Status and Recovery of Listed Salmon Populations

The Pacific Coast is home to seven different species of salmon. Under the Endangered Species Act (ESA), five of these species—Chinook, coho, sockeye, chum, and steelhead—have ESUs listed as threatened or endangered in some portion of the range where they are born, mature, and return to spawn. The intent of these listings is to help to recover the species to ensure that future salmon populations are plentiful, self-sustaining, genetically diverse, and geographically distributed. The distribution of these species on the west coast by ESU is shown in Exhibit 1.

Recovery Domains

Salmon ESUs are grouped into recovery domains that represent geographic areas. This grouping of ESUs into recovery domains allows an ecosystem approach to identifying the recovery needs and actions necessary for multiple ESUs in a geographic area. The 26 threatened or endangered ESUs of Pacific salmon have been organized into eight recovery domains by NMFS. A map showing the geographic area of these eight recovery domains and the ESUs they include can be found on the inside of the back cover of this report.

The following pages present a picture of current knowledge about the listed salmon ESUs by recovery domain. Exhibits 2 to 9 present information by recovery domain and ESU on the number of adult returns (including percentages of wild and hatchery fish), estimates of historical salmon populations (circa 1900), major factors limiting recovery, status of recovery planning, and progress towards recovery including PCSRF activities. Many factors outside of the direct purview of PCSRF affect recovery such as ocean temperatures and hydrologic patterns, including rainfall and drought. The goal of PCSRF, however, is to ensure that as salmon populations do increase, habitat conditions are adequately improved and protected to sustain the populations through both good and bad cycles of production.

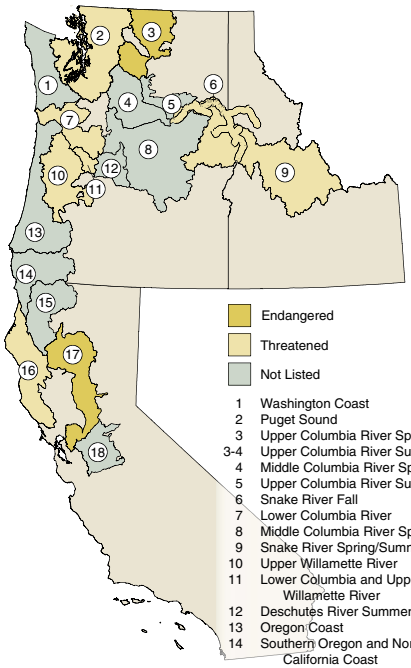
Major Factors Limiting Recovery

Numerous actions have contributed to the decline of salmon populations over time, including habitat degradation and loss, over-harvesting, detrimental hatchery practices, and losses associated with hydropower projects. The factors that contributed to the decline of each ESU were identified during the status review process that occurs when species are considered for ESA listing. Many of the same factors that contributed to the decline of salmon may also hinder recovery, but the relative impact of the factor may have changed over time. The major factors currently limiting recovery are listed (not in any order of importance) in the following exhibits for each ESU. In general, unless the major factors are addressed, the populations within the ESU will likely not recover. The factors tend to be linked and for the most part, efforts to protect and improve habitat are cumulative, meaning that the habitat value for salmon is increased as each limiting factor is addressed systematically.

Identifying the major factors limiting recovery is important and is occurring in all ESUs, often through the watershed or subbasin planning efforts taking place with the aid of PSCRF funds. Once the factors limiting recovery are understood, then investments for recovery can be targeted to address these factors. In each recovery domain, there are many activities and investments taking place. The following pages identify PCSRF activities within each recovery domain as well as activities outside the purview of PCSRF that are addressing the recovery needs of fish.

Exhibit 1. Distribution of Salmon ESUs

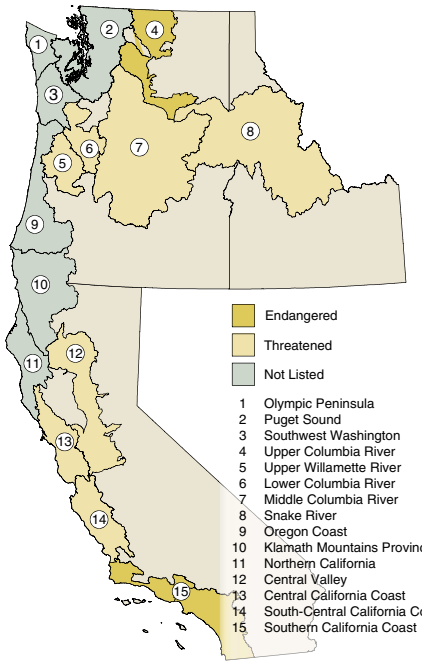
Chinook



Endangered
Threatened
Not Listed

1 Washington Coast
2 Puget Sound
3 Upper Columbia River Spring (E)
3-4 Upper Columbia River Summer/Fall (N)
4 Middle Columbia River Spring
5 Upper Columbia River Summer/Fall
6 Snake River Fall
7 Lower Columbia River
8 Middle Columbia River Spring
9 Snake River Spring/Summer
10 Upper Willamette River
11 Lower Columbia and Upper Willamette River
12 Deschutes River Summer/Fall
13 Oregon Coast
14 Southern Oregon and Northern California Coast
15 Upper Klamath Trinity
16 California Coast
17 Sacramento River Winter (E)
17 Central Valley Spring (T)
17-18 Central Valley Fall and Late Fall (N)

Steelhead



Endangered
Threatened
Not Listed

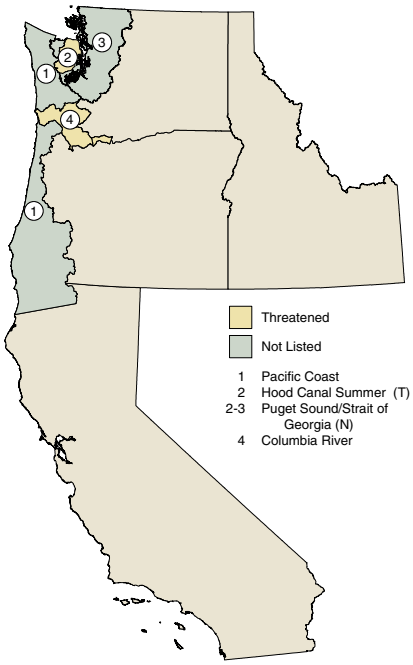
1 Olympic Peninsula
2 Puget Sound
3 Southwest Washington
4 Upper Columbia River
5 Upper Willamette River
6 Lower Columbia River
7 Middle Columbia River
8 Snake River
9 Oregon Coast
10 Klamath Mountains Province
11 Northern California
12 Central Valley
13 Central California Coast
14 South-Central California Coast
15 Southern California Coast

