent extinction and improve the status of ESA-listed species and ensure the overall sustainability of salmon.

The PCSRF watershed assessments and recovery planning efforts identify key factors that limit salmon recovery (limiting factors) for each ESU and DPS. These efforts result in the prioritization of recovery actions based on those limiting factors. The PCSRF supports 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. The use of the PCSRF to fund the highest priority salmon restoration and conservation needs is critical. Additionally, continuously tracking the results of the PCSRF investments helps promote wise use of the PCSRF.

PCSRF Performance Goals and Measures

Over the past 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 toward restoration and conservation of Pacific salmon and steelhead populations. The activities to assess progress and the performance goals and indicators are found in the *Pacific Coastal Salmon Recovery Fund Performance Goals, Measures and Reporting Framework* (Framework) at http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/upload/PCSRF-Perf-Framework.pdf. The goals of the PCSRF as outlined in the Framework 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

The Framework developed by NMFS and the states and tribes provides an evolving mechanism to track progress. Development of the indicators in the Framework focuses on the specific investments being made with the PCSRF for salmon restoration and conservation. In developing the Framework, NMFS and its partners recognize that other variables can affect salmon recovery, including biological constraints inherent in the salmon life cycle and factors such as climate and ocean conditions. Exhibit 1-2 depicts an overview of the Framework, showing the structure of "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, increased fish populations). In this Report, performance based on the PCSRF is tracked at different spatial scales—Pacific Coast region-wide, recov-

Exhibit 1-2: Performance Reporting Framework

			PCSRF Goals (Outcomes)		
Inputs	Reporting Categories	Outputs	Short-Term (<5 years)	Mid-Term (5-15 years)	Long-Term (>15 years)
PCSRF funding to state and tribal governments through grants and contracts State direct match resources State, tribal, and other indirect contributions	» Habitat restoration » Habitat protections » Habitat access » Water quality » Water quantity » Hatcheries/enhancement » Harvest management » Watershed/species planning and assessment » Recovery plan development and implementation » Research, monitoring, and evaluation » Outreach, education, and technical assistance	» Instream habitat projects completed » Wetland habitat projects completed » Estuarine habitat projects completed » Land acquisition projects completed » Riparian habitat projects completed » Upland habitat projects completed » Fish passage projects completed » Hatchery/enhancement projects completed » Watershed planning and assessment projects completed » Research, monitoring, and evaluation projects completed	Enhanced availability and quality of habitat Improved management practices Major habitat limiting factors addressed for ESA-listed salmon	Improved status of ESA-listed salmon (naturally spawning populations increased) Maintained healthy salmon populations	Overall sustainability of Pacific salmon

ery domain, and state and tribal levels. The indicators reported provide measures of progress relative to outputs and outcomes and are further identified and discussed in the following sections and chapters of this Report.

Distribution of Funding for Salmon Restoration and Conservation

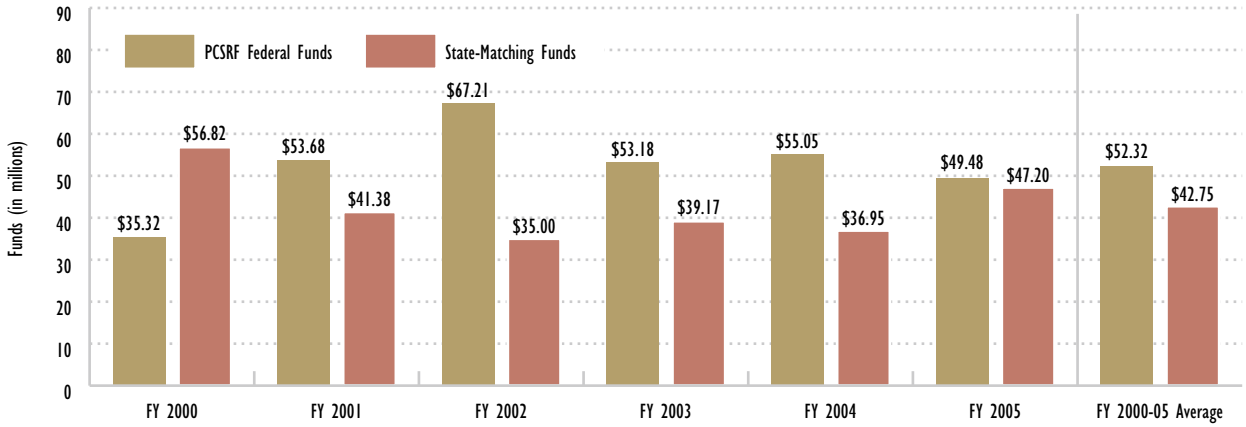
The Congressionally appropriated PCSRF federal funds are distributed by NMFS to the states and tribes, who subsequently manage and distribute the funds to various entities conducting projects that address the PCSRF goals outlined in the Framework. The PCSRF federal funds are awarded to the states and tribes as appropriations become available. 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. NMFS has established Memoranda of Understanding (MOUs) with the states of Washington, Oregon, California, Alaska, and Idaho as well as three tribal commissions.[2] The MOUs establish criteria and processes for funding priority projects.

In addition to PCSRF federal funds, most states provide funds to match the PCSRF distributions through their grant distribution processes. Tribes are not required to provide matching funds. The federal 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. These local contributions are important to the success of the PCSRF, but are often difficult to quantify.

Exhibit 1-3 displays the total amounts of PCSRF federal and state-matching funds committed for salmon recovery (not including local and sponsor match) by fiscal year. Idaho was added to the program in 2004. The average of the state-match funds committed for California, Idaho,

[2] 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. This Report refers to the first two Tribal commissions as "Pacific Coastal" tribes.

Exhibit 1-3: PCSRF Federal and State-Matching Funds Committed for Salmon Recovery in Washington, Oregon, California, and Idaho in FY 2000-2005*



* FY 2004 and 2005 include Idaho.

Oregon, and Washington over the six years is approximately 82 percent of the PCSRF funds committed.

The states of Washington, Oregon, California, Idaho, and Alaska each conduct a competitive process to award their non-earmarked funds. Because of competitive funding cycles, many of the PCSRF federal funds are committed to projects in the year following the availability of appropriations. As of this Report, only 15 percent of FY 2006 funds have been committed to projects. Some projects are funded for operations over several years, and completion of projects may be affected by construction windows, the seasonal nature of salmon-related work, and processes required for issuing contracts and securing permits. Each state has a different process, but most include rigorous reviews of the scientific and technical merit of proposals and incorporate public and stakeholder input.

Mechanisms are in place to ensure that selected projects include measures of performance as outlined in the Framework to track accountability in the use of public funds. Evaluating progress toward the PCSRF goals of improved habitat and sustainable salmon populations requires multiple years of monitoring after project implementation. The PCSRF grantees are required to allocate 10 percent of their funding from PCSRF for monitoring and evaluation. Since the FY 2002 funding cycle, NMFS has required the PCSRF grantees to report information and metrics on project activities to a uniform database using a consistent set of performance indicators (see http://webapps.nwfsc.noaa.gov/pcsrf) as currently described in the Framework. This database is the source of information used to track progress toward the PCSRF goals.

Report Organization

The chapters of this Report highlight and discuss PCSRF activities, performance, and progress toward Pacific salmon recovery at different scales. Chapter 2 summarizes region-wide progress toward the PCSRF goals and program performance. Chapter 3 displays the most current information available about the status of ESA-listed salmon populations in California, Idaho, Oregon, and Washington and highlights progress toward the goals by ESU/DPS and recovery domains. Chapter 4 highlights the individual state and tribal accomplishments achieved through the PCSRF program. Chapter 5 offers concluding remarks about the PCSRF's contributions to salmon restoration and conservation. The data included in this Report are generated from the PCSRF database and cover the time period from program inception through November 2006. The PCSRF data are routinely validated and quality checked, and may be revised as more project information becomes available. As a result, numbers and figures in this Report may differ from previous years. The data and figures presented represent an update to previous versions of the PCSRF Report to Congress.

Chapter 2: Region-wide Pacific Coastal Salmon Recovery Fund Performance

The PCSRF project accomplishments, outputs, and preliminary outcomes contribute to the overall region-wide goal of Pacific salmon sustainability. These measures are components of the Framework described in Chapter 1. They provide a structured means to assess overall PCSRF performance and progress toward long-term program objectives such as recovery of ESA-listed salmon populations. The intricate and variable life cycle of salmon and the nature of habitat requirements and restoration work mean that end results from projects often require several years to become evident. The information presented in this chapter highlights the funded and completed projects as of November 30, 2006.

Performance Progress

The PCSRF progress toward short-term, mid-term, and long-term outcomes and goals identified in the Framework is measured and reported through the region-wide output and outcome indicators displayed in Exhibit 2-1. The outputs of projects ongoing and completed serve as a first level indicator of state and tribal efforts toward outcomes.

Instream, riparian, and upland habitat projects provide erosion control, enhance instream flow and streambed conditions, and improve water quality and quantity in watersheds inhabited by salmon. Restoration plays a unique role in salmon migration, reproduction, and juvenile rearing within the watersheds. Estuarine and wetland restoration projects protect and improve habitat that is important for migration, rearing, and transitioning into the ocean environment. Cumulatively, through riparian, estuarine, wetland, and upland projects over 419,000 acres of habitat have been treated and restored, with over 9,100 acres of wetland and estuarine habitat created. Additionally, more than 5,800 stream miles were treated and restored. Since program inception over 104,000 acres of habitat have been protected through acquisition, easement, or lease. In total, the PCSRF has improved nearly 532,000 acres of habitat essential to various stages of the salmon and steelhead life cycle. Based on analysis of projects within recovery domains, approximately 76 percent of habitat project activities are addressing habitat factors that are limiting salmon recovery.

The proliferation of stream and river barriers over the past century has been largely detrimental to salmon. They impede salmon from reaching spawning habitat, interrupt their migration, and inhibit completion of the various stages of the intricate life cycle of salmon. Removing these barriers has been one of the focus areas for improving salmon status and condition in the Pacific Coast region. A large portion of the PCSRF projects concentrate on increasing fish access to previously unavailable habitat and improving overall watershed productivity for salmon through the removal of stream barriers and replacement of ineffective culverts. Since program inception, more than 5,000 additional stream miles have been made accessible to fish, with over 2,500 barriers to salmon habitat removed.

Exhibit 2-1: Region-wide Performance Reporting Results

Outputs	Region-Wide Performance Indicators	Short-Term Outcomes (<5 years)	Mid-Term Outcomes (5-15 years)	Long-Term Outcomes (>15 years)
Instream habitat projects	**1,570** stream miles treated	**Enhanced availability and quality of habitat** *More than 532,000 acres of habitat and nearly 11,000 stream miles enhanced, accessible, or available*	**Improved status of ESA-listed salmon** *Improved status of 16 of 19* ESA-listed salmon ESUs/DPSs*	**Overall sustainability of Pacific salmon**
Wetland habitat projects	**7,541** acres created **14,703** acres treated			
Estuarine habitat projects	**1,579** acres created **2,811** acres treated			
Land acquisition projects	**104,514** acres acquired/protected **380** stream bank miles acquired or protected			
Riparian habitat projects	**4,291** stream miles treated **21,675** acres treated	**Improved management practices** *All harvests managed to conserve wild populations*		
Upland habitat projects	**379,842** acres treated		**Maintained healthy salmon populations** *See Exhibits 2-2 and 2-3,*	
Fish passage projects	**2,595** barriers removed **5,003** stream miles opened **583** fish screens installed	**Habitat limiting factors addressed for ESA-listed salmon** *76% of all habitat projects are addressing major habitat limiting factors*		
Hatchery/enhancement projects	More than **300 million** hatchery fish marked for management strategies			
Watershed planning and assessment projects	**26 ESUs (all)** have identified factors limiting recovery			
Research, monitoring, and evaluation projects	**48,769** miles of streams monitored **287** assessments completed			

* Where trend data are available for 12 years or longer.

Watershed and species assessments play a key role in understanding factors limiting salmon recovery in the Pacific Coast region. Through watershed and species assessments, NMFS has identified factors limiting recovery for all 26 ESA-listed ESUs/DPSs. These assessments identify habitat conditions and needs on a population basis within watersheds. Examples of identified habitat conditions affecting recovery include poor water quality and instream conditions, and inadequate canopy cover and vegetation along stream banks.

Fish marking programs support efforts to identify stock and estimate fish abundance and allow for selective fisheries for hatchery fish. Since FY 2000, hundreds of millions of hatchery fish have been marked to improve harvest and hatchery management practices throughout the region. Monitoring is an important activity in determining progress toward the goal of sustainable salmon populations. Monitoring the abundance of listed threatened and endangered salmon and steelhead species is essential to species recovery. The salmon ESU and steelhead DPS abundance numbers presented in Chapter 3 serve as a general indicator of the mid-term PCSRF program goal to improve the status of salmon. Collectively, they are showing region-wide improvements in listed populations. Of the 26 ESUs/DPSs listed as endangered or threatened under the ESA, 19 have more than 12 years of recent data that can be used by the Technical Recovery Teams to assess trends. Of these, 16 show stable or increasing population trends. Monitoring of non-listed species is equally important to assess overall salmon population sustainability and to identify when actions may be needed to prevent listing. Exhibits 2-2 and 2-3 provide examples of the activities and types of data that have been collected by monitoring programs for non-listed species.

The Pacific Coast region-wide summary measures discussed above provide an overview of the current broad-scale progress toward improved salmon habitat and sustainable salmon populations. Exhibit 2-4 shows the distribution of habitat projects throughout the Pacific Coast region. The results of these efforts, as reflected by salmon returns, often take many years. The following chapters of this Report discuss salmon recovery at the recovery domain level and specific state and tribal efforts toward the outlined program objectives.

Exhibit 2-2: Trends in Non-ESA-Listed Salmon Populations in Oregon

The Oregon Department of Fish and Wildlife (ODFW) monitors and manages non-listed fish species throughout the State of Oregon as part of the Native Fish Conservation Policy (Oregon Administrative Rule 635-007-0507). Various non-ESA-listed Species Management Units (SMUs) are monitored. The ODFW chart below highlights the abundance for Wild Rogue Coho.

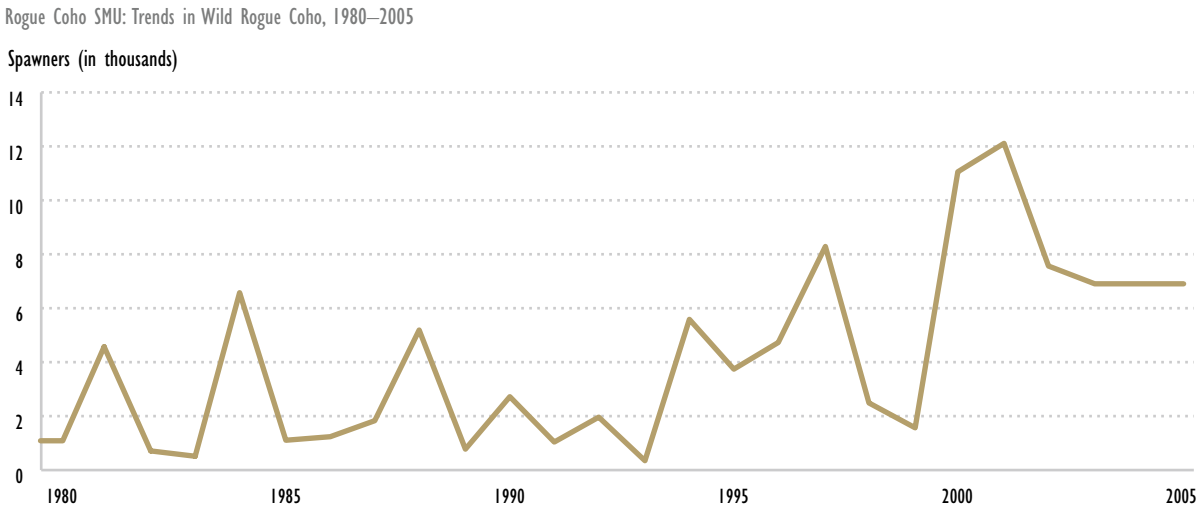


Exhibit 2-3: Trends in Non-ESA-Listed Klamath River Basin Fall-Run Chinook in California

For nearly 20 years California has collected data on hatchery returns, natural spawners, and angler and Indian net harvests to determine abundance of Klamath River basin fall Chinook salmon. The graph below shows run-size estimates for Klamath River basin fall Chinook from 1978-2005.

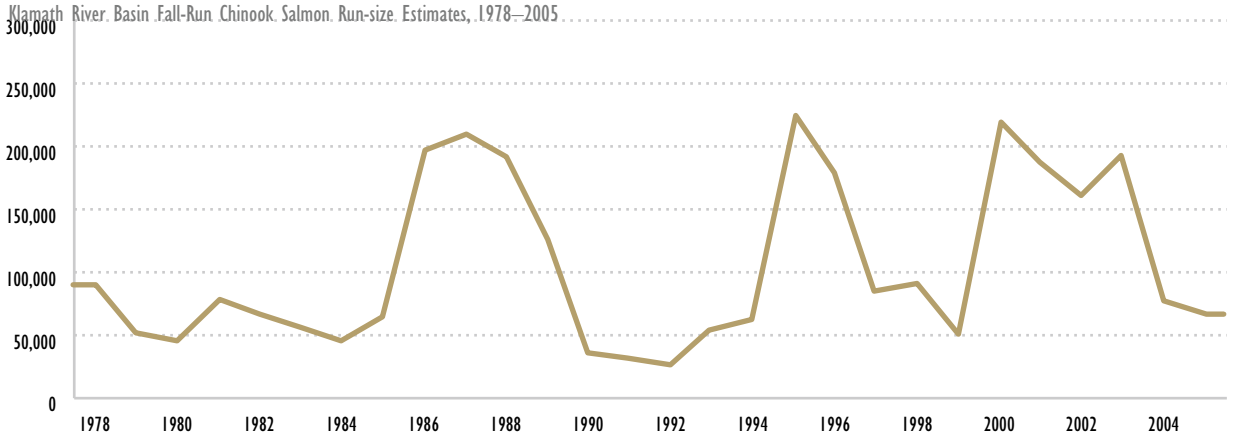
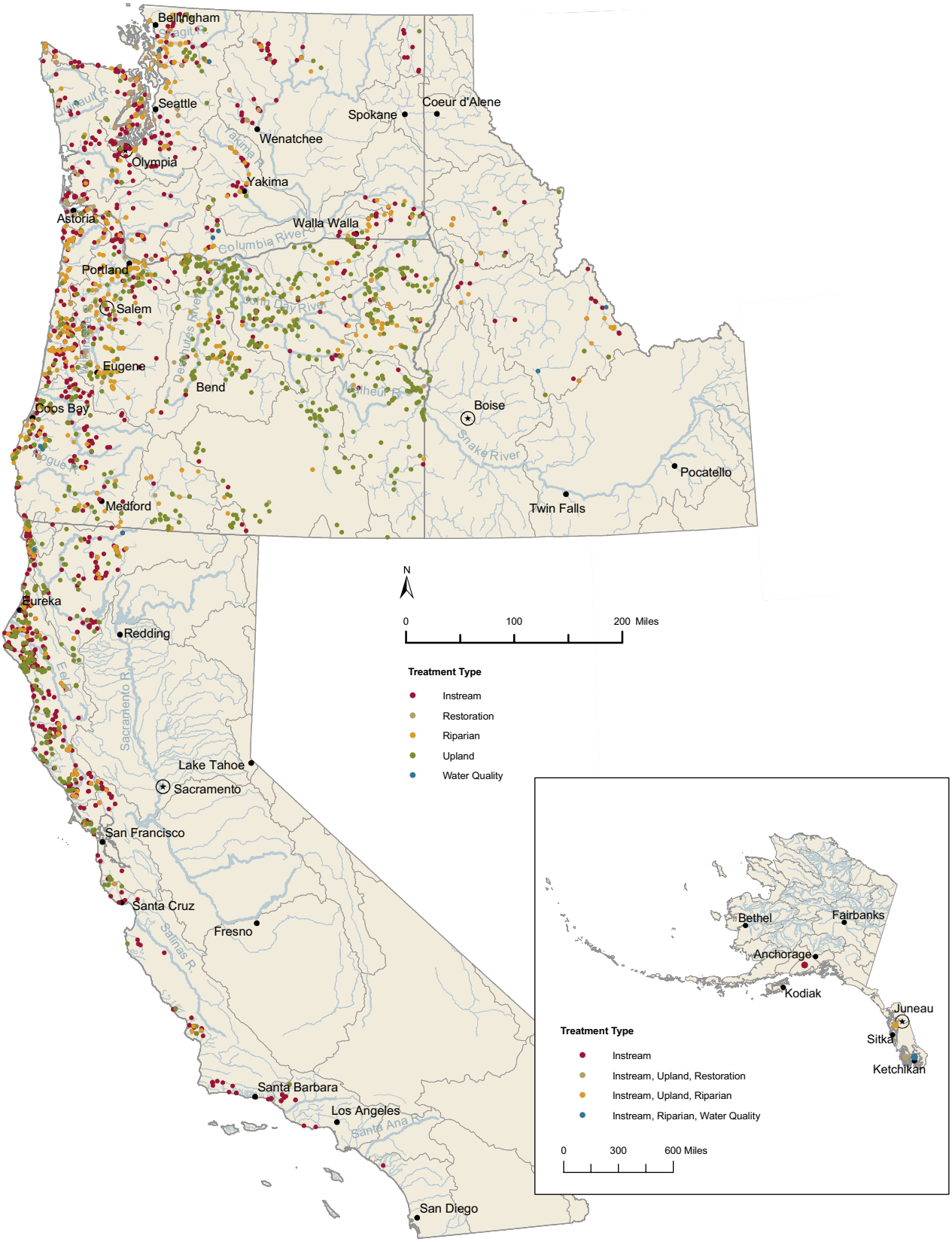


Exhibit 2-4: PCSRF Region-Wide Major Habitat Project Types



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

A high priority of the PCSRF program is funding ESA recovery and restoration of 16 salmon Evolutionarily Significant Units (ESUs) and 10 steelhead Distinct Population Segments (DPSs). These ESUs and DPSs are grouped into seven recovery domains. Additionally, one previously listed population is tracked in a Restoration Area (see inside back cover). Recovery domains provide the means to consider ecosystems as a component of salmon recovery. The listed salmon and steelhead ESUs/DPSs require investment of multiple resources to reach self-sustaining and genetically diverse levels. The PCSRF provides resources for habitat restoration and protection that can assist in sustaining the species when external conditions produce high and low population cycles. The distribution of salmon ESUs and steelhead DPSs in the Pacific Coast region is displayed in Exhibit 3-1.

