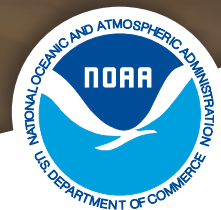


# 2009 Report to Congress

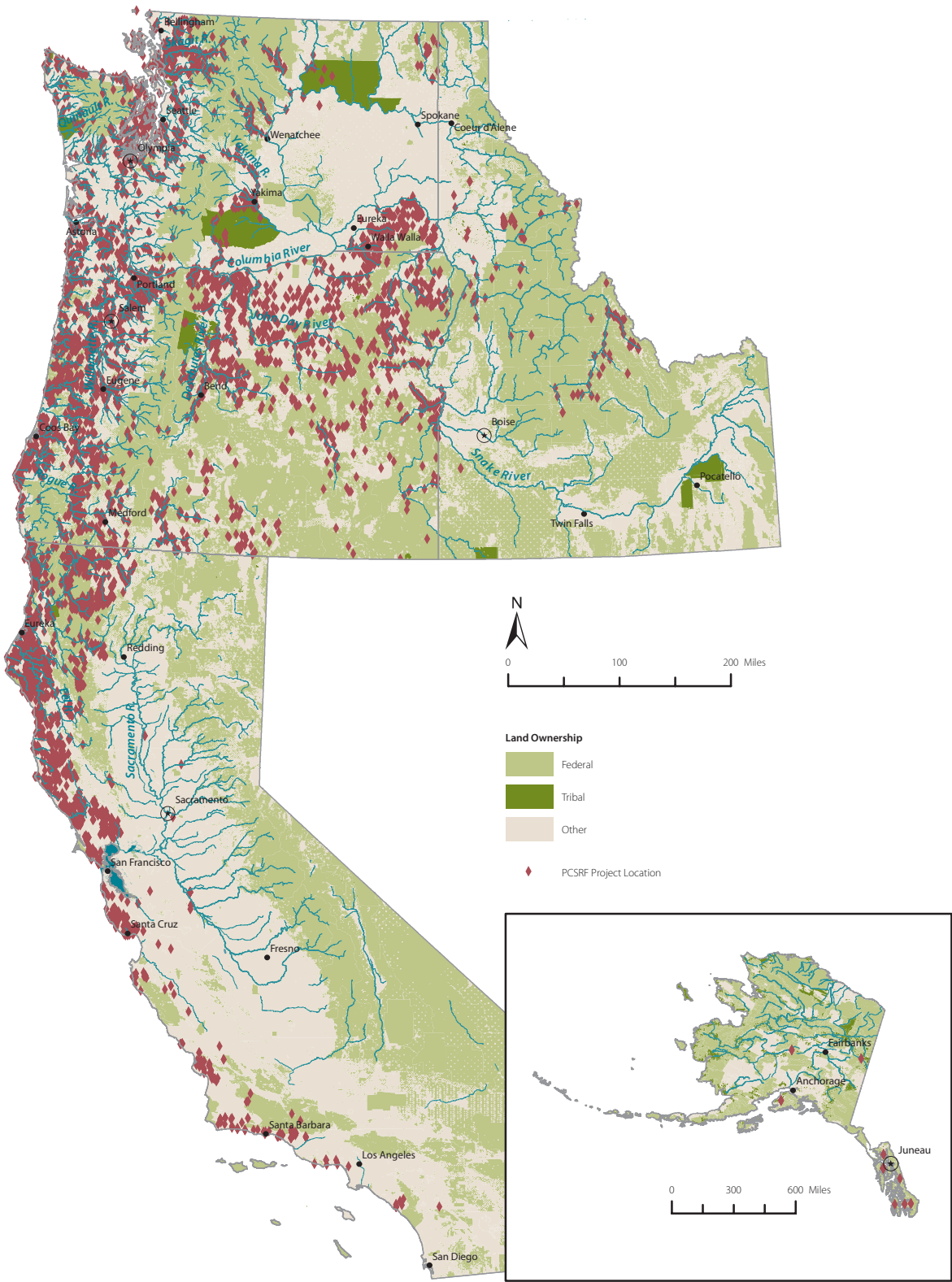
## Pacific Coastal Salmon Recovery Fund

FY 2000–2008

NOAA



# PCSRF Project Locations



# 2009 Report to Congress: Pacific Coastal Salmon Recovery Fund, FY 2000–2008

## Synopsis

Pacific salmon and steelhead<sup>1</sup> are significant biological, cultural, and economic assets to Pacific Coast states and tribes and to the United States as a whole. Changes in coastal ecosystems, from both human and natural factors, have contributed to the decline of Pacific salmonids<sup>2</sup> since the early 1900s. Certain land-use, water-use, fishery harvest, and hatchery practices have increased the vulnerability of salmonid populations and resulted in the listing of many populations as threatened or endangered species under the federal Endangered Species Act (ESA).<sup>3</sup> Congress has recognized the importance of ensuring the recovery and sustainability of salmonids and since 2000 has provided funding to NOAA's National Marine Fisheries Service (NMFS) to manage the Pacific Coastal Salmon Recovery Fund (PCSRF). This 2009 Report to Congress documents activities and progress under the PCSRF since FY 2000.

