Statewide Strategy to Recover Salmon

RESPONDING TO FEDERAL ENDANGERED SPECIES ACT LISTINGS “THE WASHINGTON WAY”
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Statewide Strategy to Recover Salmon

RESPONDING TO FEDERAL ENDANGERED SPECIES ACT LISTINGS “THE WASHINGTON WAY”
Salmon Recovery Regions

1 Not developing salmon recovery plans at this time.
2 Lake Ozette Steering Committee, under NMFS guidance, preparing Lake Ozette sockeye recovery plan.
Preface

Washington’s Statewide Strategy to Recover Salmon — *Extinction is not an Option* — was published in 1999. It recognized strategic regional and watershed actions were essential to success. In consultation with the National Marine Fisheries Service, United States Fish and Wildlife Service, and Washington Department of Fish and Wildlife, the Governor’s Salmon Recovery Office (GSRO) identified seven salmon recovery regions; subsequent to that time, these regions have evolved, and six self-created groups have developed plans that have been submitted jointly with GSRO to the federal agencies as recovery plans under the federal Endangered Species Act section 4(f). These plans also meet the requirement of Washington’s Salmon Recovery Act RCW 77.85.030(1).

The Statewide Strategy set a standard for these recovery efforts. It says our vision is to “restore salmon, steelhead, and trout to healthy harvestable levels and improve habitats on which fish rely.” The goals include an emphasis on wild productive and diverse populations, a commitment to ensuring our actions benefit salmon, and an approach that encourages participation from citizens and recovery partners. The GSRO approves regional plans that are submitted to the federal agencies, and all regional plans approved by the GSRO meet this standard.

These plans will certainly change as they are implemented. Our commitment to adaptive management requires we evaluate the effectiveness of our actions in accomplishing our goals, and we will adjust as information guides us on this long journey.

"The goals include an emphasis on wild productive and diverse populations, a commitment to ensuring our actions benefit salmon, and an approach that encourages participation from citizens and recovery partners."
Our approach must integrate economic and environmental concerns in a way that engenders a new kind of prosperity for our state, one that enriches today without impoverishing tomorrow.

GOVERNOR CHRISTINE GREGOIRE
Dear Readers:

Our wild salmon are in trouble. Fifteen salmon species, dispersed throughout 75 percent of Washington State, are listed under the Endangered Species Act. While significant challenges are before us, I have hope for the future. Our state has a tradition of fighting to preserve its quality of life and a commitment to passing on a strong legacy of stewardship to future generations.

The key to creating the recovery plans summarized in this report, and to our success over the long-term, is collaboration. People throughout the state, representing agriculture and business, state and tribal governments, watershed coalitions, volunteer organizations, and other interested stakeholders have participated in a historic process that well may be unique within the United States. We did not wait for the federal government to tell us what to do; we rolled up our sleeves and got to work. We took our own initiative to develop salmon recovery plans that came from the bottom up, not the top down. As Governor, I am proud of this tradition and call it working together “The Washington Way.”

Now, the real work begins. We need to implement these plans, translating them into real actions with real results that will benefit both human and fish populations in the generations to come.

We must leverage our resources and clearly demonstrate a good return on taxpayer dollars. Our approach must integrate economic and environmental concerns in a way that engenders a new kind of prosperity for our state, one that enriches today without impoverishing tomorrow.

This is not an easy task. The problems we must address were years in coming and they will take years to correct. But by working together in a spirit of cooperation, by bearing in mind that what we do will make a lasting difference in Washington State, and by renewing our commitment to creative problem solving, I have no doubt that we can get the job done.

Thank you for your interest in, and dedication to, protecting this important part of our shared heritage.

Sincerely,

CHRISTINE O. GREGOIRE
WASHINGTON STATE GOVERNOR
JANUARY 2006
To appreciate Washington’s recovery plans and get a good picture of what to expect from their implementation, we need first to understand the foundations for listing salmon and steelhead.

The federal government lists a species when it has determined there is sufficient scientific evidence to conclude there is a danger to the continued existence of the plant or animal throughout all or a significant portion of its range. The National Marine Fisheries Service (NMFS) made decisions about Washington’s salmon on the basis of two aspects:

- The species’ biological status, and
- Listing factors that contributed to the species’ decline

These two aspects are addressed very specifically by NMFS when they list the species. Status is determined using technical viability criteria, and factors are determined using categories identified in the Endangered Species Act. These same factors must be evaluated when making the decision to de-list.

**Biological Status: Viability Criteria**

A viable salmonid population (VSP) is one that negligible risk of extinction over a 100-year time frame and supports a minimum number of fish defined by NMFS. NMFS will judge viability of the species, or Evolutionarily Significant Unit (ESU), based on abundance, productivity, distribution, and diversity.

**Listing Factors**

ESA requires that five criteria be evaluated when making a decision to list a species. These criteria, called “listing factors,” are generally analyzed in terms of threats and factors that limit recovery. We usually refer to these threats as the “4 H’s” and include habitat, harvest, hatcheries, and hydro, plus natural factors such as disease and predation. NMFS determines the impacts of these factors and what role they play in the decline, as well as protective efforts that may be occurring to ease their effect.
ESA requires that five criteria be evaluated when making a decision to list a species. These criteria, called “listing factors,” are generally analyzed in terms of threats and factors that limit recovery.