Fish Abundance and Major Factors Limiting Recovery

This chapter presents information on abundance and factors limiting recovery of salmon and steelhead by recovery domain. Graphics on the following pages show estimates of adult returns (including percentages of wild and hatchery fish where known) and the historical population size. Tables for each recovery domain list major limiting factors that represent a set of conditions that have been identified as inhibiting recovery; ESA-listed salmon and steelhead are not likely to recover if the major limiting factors are not addressed. The limiting factors are defined in the Framework (see http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/upload/PCSRF-Perf-Framework.pdf). For each recovery domain, the PCSRF activities that address the limiting factors are identified. The habitat factors that the PCSRF addresses tend to be linked and efforts to improve habitat are often cumulative, meaning that as each limiting factor is addressed, the habitat value for salmon increases.

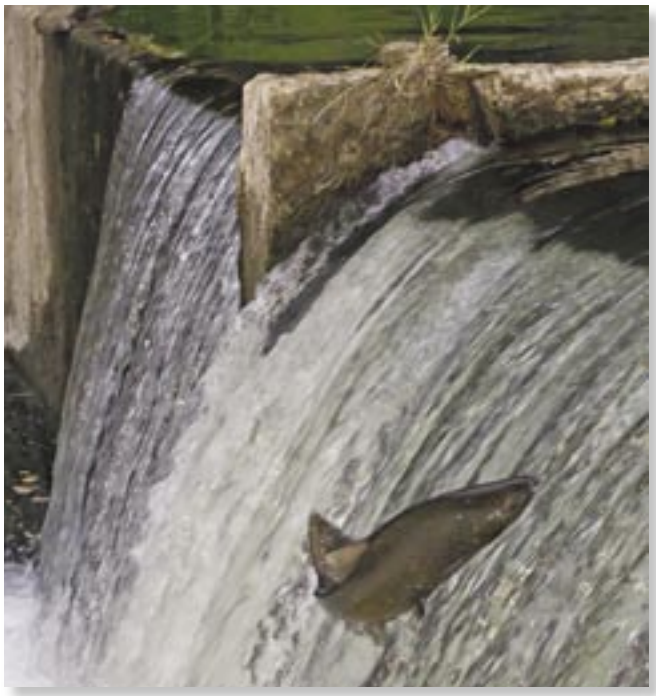
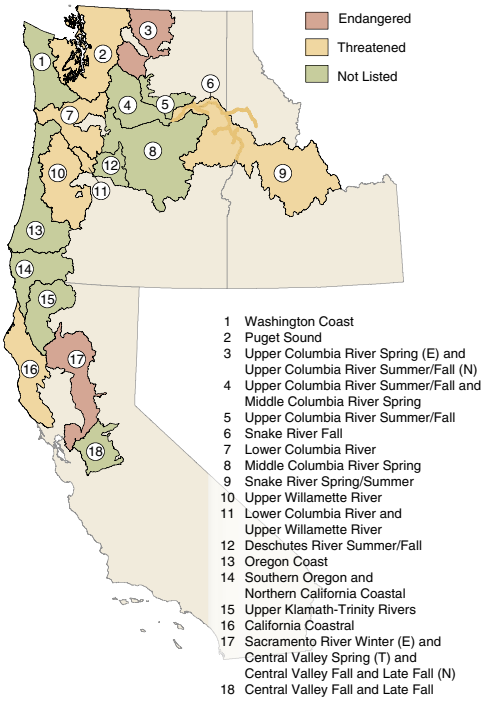
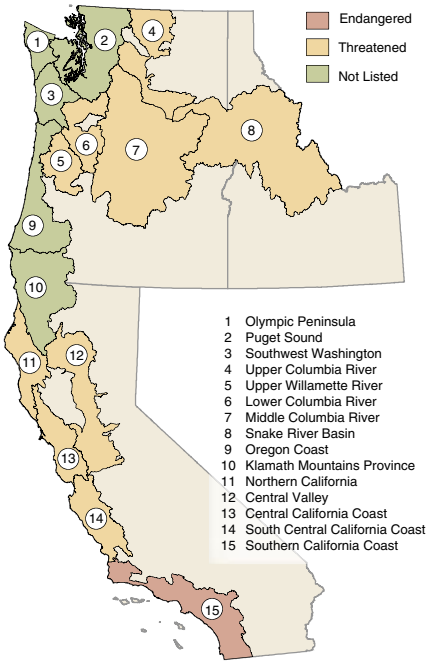


Exhibit 3-1: Distribution of Salmon ESUs and Steelhead DPSs

Chinook

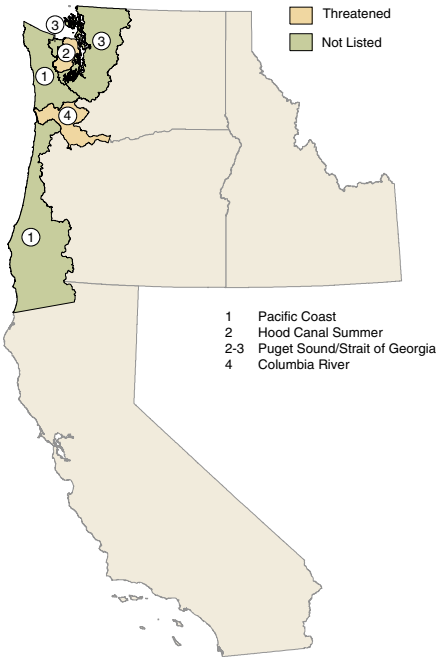


Steelhead



Sockeye

Chum



Coho

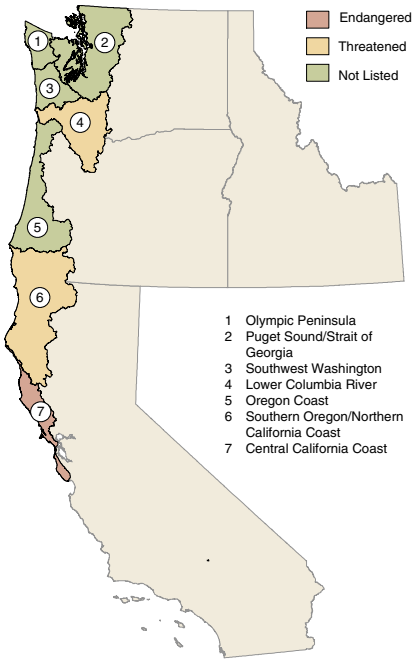
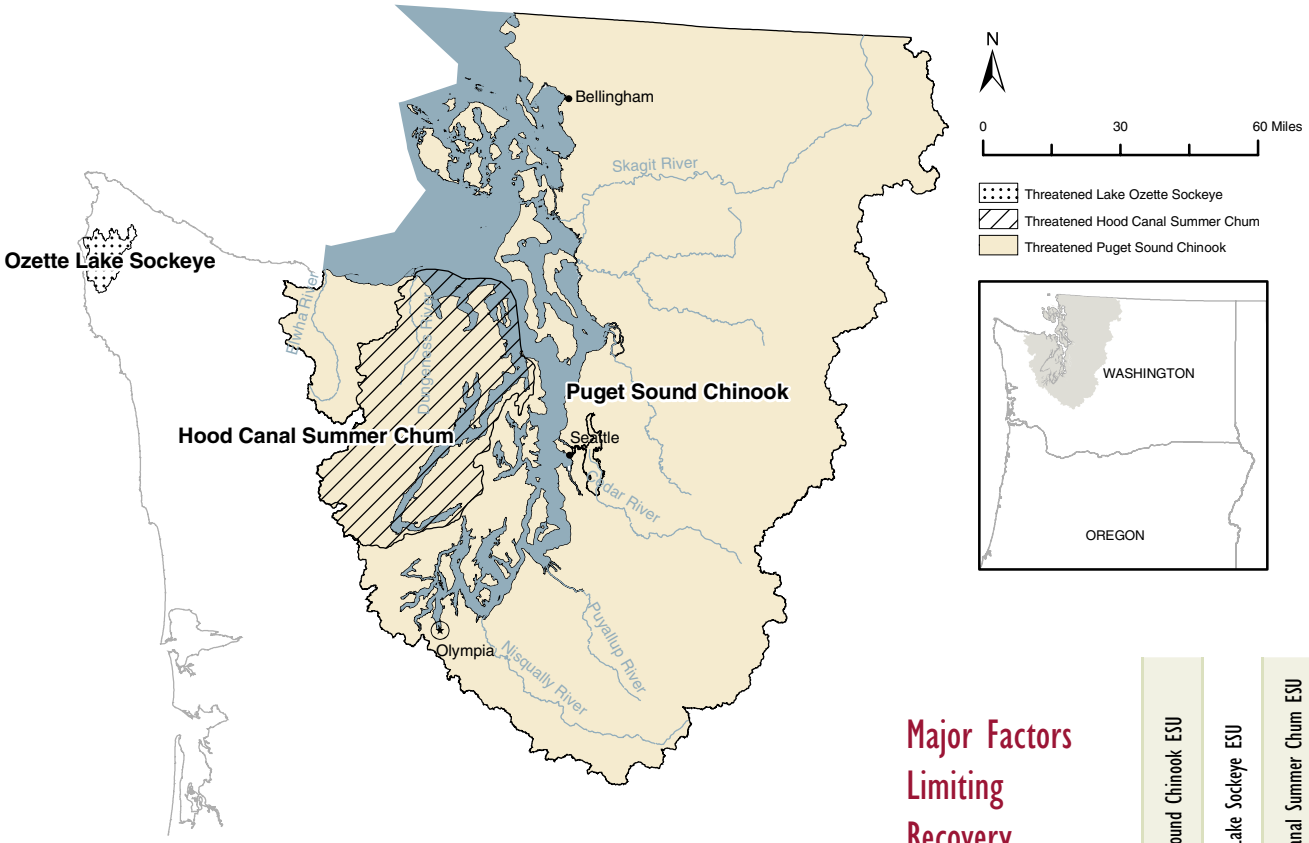


Exhibit 3-2: Puget Sound Recovery Domain

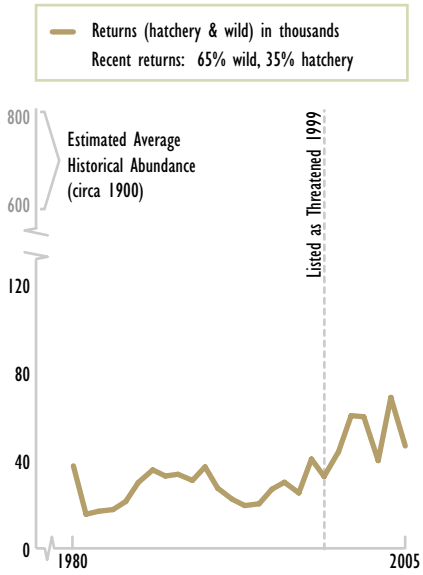


PCSRF Activities in the Recovery Domain

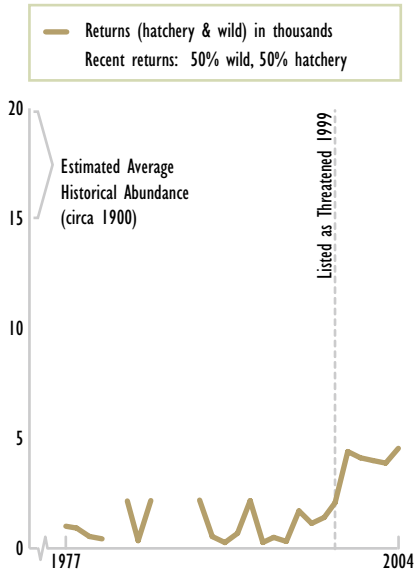
- Restored 87 stream miles and stabilized 15 stream miles of instream habitat
- Returned 12 cubic feet per second of water for instream flow
- Restored 92 acres of upland habitat and reduced impacts from 229 miles of road
- Restored 1,249 acres and 148 stream miles of riparian habitat
- Restored 114 acres and created 43 acres of wetland habitat
- Restored 1,935 acres and created 1,106 acres of estuarine habitat
- Protected 7,552 acres and 82 stream miles of habitat through land acquisition, easement, or lease
- Treated 497 acres of riparian habitat for invasive species
- Treated 9 acres of wetland habitat for invasive species
- Treated 1,060 acres of estuarine habitat for invasive species
- Removed 85 barriers to fish passage, opening 197 stream miles
- Installed 2 fish screens

Major Factors Limiting Recovery	Puget Sound Chinook ESU	Ozette Lake Sockeye ESU	Hood Canal Summer Chum ESU
Degraded Habitat–Estuarine and Nearshore Marine	●		●
Degraded Habitat–Floodplain Connectivity and Function	●	●	●
Degraded Habitat–Channel Structure and Complexity	●	●	●
Degraded Habitat–Riparian Areas and Large Woody Debris Recruitment	●	●	●
Degraded Habitat–Stream Substrate	●	●	●
Degraded Habitat–Stream Flow			●
Degraded Habitat–Water Quality	●		
Degraded Habitat–Fish Passage			
Hatchery-related Adverse Effects			
Harvest-related Adverse Effects			
Predation/Competition/Disease		●	
PCSRF Projects Addressing Major Habitat Limiting Factors	53%	75%	59%

Puget Sound Chinook ESU



Ozette Lake Sockeye ESU



Hood Canal Summer Chum ESU

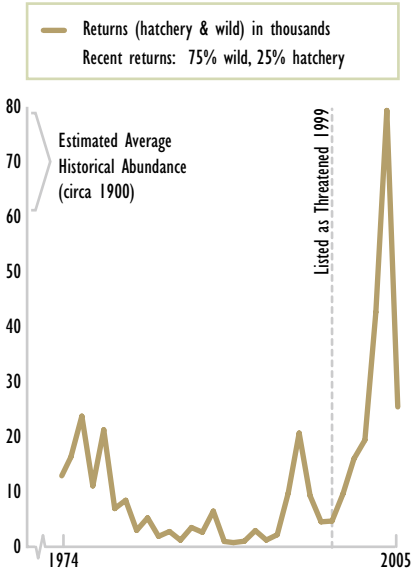
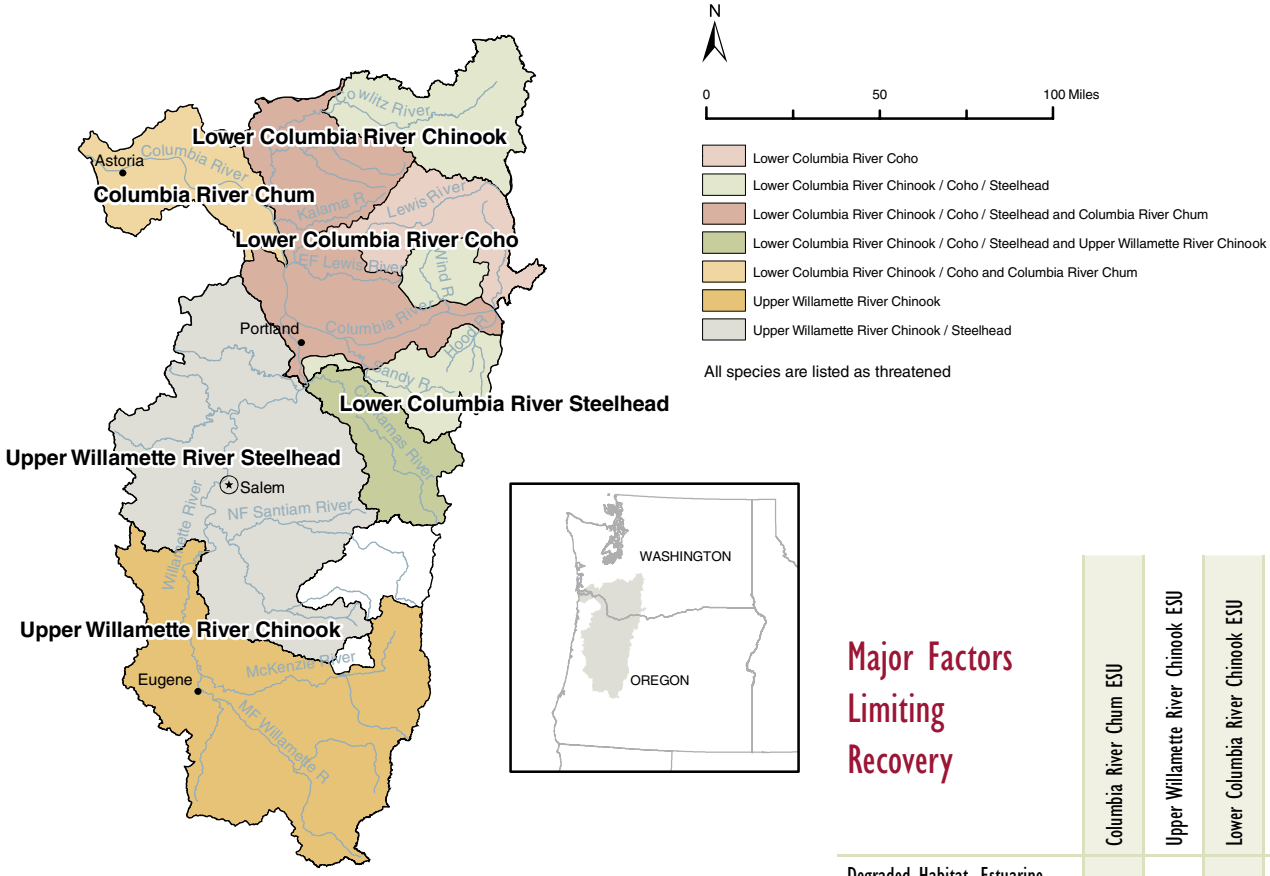