Sockeye

Endangered
Threatened
Not Listed

1 Ozette Lake (T)
2 Lake Pleasant (N)
3 Quinault Lake
4 Baker River
5 Okanogan River (N)
6 Lake Wenatchee
7 Snake River

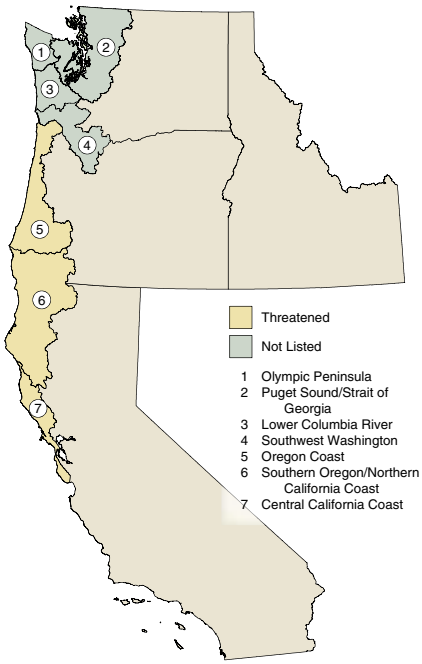
Chum



Threatened
Not Listed

1 Pacific Coast
2 Hood Canal Summer (T)
2-3 Puget Sound/Strait of Georgia (N)
4 Columbia River

Coho

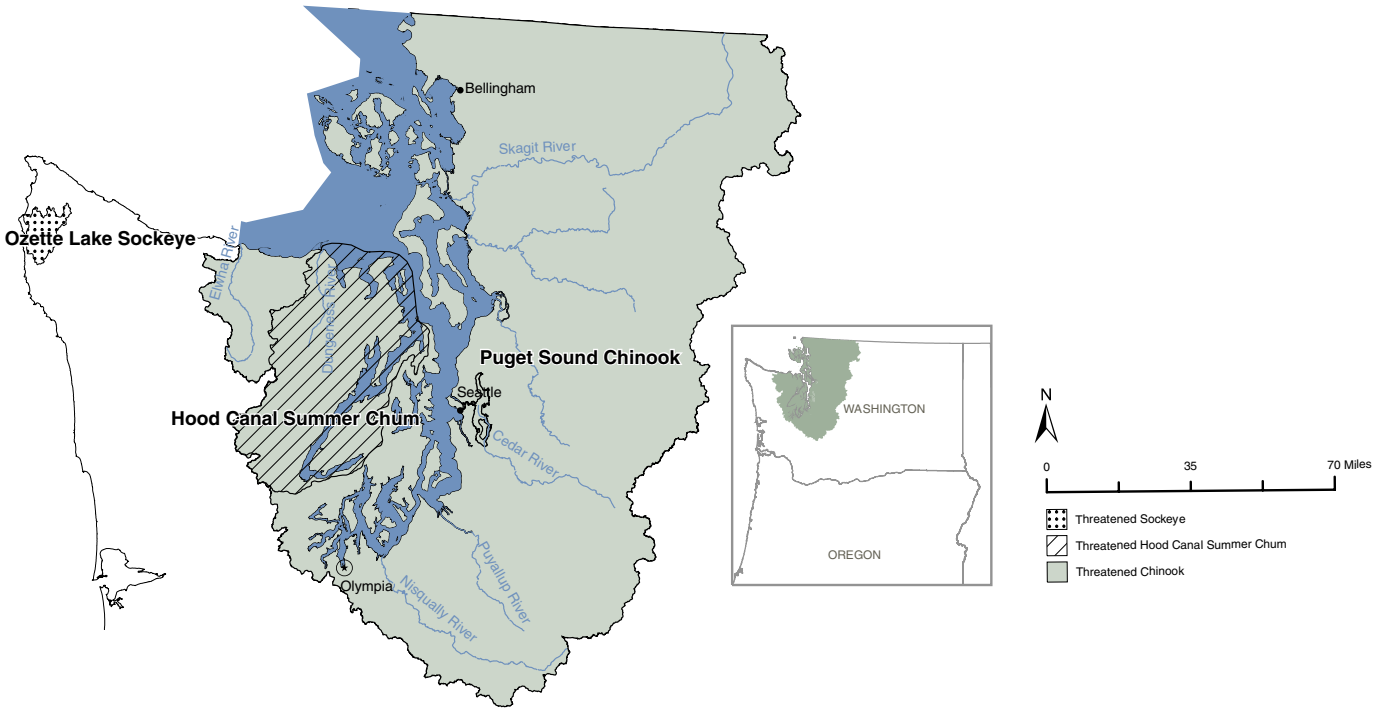


Threatened
Not Listed

1 Olympic Peninsula
2 Puget Sound/Strait of Georgia
3 Lower Columbia River
4 Southwest Washington
5 Oregon Coast
6 Southern Oregon/Northern California Coast
7 Central California Coast

Exhibit 2. Puget Sound Recovery Domain

A Recovery Plan being prepared by the Shared Strategy and the State of Washington is expected to be submitted to NMFS in July 2005.



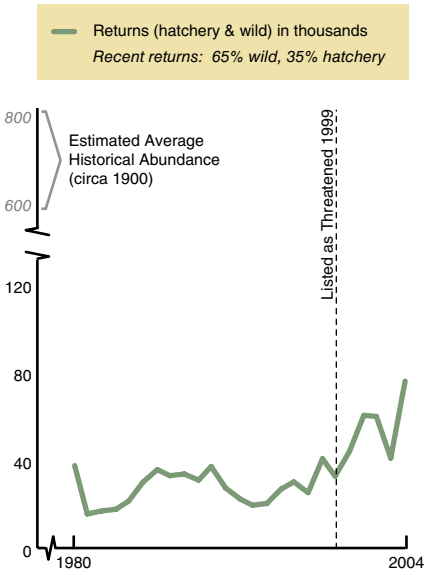
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Harvest strategies and plans address impacts on listed salmon
- Upgraded state forest practice rules
- Implementation of Northwest Forest Plan on federal lands
- Habitat restoration projects by local governments and voluntary groups underway in many areas
- Detrimental hatchery practices being reformed
- Routine road maintenance in conformance with ESA
- Locally-produced watershed-level recovery plans are addressing limiting factors
- Consultations occurring on stream temperature

PCSRF Activities in the Recovery Domain

- 52,802 estuarine acres treated or underway
- 962 artificial estuarine acres created or underway
- 62 completed stream miles treated or underway through instream habitat projects
- 65 miles of streambank treated or underway through riparian habitat projects
- 232 wetland acres treated or underway
- 41 artificial wetland acres created or underway
- 8,016 acres protected or underway through land acquisition projects

Puget Sound Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and in-river channel structure

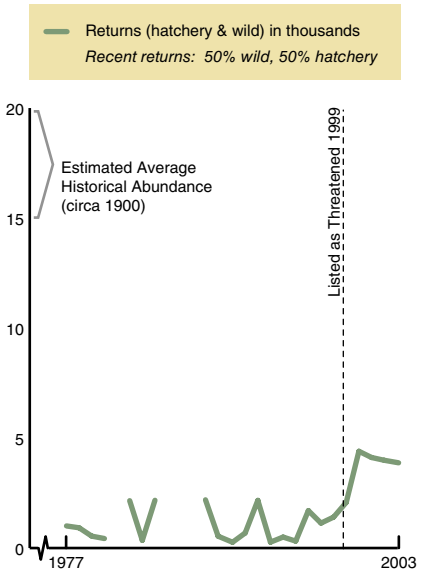
Degraded estuarine conditions and loss of estuarine habitat

Riparian area degradation and loss of in-river large woody debris

Excessive sediment in spawning gravels

Degraded water quality and temperature

Ozette Lake Sockeye ESU



MAJOR FACTORS LIMITING RECOVERY

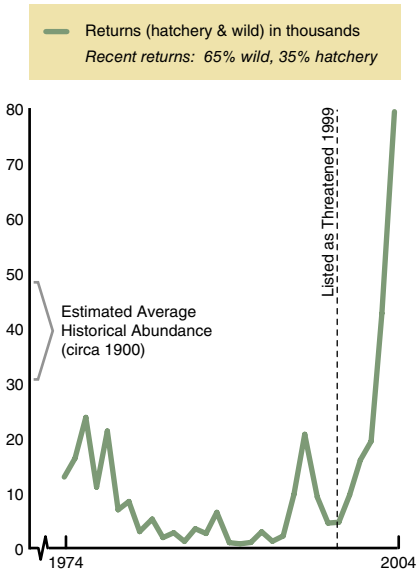
Excessive sediment in spawning gravels

Riparian area degradation and loss of in-river large woody debris

Degraded tributaries/river habitat conditions

Predation on adults by otters and seals

Hood Canal Summer Chum ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and mainstem river channel structure