<sup>1</sup> Steelhead are the anadromous life form of freshwater rainbow trout. Steelhead migrate to the ocean but return to freshwater streams to spawn.

<sup>2</sup> In this report, the term "salmonids" refers to both salmon and steelhead.

<sup>3</sup> For tracking and assessment purposes, individual populations of salmon and steelhead are grouped into Evolutionarily Significant Units (ESUs) for salmon and Distinct Population Segments (DPSs) for steelhead. Each ESU and DPS represents a specific genetic stock and is considered by NMFS to be a "species" for listing purposes under the ESA. There are 37 salmon ESUs and 15 steelhead DPSs (52 total) within the Pacific Coast region (not including Alaska). Of these, 17 ESUs and 11 DPSs are currently listed as threatened or endangered under the ESA. The ESUs and DPSs are organized into seven recovery domains (see map on the inside back cover).

## Salmon and Steelhead—A Precious Resource

Salmonids are an integral part of the cultures and economies of communities and tribes along the Pacific Coast. Salmon runs provide both direct and indirect economic benefits and are important to the cultural practices and identities of many communities. The benefits of healthy runs are seen along the coast and inland as far as Idaho, as fish move into the upper reaches of the Columbia Basin. Changes in runs can affect fisheries, severely impacting jobs and businesses in coastal communities. For example, the combined value of the West Coast (California, Oregon, and Washington) recreational and commercial ocean fisheries dropped 46 percent in 2007 to about \$39 million, from the 2002–2006 annual average of \$71 million. In recognition of these impacts, the Secretary of Commerce declared fishery "disasters" in the Klamath River in 2006 and the Sacramento River in 2008.

Salmonids also play a key role in supporting healthy ecosystems and animal and plant communities, from the open ocean to upland habitats hundreds of miles inland. Salmon in the marine environment are an important food source for killer whales. As they return upstream to spawn, salmon support robust populations of top-level predators, such as otters, bears, and eagles. Additionally, their carcasses bring vital nutrients from the ocean to support upland riparian ecosystems and healthy plant communities.

## Variable Environmental Conditions Affect Salmon Recovery

NMFS and its partners recognize that many variables affect salmon and steelhead recovery, including biological aspects of their life cycles and climatic and ocean conditions. For example, the following conditions were described in a 2006 report\* by NMFS' scientists:

*“Over the past three decades, physical and biological oceanographic conditions have varied greatly in continental shelf waters of the northern California Current (CC) off the Pacific Northwest. Between 1977 and 1998, the northern CC was in a warm and relatively unproductive phase; as a result, salmon numbers in the Pacific Northwest declined significantly. Two of the largest tropical El Niño events of the century occurred during these 22 years: one in 1983 and a second during 1997-1998. These remote events contributed to exceptionally warm ocean temperatures in the northern CC.*

*During the past 10 years, conditions in the northern CC have been particularly variable, with the 1997-1998 El Niño followed by 4 years of tropical La Niña events, which contributed to a period of cool and productive ocean conditions. During this period, Pacific Northwest salmon numbers rebounded dramatically. However, in late 2002, oceanographic conditions again reversed, and warm conditions prevailed for the next four years. This recent return to a warm phase coincided with a decline in adult return rates of both coho and yearling Chinook salmon, reversing the trend of high adult returns observed from 2000 to 2003.”*

\* NOAA, 2006. *Ocean Conditions and Salmon Survival in the Northern California Current*. <http://www.nwfsc.noaa.gov/research/divisions/fed/ecosysrep.pdf>.

## The PCSRF Program

The PCSRF was established by Congress in FY 2000 to address the need to protect, restore, and conserve Pacific salmon and steelhead and their habitat and the impacts of the Pacific Salmon Treaty Agreement between the United States and Canada. Under the PCSRF, NMFS manages a program to provide funding to states and tribes of the Pacific Coast region (Washington, Oregon, California, Idaho, and Alaska) to implement projects to restore and protect salmonid populations and their habitat. The thousands of PCSRF projects throughout the region have made important contributions to improve the status of ESA-listed species, preventing extinctions and helping to protect currently healthy populations (see map on inside front cover).

NMFS and partner states and tribes have implemented an approach to track progress, measure performance, and ensure accountability in the use of public funds. Since FY 2002, NMFS and grantees have worked to develop approaches for reporting information and metrics on project activities using a consistent set of performance indicators. These indicators are described in the *Pacific Coastal Salmon Recovery Fund Performance Goals, Measures and Reporting Framework*.<sup>4</sup> Indicators of performance have been developed for each goal in the Reporting Framework, focusing on specific investments made within the PCSRF for salmonid restoration and conservation. This 2009 Report provides a summary of accomplishments from program inception through October 2008, as measured by these indicators.