Exhibit 3-3: Willamette/Lower Columbia Recovery Domain



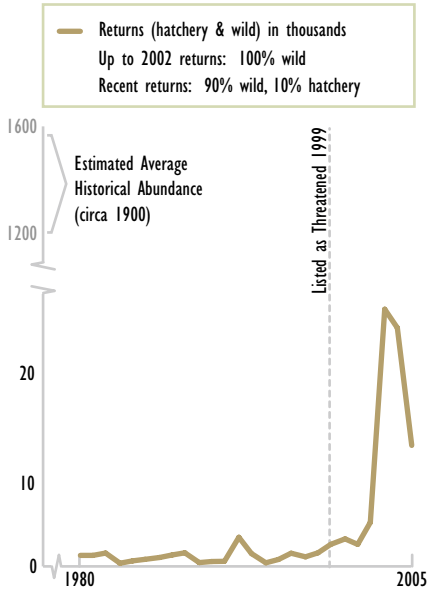
PCSRF Activities in the Recovery Domain

- Restored 79 stream miles and stabilized 4 stream miles of instream habitat
- Restored 1,491 acres of upland habitat and reduced impacts from 1 mile of road
- Restored 1,339 acres and 460 stream miles of riparian habitat
- Restored 2,405 acres and created 35 acres of wetland habitat
- Restored 504 acres and created 414 acres of estuarine habitat
- Protected 2,223 acres and 28 stream miles of habitat through land acquisition, easement, or lease
- Treated 827 acres of riparian habitat for invasive species
- Treated 59 acres of wetland habitat for invasive species
- Removed 165 barriers to fish passage, opening 494 stream miles

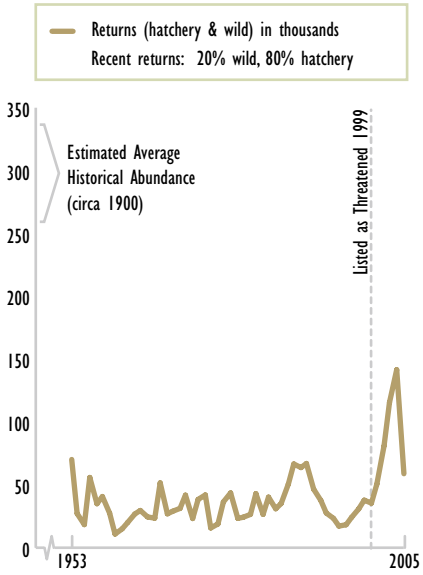
Major Factors Limiting Recovery

	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
Degraded Habitat—Estuarine and Nearshore Marine	●		●			
Degraded Habitat—Floodplain Connectivity and Function	●	●	●	●	●	●
Degraded Habitat—Channel Structure and Complexity	●	●	●	●	●	●
Degraded Habitat—Riparian Areas and Large Woody Debris Recruitment	●	●	●	●	●	●
Degraded Habitat—Stream Substrate	●		●	●		●
Degraded Habitat—Stream Flow	●		●	●	●	●
Degraded Habitat—Water Quality		●		●		●
Degraded Habitat—Fish Passage	●	●	●	●	●	
Hatchery-related Adverse Effects		●	●			●
Harvest-related Adverse Effects			●			●
Predation/Competition/Disease				●		
Mainstem Columbia River Hydropower-related Adverse Effects						
PCSRF Projects Addressing Major Habitat Limiting Factors	71%	76%	72%	71%	63%	55%

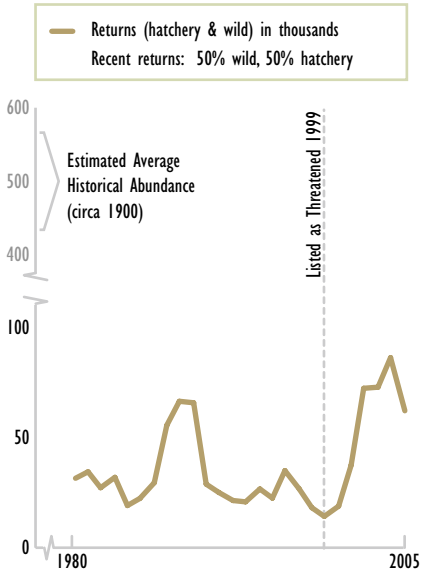
Columbia River Chum ESU



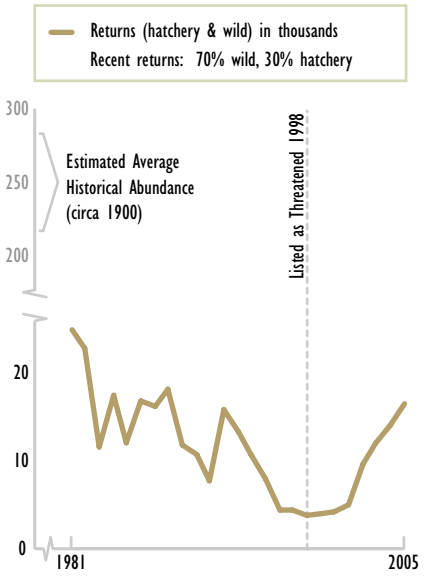
Upper Willamette River Chinook ESU



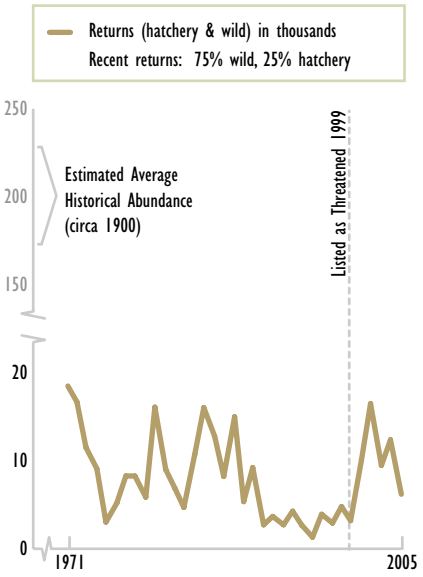
Lower Columbia River Chinook ESU



Lower Columbia River Steelhead DPS



Upper Willamette River Steelhead DPS



Lower Columbia River Coho ESU

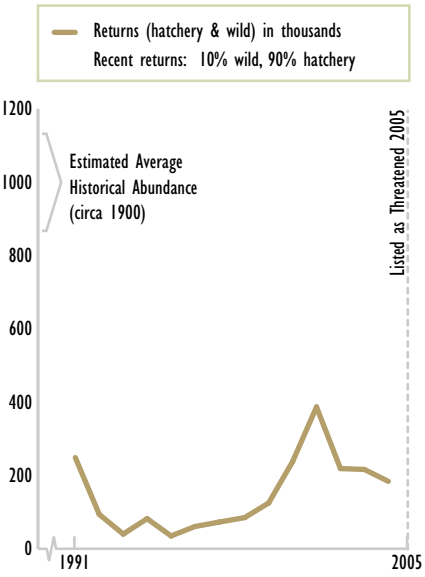
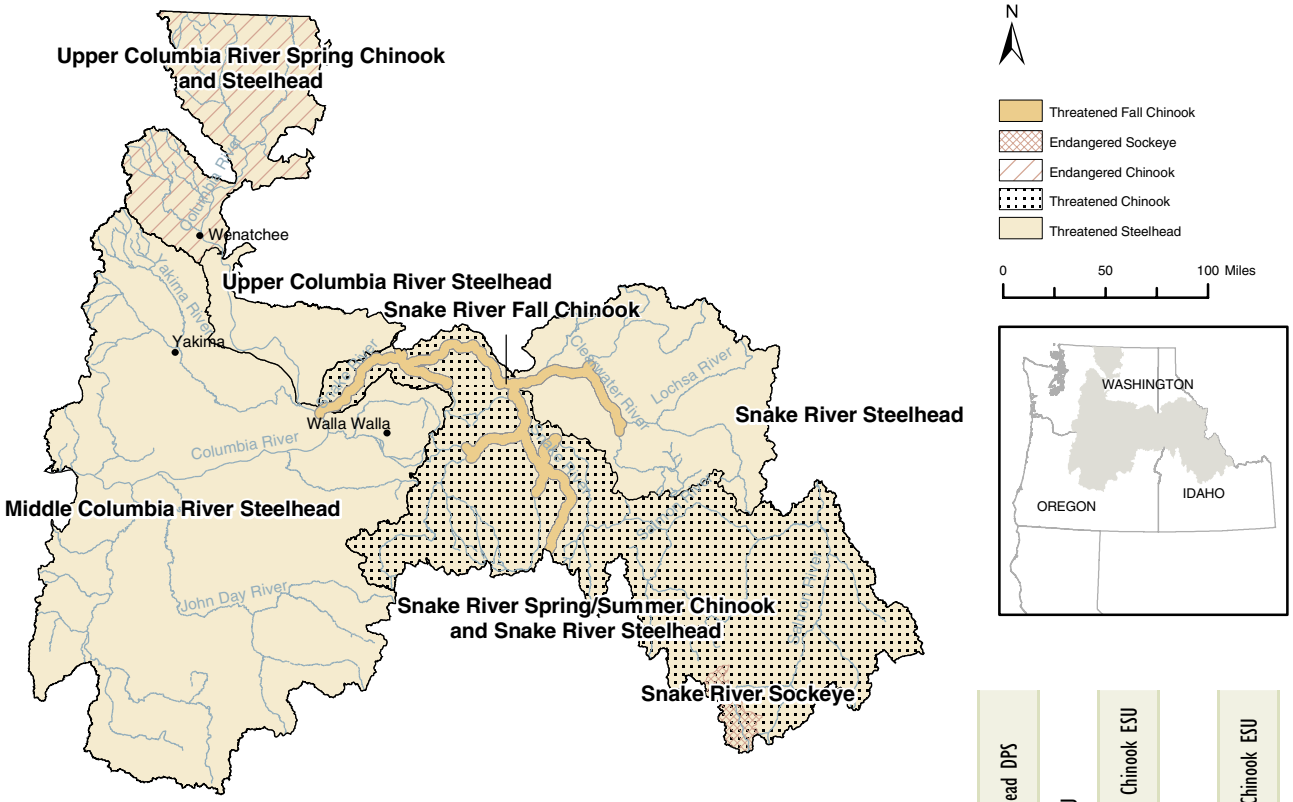


Exhibit 3-4: Interior Columbia Recovery Domain



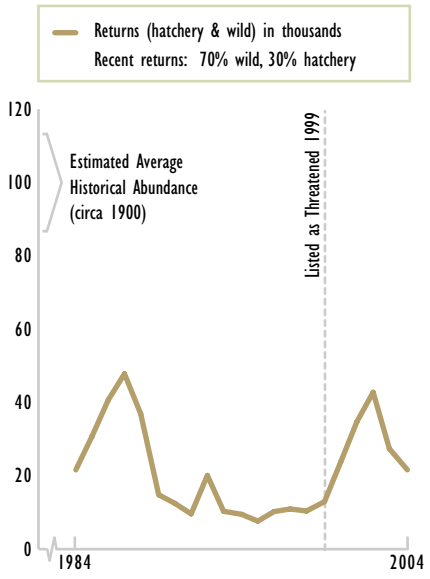
PCSRF Activities in the Recovery Domain

- Restored 130 stream miles and stabilized 17 stream miles of instream habitat
- Restored 87,165 acres of upland habitat and reduced impacts from 132 miles of road
- Restored 3,395 acres and 577 stream miles of riparian habitat
- Restored 1,049 acres of wetland habitat
- Protected 47,669 acres and 192 stream miles of habitat through land acquisition, easement, or lease
- Treated 696 acres of riparian habitat for invasive species
- Removed 196 barriers to fish passage, opening 1,601 stream miles
- Returned 719 cubic feet per second of water for instream flow
- Installed 467 fish screens

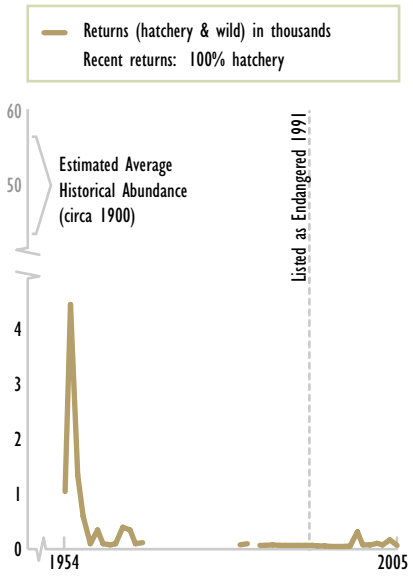
Major Factors Limiting Recovery

	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
Degraded Habitat–Estuarine and Nearshore Marine			●				
Degraded Habitat–Floodplain Connectivity and Function	●	●	●		●	●	●
Degraded Habitat–Channel Structure and Complexity		●	●		●	●	●
Degraded Habitat–Riparian Areas and Large Woody Debris Recruitment	●		●		●	●	
Degraded Habitat–Stream Substrate	●		●		●	●	●
Degraded Habitat–Stream Flow	●		●		●	●	●
Degraded Habitat–Water Quality	●				●	●	
Degraded Habitat–Fish Passage	●					●	●
Hatchery-related Adverse Effects			●				●
Harvest-related Adverse Effects		●					
Predation/Competition/Disease	●					●	●
Mainstem Columbia River Hydropower-related Adverse Effects	●	●	●	●	●	●	●
PCSRF Projects Addressing Major Habitat Limiting Factors	74%	67%	45%	0%	74%	76%	45%

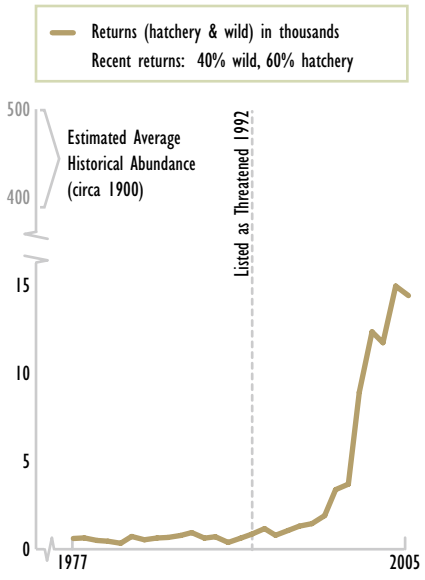
Middle Columbia River Steelhead DPS



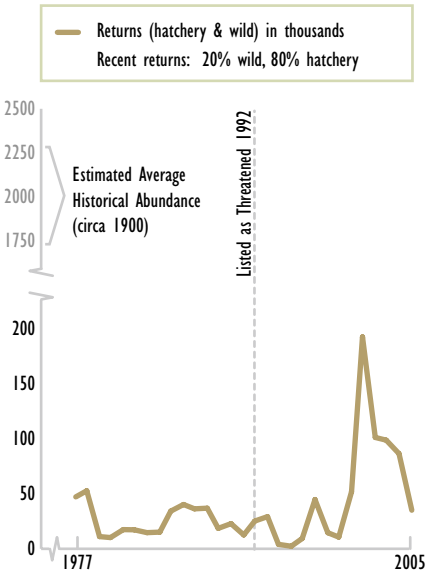
Snake River Sockeye ESU



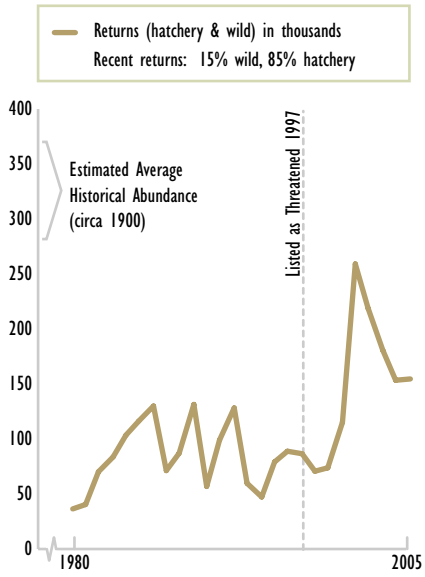
Snake River Fall Chinook ESU



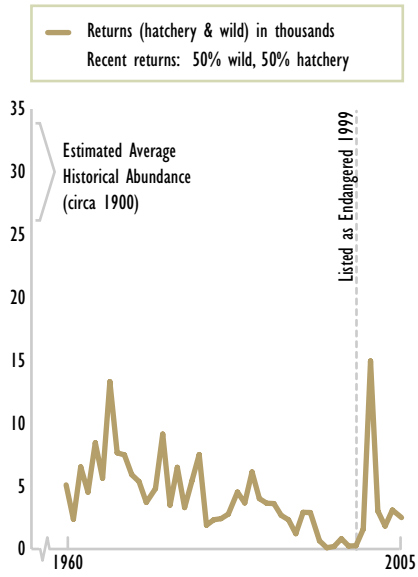
Snake River Spring/Summer Chinook ESU



Snake River Steelhead DPS



Upper Columbia River Spring Chinook ESU



Upper Columbia River Steelhead DPS

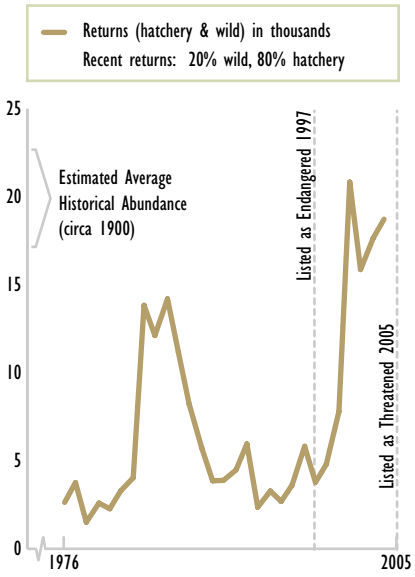
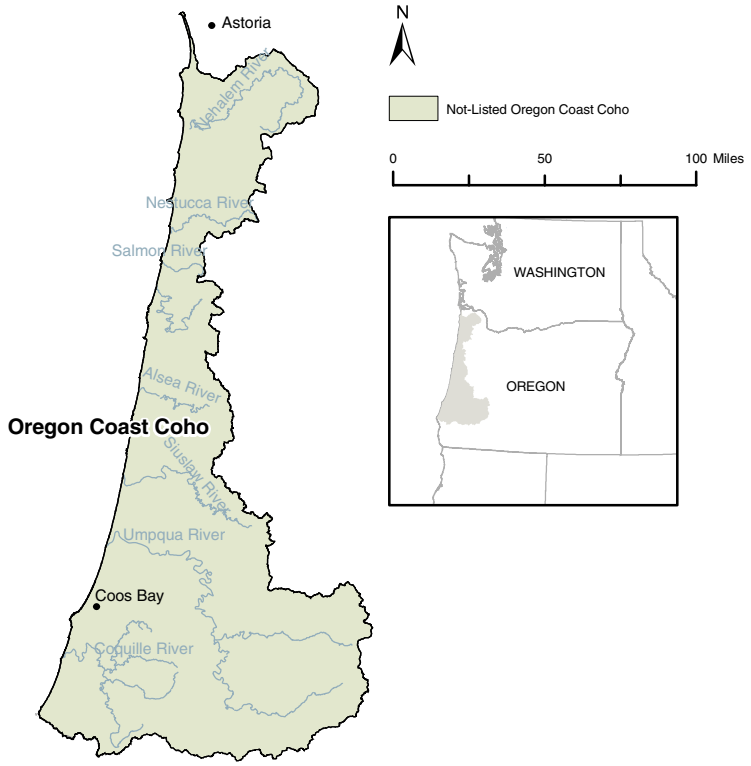
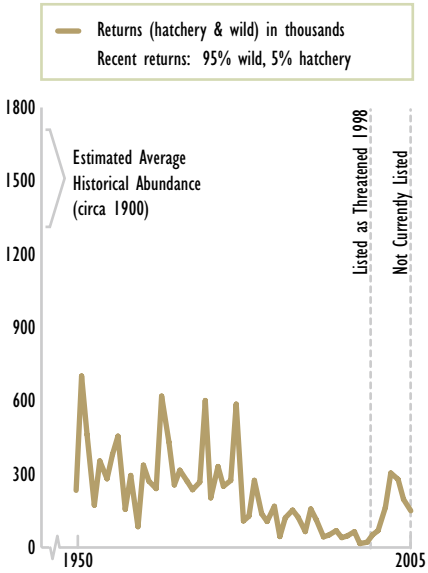