Degraded estuarine conditions and loss of estuarine habitat

Riparian area degradation and loss of in-river wood in mainstem

Excessive sediment in spawning gravels

Reduced stream flow in migration areas

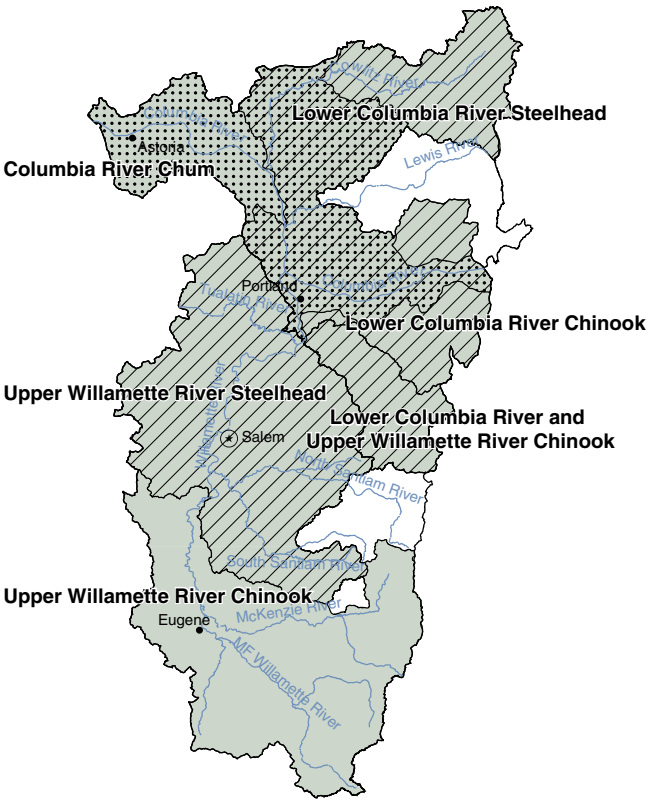
Puget Sound Recovery Plan

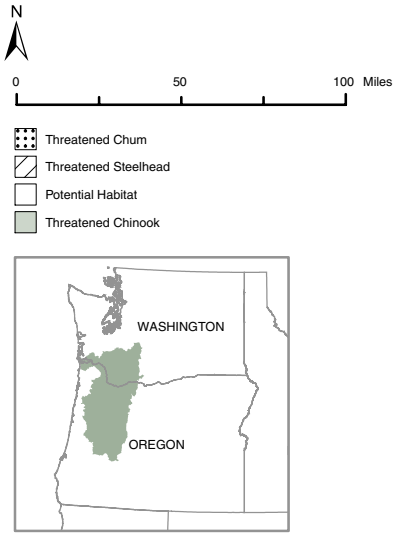
In the Puget Sound region, a collaborative recovery planning effort to restore and protect salmon has been underway and will culminate in a draft recovery plan being transmitted to the National Marine Fisheries Service for formal review in July 2005. The draft recovery plan has been developed in conjunction with local watershed interests, ensuring support by the people living and working in the watersheds of Puget Sound. Federal, state, tribal, and local governments have provided leadership for this effort; the Shared Strategy for Puget Sound, a nonprofit organization, manages and coordinates the effort.

The Puget Sound plan combines watershed-based plans and actions with necessary regional elements designed to meet the recovery plan requirements of the Endangered Species Act. NMFS will analyze the plan and, if the plan meets the necessary basic requirements of the ESA, will move forward with adoption of the plan in late 2005 or early 2006.

Exhibit 3. Willamette/Lower Columbia Recovery Domain

A Recovery Plan for the Washington portion of this domain was submitted to NMFS by the Lower Columbia Fish Recovery Board and the State of Washington in December 2004. This recovery plan for the Washington portion of the domain was endorsed by NMFS, supplemented with additional key elements not in the plan, and released for public review and comment in April 2005.





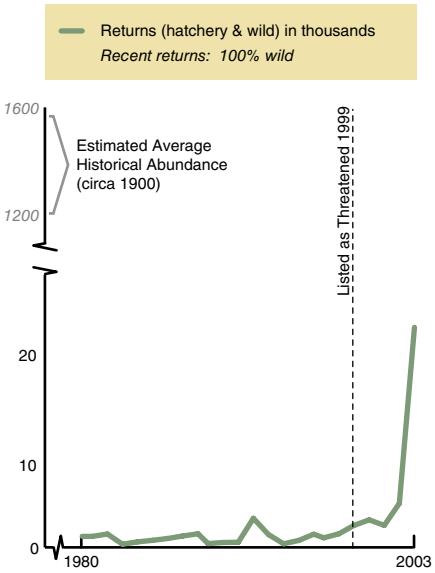
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Selective fisheries and other fishery management strategies have reduced harvest impacts
- Passage, flow, and other effects of dams are being addressed through consultations with hydropower system operators
- Implementation of Northwest Forest Plan on federal lands
- Increased late-fall flow is allowing mainstem spawning access for chum
- Fish screens and tailrace barriers are being installed at dams
- Detrimental hatchery practices being reformed
- Improved forest practices in some areas
- Many local scale habitat restoration efforts underway
- Relocation efforts and other management strategies are decreasing avian predation
- Protected more than 1,900 acres of riparian, floodplain and wetland habitats

PCSRF Activities in the Recovery Domain

- 249 stream miles opened or underway through fish passage projects
- 29 stream miles treated or underway through instream habitat projects
- 175 acres treated or underway through upland habitat projects
- 2,081 wetland acres treated or underway
- 35 artificial wetland acres created or underway
- 89 blockages removed/upgraded or underway through fish passage projects
- 92 miles of streambank treated or underway through riparian habitat projects

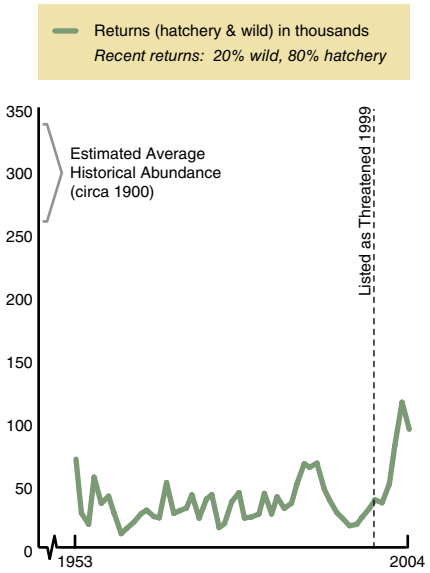
Columbia River Chum ESU



MAJOR FACTORS LIMITING RECOVERY

- Altered channel form and stability in tributaries
- Excessive sediment in tributary spawning gravels
- Altered stream flow in tributaries and mainstem Columbia
- Loss of some tributary habitat types
- Harassment of spawners in tributary and mainstem

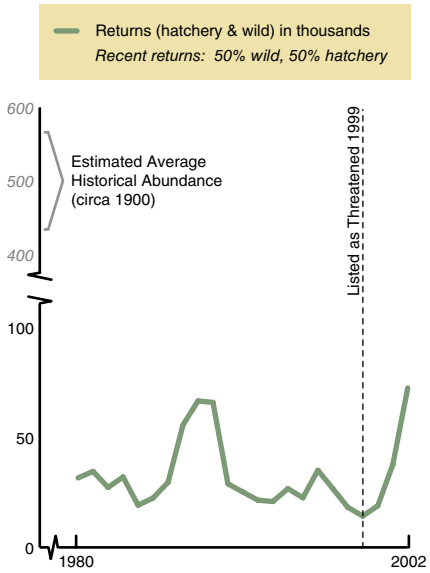
Upper Willamette River Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/ rearing habitat in tributaries
- Altered water quality and temperature in tributaries
- Lost/degraded floodplain connectivity and lowland stream habitat
- Altered streamflow in tributaries
- Hatchery impacts

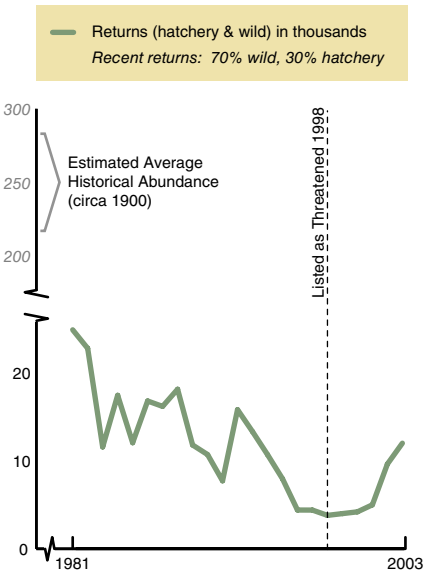
Lower Columbia River Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Reduced access to spawning/ rearing habitat in tributaries
- Hatchery impacts
- Loss of habitat diversity and channel stability in tributaries
- Excessive sediment in spawning gravel
- Elevated water temperature in tributaries
- Harvest impacts on fall Chinook

Lower Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Degraded floodplain and stream channel structure and function

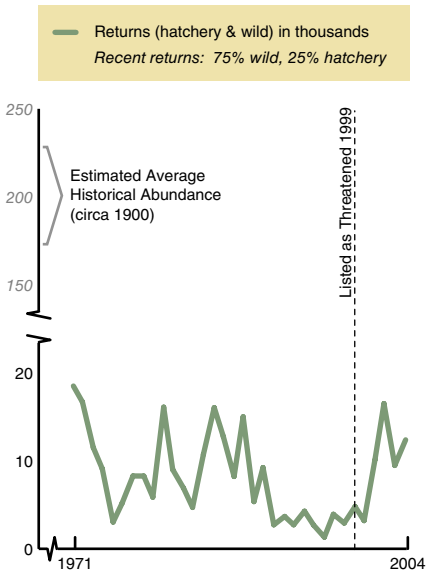
Reduced access to spawning/ rearing habitat