The funding for the PCSRF is approved by Congress annually and distributed by NMFS to states and tribes (Exhibit 1). For many years, the PCSRF funds were specifically allocated by Congress to five states (Alaska, California, Idaho, Oregon, and Washington) and three tribal commissions. In FY 2007, NMFS instituted a competitive funding process to award funds among the states and tribes based on NMFS' mission goals and regional priorities for salmon recovery. An announcement is published in the *Federal Register* early each calendar year, outlining requirements and timing for the competitive process.

<sup>4</sup> The Reporting Framework is available online at: <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/upload/PCSRF-Perf-Framework.pdf>.

**Exhibit 1: NMFS PCSRF Allocations to States and Tribes (in Millions)**

State/Tribe	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total
Washington	\$18.0	\$30.2	\$34.0	\$27.8	\$26.0	\$24.6	\$23.7	\$24.1	\$23.8	\$232.2
Alaska	\$14.0	\$19.5	\$27.0	\$21.9	\$20.6	\$23.7	\$21.7	\$16.7	\$14.6	\$179.7
California	\$9.0	\$15.1	\$17.0	\$13.9	\$13.0	\$12.8	\$6.4	\$7.9	\$9.6	\$104.7
Oregon	\$9.0	\$15.1	\$17.0	\$13.9	\$13.0	\$12.8	\$6.4	\$7.3	\$9.2	\$103.7
Idaho*	●	●	●	●	\$4.9	\$4.4	\$2.2	\$2.8	\$2.4	\$16.7
Pacific Coastal Tribes	\$6.0	\$7.4	\$11.0	\$8.9	\$8.4	\$7.9	\$4.9	\$6.1	\$5.5	\$66.1
Columbia River Tribes	\$2.0	\$2.5	\$4.0	\$3.0	\$3.1	\$2.5	\$1.2	\$1.7	\$1.9	\$21.8
<b>Totals</b>	<b>\$58.0</b>	<b>\$89.8</b>	<b>\$110.0</b>	<b>\$89.4</b>	<b>\$89.0</b>	<b>\$88.7</b>	<b>\$66.5</b>	<b>\$66.6</b>	<b>\$66.9</b>	<b>\$724.9</b>

\* Idaho entered the program in FY 2004.

States, tribal commissions, and individual tribes not affiliated with a commission are all eligible to apply.<sup>5</sup>

States and tribal entities allocate their awarded funds to specific projects based on their own competitive processes to screen and prioritize projects that best address the PCSRF goals. In addition to the PCSRF federal funds, states provide significant matching funds through their grant allocation processes.<sup>6</sup> The federal and state matching funds are supplemented by private and local contributions at the project level, including additional funding, volunteer time, and other in-kind donations. These local contributions are difficult to quantify, but are important to the success of the PCSRF.

<sup>5</sup> Pacific Coastal Tribes include the Northwest Indian Fish Commission (NWIFC) on behalf of 20 western Washington treaty tribes (Hoh, Jamestown S'Klallam, Lower Elwha Klallam, Lummi, Makah, Muckleshoot, Nisqually, Nooksack, Port Gamble S'Klallam, Puyallup, Quileute, Quinault Nation, Sauk-Suiattle, Skokomish, Squaxin Island, Stillaguamish, Suquamish, Swinomish, Tulalip, and Upper Skagit); the Klamath River Inter-Tribal Fish Commission (KRITFC) on behalf of four Klamath Basin tribes (Hoopa Valley [CA], Karuk [CA], Klamath [OR], and Yurok [CA] tribes); and tribes not associated with a tribal commission (Round Valley Indian Tribes in the Eel River Basin [CA], the Confederated Tribes of the Chehalis Reservation [WA], Coquille Indian Tribe [OR], the Confederated Tribes of the Grand Ronde [OR], and the Confederated Tribes of the Siletz Indians [OR]). Columbia River Tribes include the Columbia River Inter-Tribal Fish Commission (CRITFC) on behalf of four tribes (Nez Perce [ID], Confederated Tribes of the Umatilla [OR], Confederated Tribes of the Warm Springs [OR], and the Yakima Nation [WA]); and tribes not affiliated with a tribal commission (Colville Confederated Tribes [WA], and the Shoshone-Bannock Tribe [ID]).

<sup>6</sup> Tribes are not required to provide matching funds.

## PCSRF Actions and Performance

For the past 8 years, the PCSRF has provided means for states and tribes to invest in priority habitat restoration; fish passage improvements; research, monitoring, and evaluation; and education projects. States have used matching funds to supplement the PCSRF investments in thousands of projects, ranging from single culvert replacements to large habitat restoration projects covering hundreds of acres. Significant progress has been made in the PCSRF goals of habitat protection and salmonid recovery, as described in the following sections (Exhibit 2). Specific examples of grantee PCSRF activities are described in the last few pages of this Report.

### The PCSRF Goals

Progress is expected on short-term PCSRF goals within approximately 5 years of project implementation. Mid-term goals require between 5 and 15 years of measurements for results to be discernible, while long-term goals require more than 15 years of investments and monitoring to begin to see results.