Exhibit 3-5: Oregon Coast Restoration Area*



Oregon Coast Coho ESU



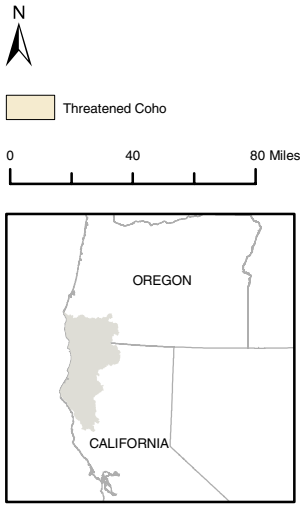
PCSRF Activities in the Restoration Area

- Restored 212 stream miles of instream habitat
- Restored 192 acres of upland habitat and reduced impacts from 72 miles of road
- Restored 1,239 acres and 477 stream miles of riparian habitat
- Restored 54 acres and created 3 acres of wetland habitat
- Restored 17 acres of estuarine habitat
- Protected 1,114 acres and 8 stream miles of habitat through land acquisition, easement, or lease
- Treated 12 acres of wetland habitat for invasive species
- Removed 408 barriers to fish passage, opening 392 stream miles
- Installed 15 fish screens

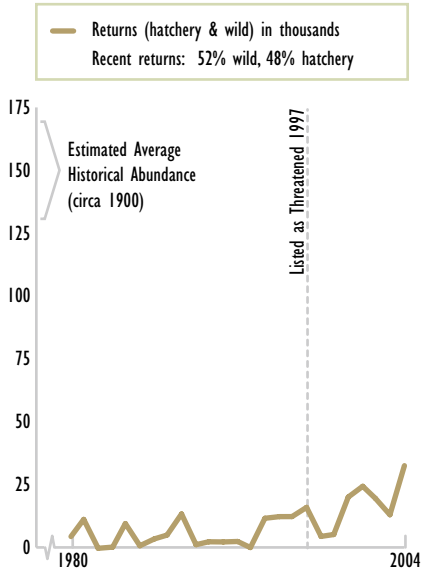
Major Habitat Factors	Oregon Coast Coho ESU
Degraded Habitat–Estuarine and Nearshore Marine	
Degraded Habitat–Floodplain Connectivity and Function	●
Degraded Habitat–Channel Structure and Complexity	●
Degraded Habitat–Riparian Areas and Large Woody Debris Recruitment	●
Degraded Habitat–Stream Substrate	●
Degraded Habitat–Stream Flow	
Degraded Habitat–Water Quality	●
Degraded Habitat–Fish Passage	
Hatchery-related Adverse Effects	
Harvest-related Adverse Effects	
Predation/Competition/Disease	●
PCSRF Projects Addressing Major Habitat Factors	68%

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

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



Southern Oregon/Northern California Coast Coho ESU*



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

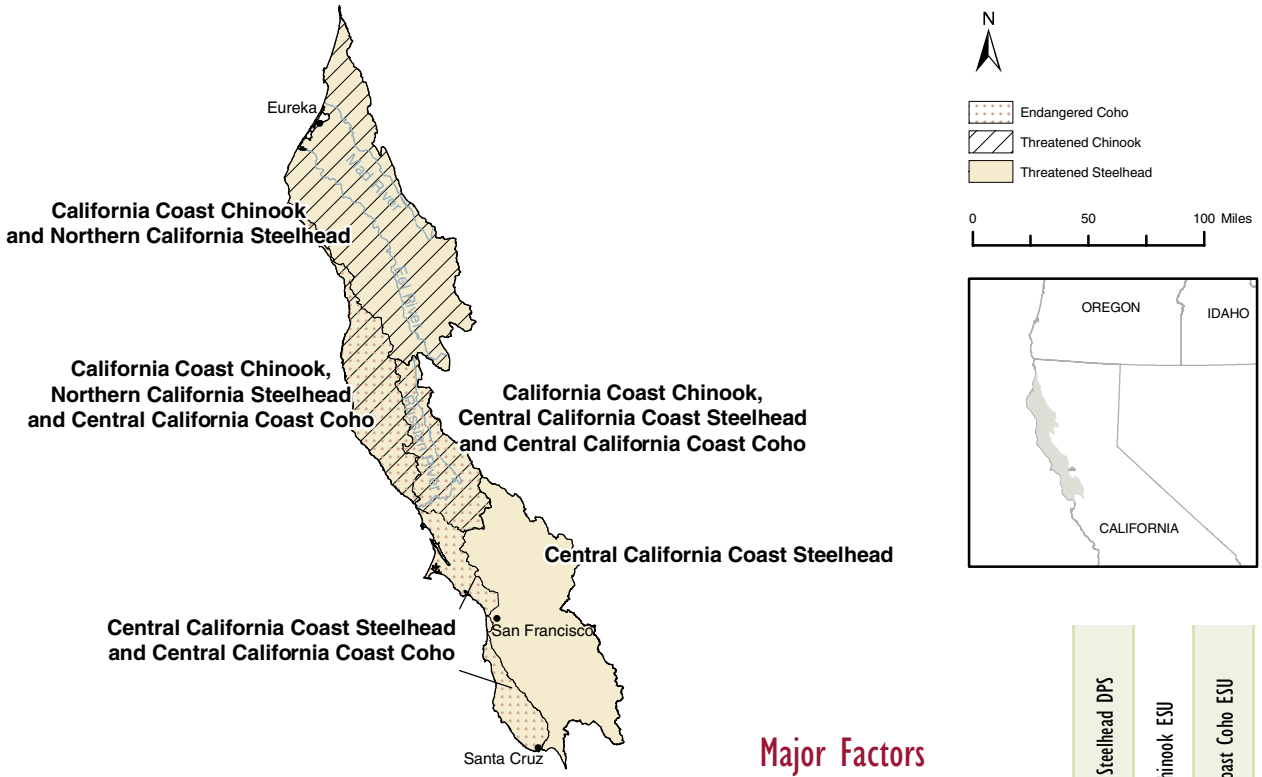
PCSRF Activities in the Recovery Domain

- Restored 242 stream miles and stabilized 31 stream miles of instream habitat
- Restored 1,081 acres of upland habitat and reduced impacts from 896 miles of road
- Restored 733 acres and 195 stream miles of riparian habitat
- Restored 9 acres and created 2 acres of wetland habitat
- Protected 25,260 acres and 2 stream miles of habitat through land acquisition, easement, or lease
- Treated 29 acres of riparian habitat for invasive species
- Removed 457 barriers to fish passage, opening 281 stream miles
- Returned 41 cubic feet per second of water for instream flow
- Installed 78 fish screens

Major Factors Limiting Recovery

	Southern Oregon/Northern California Coast Coho ESU
Degraded Habitat–Estuarine and Nearshore Marine	●
Degraded Habitat–Floodplain Connectivity and Function	●
Degraded Habitat–Channel Structure and Complexity	●
Degraded Habitat–Riparian Areas and Large Woody Debris Recruitment	●
Degraded Habitat–Stream Substrate	●
Degraded Habitat–Stream Flow	●
Degraded Habitat–Water Quality	●
Degraded Habitat–Fish Passage	●
Hatchery-related Adverse Effects	●
Harvest-related Adverse Effects	
Predation/Competition/Disease	●
PCSRF Projects Addressing Major Habitat Limiting Factors	89%

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



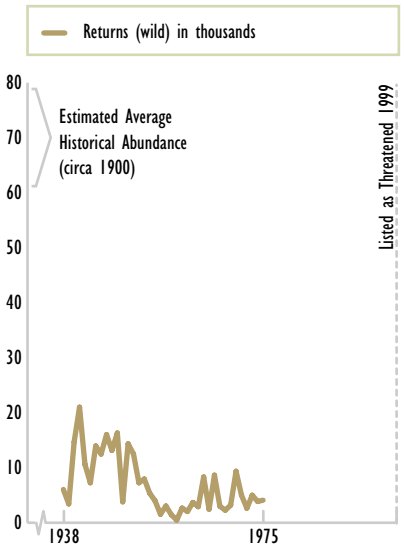
PCSRF Activities in the Recovery Domain

- Restored 269 stream miles and stabilized 9 stream miles of instream habitat
- Restored 7 acres of upland habitat and reduced impacts from 396 miles of road
- Restored 7 acres and 30 stream miles of riparian habitat
- Removed 125 barriers to fish passage, opening 205 stream miles

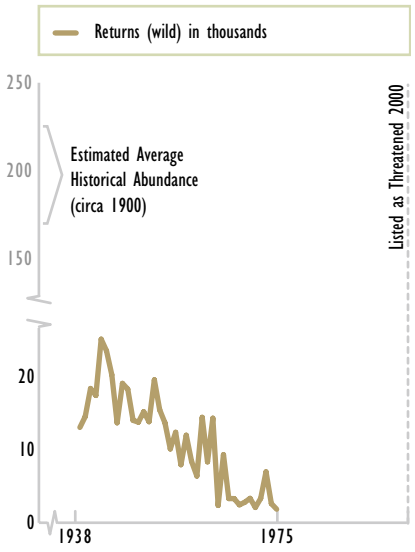
Major Factors Limiting Recovery

	Northern California Steelhead DPS	California Coastal Chinook ESU	Central California Coast Coho ESU	Central California Coast Steelhead DPS
Degraded Habitat–Estuarine and Nearshore Marine	●	●	●	●
Degraded Habitat–Floodplain Connectivity and Function	●	●	●	●
Degraded Habitat–Channel Structure and Complexity	●	●	●	●
Degraded Habitat–Riparian Areas and Large Woody Debris Recruitment	●	●	●	●
Degraded Habitat–Stream Substrate	●	●	●	●
Degraded Habitat–Stream Flow		●	●	●
Degraded Habitat–Water Quality	●	●		●
Degraded Habitat–Fish Passage			●	●
Hatchery-related Adverse Effects				
Harvest-related Adverse Effects				
Predation/Competition/Disease	●	●		
PCSRF Projects Addressing Major Habitat Limiting Factors	89%	89%	87%	87%

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

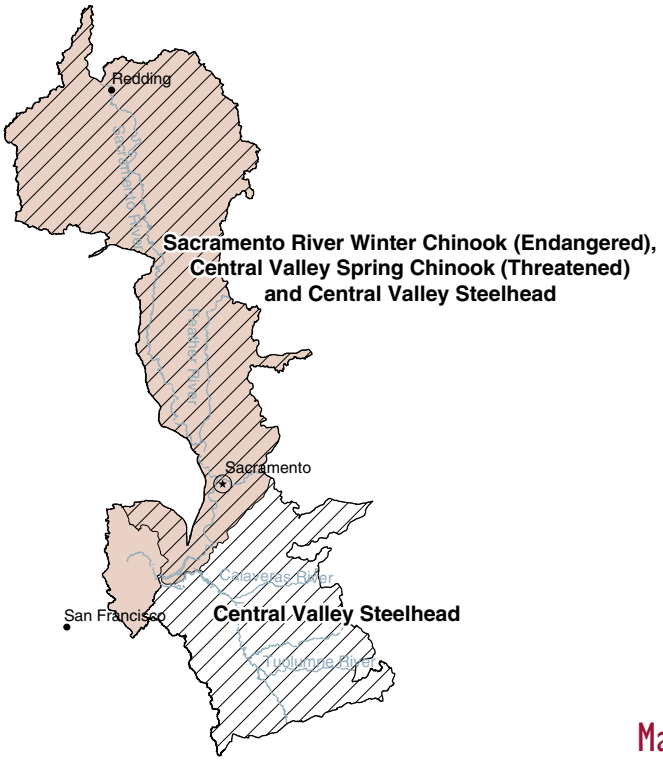
Central California Coast Coho ESU

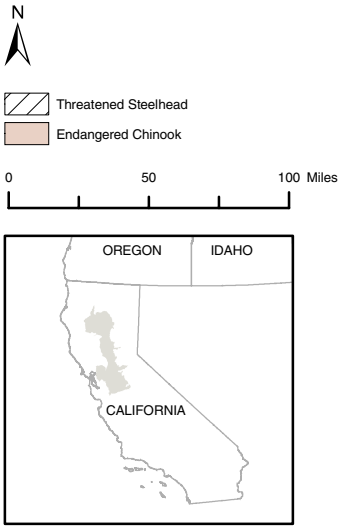
No abundance time series data are available.

- 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

- Increased water releases from dams
- Improved water quality and water supply through cooperative efforts by CALFED Bay-Delta Program[3]
- Modified dams to improve habitat, temperature, and flow
- Screened water diversions
- Enhanced efforts to reduce illegal harvest
- Planned Battle Creek dam removal program
- Improved stream flows

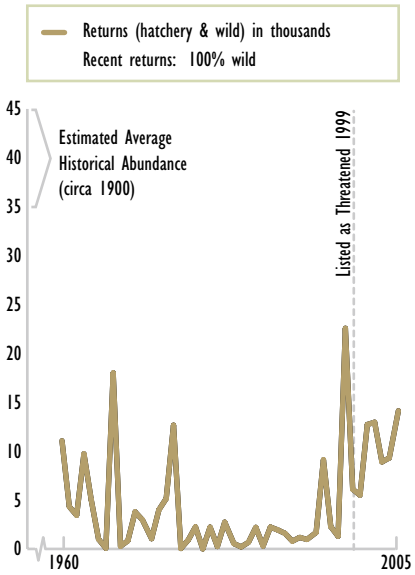
[3] The CALFED Bay-Delta Program is a collaboration among 25 state and federal agencies working together to improve water supplies in California and the health of the San Francisco Bay/Sacramento-San Joaquin River Delta.

Major Factors Limiting Recovery

	Central Valley Spring Chinook ESU	Sacramento River Winter Chinook ESU	Central Valley Steelhead DPS
Degraded Habitat—Estuarine and Nearshore Marine			
Degraded Habitat—Floodplain Connectivity and Function			
Degraded Habitat—Channel Structure and Complexity	●	●	●
Degraded Habitat—Riparian Areas and Large Woody Debris Recruitment	●		
Degraded Habitat—Stream Substrate	●		●
Degraded Habitat—Stream Flow	●	●	●
Degraded Habitat—Water Quality	●	●	●
Degraded Habitat—Fish Passage	●	●	●
Hatchery-related Adverse Effects		●	
Harvest-related Adverse Effects		●	
Predation/Competition/Disease		●	
PCSRF Projects Addressing Major Habitat Limiting Factors	*	*	*

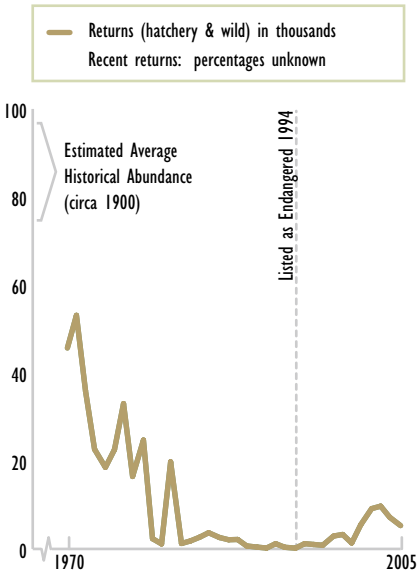
* PCSRF funds were not allocated to projects in this recovery domain.

Central Valley Spring Chinook ESU



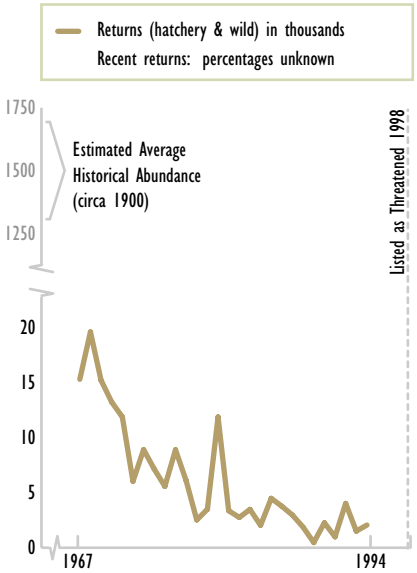
Note: For the purpose of data continuity between years, carcass counts officially recognized by tribes and state and federal agencies are not included in the abundance figures.

Sacramento River Winter Chinook ESU



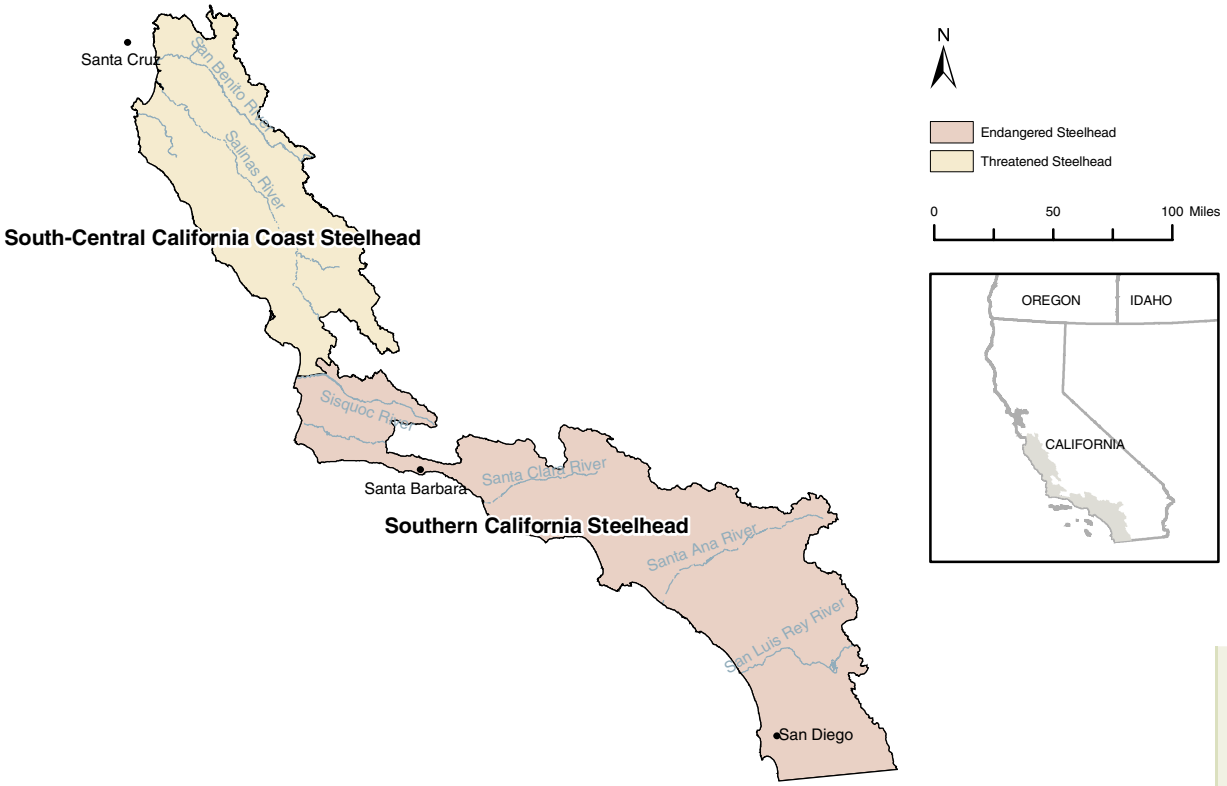
Note: For the purpose of data continuity between years, carcass counts officially recognized by tribes and state and federal agencies are not included in the abundance figures.