Altered streamflow in tributaries

Excessive sediment and elevated water temperatures in tributaries

Hatchery impacts

Upper Willamette River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

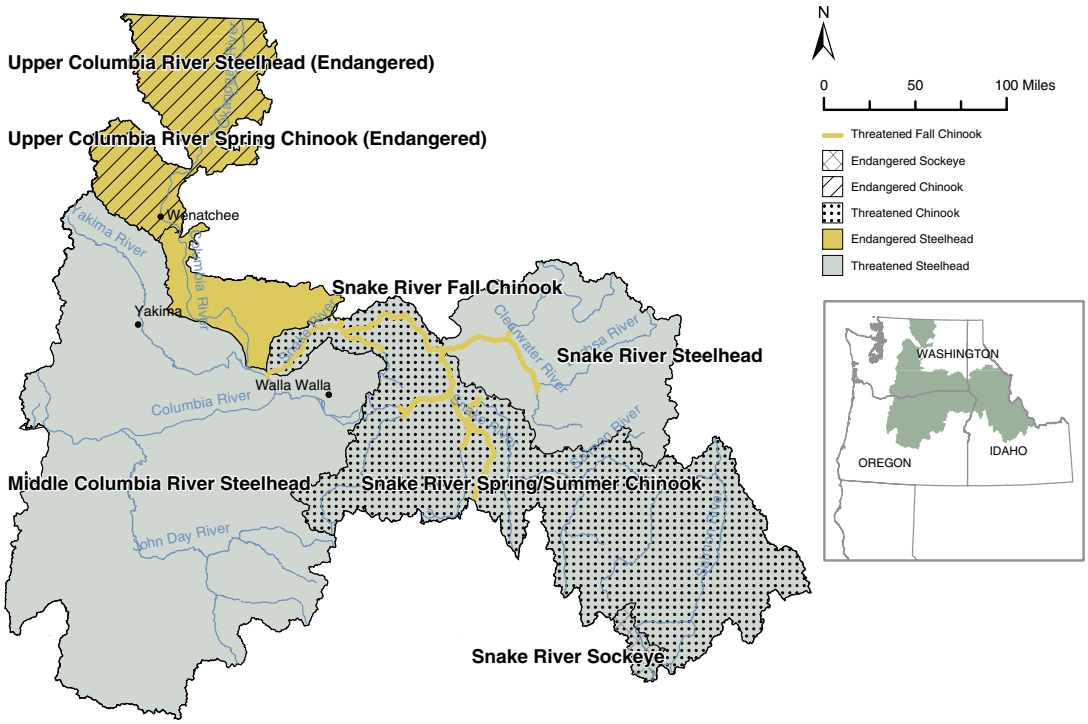
Reduced access to spawning/ rearing habitat in tributaries

Altered water quality and temperature in tributaries

Lost/degraded floodplain connectivity and lowland stream habitat

Altered streamflow in tributaries

Exhibit 4. Interior Columbia Recovery Domain



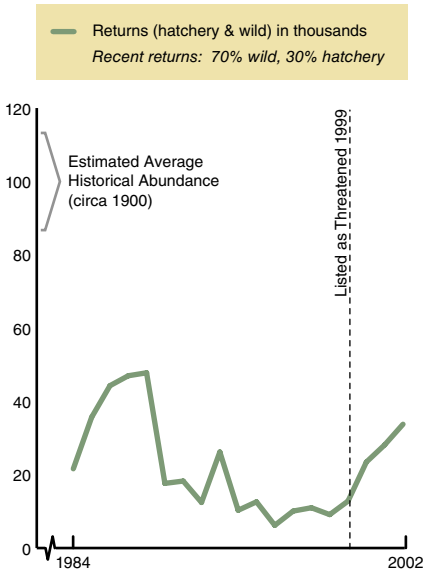
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Aggressive screening and reconstruction program
- Captive broodstock program has prevented extinction in one ESU and preserved diversity for others
- Re-purchased water rights
- Some habitat reconnection
- Installation of instream rock structures
- Improved forestry practices
- Systematic removal of marked hatchery fish
- Federal land management plans and ESA consultations improved effects on federal lands
- Some progress to restore stream flows
- Some reduction in northern pikeminnow predation through bounty programs
- Improved agricultural practices
- Ongoing efforts to re-establish fish passage (e.g., Fifteenmile Subbasin – 80 fish screens, 5 fish ladders)
- Dam relicensing processes used to address effects of privately-owned hydroelectric projects
- Implementation of Habitat Conservation Plans for privately-owned hydroelectric projects in the mainstem upper Columbia River
- Improved downstream passage, water quality, and flow management actions at mainstem lower Snake and Columbia federal hydropower projects
- Protected stream flow of approximately 130 cfs. in the Deschutes basin and 170 cfs. in the John Day basin

PCSRF Activities in the Recovery Domain

- 187 stream miles treated or underway through instream habitat projects
- 14,501 acres treated or underway through upland habitat projects
- 627 stream miles assessed or underway for research monitoring and evaluation
- 313 miles of streambank treated or underway through riparian habitat projects
- 17,611 acres protected or underway through land acquisition projects
- 138 passage blockages removed/upgraded or underway
- 758 stream miles opened or underway through fish passage projects

Middle Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Hydropower system mortality at mainstem Columbia River

Reduced stream flow in tributaries

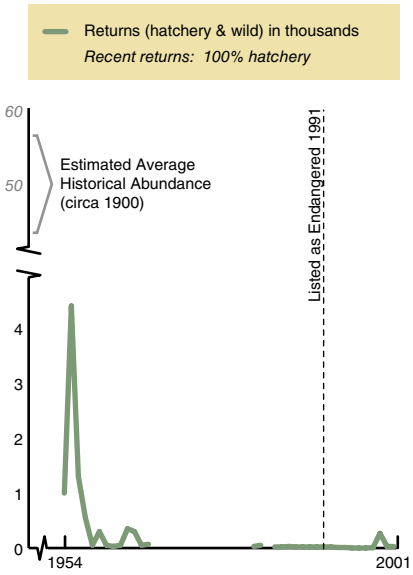
Impaired passage in tributaries

Excessive sediment

Degraded water quality

Altered channel morphology

Snake River Sockeye ESU



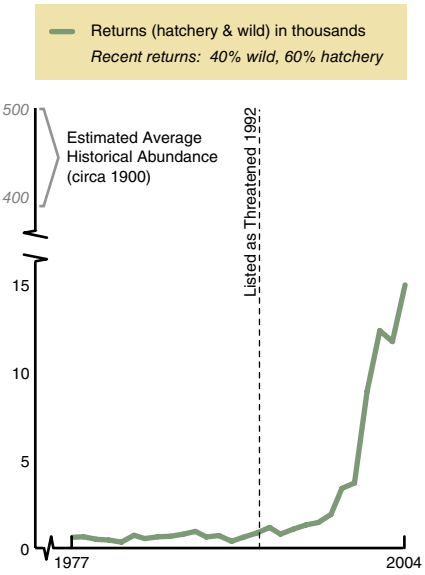
MAJOR FACTORS LIMITING RECOVERY

Reduced tributary stream flow

Impaired tributary passage and blocks to migration

Mainstem lower Columbia hydropower system mortality

Snake River Fall Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

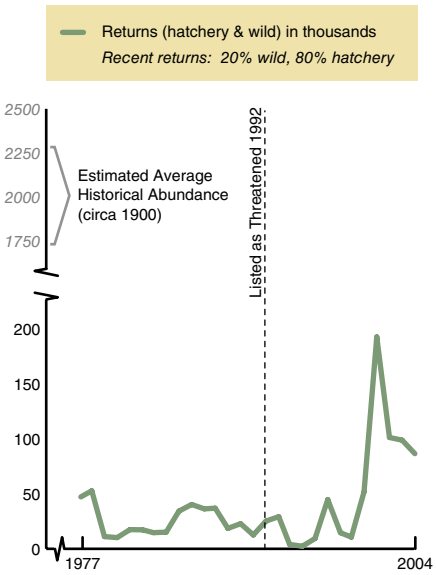
Mainstem lower Snake and Columbia hydropower system mortality

Degraded water quality

Reduced spawning/rearing habitat due to mainstem lower Snake River hydropower system

Harvest impacts

Snake River Spring/ Summer Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem lower Snake and Columbia hydropower system mortality

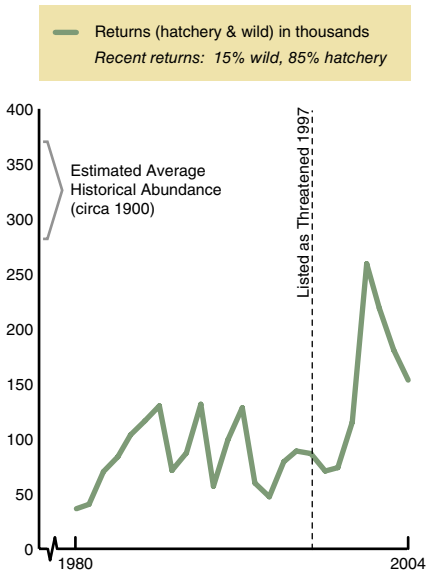
Reduced tributary stream flow

Altered tributary channel morphology

Excessive sediment in tributaries

Degraded tributary water quality

Snake River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem lower Snake and Columbia hydropower system mortality