## Exhibit 2: Region-wide Performance Reporting Results, FY 2000-2008\*

Output	Regional Indicator	Completed
Instream Habitat Projects	Stream Miles Treated	878
Wetland Habitat Projects	Acres Created	2,047
	Acres Treated	28,713
Estuarine Habitat Projects	Acres Created	599
	Acres Treated	927
Land Acquisition Projects	Acres Acquired or Protected	122,271
	Stream Bank Miles Acquired or Protected	2,300
Riparian Habitat Projects	Stream Miles Treated	4,526
	Acres Treated	45,803
Upland Habitat Projects	Acres Treated	444,885
Fish Passage Projects	Number of Barriers Removed	2,169
	Stream Miles Opened	4,299
	Number of Fish Screens Installed	944
Hatchery Fish Enhancement Projects	Number of Fish Marked for Management Strategies	237,263,775
Watershed Planning and Assessment Projects	Number of ESUs and DPSs with Factors Limiting Recovery Identified	27 out of 28 ESU/DPSs
Research, Monitoring, and Evaluation Projects	Miles of Stream Monitored	166,635
	Number of Assessments Completed	462

\* Some of the above values are less than those reported for FY 2000-2007 in the 2008 Report to Congress. The reductions are due to corrected final values for completed projects.

### Short-Term Goal: Enhance Availability and Quality of Salmonid Habitats

#### Progress: More and Better Habitat Is Available

- » Nearly 650,000 acres of habitat have been restored, protected, and made accessible to salmonids by the PCSRF projects. Degraded habitat is considered a major factor limiting the recovery of all 27 Evolutionarily Significant Units (ESUs) and Distinct Population Segments (DPSs) along the Pacific Coast for which assessments have been completed (limiting factors have been assessed for all 28 listed ESUs/DPSs *except* the Puget Sound steelhead DPS). Instream, riparian and upland habitat restoration projects provide high-quality salmonid rearing and spawning habitat by preventing sedimentation, enhancing stream-bed conditions, increasing instream flows, and improving
- » The PCSRF projects have opened 4,299 miles of stream habitat since the program's inception. Projects include the removal of fish passage barriers such as old and malfunctioning culverts, road easements, and water diversion dams. Many of these barriers prevent fish from migrating upstream to otherwise usable habitat, making barrier removal a cost-effective way to increase available spawning and rearing habitat. The removal of these barriers also prevents unnatural flood events due to blockages or changes in the natural stream bed, establishes natural instream flow, and helps maintain healthy water temperatures for salmonids.

water quality and quantity in critical salmonid habitats. The PCSRF is critically important to the financing of multi-year, multi-jurisdictional restoration projects vital to salmonid recovery.

## Short-Term Goal: Improve Management Practices

### *Progress: Fisheries Management Practices Are Protecting Wild Stocks*

- » The PCSRF has contributed to marking more than 200 million hatchery fish over the past 8 years. Fish marking programs allow grantees to estimate fish abundance and support selective fisheries for hatchery fish. These efforts help manage fisheries to protect wild stocks.
- » Hatchery improvements are another focus for the PCSRF to improve overall management practices within each watershed. Improvements to hatchery practices and facilities, such as the removal of old equipment and modifications to fish collection protocols, have improved fish supplementation efforts in select watersheds and reduced impacts on wild salmonid stocks.

## Short-Term Goal: Address Major Habitat Limiting Factors

### *Progress: Watershed Assessments Are Helping Focus Resources on Priority Needs*

- » For 27 of the 28 ESA-listed ESUs and DPSs, grantees have developed watershed assessments and watershed-specific recovery plans that identify key factors limiting salmonid recovery. These factors are defined in the Reporting Framework and are used to prioritize recovery actions within each ESU/DPS. By focusing on projects that address these limiting factors, grantees can effectively use funds for projects that have a greater cumulative effect on local populations.

## Mid-Term Goal: Improve Status of ESA-Listed Salmonids (increase naturally spawning populations)

### *Progress: ESA-Listed Runs Are Improving*

- » In the Pacific Coast region, 22 ESUs/DPSs are listed as threatened and 6 ESUs/DPSs are listed as endangered under the ESA. Of these, 20 have more than 10 years of

## Salmon Returns Vary by Population

Salmonids have a complex life history, inhabit wide ranges of geography that overlap many jurisdictions, and use a variety of habitats from freshwater streams and rivers to estuaries and the ocean. These factors create a number of challenges for fishery managers attempting to predict annual population numbers and plan effective long-term management strategies. Differences across populations mean that some populations may be more vulnerable to a particular environmental or human-caused ecosystem change than others. The following examples illustrate some of the population variability.

### 2008 Closure of West Coast Fisheries

In April 2008 the Pacific Fishery Management Council (PFMC) closed most of the salmon fisheries on the West Coast south of the Washington/Oregon border in response to the sudden collapse of Sacramento River Fall Chinook salmon and the poor status of many other coho salmon stocks. The PFMC closed commercial and recreational Chinook fisheries south of Cape Falcon, Oregon, and allowed only a limited hatchery coho recreational fishery of 9,000 fish in Oregon. NMFS, at the request of the PFMC, has convened a scientific investigation of the potential causes of the decline of the Sacramento River Fall Chinook stock and an analysis of the potential depression of other salmon stocks.