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.

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



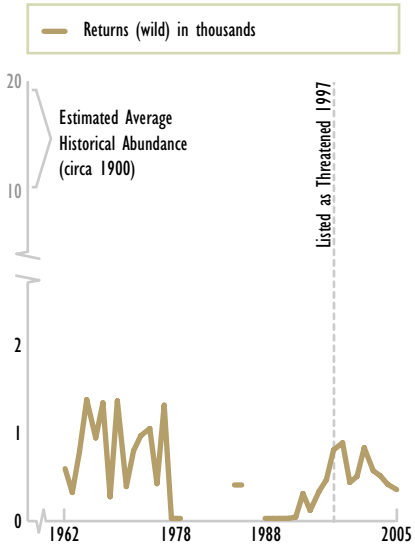
PCSRF Activities in the Recovery Domain

- Restored 114 stream miles and stabilized 2 stream miles of instream habitat
- Reduced impacts from 24 miles of road in upland habitat
- Protected 1,191 acres and 3 stream miles of habitat through land acquisition, easement, or lease
- Removed 45 barriers to fish passage, opening 173 stream miles
- Installed 2 fish screens

Major Factors Limiting Recovery

	South-Central California Coast Steelhead DPS	Southern California Steelhead DPS
Degraded Habitat—Estuarine and Nearshore Marine	●	●
Degraded Habitat—Floodplain Connectivity and Function	●	●
Degraded Habitat—Channel Structure and Complexity	●	●
Degraded Habitat—Riparian Areas and Large Woody Debris Recruitment	●	●
Degraded Habitat—Stream Substrate	●	●
Degraded Habitat—Stream Flow	●	●
Degraded Habitat—Water Quality	●	●
Degraded Habitat—Fish Passage	●	●
Hatchery-related Adverse Effects		
Harvest-related Adverse Effects		
Predation/Competition/Disease	●	●
PCSRF Projects Addressing Major Habitat Limiting Factors	90%	90%

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

Each recovery domain has a Technical Recovery Team (TRT) charged with providing the technical basis for recovery plans. Recovery plans identify the recovery and restoration actions necessary to address the key factors limiting the species and help to prioritize the implementation of recovery actions. To ensure the development and implementation of recovery plans in the Pacific Coast region, NMFS and the TRTs have worked cooperatively with multiple entities within recovery domains, including government agencies, landowners, and other interested parties involved in salmon recovery.

Watershed assessment and planning projects conducted using the PCSRF and other funds have helped identify the factors limiting recovery and provided a means to determine whether resources for restoration projects are targeted appropriately. As salmon recovery planning progresses, recovery plans will be developed, either through local recovery planning efforts or by NMFS staff in collaboration with stakeholder groups, to meet the requirements of the ESA. These plans will continue to play important roles in progress toward recovery and long-term salmon and steelhead sustainability. The current status of the plans by recovery domain is shown in Exhibit 3-10. Also, 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

ESU/DPS	Technical Recovery Teams		Interim Regional Recovery Plan*	ESA Recovery Plan
	Identification of Independent Populations	Population Viability Guidelines and Recovery Goals		
Puget Sound Recovery Domain				
Puget Sound Chinook	●	●		●
Hood Canal Summer Chum	●	●		●
Ozette Lake Sockeye	●	●		○
Willamette/Lower Columbia Recovery Domain				
Lower Columbia Chinook, Coho, and Steelhead; Columbia Chum*	●	●		○
Washington Lower Columbia Management Unit	●	●	●	
Oregon Lower Columbia Management Unit	●	●	○	
Upper Willamette Chinook and Steelhead	●	●	○	
Interior Columbia Recovery Domain				
Upper Columbia River Steelhead and Spring Chinook	●	●		◑
Middle Columbia River Steelhead*	●	●		○
Eastern Washington Lower Snake Management Unit	●	●	◑	
Washington Yakima River Management Unit	●	●	◑	
Oregon Management Unit	●	●	○	
Washington Columbia Gorge Management Unit	●	●	○	
Snake River Sockeye, Fall and Spring Chinook, and Snake River Basin Steelhead*	●	●		○
Eastern Washington Lower Snake River Management Unit	●	●	◑	
Oregon Snake River Basin Management Unit	●	●	○	
Idaho Snake River Basin Management Unit	●	●	○	
Southern Oregon/Northern California Coast Recovery Domain	●	○		○
North-Central California Coast Recovery Domain	●	○		○
Central Valley Recovery Domain	●	○		○
South-Central/Southern California Coast Recovery Domain	●	○		○

* Interim plans contain all plan elements required by the ESA, but address only a portion of an ESU or DPS. A number of interim regional plans are combined to address the entire ESU or DPS, and this full plan then is proposed and finalized as an ESA recovery plan. (Interim plans are only developed in certain domains, depending on jurisdictional boundaries and local planning efforts.)

● = Completed
◑ = Proposed Plan
○ = Underway

Chapter 4: State and Tribal Efforts

The PCSRF state and tribal partners play a key role in administering and managing the many on-the-ground projects directed at recovering threatened and endangered salmon and maintaining healthy salmon populations. The states of Alaska, California, Idaho, Oregon, and Washington and the Pacific Coastal and Columbia River tribes and tribal commissions each separately receive funding from the PCSRF and manage and sponsor salmon recovery and conservation projects within their jurisdictions. The projects undertaken are reviewed and awarded through grant processes conducted by the individual states and tribal entities. In addition to the federal PCSRF funds allocated, the states of California, Idaho, Oregon, and Washington are required to provide a 25 percent match of state funds for salmon recovery activities under their MOUs with NMFS. All of the states have met this requirement and, since program inception, California, Oregon, and Washington have provided 50 percent or more in state-matching funds. In the past year, overall state-matching funds nearly equaled federal funding. Given the lags in funding cycles, only 15 percent of FY 2006 PCSRF federal funds have been committed to projects by the states and tribes, resulting in lower percentages for FY 2006 funding reported in the following sections.

The following sections present an overview of the activities and accomplishments by each state and tribal entity. The types, numbers, and locations of projects and funding allocated are presented under each of the respective state and tribal sections. Additionally, detailed descriptions of a cross section of projects and their contribution to salmon recovery or conservation are highlighted in the sidebars.

Washington

In FY 2006 Washington's PCSRF appropriation was $24.7 million. Washington's PCSRF and state-match funds are largely targeted toward habitat protection and restoration projects. The Washington Salmon Recovery Funding Board distributes and manages the PCSRF federal and state-matching funds using a competitive grant distribution process based on assessed needs and priorities for salmon recovery within the State of Washington. Exhibit 4-1 depicts the distribution of funds for projects in the state from program inception to November 30, 2006.

Washington has committed more than $155 million in funding from the PCSRF toward salmon recovery and salmon habitat restoration projects. Additionally, the State of Washington has supplemented the PCSRF with over $79 million in state salmon conservation and restoration funds (51 percent state match on PCSRF funds). Washington has committed approximately 33 percent of the 2006 PCSRF funds. With the total funds committed, Washington has accomplished the following for salmon recovery:

- Removed 198 fish passage barriers, opening 304 stream miles through culvert removal and 579 stream miles through other barrier removal
- Restored 148 miles of instream habitat
- Installed 457 fish screens
- Restored 10,935 acres of upland habitat
- Reduced impacts from 281 miles of road
- Restored 170 stream miles and 2,310 acres of riparian habitat

Exhibit 4-1: Washington Distribution of PCSRF and State-Matching Funds FY 2000-2006

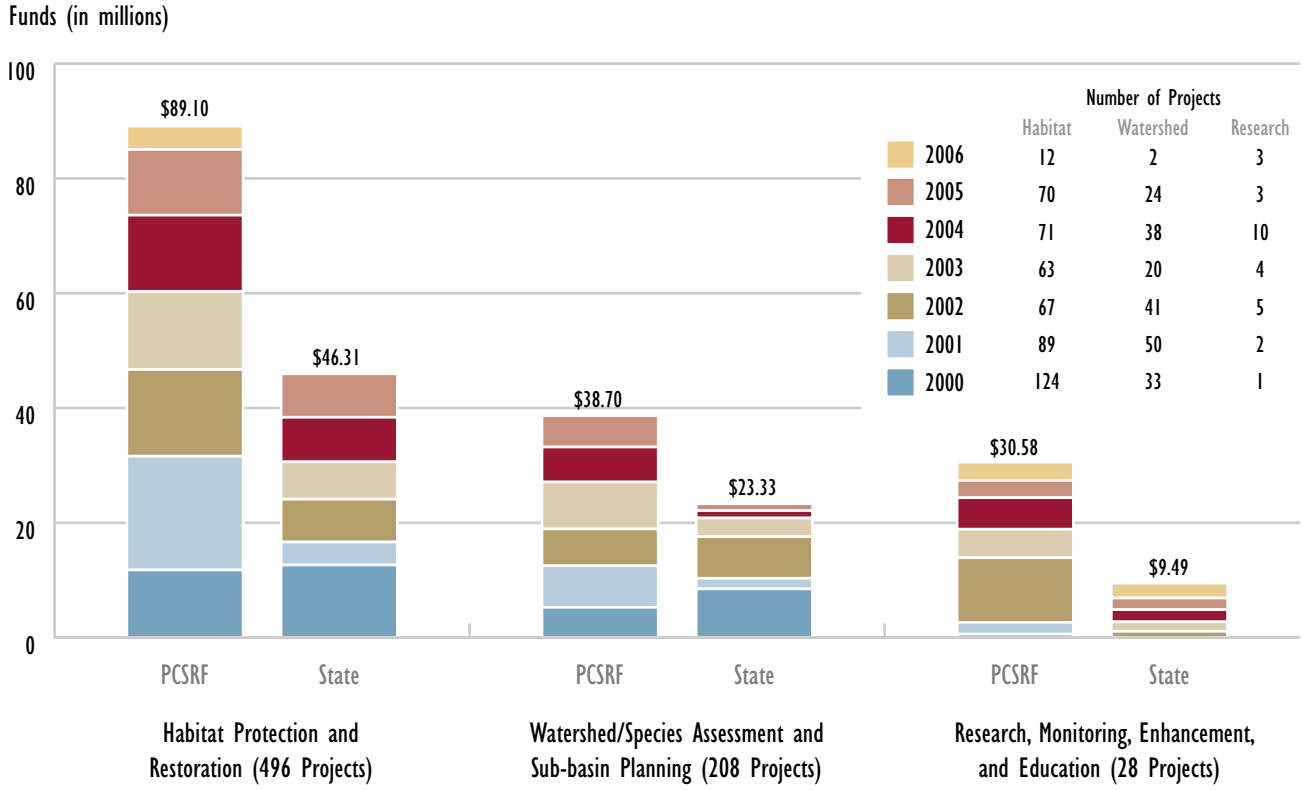
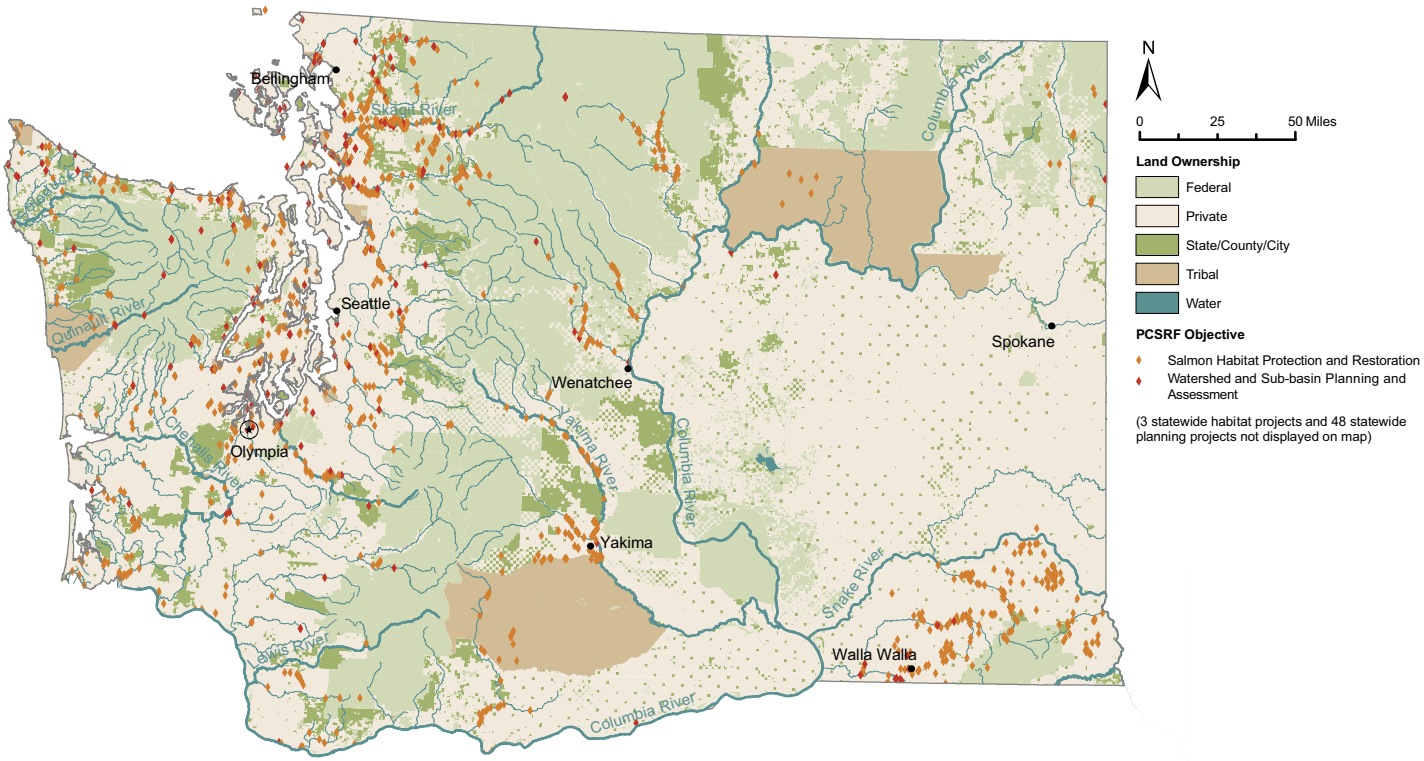


Exhibit 4-2: Locations of PCSRF Projects in Washington



Washington: Whidbey Island Juvenile Salmon Nearshore Monitoring

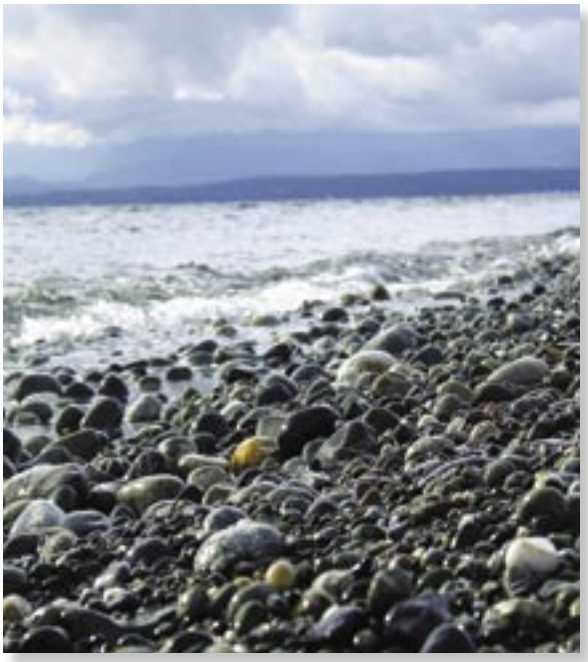
Since 2005, the Washington Salmon Recovery Funding Board has allocated PCSRF funds toward documenting juvenile salmon in nearshore habitat along Whidbey Island in Puget Sound. The project is conducted by Washington Trout, a non-profit conservation-ecology research organization dedicated to protecting and restoring wild fish in the state of Washington. The project is examining the loss of nearshore and estuarine habitat in Puget Sound and the impact on ESA listed Chinook salmon, Hood Canal summer chum salmon, as well as other species.

The use and importance of nearshore, estuarine, salt marsh, and lagoon habitats by juvenile salmon was recently identified as a high-priority data gap. The data generated by this project will assist in prioritization of habitat protection and restoration projects on the western shore of Whidbey Island. The results of this project may be used in the future to effectively target resources and efforts for nearshore habitat throughout the Puget Sound Region.

Washington Trout conducted beach seine sampling at 5 sites throughout 2006. All juvenile salmon collected were enumerated, identified, and analyzed to determine origin (e.g. hatchery vs. wild). Additionally, the project will conduct genetic sampling to determine origin.

- Restored 297 acres and created 44 acres of wetland habitat
- Restored 2,587 acres and created 1,579 acres of estuarine habitat
- Restored 699 acres of riparian habitat
- Treated 1,096 acres of estuarine habitat for invasive species
- Protected 14,828 acres and 164 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/.



Oregon: Wallowa River/McDaniel Habitat Restoration

Completed in 2006, the Wallowa River/McDaniel Habitat Restoration Project restored riparian and floodplain habitat in the Grande Ronde Basin in northeast Oregon by reconstructing channel sinuosity. The project created a meandering channel capable of connecting with the floodplain in a previously steep and narrowed section of the river. The effort has yielded improved habitat diversity and water quality for salmon in the Wallowa River. Chinook salmon and steelhead were observed spawning in the newly constructed channel in the year following construction. The project was funded through PCSRF and other state and tribal partners.

Before

After

Oregon

In FY 2006 Oregon's PCSRF appropriation was $6.4 million. Oregon designates the majority of its PCSRF funds to activities complementing habitat restoration and recovery efforts. The Oregon Watershed Enhancement Board (OWEB) administers the PCSRF federal and state-match funds through a competitive grant process for selecting salmon recovery projects. Under Oregon state law, the majority of state salmon recovery funding must be allocated to habitat restoration and protection projects in Oregon. The projects and programs supported include recovery planning, watershed councils, watershed assessments, and monitoring of fish populations, habitat conditions, and the effectiveness of restoration activities.

Since program inception, Oregon has committed approximately $75 million in PCSRF funds and over $126 million in state-matching funds for salmon recovery efforts (168 percent state-match). Oregon has committed approximately 47 percent of the 2006 PCSRF funds. Exhibit 4-3 displays the distribution of funds in Oregon from program inception to November 30, 2006. 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:

- Removed 1,252 fish passage barriers, opening 860 stream miles through culvert removal and 1,906 stream miles through other barrier removal
- Restored 428 miles of instream habitat
- Returned 427 cubic feet per second of instream flow to rivers and streams in the state
- Restored 365,635 acres of upland habitat
- Reduced impacts from 21,221 miles of road
- Restored 15,959 acres and 3,500 stream miles of riparian habitat
- Restored 10,460 acres and created 7,498 acres of wetland habitat
- Treated 7,402 acres of riparian habitat for invasive species
- Protected 50,278 acres and 147 stream miles through land acquisition, easement, or lease

In addition to the allocation of funding to salmon restoration projects, Oregon has allocated nearly $2 million to employ displaced individuals in the fishing industry to implement salmon recovery projects along the Oregon coast. More information about Oregon's salmon conservation and restoration efforts is available from OWEB at http://oregon.gov/OWEB/.