Reduced tributary stream flow

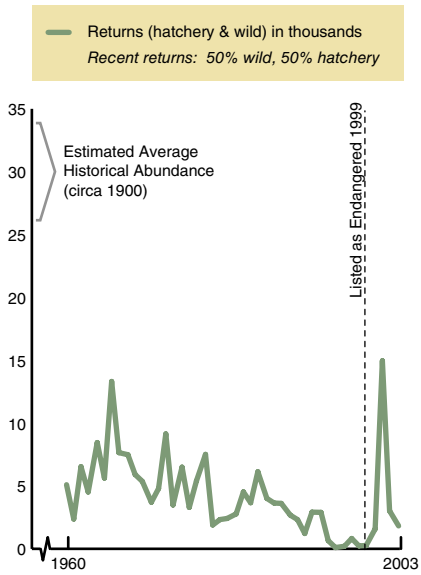
Altered tributary channel morphology

Excessive sediment in tributaries

Degraded tributary water quality

Harvest and hatchery related adverse effects

Upper Columbia River Spring Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem Columbia River hydropower system mortality

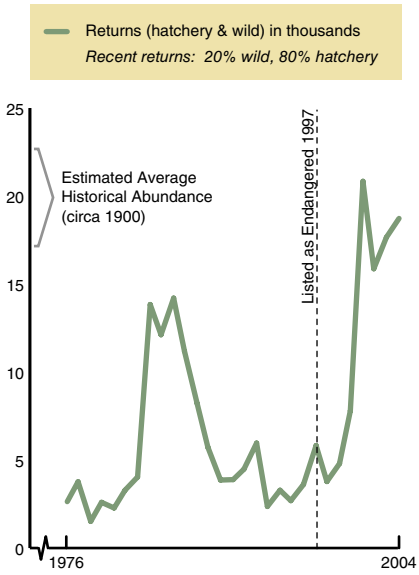
Tributary riparian degradation and loss of in-river wood

Altered tributary floodplain and channel morphology

Reduced tributary stream flow and impaired passage

Harvest impacts

Upper Columbia River Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Mainstem Columbia River hydropower system mortality

Reduced tributary stream flow

Tributary riparian degradation and loss of in-river wood

Altered tributary floodplain and channel morphology

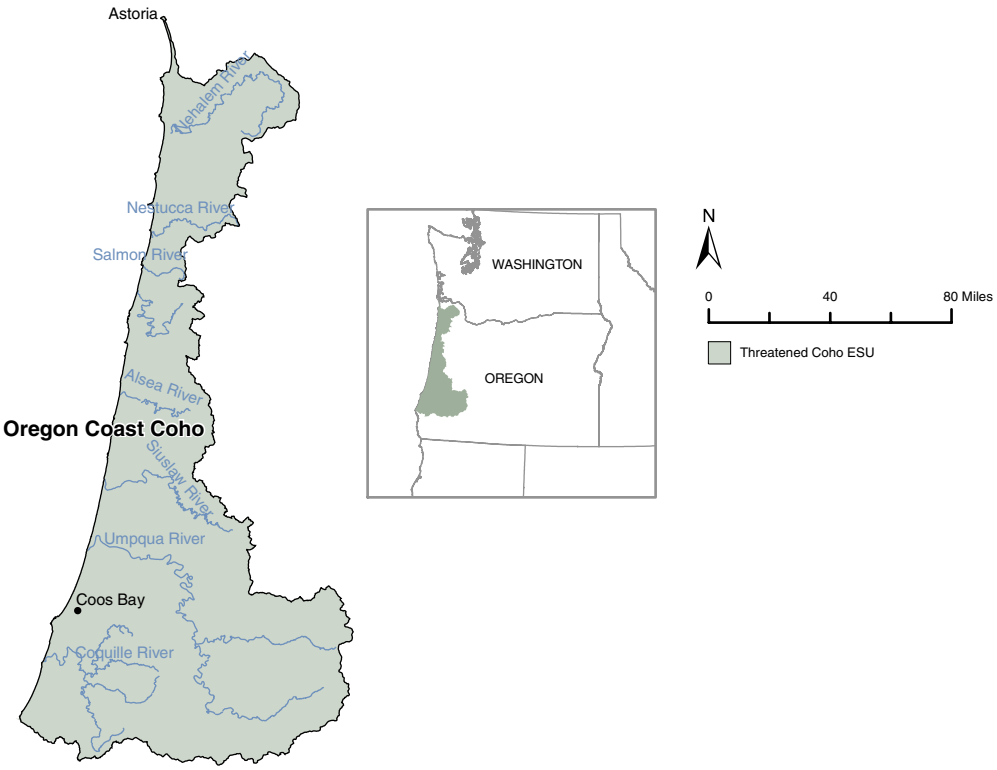
Excessive sediment

Degraded tributary water quality

Engagement in Salmon Recovery and Conservation

Salmon recovery and conservation is of utmost importance to many organizations and individuals. Many of the plans being developed to recover and conserve salmon have been overseen by and had input from a broad collection of entities. For example, in the Puget Sound Recovery Domain, the watershed plan for the Skagit River has included participation from 11 cities, counties and local agencies 13 non-profit organizations, three federal agencies, four state agencies, three tribal entities, four educational institutions, and two private companies.

Exhibit 5. Oregon Coast Recovery Domain



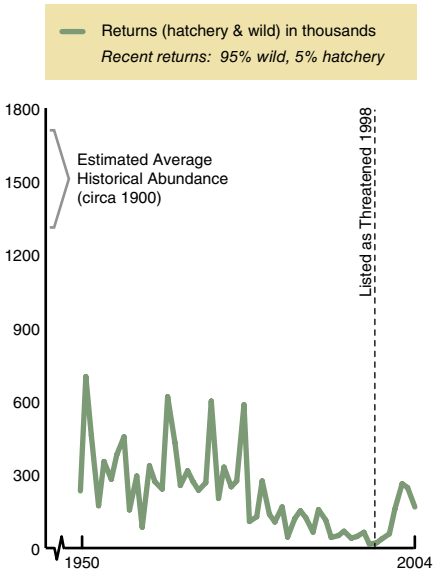
Activities Addressing Recovery Needs for ESUS in the Recovery Domain

- Harvest impacts addressed
- Detrimental hatchery practices being reformed
- Development of hatchery and genetic management plans
- Removal of many fish passage barriers
- Improved road maintenance on state and private forest lands
- Habitat protection through Northwest Forest Plan and ESA consultations
- Habitat restoration through watershed councils and landowners
- More than 1,500 acres of coastal lowland and tidal marsh protected
- More than 1,500 miles of roads upgraded to reduce sediment inputs to coho streams
- More than 500 miles of roads decommissioned
- Approximately 230 miles of riparian area fenced and 380 miles of riparian stream planted
- Some 520 miles of stream enhanced with the placement of large wood

PCSRF Activities in the Recovery Domain

- 15 fish screens installed/upgraded or underway
- 35 wetland acres treated or underway
- 75 stream miles assessed or underway through research, monitoring and evaluation projects
- 227 passage blockages removed/upgraded or underway
- 237 stream miles opened or underway through fish passage projects