### Record 2008 Columbia River Sockeye Returns

In the summer of 2008 a record number of sockeye salmon returned to the Columbia and Snake River systems. Approximately 250,000 fish returned to the basin, the highest returns on record since 1950. A number of variables may have contributed to the increased number of fish, including more favorable ocean conditions, better outmigration due to increased spill water over the Lower Columbia dams, and increased hatchery output. Returns of the endangered Snake River sockeye population were the highest since 1959.



recent data that can be used to assess population trends. Of the 20 populations, 17 show stable or increasing trends (Exhibit 3).

### Mid-Term Goal: Maintain Healthy Salmon Populations

#### *Progress: Programs Are Established to Monitor Salmonid Populations*

» PCSRF grantees are required to allocate at least 10 percent of their project funding to monitoring and evaluation activities of individual and regional projects. These dedicated funds allow grantees to collect data on both listed and non-listed salmonids for multiple years during and after project completion. These data not only help to determine the status of populations, but also identify effective actions essential to species recovery and sustainability. Washington, Oregon, and Idaho are also involved in the development of “Intensively Monitored Watersheds” to measure project effectiveness on a watershed scale. The availability of monitoring data is very important for maintaining healthy salmonid populations.

### Long-Term Goal: Sustain Pacific Salmon

The current status and viability of salmonid populations vary significantly across the Pacific Coast region. Populations in Alaska are currently considered healthy and none are listed under the ESA. Salmonid runs in the Pacific Coastal area of other states vary widely as previously described.

**Exhibit 3: ESA-Listed ESUs and DPSs\***

Recovery Domain	ESU/DPS	Stable or Increasing
Puget Sound	Ozette Lake Sockeye (T)	●
	Hood Canal Summer-run Chum (T)	●
	Puget Sound Steelhead (T)	
	Puget Sound Chinook (T)	●
Willamette/Lower Columbia	<b>Columbia River Chum (T)</b>	●
	Lower Columbia River Chinook (T)	●
	Upper Willamette River Chinook (T)	●
	Lower Columbia River Steelhead (T)	●
	Lower Columbia River Coho (T)	
	<b>Upper Willamette River Steelhead (T)</b>	●
Interior Columbia	Snake River Sockeye (E)	
	Upper Columbia River Spring Chinook (E)	●
	Snake River Fall Chinook (T)	●
	Snake River Spring/Summer Chinook (T)	
	Upper Columbia River Steelhead (E)	●
	Middle Columbia River Steelhead (T)	●
	Snake River Basin Steelhead (T)	●
Oregon Coast	<b>Oregon Coast Coho (T)</b>	●
S. Oregon/N. California Coast	<b>S. Oregon/N. California Coast Coho (T)</b>	●
Central Valley	<b>Sacramento River Winter Run Chinook (E)</b>	●
	California Central Valley Spring Chinook (T)	
	California Central Valley Steelhead (T)	
North-Central California Coast	California Coastal Chinook (T)	
	Northern California Steelhead (T)	
	Central California Coast Coho (E)	
	Central California Coast Steelhead (T)	
S. Central/S. California Coast	<b>S. Central California Coast Steelhead (T)</b>	●
	Southern California Steelhead (E)	

(T) = Threatened (E) = Endangered

\* Bold font indicates those ESUs/DPSs with 10 or more years of data that can be used to assess population trends.



### Progress: Knowledge of Requirements for Recovery and Sustainability Is Improved

» Technical Recovery Teams (TRTs) have been established in Recovery Domains to provide guidance on the technical and scientific aspects of recovery that will protect and restore salmonid populations. TRTs conduct analyses that identify goals for individual populations to be considered viable and have a negligible risk of extinction based on a number of factors. NMFS is collaboratively developing recovery plans to identify the recovery and restoration actions necessary to address key limiting factors for each population. Plans also prioritize recovery actions for implementation to restore populations to viable levels and enhance their ability to respond to ecosystem changes. The plans play an important role in progress toward recovery and long-term salmonid sustainability. To date, ESA recovery plans have been completed for the following ESUs/DPSs:

- » Puget Sound Chinook
- » Hood Canal Summer Chum
- » Upper Columbia River Spring Chinook
- » Upper Columbia River Steelhead
- » Lake Ozette Sockeye

A “draft-for-public-review” recovery plan has been released for the Mid-Columbia River Steelhead.

» Data gathered through fisheries and watershed assessments and monitoring are providing information critical to the long-term viability of salmonid populations.