Exhibit 4-3: Oregon Distribution of PCSRF and State-Matching Funds FY 2000-2006

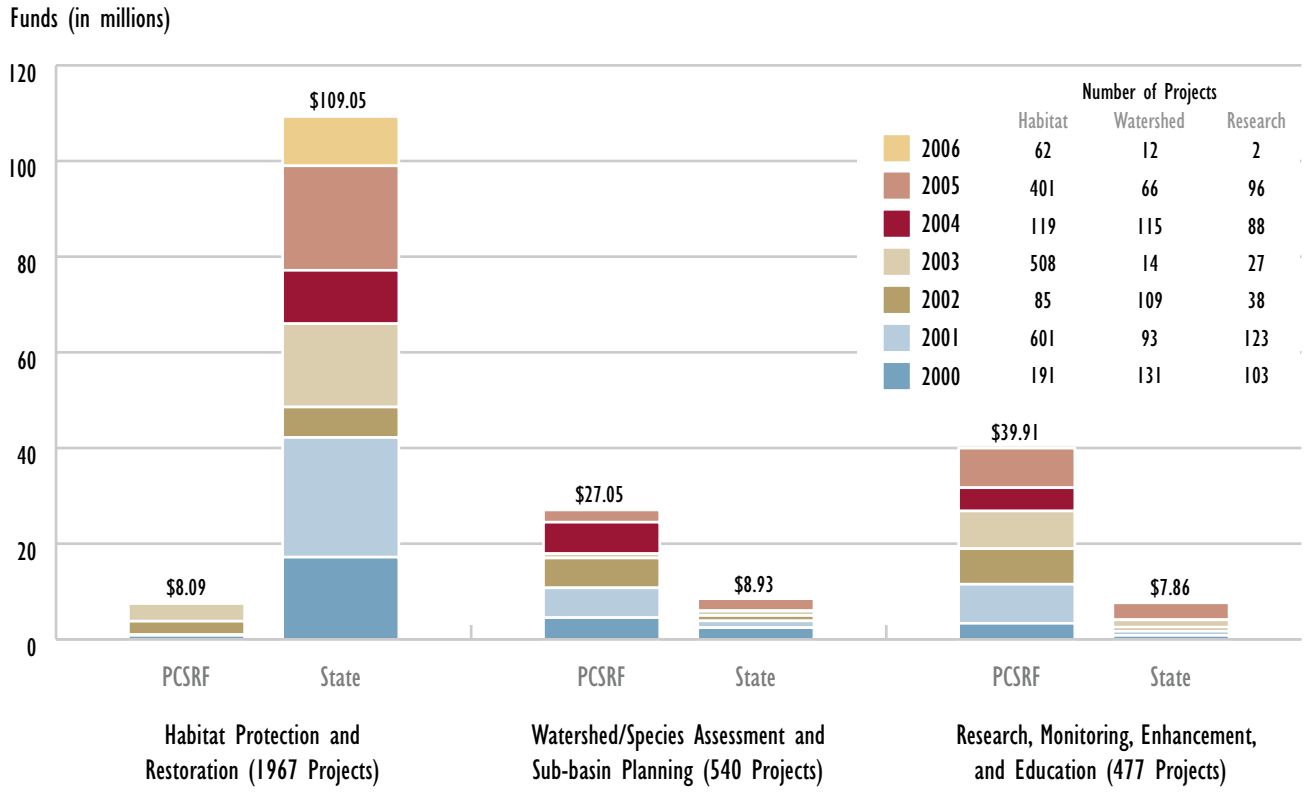
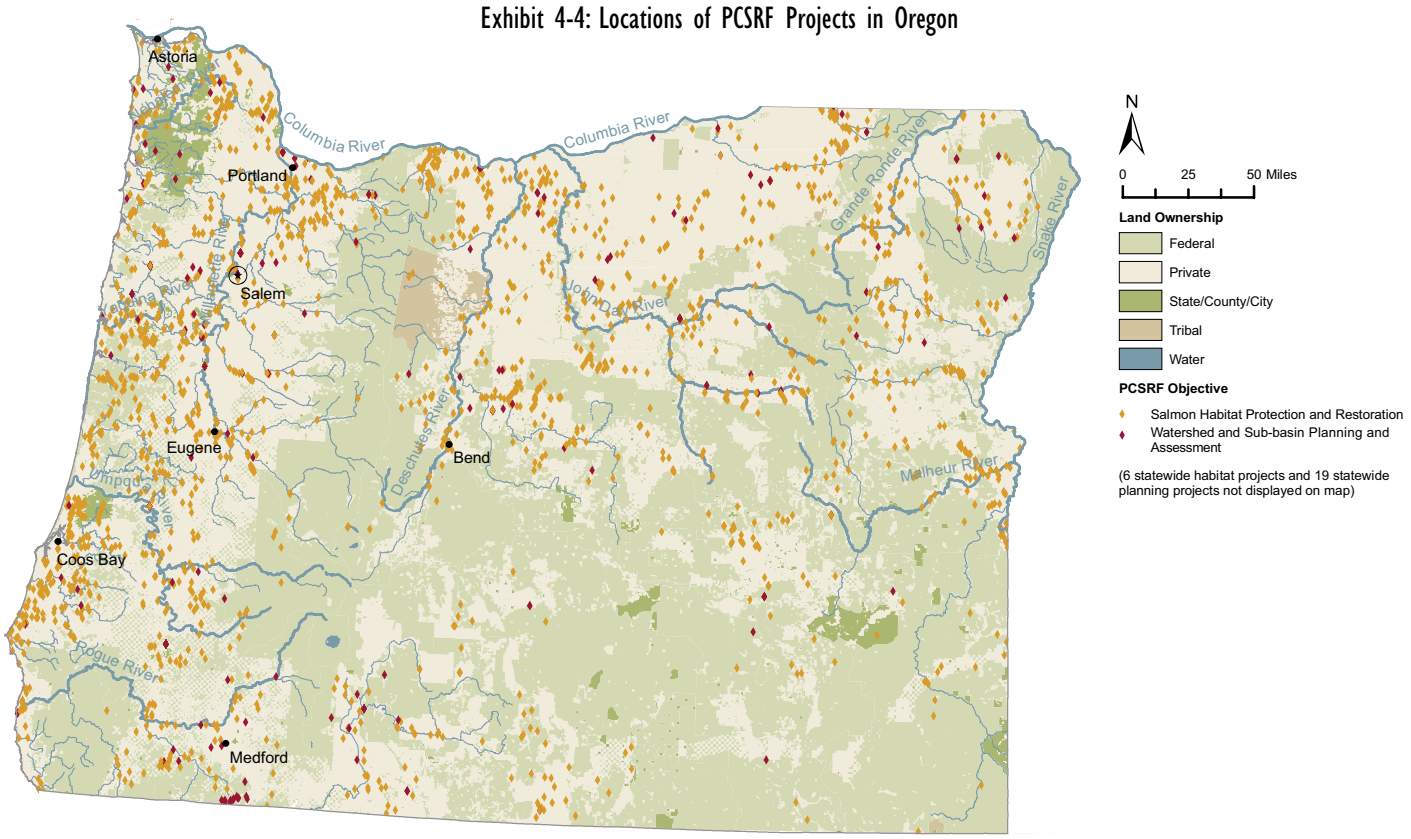


Exhibit 4-4: Locations of PCSRF Projects in Oregon



California

In FY 2006 California's PCSRF appropriation was $6.4 million. California's PCSRF and state-matching funds are primarily directed to habitat restoration and protection projects critical to salmon survival and productivity in the coastal regions of the state. Managed by the California Department of Fish and Game, California distributes funding from the PCSRF and state-matching funds for salmon recovery and restoration through a competitive grant program.

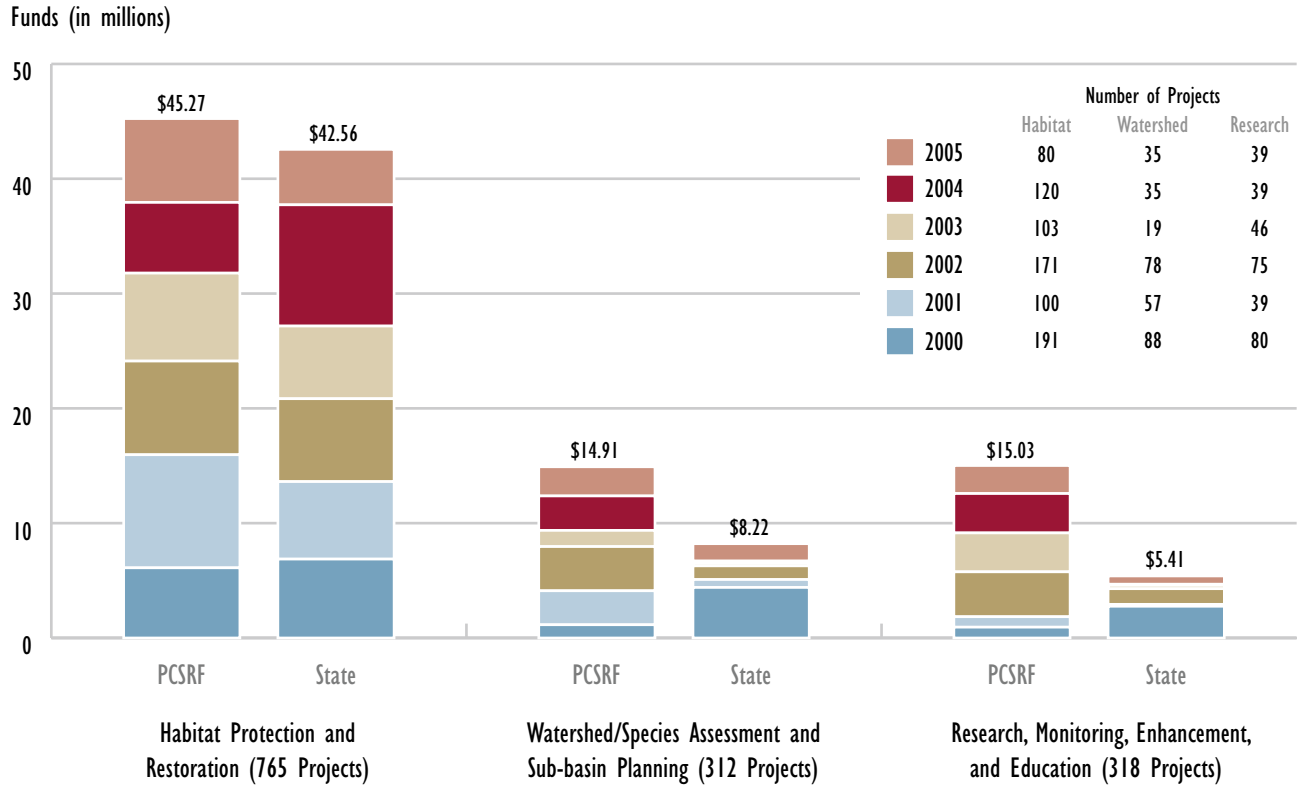
Since FY 2000, more than $75 million of the PCSRF federal funds and $56 million of state-match funds have been committed to salmon conservation and restoration activities (75 percent state-match). As of November 2006 California had not committed FY 2006 PCSRF funds. The distribution of California's funds is displayed in Exhibit 4-5.

California has accomplished the following activities for preserving and restoring salmon and salmon habitat with the PCSRF and state-match funds:

- Removed 605 fish passage barriers, opening 95 miles through culvert removal and 451 miles through other barrier removal
- Restored 610 miles of instream habitat
- Restored 693 acres of upland habitat
- Reduced impacts from 1,309 miles of road
- Restored 614 acres and 169 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 the PCSRF and state-matching funds in California. More information about California's salmon recovery efforts is available at http://www.dfg.ca.gov/nafwb/fishgrant.html.

Exhibit 4-5: California Distribution of PCSRF and State-Matching Funds FY 2000-2005



California: Horse Creek Dam Removal

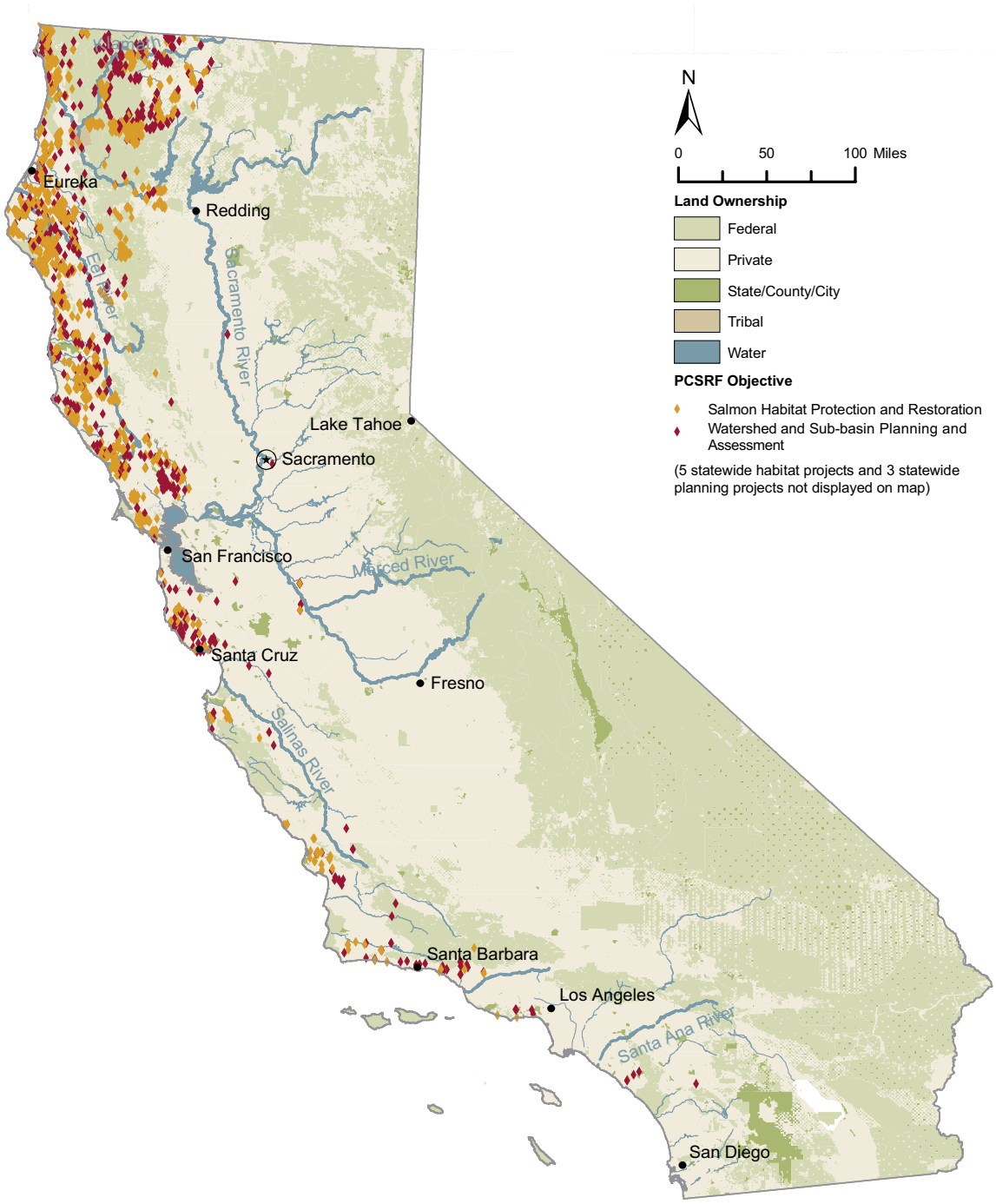
In 2006, the California Department of Fish and Game (CDFG), in partnership with other funders, leveraged funding from the PCSRF to remove the Horse Creek Dam in the Los Padres National Forest to allow passage for the endangered Southern California steelhead. The dam was demolished using explosives. The project partners included NMFS, Los Padres National Forest, California Conservation Corp–Los Padres Center, the Community Environmental Council, the American Rivers Foundation, and Stoecker Ecological.

The Horse Creek Dam removal opened 15 miles of stream habitat above the dam. Horse Creek is a tributary to the Sisquoc River in northern Santa Barbara County. The Sisquoc River and its tributaries were designated as critical habitat for ESA-listed Southern California steelhead in 2005. The dam was originally constructed in 1968 to prevent debris flows following a large fire in the upper drainage basin. By the spring of 1969 the reservoir was completely filled with debris, blocking the passage of steelhead and other aquatic species into the upstream habitat and causing excessive streambed erosion downstream of the dam.

With the dam removed, CDFG plans to conduct biological and topographic surveys to gauge the response of the stream channel, as well as the response of fish and other aquatic species. The dam removal and restoration project has been funded by the PCSRF, U.S. Forest Service, CDFG, and American Rivers Foundation.

California has also used funds from the PCSRF to develop a web-based system to improve the ability to manage, retrieve, and process information necessary for restoring and recovering ESA-listed salmon and steelhead and their habitats throughout California. "CalFish" is an on-line integrated web-based fisheries and information system that includes a variety of resources such as GIS spatial layers and tabular downloadable data, pre-made summaries and documents, tools and standards, and links to other relevant watershed and fisheries resource sites. The website was made public in January 2005.

Exhibit 4-6: Locations of PCSRF Projects in California



Idaho

In FY 2006 Idaho's PCSRF appropriation was $2.2 million. Idaho directs a majority of funding from the PCSRF to salmon habitat protection and restoration projects. The Idaho Office of Species Conservation (OSC) administers the PCSRF for salmon recovery projects for the state of Idaho. OSC has committed approximately $9.8 million from the PCSRF and $4.1 million in state-matching funds (42 percent state-match) since Idaho's inception into the PCSRF in FY 2004. Idaho has committed approximately 29 percent of its 2006 PCSRF funds. Exhibit 4-7 depicts the distribution of funds through November 30, 2006 in Idaho.