Oregon Coast Coho ESU



MAJOR FACTORS LIMITING RECOVERY

Loss of overwintering habitat

Reduced habitat capacity

Altered stream morphology and complexity

Excessive sediment

Variation in ocean conditions

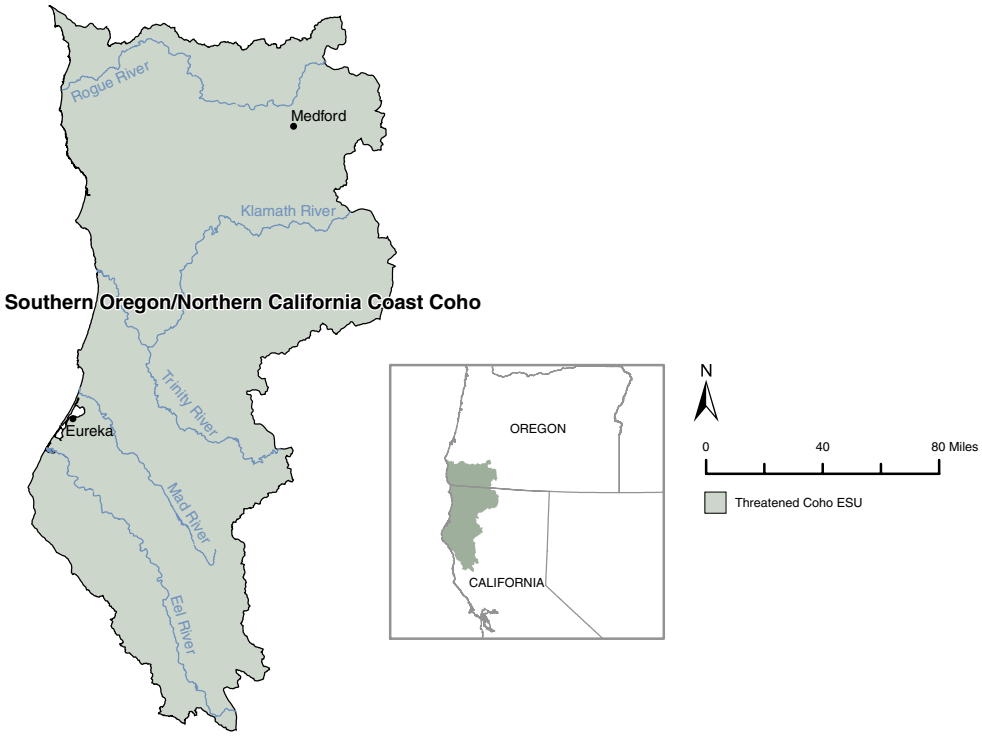
High water temperature

Oregon Coastal Coho Plan

Oregon has used monitoring data gathered over more than two life cycles of coho salmon to evaluate the status of the Oregon Coastal Coho ESU. The evaluation has brought together population biologists, conservation biologists and ecologists to review the population characteristics of coho salmon along the Oregon coast and evaluate the conservation activities being implemented. The state analysis has resulted in a conclusion of minimal viability for the ESU and identified limiting factors for the ESU and each population in the ESU. NMFS and the state are working with a stakeholder group to develop a conservation recovery plan. The conservation recovery plan will identify the restoration priorities and the actions necessary to lift and sustain the population above minimal viability to a healthier status.

Exhibit 6. Southern Oregon/Northern California Coast Recovery Domain

California Coho Recovery Plan published 2004 by CDFG.



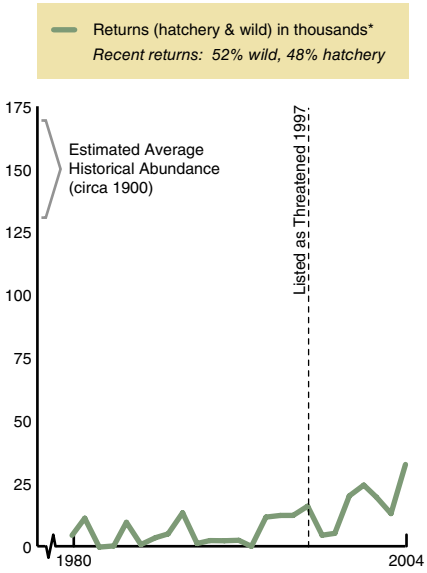
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Water quality standards for all northern California waters being updated
- Improved agricultural practices, gravel extraction practices, and fish passage efforts
- Coordinated ecosystem management (Northwest Forest Plan) for federal forest lands
- California Coho Recovery Plan addresses limiting factors by watershed and ensures high priority actions are addressed
- Harvest impacts have been reduced
- Hatchery impacts have been reduced and are being addressed through hatchery and genetic management plans
- Proactive efforts underway to minimize effects of dams
- Five Counties Salmonid Conservation Program opened over a hundred miles of historic habitat and prevented thousands of cubic yards of sediment from entering waters courses
- Development of Rogue basin fish passage prioritization effort

PCSRF Activities in the Recovery Domain

- 66 fish screens installed/upgraded or underway
- 603 acres treated or underway through upland habitat projects
- 24,984 acres protected or underway under land acquisition projects
- 2,000 blockages removed/upgraded or underway through fish passage
- 42 stream miles treated or underway through instream habitat projects
- 27 miles of streambank treated or underway through riparian habitat projects
- 914 stream miles assessed or underway through research, monitoring and evaluation projects
- State funding allocation to match federal funds to remove Savage Rapids Dam, a mainstem dam on the Rogue River

Southern Oregon/ Northern California Coast Coho ESU



MAJOR FACTORS LIMITING RECOVERY

Loss of channel complexity, connectivity, and sinuosity

Loss of flood plain and estuarine habitats

Loss of riparian habitats and large in-river wood

Reduced streamflow

Poor water quality, temperature, and excessive sedimentation

Unscreened diversion and fish passage structures

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

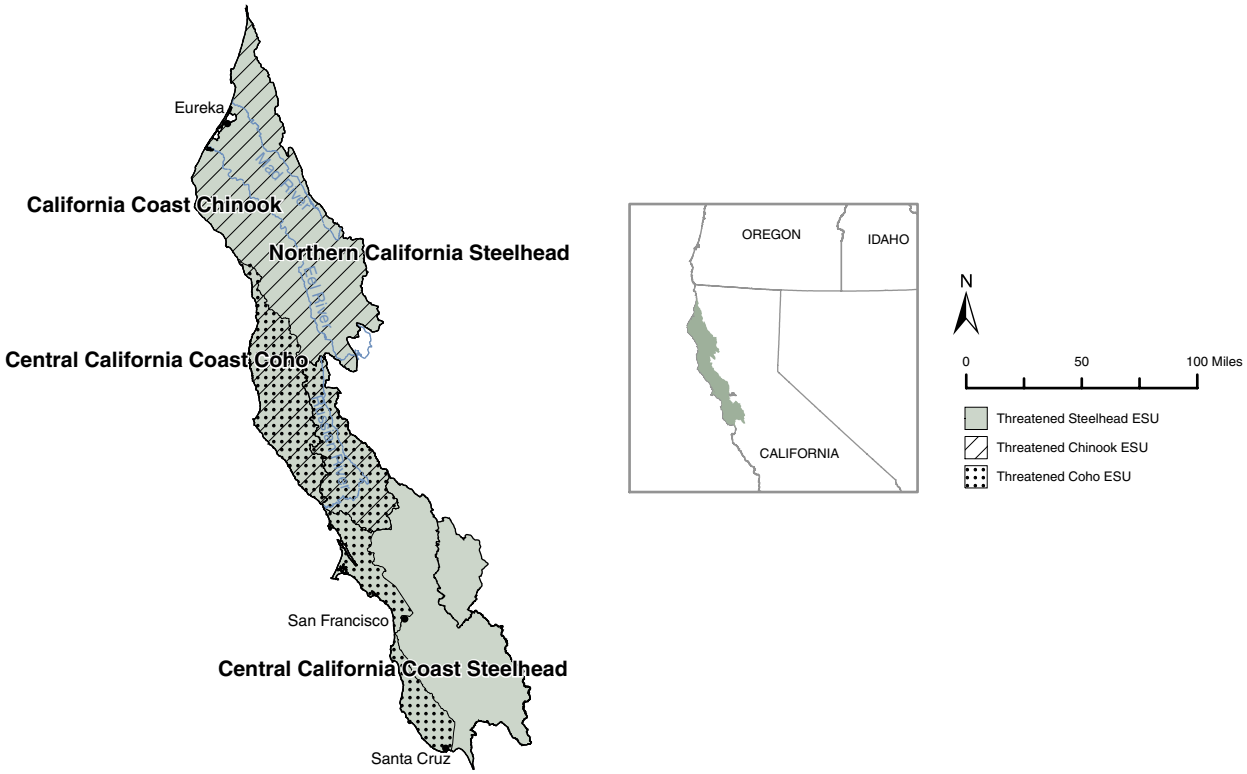
California Coho Recovery Plan

The state's recovery strategy for California coast coho addresses recovery at both the regional and watershed scales. It was compiled with participation from representatives of federal, state and local agencies, tribes, commercial fishers, recreational anglers, academia, environmental groups, water agencies, non-profit organizations, and industry groups (cattle, timber, and agriculture).

The state recovery plan includes over 700 conservation and regulatory recommendations addressing a broad spectrum of land use activities throughout the range of California coho and another 200 recommendations related to agricultural practices. The state has integrated the recovery plan with its habitat restoration program in an effort to ensure a greater likelihood of funding for high priority watersheds.

Exhibit 7. North-Central California Coast Recovery Domain

Indirect benefits expected from CDFG coho salmon. recovery plan.