## Summary

Since the PCSRF program’s inception in 2000, grantees have implemented projects throughout the Pacific Coast region that are contributing to the recovery and sustainability of many salmonid populations. Much of this work has been accomplished by improving degraded instream, upland, riparian, and estuary habitat; improving passage to habitat that was previously inaccessible; and improving the quantity and quality of information for effective management practices. Grantees are working to increase their knowledge of salmonid

viability through project effectiveness monitoring which contributes to mid- and long-term PCSRF goals. Progress has been made in the overall recovery and conservation of Pacific salmonids, but continued commitment, collaboration, and resources are required to achieve the goal of full recovery and sustainability.

# Example PCSRF Grantee Projects

## Pacific Coast Tribes: Quinault River Floodplain Restoration

The Quinault River once provided more than 55 miles of spawning habitat for native sockeye from the mouth of Lake Quinault to the Olympic National Park border. Today less than 3 miles of spawning habitat remains, and sockeye populations have declined significantly. The Quinault Indian Nation (QIN) is working to stop the destruction of remaining spawning habitat and restore degraded sockeye riparian habitat through the implementation of the Upper Quinault River Restoration Plan. The Restoration Plan outlines the steps required to help restore sockeye runs in the Quinault and includes projects such as the installation of large woody debris and restoration of 11 miles of barren floodplains within the watershed.

Approximately \$1.2 million from multi-year PCSRF grants, a Washington State Salmon Recovery Funding Board grant, a U.S. Forest Service grant, and a local county mitigation grant were used to install large woody debris as engineered logjams to protect one of the few remaining side channels that sockeye use to spawn near Lake Quinault. The installation of woody debris helps to slow water velocity and creates protected pools needed by sockeye to spawn. In conjunction with riparian planting to promote bank stabilization, this project will increase the overall functional habitat available to returning sockeye and their progeny. The QIN worked with local landowners and the Olympic National



Park to secure in-kind donations of woody debris and gain access to the site. This initial effort represents the starting point of on-the-ground work, where it is estimated that it will take from 30 to 50 years to fully implement the Upper Quinault River Restoration Plan.

The projects implemented under the Restoration Plan complement other aspects of QIN's sockeye salmon restoration efforts that include carefully controlling harvests, improving rearing habitat for sockeye in Lake Quinault, and maintaining a sockeye hatchery supplementation program at the Lake Quinault Hatchery.

## Columbia River Tribes: Nez Perce Tribe Clearwater River Coho Salmon Reintroduction Project

Coho salmon—an historically critical food source, trade item, and cultural resource for the Nez Perce Tribe (NPT)—were extirpated from the Clearwater Basin (a tributary of the Snake River) in Idaho following the construction of Lewiston Dam in 1927. The fish ladder associated with the dam was poorly designed and prevented passage of salmon during low flows in summer and fall. Various attempts were made to strengthen the coho run in the 1960s, but over a period of several years the program was dropped due to continued excessive harvest rates in the ocean and the lower river. In 1986, coho salmon were declared extinct in the Snake River Basin.



The NPT initiated a coho salmon restoration project in 1995 with the acquisition and release of 630,000 juvenile coho salmon in five streams in the Clearwater Basin. These were the first coho salmon released in the larger Snake River Basin in 30 years. In 2001, and annually thereafter, the NPT used PCSRF funds to establish the Clearwater River Coho Salmon Reintroduction project to continue to reintroduce and restore coho salmon to abundance and productivity levels sufficient to support sustainable runs and annual tribal and non-tribal harvest. A goal of 14,000 returning adult coho salmon to the Clearwater River has been established in the Columbia River Inter-Tribal Fish Commission Wy-Kan-Ush-Mi Wa-Kish-W+it (Spirit of the Salmon) Columbia River Anadromous Fish Restoration Plan.



In 2008, the Clearwater River saw a return of 4,770 coho, the highest since extirpation occurred. This year also marks the highest number of eggs ever collected by the Clearwater Coho Restoration Project (~1.5 million) from returning adults. In December 2008, the NPT began transporting 900,000 eyed-eggs to Eagle Creek National Fish Hatchery where they will be incubated and reared until March of 2010. This is an important step forward in re-establishing a wild coho stock in the Clearwater River.

## Washington: Protecting Valuable Salmon Habitat Along the Skagit River

The 150-mile-long Skagit River flows south from the Cascade Mountains in Canada, through Washington, emptying into the Puget Sound near Mount Vernon. The Skagit River is the only large river system in Washington that is home to healthy populations of five salmon species (Chinook, coho, chum, pink, and sockeye) and three species of trout (bull trout, cutthroat, and steelhead). The river supports 25 percent of threatened Puget Sound Chinook stocks and the largest bull trout and steelhead populations in Puget Sound. Protecting Skagit River habitat is critically important to ensure the watershed stays a healthy place for salmon to spawn and grow.