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

- Removed 61 barriers to fish passage, opening 406 stream miles
- Restored 12 and stabilized 4 stream miles of instream habitat
- Returned 255 cubic feet per second of water for instream flow
- Restored 1,525 acres of upland habitat
- Reduced impacts from 98.5 miles of road
- Restored 532 acres and 37 stream miles of riparian habitat
- Protected 1,800 acres and 16 stream miles 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 2004-2006

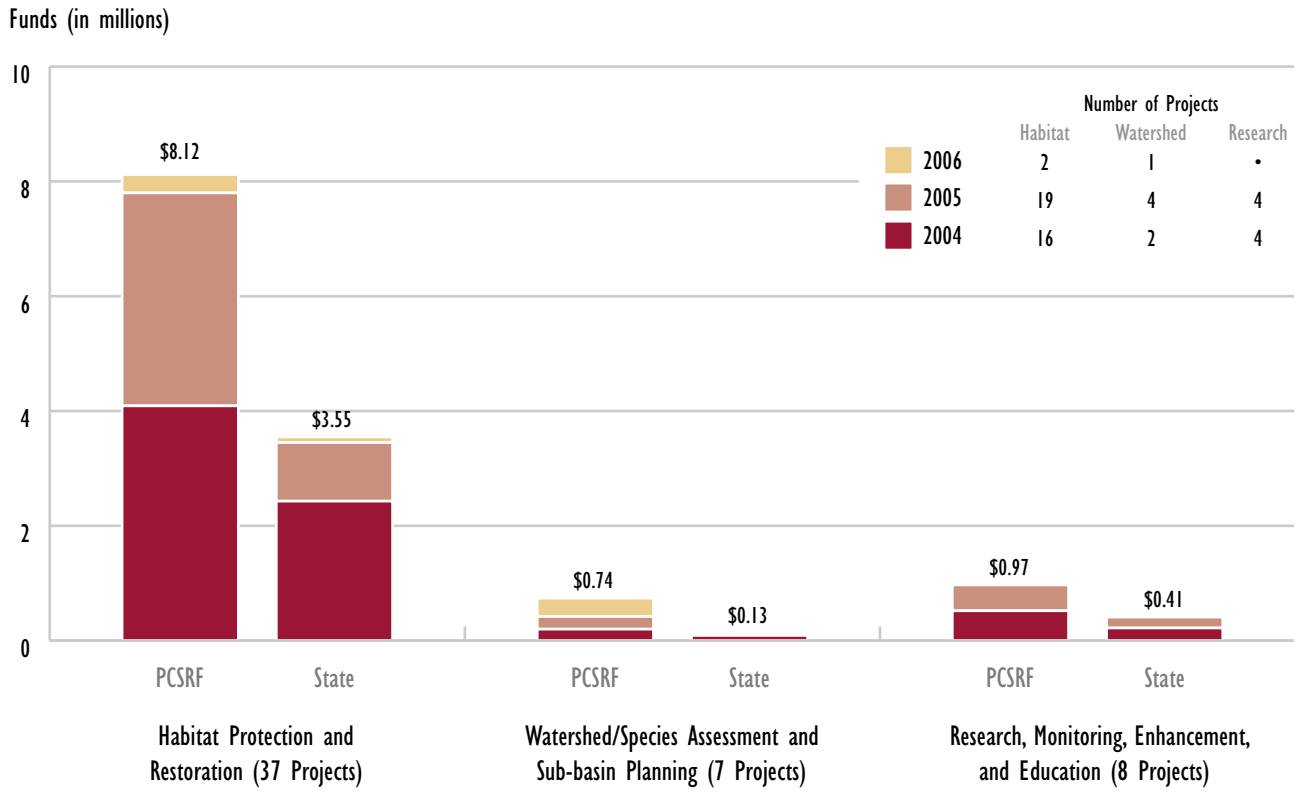
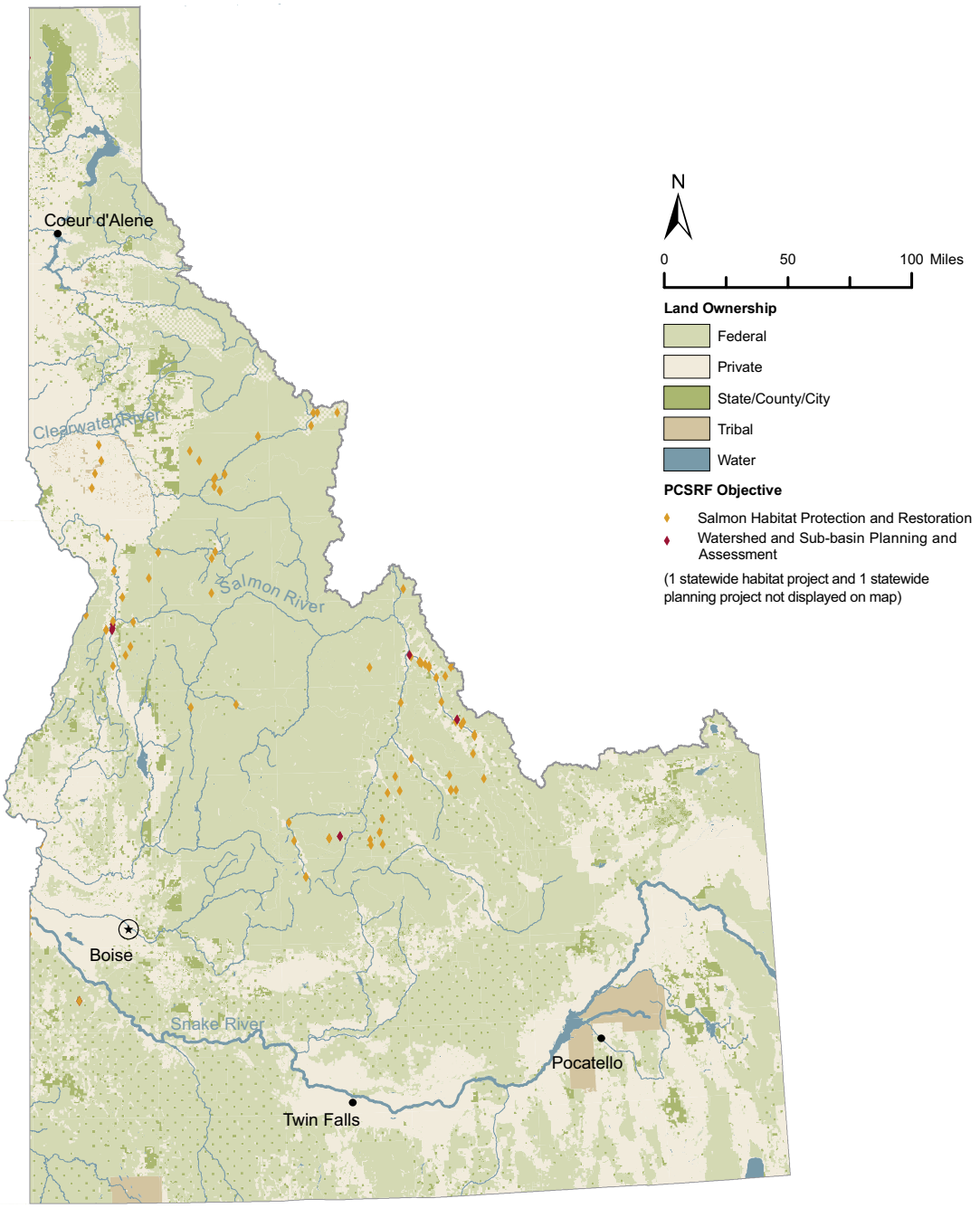


Exhibit 4-8: Locations of PCSRF Projects in Idaho



Idaho: Iron Creek Critical Habitat Restoration

The Idaho Office of Species Conservation, in conjunction with local landowners, used funding from the PCSRF to restore and reconnect critical salmon habitat in the Iron Creek watershed through barrier removal, instream flow restoration, and improved agricultural practices. The project changed agriculture flood irrigation to sprinkler irrigation, removed barriers to fish passage, and installed riparian fencing with a stock-watering system to keep livestock out of the watershed.

Iron Creek is a main-stem tributary of the Salmon River, between the East and North Forks. Within this reach of approximately 128 river miles, there exist only seven tributaries of significant size to provide thermal refuge for salmon and resident fish species. Iron Creek has been identified by local, state, and federal fish biologists as the most significant Salmon River tributary for thermal refuge in the 22-mile reach between Twelve Mile Creek and Hat Creek.

Thermal refuges such as Iron Creek are critical to salmon survival in the late summer months when water temperatures in the Salmon River become intolerable to salmon and other fish. In the past, irrigation practices seasonally dewatered sections of Iron Creek during the months when river temperatures are known to reach potentially lethal levels for salmon. Through the project, 5.4 cubic feet per second of flow has been restored in Iron Creek, along with the removal of four fish barriers to critical habitat.

Before

After

Alaska

In FY 2006 Alaska's PCSRF appropriation was $21.7 million. The Alaska Department of Fish and Game manages Alaska's PCSRF program on behalf of the State of Alaska. Funding from the PCSRF primarily supports research, monitoring, enhancement, and education projects that help sustain Pacific salmon resources, salmon habitat, and salmon-dependent industry and communities. These efforts contribute to Alaska's sustainable salmon management programs. Alaska has successfully met biologically based escapement goals for 250 of 253 salmon indicator stocks over the past five years, and has no salmon stocks listed under the Endangered Species Act.

Since FY 2002, Congress has earmarked a substantial portion of Alaska's PCSRF funding for salmon education, watershed assessment and planning, habitat restoration, research and monitoring, and enhancement projects. The distribution of non-earmarked funding uses input and recommendations from interagency Advisory and Science Coordination panels. Since 2000 the State of Alaska committed approximately $104.1 million in PCSRF funds and $17.41 million in state in-kind support for salmon sustainability. Alaska has committed approximately 1 percent of its 2006 PCSRF funds. Alaska's distribution of funds through November 30, 2006, is shown in Exhibit 4-9.

PCSRF and state in-kind investments have contributed to improvements in salmon habitat and management and to sustainable fisheries and management. Projects have:

- Removed 351 barriers to fish passage, opening 34 stream miles
- Reduced impacts from 58 miles of road
- Restored 3,877 acres of wetland habitat

Projects are located throughout Alaska as shown in Exhibit 4-10. More information about Alaska's PCSRF program is available at http://www.adfg.state.ak.us/special/sssf/sssf.php.

Exhibit 4-9: Alaska Distribution of PCSRF and State-Matching Funds FY 2000-2006

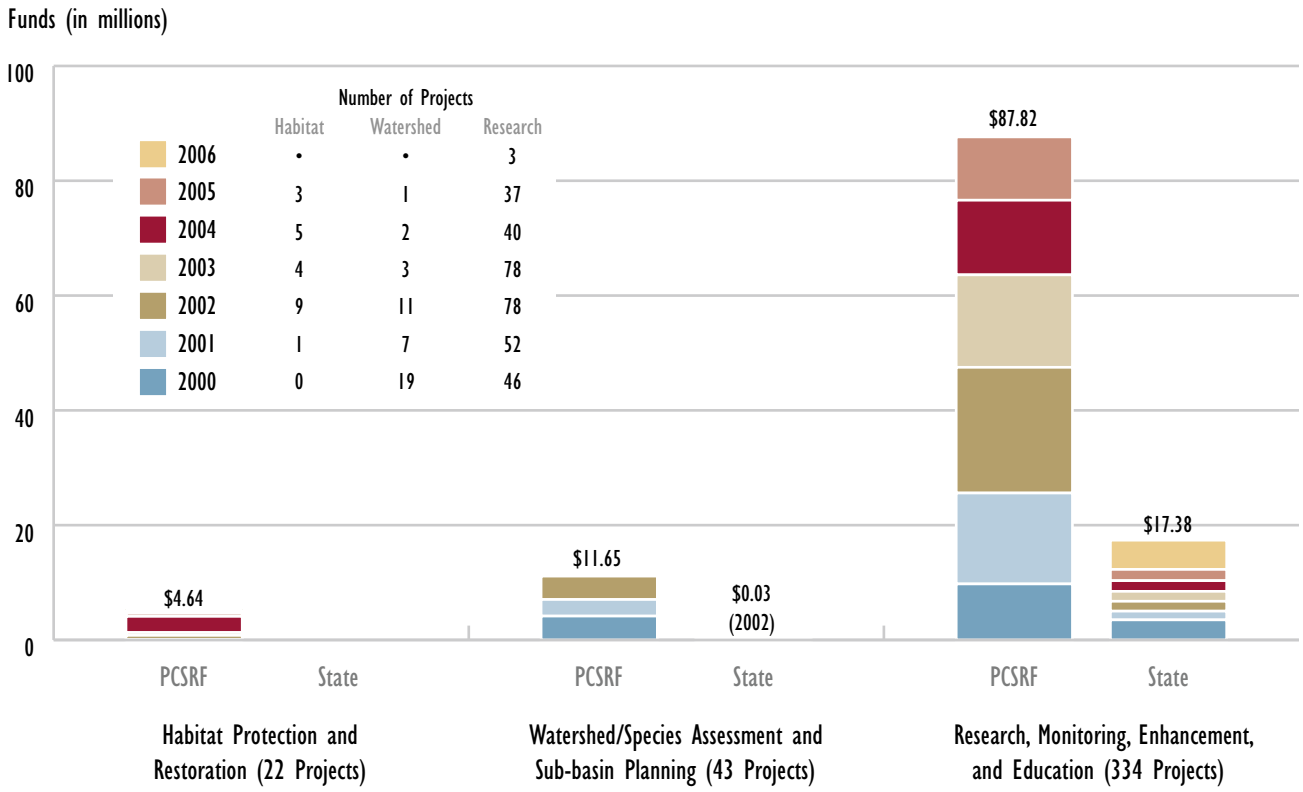
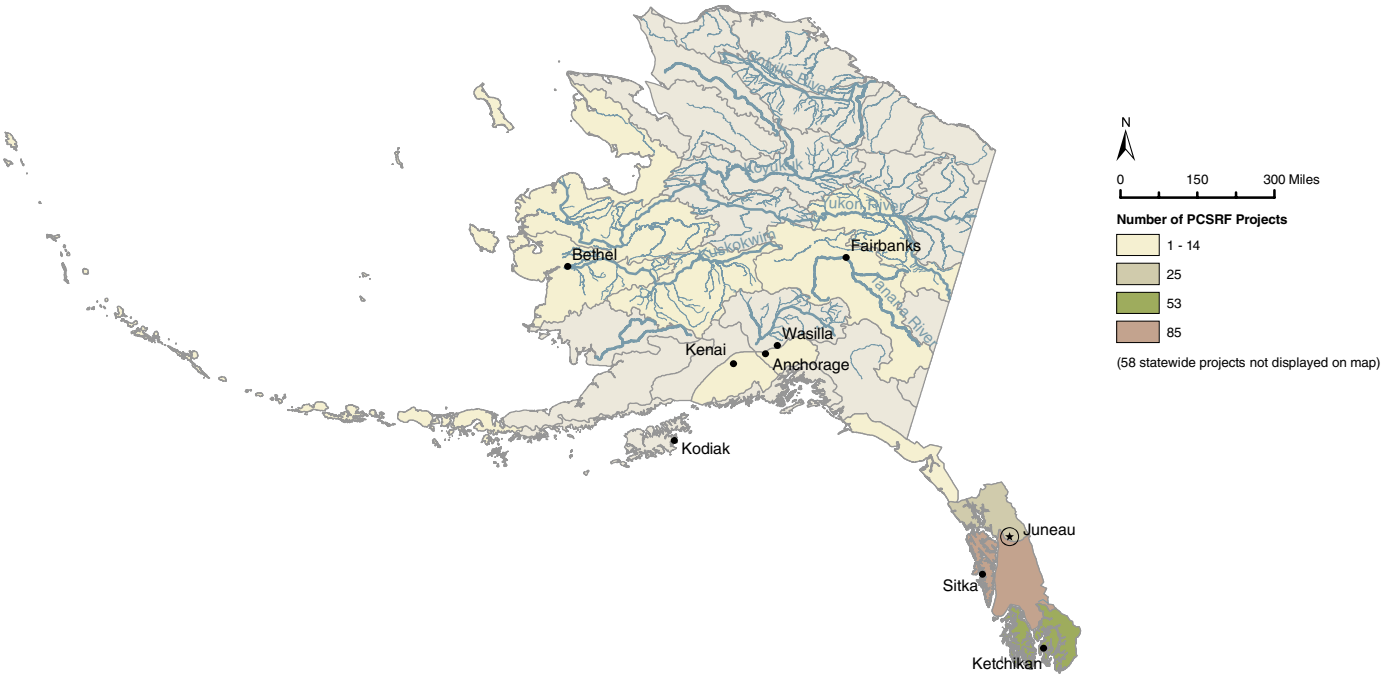
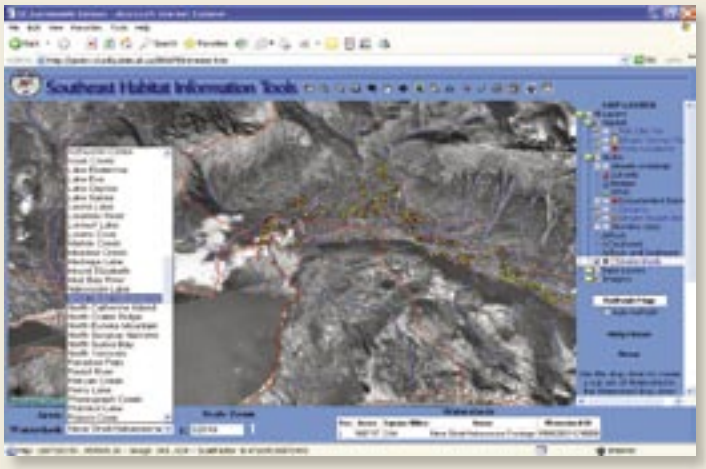


Exhibit 4-10: Locations of PCSRF Projects in Alaska



Alaska: Developing a Web-Based System for Improved Access to Salmon Resource Information



The State of Alaska is using funding from the PCSRF for development of a web-based system to improve the ability to manage, retrieve, and process important information necessary for sustaining Southeast Alaska salmon resources. With over 5,600 documented salmon streams in Southeast Alaska, the system will facilitate compilation of and access to important annual salmon resource and habitat information gathered through more than 30 datasets from 10 federal, state, local, and tribal entities. Alaska Department of Fish and Game staff currently has access to the developing system through local intranets, and the system will be made available to other agencies and entities across the public internet by May 2008 (www.adfg.state.ak.us).

Key information related to Southeast Alaska's abundant salmon resources incorporated in the system includes: salmon escapement information for managed stocks; catch reporting; upland and nearshore marine habitat distribution and condition; past land management activities; and location of stream crossing structures and evaluation of their fish passage status. Online reports and data download capabilities will be useful for watershed planning, project or activity permitting, and prioritization of future restoration opportunities that will help ensure the sustainability of Southeast Alaska's important salmon resources.

Monitoring and Trends in Non-ESA-Listed Salmon Populations in Alaska

The Alaska Department of Fish and Game (ADF&G) is responsible, under the state's constitution, to support salmon management in sustainable ways. A framework for Alaska salmon management is contained in the Sustainable Salmon Fisheries Policy (http://www.adfg.state.ak.us/special/susalpol.pdf).

The ADF&G has developed escapement goals for most of the state's salmon stocks or stock groups under the Alaska Escapement Goal Policy. Scientifically defensible methods are used to determine sustainable escapement goals that are based on historical assessments of stock specific escapements, catch, and productivity. Escapement goals represent management targets used to manage fisheries. The minimum escapement goals provide precautionary escapement thresholds; maintaining escapement above the thresholds effectively conserves the stocks in the face of variable production. ADF&G has developed and consistently maintained a comprehensive program of escapement assessment and fishery monitoring. The results of these assessments provide scientific information to maintain biologically based escapement goals and information to effectively manage salmon fisheries and maintain salmon escapements at sustainable levels. Escapement goals are reviewed and reports updated on a triennial schedule for each of the state's management areas.

Monitoring escapements relative to goals provides an indication of the status of salmon stocks and, over an extended period, the long-term sustainability of the resource. ADF&G has established escapement goals for 253 stocks/stock aggregates of salmon in Alaska. In the vast majority of cases, ADF&G reports that these escapement goals are met on an annual basis. As of March 2006, the Alaska Board of Fisheries has determined that only 3 (1 percent) of the 253 Alaska salmon stocks/stock aggregates are classified under the Sustainable Salmon Fisheries Policy as "Stocks of Management Concern." This means they have been below their respective escapement goal ranges for a period of four to five years.

Columbia River Tribes

In FY 2006 the Columbia River Tribe's PCSRF appropriation was $1.2 million. The Columbia River tribes that receive direct funding from the PCSRF include the 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 the PCSRF 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.