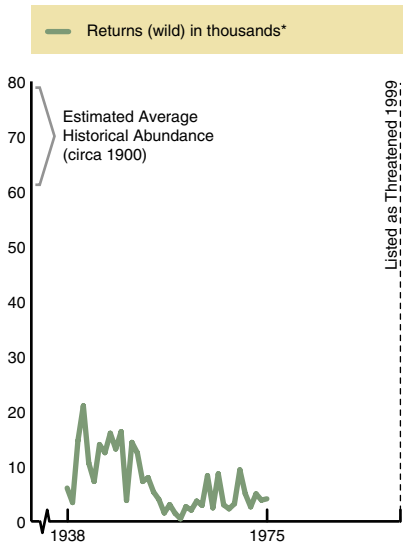
Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Water quality standards for all northern California waters being updated
- California Coho Recovery Plan addresses limiting factors by watershed and ensures high priority actions are addressed
- Over 10,000 acres of private farmland inspected/ certified for fish friendly farming
- Hatchery improvements underway
- Road maintenance practices improved
- Improved captive broodstock programs

PCSRF Activities in the Recovery Domain

- 9 stream miles opened or underway through fish passage projects
- 9 miles of stream bank treated or underway through riparian habitat projects
- 402 acres treated or underway through upland habitat projects
- 73 stream miles assessed or underway through research monitoring and evaluation projects
- 651 blockages removed/upgraded or underway through fish passage projects

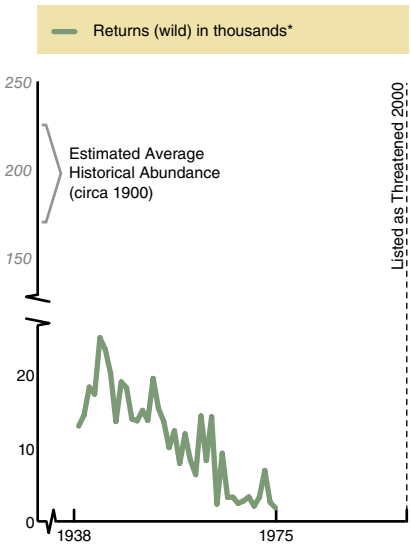
California Coast Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

Northern California Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

** Note: There are no time series ESU abundance data for the four ESUs within this recovery domain. For the California Coast Chinook ESU and the Northern California Steelhead ESU shown below, data from dam counts on the South Fork Eel River from 1938–1975 represent the best proxy for these two ESUs and are shown here.*

Central California Coast Steelhead ESU

- Threatened 1997
- Historical estimate 94,000
- Current estimate 14,100

MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Urbanization
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

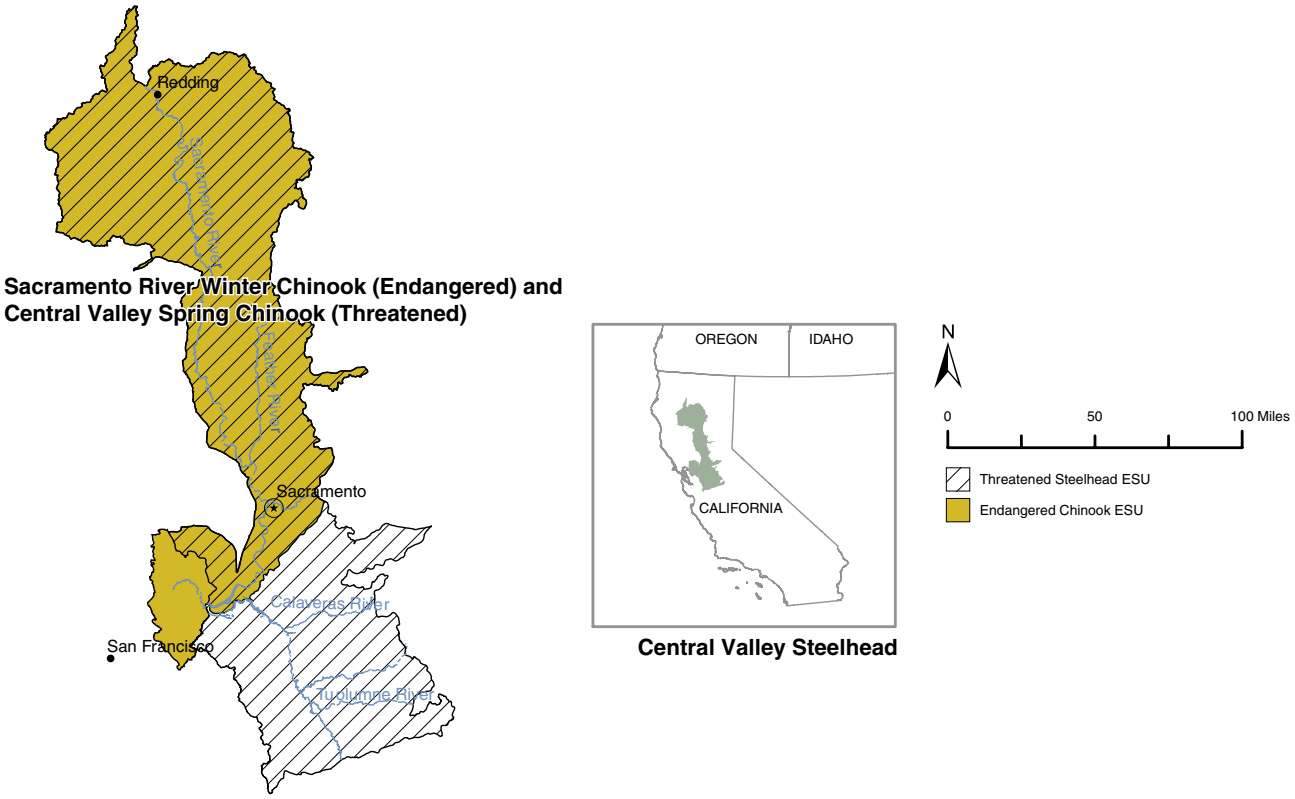
Central California Coast Coho ESU

- Threatened 1996 (proposed reclassification as endangered, June 14, 2004)
- Historical estimate 56,100
- Current estimate 6,160

MAJOR FACTORS LIMITING RECOVERY

- Loss of channel complexity, floodplain and estuarine habitats
- Urbanization
- Loss of riparian habitat
- Excessive sediment from roads
- Degraded water quality
- Reduced access to spawning/ rearing habitat
- Unscreened diversions

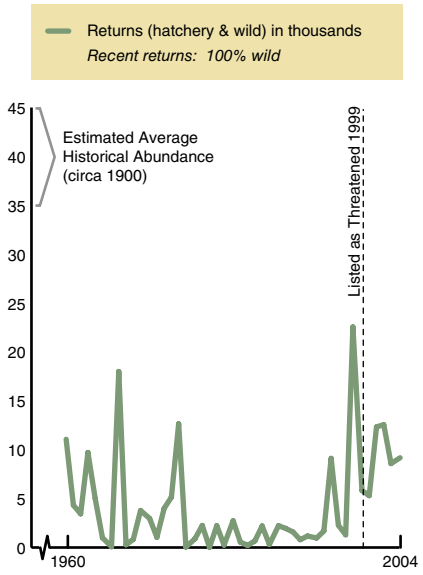
Exhibit 8. Central Valley Recovery Domain



Activities Addressing Recovery Needs for ESUs in the Recovery Domain

- Captive broodstock program for Sacramento winter Chinook was once considered essential to keeping population from going extinct; it is now being considered for termination
- Increased water releases from dams
- Cooperative efforts by CALFED to improve water quality and water supply
- Modifications to dams to improve habitat, temperature, flow
- Some diversions screened
- Enhanced efforts to reduce illegal harvest
- Dam removal program (Battle Creek) planned
- Some instream flow improvements

Central Valley Spring Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Reduced access to spawning/rearing habitat from impassable barriers

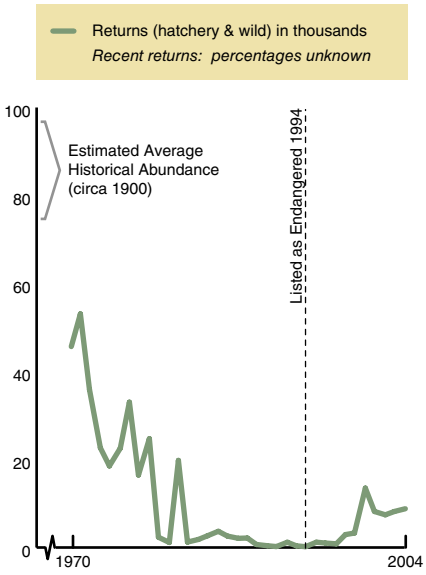
Altered and degraded habitat

Temperature

Hatchery fish impacts

Degraded water quality

Sacramento River Winter Chinook ESU



MAJOR FACTORS LIMITING RECOVERY

Single population low in abundance

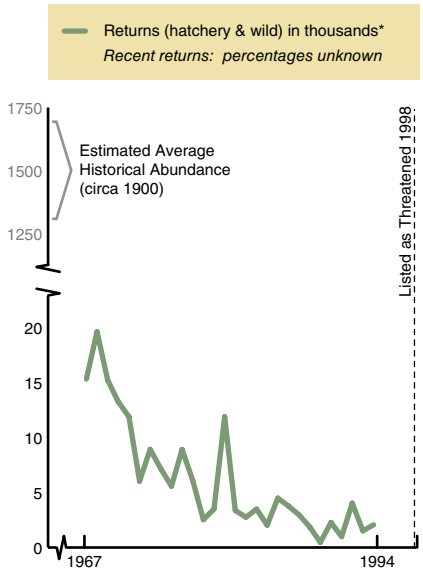
Reduced access to spawning/rearing habitat from impassable barriers