In 1998, the Skagit Watershed Council created a habitat protection committee and appointed The Nature Conservancy (TNC) as chair, and the following year adopted a science-based method for assessing and prioritizing the cost-effectiveness of habitat protection actions. The prioritization formula rates parcels based on the quality and quantity of functioning fish habitat, their adjacency to protected areas, their risk of development, and their costs to acquire. Since 2000, Skagit Land Trust and TNC have used this systematic approach to secure nearly \$6 million in funds from the Washington Salmon Recovery Funding Board, including nearly \$1.7 million in multi-year PCSRF grants, to inventory, prioritize, and protect more than 1,220 acres along the Skagit River, its tributaries, and wetlands. The Skagit Land Trust focused its efforts on acquiring high-priority floodplain acres in the middle Skagit River, examining 9,500 tax parcels and creating a prioritized list of 197 properties. The land trust and partners contacted landowners to gauge their willingness to sell.



The Skagit Land Trust has protected about 768 acres of habitat to date and is anticipated to purchase an additional 300 acres in the middle Skagit over the next few years. In the upper Skagit River, where a majority of salmon return to spawn, TNC projects have resulted in the permanent protection of 435 acres of the highest-quality Chinook and coho rearing and spawning habitat remaining in the watershed. Today, the map of protected lands along the Skagit River is a jigsaw puzzle of habitat gradually being reunited. This increasingly connected map is the product of collaboration at its best—Skagit Watershed Council, Skagit Land Trust, Skagit County, U.S. Forest Service, Seattle City Light, TNC, Washington Department of Fish and Wildlife, and others working together toward a common goal.

## Oregon: Small Dam Removal Effectiveness Monitoring

Dam removal restoration projects are a high priority for the restoration investments of the Oregon Watershed Enhancement Board (OWEB). Focusing PCSRF effectiveness monitoring dollars to evaluate the success of these projects will provide valuable information for future project development and implementation. Dam removal can provide better and more consistent access to habitat for salmonids. Monitoring projects often require multiple years of investment to monitor physical conditions (e.g., sediment) and biological response (e.g., salmon dispersal and habitat use) to determine overall benefits and successes.

The following dams have recently been removed or are scheduled for removal within the next couple of years in Oregon: Brownsville Dam on the Calapooia River (2007), Marmot Dam on the Sandy River (2007), Chiloquin Dam on the Sprague River (2008), and Savage Rapids Dam on the Rogue River (2009). Plans are in development for the future removal of Sodom Dam on the Calapooia River. The removal and scheduled removal of these dams has placed OWEB in a unique position to evaluate the effects of dam removal on salmon habitat. The combined



objectives of these effectiveness monitoring projects are to document the short-term effects of the removals while improving predictions of future ecosystem responses to future dam removal.

## Idaho: Corral Creek Culvert Replacement

The Corral Creek culvert replacement project removed a large concrete culvert that had formed a complete barrier for steelhead migration to upstream habitat on Corral Creek, within the Potlatch River drainage in Idaho. In the early 1900s, the railroad crossing over Corral Creek was filled with a concrete culvert to replace a wooden trestle. The 200-foot culvert created a velocity barrier to over 10,000 acres of high-quality fisheries habitat, approximately 90 miles of stream, and 80 percent of the watershed.

In 1995-1996 and 2003-2004, Idaho Department of Fish and Game documented successful steelhead spawning and rearing use within the Corral Creek drainage below the culvert barrier. Those surveys and other habitat-specific survey work noted that not only were steelhead present, but the creek had excellent salmonid habitat throughout the drainage made inaccessible by the culvert. In addition to fisheries concerns, the site carried a risk of personal injury and property damage if the culvert were to fail during high-flow events, causing flooding. Through collaborative efforts between state and local agencies, including two multi-year PCSRF grants of over \$800,000, excavation was started at the site in late summer 2007.

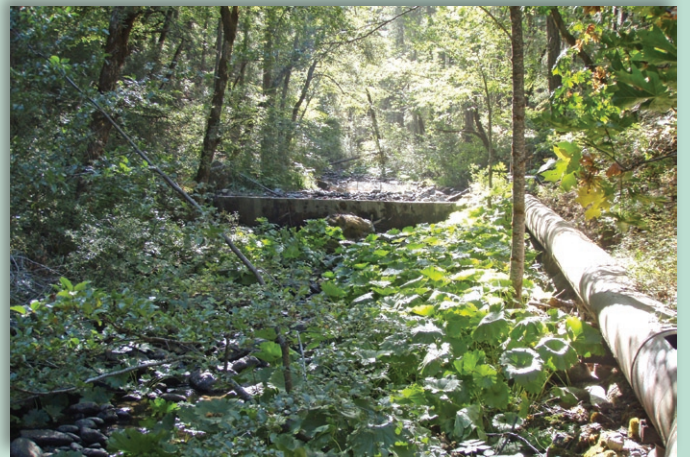


Approximately 45,000 cubic yards of fill material was removed from the site, creating terraced slopes on either side of the creek. Erosion control material was also installed. The slopes and floodplain were re-vegetated to reduce sedimentation, stabilize the site, and provide shading for migrating fish. Surveys conducted upstream of the project during the first week in August 2008 documented juvenile steelhead present in upper Corral Creek for the first time since 1913.