The Columbia River tribes have committed approximately $16.2 million in funding from the PCSRF to habitat protection and restoration projects and research, monitoring, enhancement, and education projects in the Columbia River basin. The Columbia River tribes have committed approximately 30 percent of their 2006 PCSRF funds. Exhibit 4-11 displays the distribution of the PCSRF funding through November 30, 2006, 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:

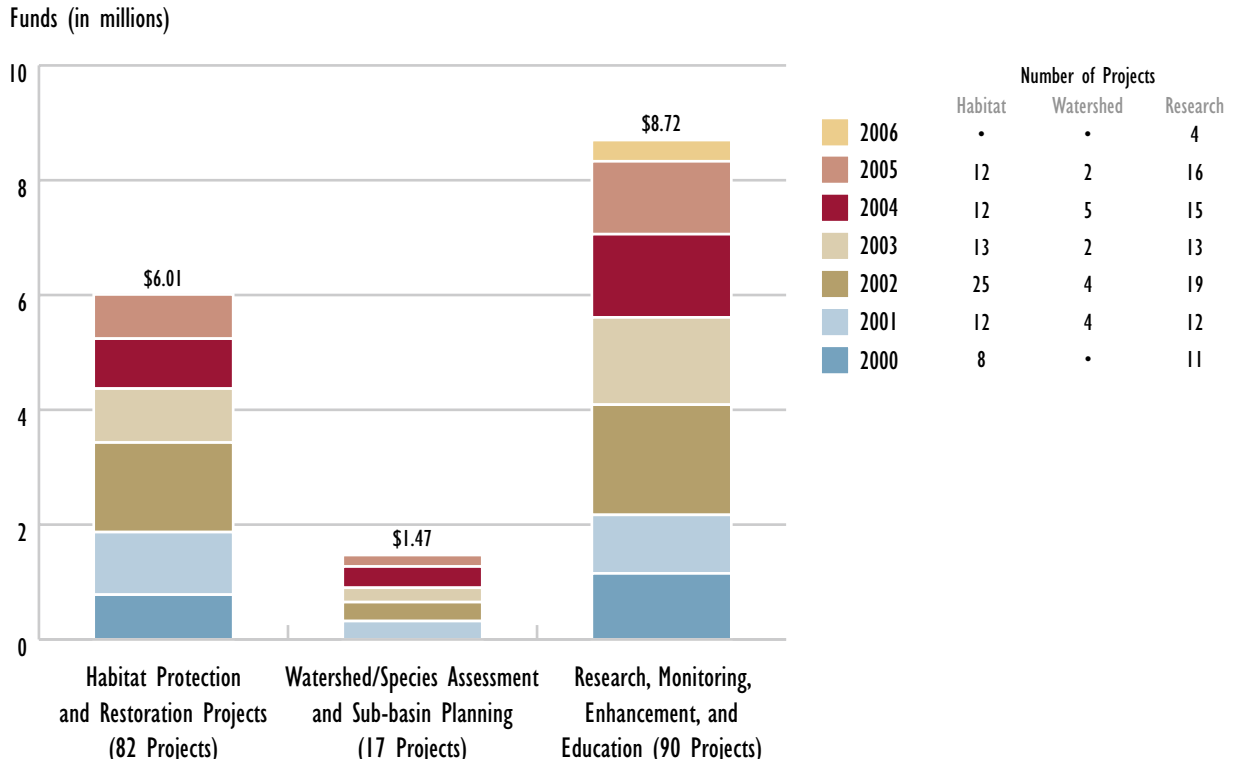
- Restored 74 and stabilized 16 stream miles of instream habitat
- Returned 10 cubic feet per second of water to instream flow
- Restored 961 acres of upland habitat and reduced impacts from 13 miles of road
- Restored 986 acres and 189 stream miles of riparian habitat
- Protected 10,660 acres and 46 stream miles of habitat through land acquisition, easement, or lease
- Treated 417 acres of riparian habitat for invasive species
- Removed 33 barriers to fish passage, opening 279 stream miles

Confederated Tribes of the Umatilla Indian Reservation (Columbia River Tribes): Fletcher Levee Removal Project

During FY 2005-2006, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) removed 1,400 linear feet of the Fletcher levee and 2,200 cubic yards of associated cobble and rock fill in Camas Creek in the north fork of the John Day River basin in Oregon. The levee opened essential habitat for spring Chinook salmon, Middle Columbia summer steelhead DPS, and other fish species in the watershed by reconnecting the stream to the adjacent wetland areas. Additionally, the CTUIR realigned 350 linear feet of stream channel and enhanced the meander development to improve instream and riparian habitat conditions critical for salmon.

The Fletcher levee, prior to removal, limited the naturally occurring over-bank stream flows and channel meander in Camas Creek. If left unaddressed, the levee would have further degraded the streambed, leading to channel widening and decreased sinuosity of the creek. In addition to the levee removal, the project included wetlands fencing and protection and restoration of native plant species, conducted in cost-share partnership with several other agencies.

Exhibit 4-11: Columbia River Tribes Distribution of PCSRF Funds FY 2000-2006



Pacific Coastal Tribes

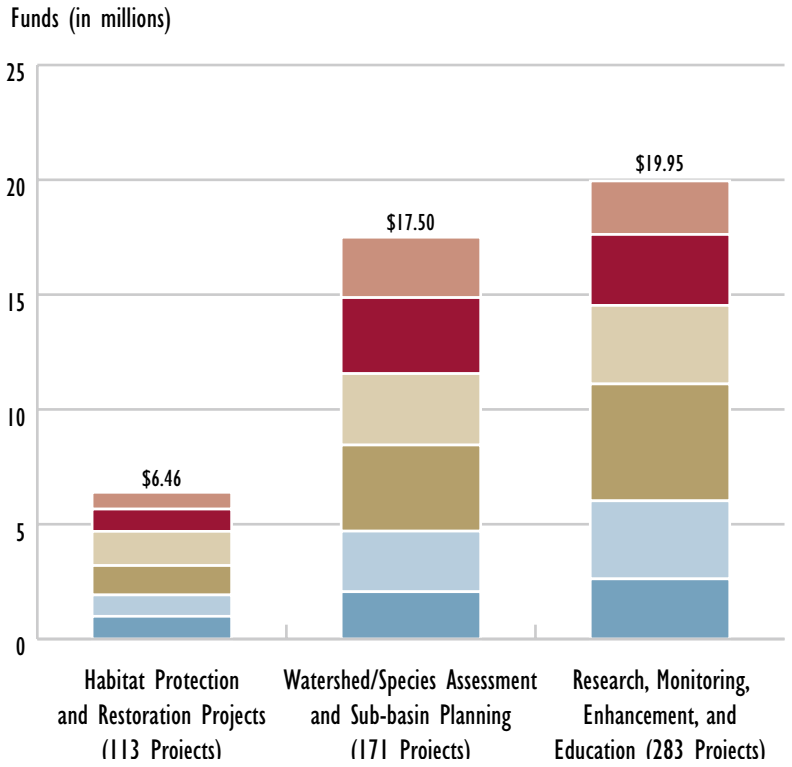
In FY 2006 the Pacific Coastal Tribe's PCSRF appropriation was $3.9 million. Since FY 2000, funding from the PCSRF for Pacific Coastal tribes has been distributed to 29 tribes and their tribal commissions in Washington, Oregon, and California. In FY 2006, PCSRF funding was distributed to the Northwest Indian Fisheries Commission (NWIFC) on behalf of 20 western Washington treaty Indian tribes; 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 Pacific Coastal tribes committed approximately $43.9 million in funding from the PCSRF toward salmon conservation and recovery. The Pacific Coastal tribes have committed approximately 1 percent of their 2006 PCSRF funds through November 30, 2006. Most of the tribes' PCSRF funds were allocated to research, monitoring, enhancement, or outreach projects in Puget Sound and Klamath River basins. The distribution of funds is displayed in Exhibit 4-12.

The Pacific Coastal tribes have conducted the following to improve habitat conditions for salmon:

- Removed 95 barriers to fish passage, opening 88 stream miles
- Restored 296 and stabilized 15 stream miles of instream habitat
- Returned 40 cubic feet per second of water to instream flow
- Restored 92 acres of upland habitat
- Reduced impacts from 42 miles of road
- Restored 1,271 acres and 224 stream miles of riparian habitat
- Restored 65 acres of wetland habitat
- Restored 139 acres of estuarine habitat
- Treated 6,703 acres of riparian habitat for invasive species
- Protected 690 acres of habitat through land acquisition, easement, or lease

Exhibit 4-12: Pacific Coastal Tribes Distribution of PCSRF Funds FY 2000-2006



	Number of Projects		
	Habitat	Watershed	Research
2006	2	•	•
2005	8	24	35
2004	18	30	49
2003	22	31	52
2002	28	41	61
2001	27	26	53
2000	8	19	33

Skokomish Tribe (Pacific Coastal Tribes): Skokomish Delta Dike Removal

In 2006, the Skokomish Tribe, in partnership with the City of Tacoma and Mason Conservation District, began a PCSRF project to remove 3,000 feet of dike on the Skokomish River Delta. The project is centered on a 108-acre parcel just west of the river's mouth, located within the tribe's reservation. In addition to dike removal, several tide gates and an access road will be removed.

Built in the 1940s, the dike has prevented the Skokomish delta from receiving a natural tidal flow, severely affecting the health of the estuary and eliminating critical juvenile salmon rearing habitat. The dike removal project aims to restore the natural nutrient flow into the delta to allow the habitat to recover from decades of deterioration.

This project is the first part of a multi-phase effort to restore more than 300 acres of the estuary to its historic conditions. The Skokomish River is the only river in the Hood Canal basin that directly supports Olympic Peninsula Hood Canal summer chum salmon, Puget Sound Chinook salmon, and bull trout—all listed as threatened under the federal Endangered Species Act.

Chapter 5: Conclusions

Pacific salmon are a significant asset to watersheds and regions across the West Coast of the United States. Their presence brings considerable economic, aesthetic, and ecological value and contributes to a cultural identity and sense of stewardship. The intricate life cycle of Pacific salmon spans several types of habitat and environments closely linked with human presence and activity. For these reasons, and the intrinsic value of the species, the PCSRF has been working closely with state, tribal, and local partners to help reverse the declining trend in abundance of many Pacific salmon stocks observed over the past several decades.

The PCSRF is committed to restoring and conserving salmon habitat, conducting assessments, developing recovery plans, monitoring, educating, and developing more effective management practices to help overall sustainability of both ESA-listed and non-listed Pacific salmon. The chart displayed in Exhibit 5-1 shows the allocation of funds, including state-matching funds, by program category to over 6,400 state and tribal projects. Exhibit 5-2 depicts the distribution of these various projects throughout the Pacific Coast region.

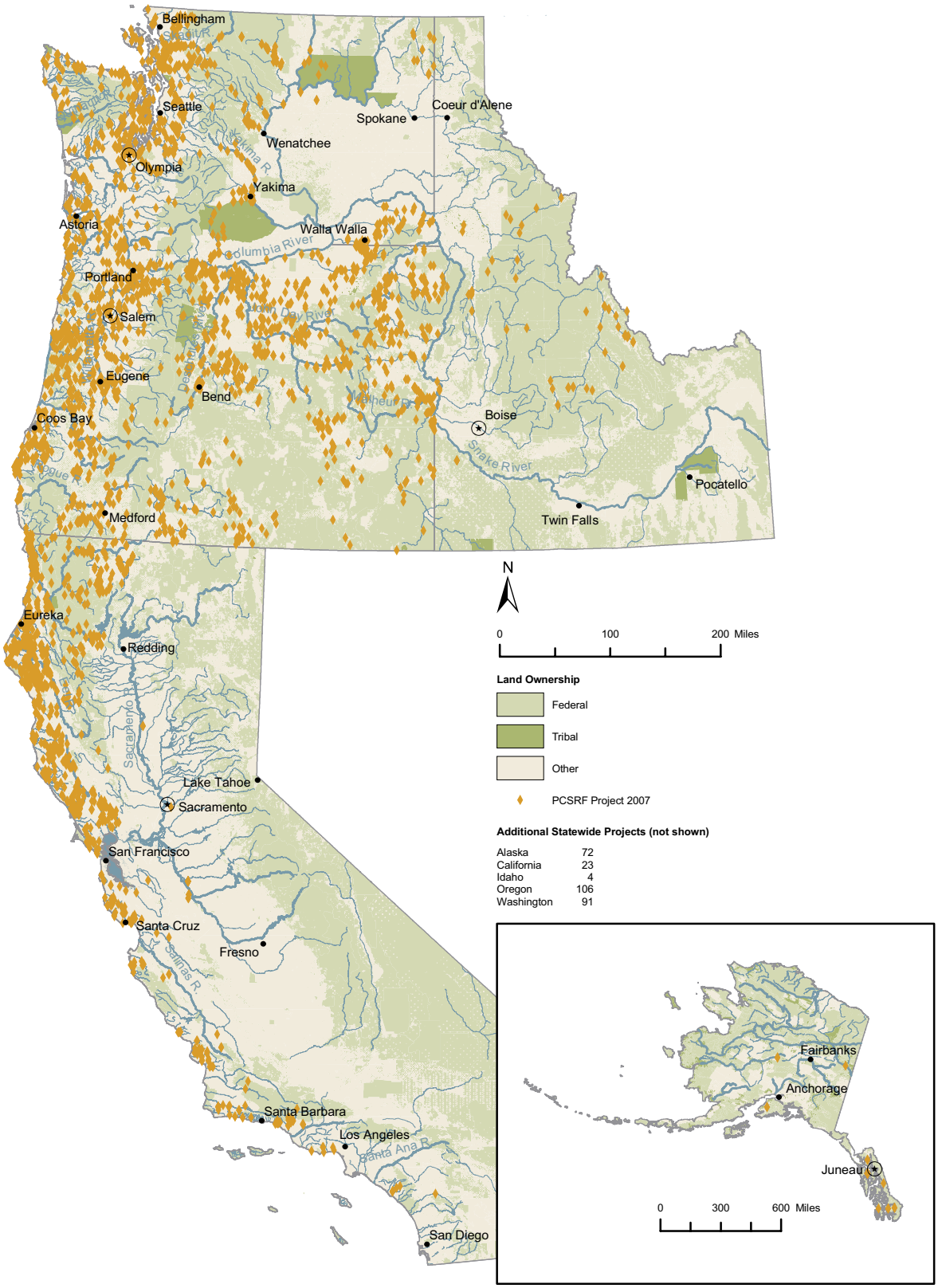
While implementing projects to restore salmon, the PCSRF has concurrently developed and refined measures for assessing program performance. Through this process, NMFS and the states and tribes have developed a Framework to track results of the PCSRF and progress toward the desired outcomes of salmon recovery and conservation. The program is currently entering a second phase of performance measures and is developing a more rigorous monitoring and evaluation effort. The next step will further the collection of data and foster organization of broader monitoring efforts across the Pacific Coast region to contribute to assessing both

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

	Funds for Habitat Protection & Restoration (3,489 projects)	Funds for Watershed Assessment & Sub-basin Planning (1,298 projects)	Funds for Research, Monitoring, Enhancement, & Education (1,551 projects)
Washington	$135.41	$62.03	$40.08
Oregon	$117.60	$35.99	$47.78
California	$87.85	$23.12	$20.45
Idaho	$11.67	$0.87	$1.38
Alaska	$4.64	$11.68	$105.59
Columbia River Tribes	$6.01	$1.47	$8.71
Pacific Coastal Tribes	$6.46	$17.50	$19.97
Total PCSRF Federal and State-Matching Funds	$369.64	$152.66	$243.96
Total PCSRF Federal Funds	$167.72	$112.01	$203.41
Total State-Matching Funds	$201.92	$40.65	$40.55

* As noted previously, validation and quality control procedures on the PCSRF database may result in changes from previously reported numbers.

Exhibit 5-2: PCSRF Projects Throughout the Region

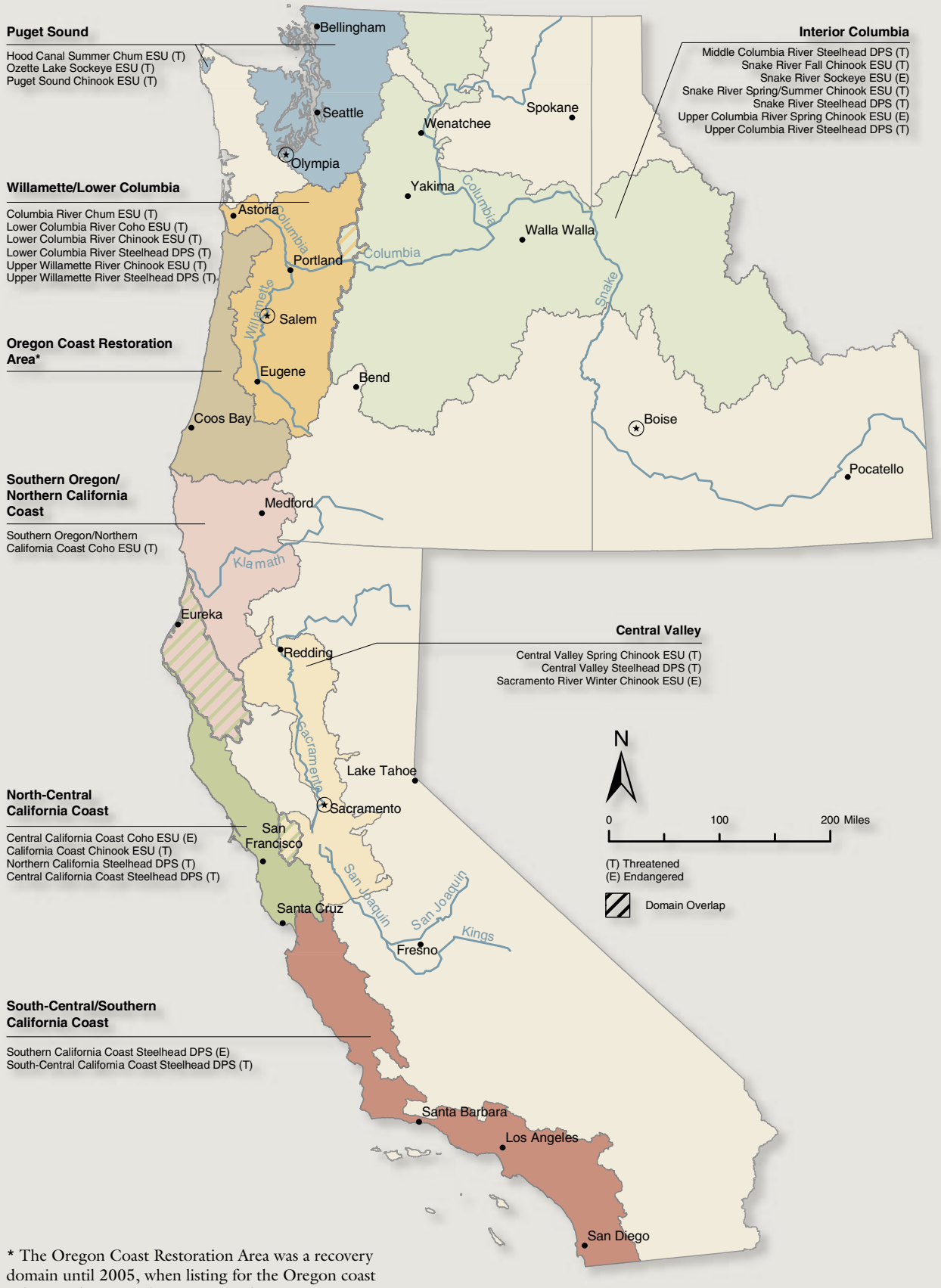


region-wide and recovery domain-specific measures. This will include information such as the following:

- Trends in area, distribution, and types of habitat
- Trends in quality of habitat
- Trends in instream flow and water temperatures
- Trends in riparian vegetation and canopy cover
- Trends in amount of accessible habitat

This continual improvement and refinement in the assessment of program performance will enhance the allocation of resources from the PCSRF. NMFS, states, and tribes are committed to making this effort and sustaining Pacific Coast salmon populations. Through the evolution of the program, the PCSRF state and tribal partners and NMFS continue to develop and implement recovery plans that provide direction and accountability for effective use of PCSRF to achieve the full recovery and restoration of Pacific salmon populations.

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.

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