Altered and degraded habitat

Reduced stream flow

Temperature

Central Valley Steelhead ESU



MAJOR FACTORS LIMITING RECOVERY

Reduced access to spawning/rearing habitat from impassable barriers

Altered and degraded habitat

Temperature

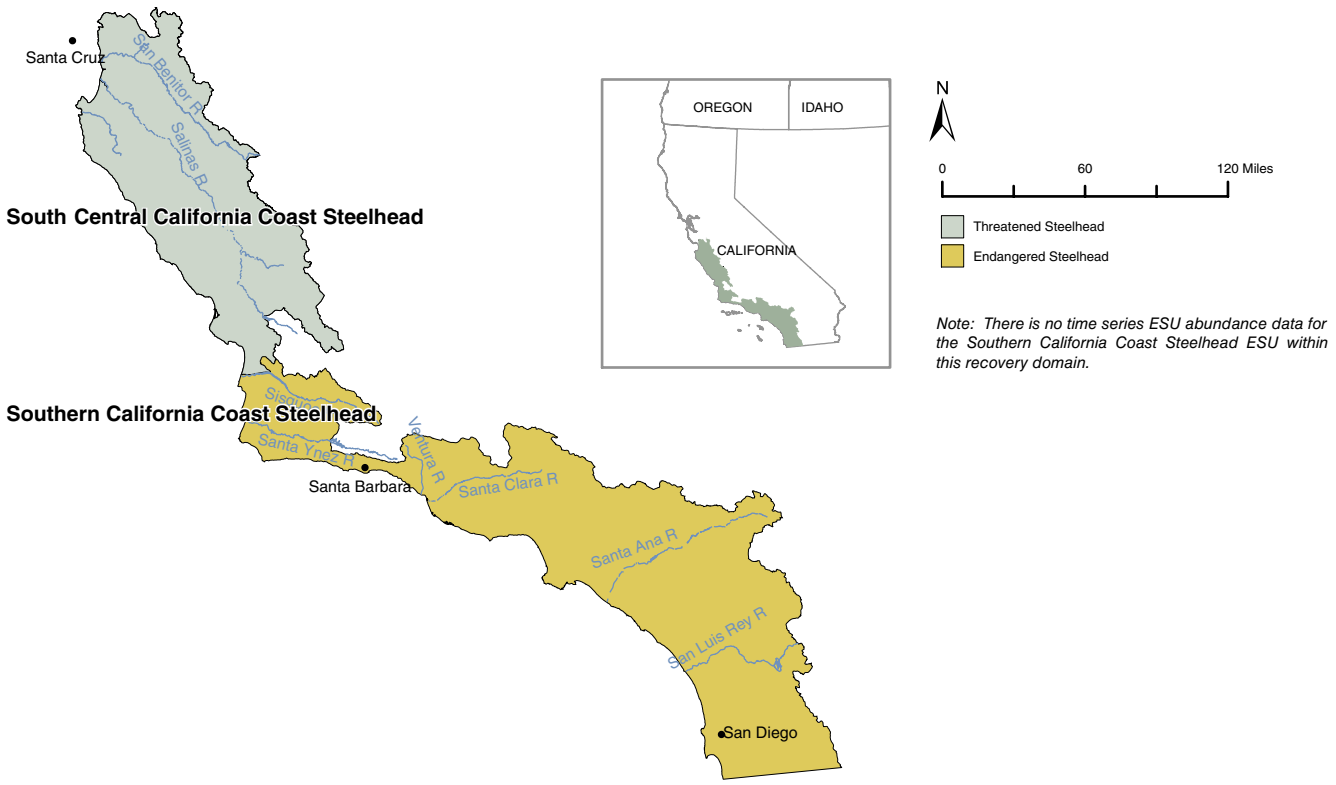
Unscreened diversions

Hatchery fish impacts

Degraded water quality

** Note: The data set represents dam counts at the Red Bluff Diversion Dam fish ladders, providing information on only a representative portion of the ESU.*

Exhibit 9. South-Central/Southern California Coast Recovery Domain



Note: There is no time series ESU abundance data for the Southern California Coast Steelhead ESU within this recovery domain.

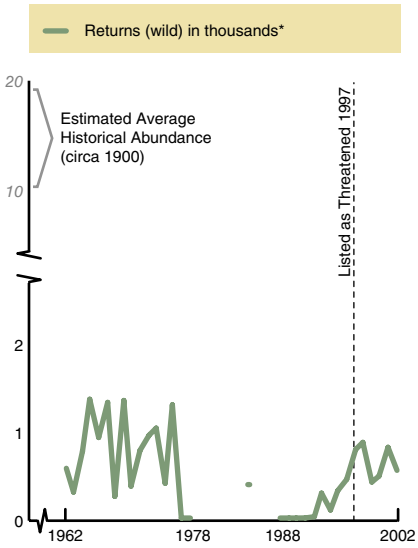
Activities Addressing Recovery Needs for ESUS in the Recovery Domain

- Various impediments to passage removed
- Several fish passage facilities planned or completed
- Impacts from several dam operations reduced
- Three large dam removals being planned
- Recreational harvest being curtailed
- Hatchery fish stocked only above impassible barriers

PCSRF Activities in the Recovery Domain

- 57 blockages removed/upgraded or underway through fish passage projects
- 24 acres protected or underway through land acquisition projects
- 21 stream miles assessed or underway through research monitoring and evaluation projects

South-Central California Coast Steelhead



MAJOR FACTORS LIMITING RECOVERY

Alteration of natural stream flow patterns

Physical impediments to fish passage

Alteration of floodplains and channels

Sedimentation of spawning and rearing habitat

Spread of exotic species

Loss of estuarine habitat

Competition with hatchery fish

Recreational angling

** 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, which may not be representative of the ESU as a whole. 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 Coast Steelhead

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

MAJOR FACTORS LIMITING RECOVERY

Alteration of natural stream flow patterns

Physical impediments to fish passage

Alteration of floodplains and channels

Sedimentation of spawning and rearing habitat

Spread of exotic species

Loss of estuarine habitat

Competition with hatchery fish

Recreational angling

Technical Recovery Teams (TRTs)

TRTs consist of six to nine experts in areas such as salmon biology, population dynamics, and conservation biology. As well, they include at least one member with experience in and knowledge of the specific geographic area and the salmonid species that inhabit the area.

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

These four elements—abundance, productivity, spatial distribution, and genetic diversity—must be considered when developing recovery plans and determining whether a species is recovered.

Recovery Planning

The ESA requires that recovery plans for listed species be developed as blueprints to determine actions for implementation and funding priorities. Technical Recovery Teams (TRTs) were formed by NMFS for each recovery domain to provide the technical basis for recovery plans. The NMFS approach to recovery planning for Pacific Coast ESUs has been to support collaborative efforts with strong participation and leadership from many entities within a recovery domain, including federal, state, local, and tribal government entities, as well as other stakeholders.

Subbasin level planning and watershed assessment projects provide a critical basis for recovery planning, by helping to identify not only the factors limiting recovery, but needed recovery actions. Knowing what actions are likely to have a large effect on recovery, greatly improves wise investment of recovery dollars to address priorities. The first locally developed regional recovery plan was presented to NMFS in late 2004, and others continue to be developed. NMFS is using these locally developed plans to complete ESA recovery plans. Many groups—from local watershed councils and environmental organizations to individual landowners and businesses—are involved in recovery planning.

Monitoring and evaluation projects provide the information needed to assess with some measure of scientific certainty whether recovery actions are appropriate and effective. PCSRF is supporting planning, assessment, and monitoring activities in all domains. The completion of monitoring and evaluation projects will also help to refine and revise performance goals and indicators for the PCSRF program over time.