### California: Whites Gulch Dam Removal

In June 2006, the California Department of Fish and Game (CDFG) awarded PCSRF funds to the Salmon River Restoration Council for the removal of two concrete diversion dams and the relocation of a passive-style screened fish diversion on the Whites Gulch River. The Whites Gulch is located on the Salmon River, a tributary of the Klamath River, in Siskiyou County, California, approximately 50 miles from the Oregon border. Whites Gulch is characterized by thick riparian vegetation and tree-lined streams, ideal for spawning salmon. The original dam was constructed on the river in the late 1800s and was replaced by the current dam in the 1980s. The river was originally home to a large salmon population, supporting a salmon cannery and a sport fishery, but the dams blocked salmon from reaching their upstream spawning habitat, and populations dwindled to low levels.



The upper dam was removed on October 1, 2008, using explosives and with the assistance of many partners including the NOAA Restoration Center, the U.S. Forest Service, Americorps Watershed Stewards, the Five Counties Salmonid Conservation Program, the FishAmerica Foundation, and local Salmon River landowners and contractors. The second dam, located downstream, was removed later in October by local landowners using heavy equipment. The removal of these two dams and of a third barrier downstream re-opened 1.5 miles of spawning and rearing habitat for spring Chinook, threatened coho and steelhead, and other native fish. The project is also likely to help protect nearby communities by reducing flooding potential caused by the dams.



## Alaska: Kenai Watershed Forum Partnership

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The Kenai Watershed Forum (KWF) is a non-profit organization dedicated to maintaining the health of watersheds on the Kenai Peninsula, an area southwest of Anchorage with salmon-rich ecosystems that greatly benefit recreational, subsistence, and commercial fishing.

The effects of invasive plant species on salmon spawning and rearing habitat are of increasing concern in Alaska. An important PCSRF-funded KWF project addresses the spread of Reed Canary Grass (RCG), a vigorous invasive species, on and in Kenai Peninsula streams. RCG alters fluvial dynamics and increases silt levels, which reduces the amount and quality of salmon spawning and rearing habitat. A 2007 survey of the Kenai Peninsula identified over 260 populations of RCG. Eradication efforts are underway in areas adjacent to tributary spawning habitat. RCG spreads by rhizomes (rootstalks) as well as by seed, so digging up individual plants has generally proven ineffective as portions of the rootstocks are often left behind to re-root. The KWF is covering patches of RCG with black non-light-penetrating tarps stapled into the ground and weighted with sandbags. Bark chips are often placed on top to make the area more aesthetically pleasing. This experimental methodology has been successful in other states dealing with this damaging invasive species on salmon-bearing streams.



Volunteers were extremely important to this project, ensuring its success and providing natural outreach to the community about invasive species on the Kenai Peninsula. Ongoing efforts of professionals and volunteers will further implement eradication and education efforts, and projects will be monitored and evaluated for effectiveness.

# Pacific Salmon and Steelhead Recovery Domains

## Puget Sound

- Hood Canal Summer Chum ESU (T)
- Ozette Lake Sockeye ESU (T)
- Puget Sound Chinook ESU (T)
- Puget Sound Steelhead DPS (T)

## Interior Columbia

- Middle Columbia River Steelhead DPS (T)
- Snake River Fall Chinook ESU (T)
- Snake River Sockeye ESU (E)
- Snake River Spring/Summer Chinook ESU (T)
- Snake River Basin Steelhead DPS (T)
- Upper Columbia River Spring Chinook ESU (E)
- Upper Columbia River Steelhead DPS (E)

## Willamette/Lower Columbia

- Columbia River Chum ESU (T)
- Lower Columbia River Coho ESU (T)
- Lower Columbia River Chinook ESU (T)
- Lower Columbia River Steelhead DPS (T)
- Upper Willamette River Chinook ESU (T)
- Upper Willamette River Steelhead DPS (T)

## Oregon Coast

- Oregon Coast Coho ESU (T)

## Southern Oregon/ Northern California Coast

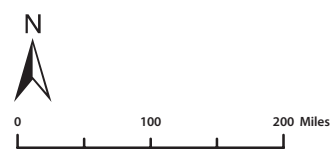
- Southern Oregon/Northern California Coast Coho ESU (T)

## North-Central California Coast

- Central California Coast Coho ESU (E)
- California Coastal Chinook ESU (T)
- Northern California Steelhead DPS (T)
- Central California Coast Steelhead DPS (T)

## South-Central/Southern California Coast

- Southern California Steelhead DPS (E)
- South-Central California Coast Steelhead DPS (T)





**National Marine Fisheries Service**

1315 East-West Highway  
SSMC 3, F/PR  
Silver Spring, Maryland 20910  
[www.nmfs.noaa.gov](http://www.nmfs.noaa.gov)

*Copies of this Report may be obtained by contacting:*

Barry Thom  
NOAA National Marine Fisheries Service  
Northwest Region  
1201 NE Lloyd Blvd., Suite 1100  
Portland, Oregon 97201  
[barry.thom@noaa.gov](mailto:barry.thom@noaa.gov)

An online version of this Report is available at [www.nwr.noaa.gov](http://www.nwr.noaa.gov).