**Five General Listing Factors in the ESA**
- Present or threatened destruction, modification, or curtailment of a species’ habitat or range
- Over-utilization for commercial, recreational, scientific, or educational purposes
- Disease or predation
- Inadequacy of existing regulatory mechanisms
- Other natural or human made factors affecting the species’ continued existence

**Four Parameters Are Used by NMFS to Define Viability**

**Abundance** This is the number of adults on the spawning grounds—the sizes of populations. NMFS considers abundance important because, all else being equal, smaller populations are at greater risk of extinction than large populations.

**Productivity** This is population growth rate; that is, over time for each fish that spawns, how many fish return. A population does not change if one fish returns for every fish that spawned. A population cannot persist when productivity is less than that, and grows when more fish return for each spawner.

**Distribution** This is the distribution of fish among and within habitats they use throughout their life cycle. Habitat is needed for all life stages in a distribution that reduces risk of mortality from catastrophic events, but close enough to allow fish to connect with one another.

**Diversity** This is variation and includes such things as genetics, life histories, physical traits of the fish (size, age, timing of the runs, migration patterns) and influences of hatchery fish. We need to avoid further reductions in natural diversity so that fish can survive short and long term changes in the environment.

**Bull Trout on a Different Path**

The US Fish and Wildlife Service listed bull trout in 2000. They drafted a recovery plan that was published for public comment in the Federal Register in 2004. They are currently doing their five-year review of the status of the species. When that is complete, they expect to resume the public process for completion of the recovery plan — likely some time in 2006. We have been assured materials produced in our regional recovery plans will be incorporated as their recovery plans progress.
## The Endangered Species Act

### Summary of Listing Criteria | Risk of Extinction

<table>
<thead>
<tr>
<th>SALMON REC. REGION</th>
<th>ESU ¹</th>
<th>CURRENT LISTING ²</th>
<th>RISKS TO VIABILITY ³</th>
<th>LISTING FACTORS ⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SNAKE RIVER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snake River Sockeye</td>
<td>Endangered</td>
<td>Extremely high for all 4 factors</td>
<td>Hydroelectric generation facilities and their operation; agriculture; logging; urbanization (including residential and industrial development); recreation, and harvest</td>
<td></td>
</tr>
<tr>
<td>Snake River Spring/Summer Chinook</td>
<td>Threatened</td>
<td>Moderately high for abundance and productivity, lower for spatial structure and diversity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snake River Fall Chinook</td>
<td>Threatened</td>
<td>Moderately high for all 4 factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snake River Basin Steelhead</td>
<td>Threatened</td>
<td>Moderate for abundance, productivity, and diversity; higher for spatial structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UPPER COLUMBIA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Columbia River Spring Chinook</td>
<td>Threatened</td>
<td>Strong concern for abundance and productivity, less concern for spatial structure and diversity</td>
<td>Degraded floodplain and channel structure; degraded riparian; impaired fish passage in tributaries; harvest-related adverse effects; mainstem hydro mortality and related effects</td>
<td></td>
</tr>
<tr>
<td>Upper Columbia River Steelhead</td>
<td>Threatened</td>
<td>High for productivity, lower for abundance, diversity, and spatial structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MIDDLE COLUMBIA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Columbia River Steelhead</td>
<td>Threatened</td>
<td>Moderate for productivity, spatial structure and diversity, greater for abundance</td>
<td>Harvest; irrigated agriculture (including storage dams, conveyance, and diversions); hydropower development; urbanization and rural development; forestry; road development</td>
<td></td>
</tr>
</tbody>
</table>
1 Evolutionarily Significant Unit. NMFS considers an ESU a “species” under the ESA.
2 As of June 28, 2005.
3 Also called Viable Salmonid Population (VSP) risks. NMFS assesses the risk to species and, hence, whether to list them under the ESA, by evaluating the viability of ESUs. For each ESU, the extinction risk for four factors — abundance, productivity, spatial distribution, and diversity — was assessed. These risks must be addressed to de-list the fish.

4 Listing factors are identified in the ESA and include present or threatened destruction or modification of habitat; over harvest; disease or predation; inadequacy of regulatory mechanisms; other natural or human factors. The effects of hatchery artificial propagation programs were evaluated on the basis of these factors, and for all ESUs the conclusion was that hatchery programs do not substantially reduce extinction risk.

<table>
<thead>
<tr>
<th>SALMON REC. REGION</th>
<th>ESU 1</th>
<th>CURRENT LISTING 2</th>
<th>RISKS TO VIABILITY 3</th>
<th>LISTING FACTORS 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOWER COLUMBIA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Columbia</td>
<td></td>
<td>Endangered</td>
<td>High for all categories, particularly spatial structure and diversity</td>
<td>Habitat degradation, especially as a result from sedimentation, fragmentation, and loss; hydropower effects; hatchery effects; over harvest in commercial and recreational fisheries; disease and predation; inadequate regulatory mechanisms; non-native species effects</td>
</tr>
<tr>
<td>River Chum</td>
<td></td>
<td>Threatened</td>
<td>Extremely high for all 4 factors</td>
<td></td>
</tr>
<tr>
<td>Lower Columbia</td>
<td></td>
<td>Threatened</td>
<td>Moderately high for all 4 factors</td>
<td></td>
</tr>
<tr>
<td>River Coho</td>
<td></td>
<td>Threatened</td>
<td>Moderate for all 4 factors</td>
<td></td>
</tr>
<tr>
<td>Lower Columbia</td>
<td></td>
<td>Threatened</td>
<td></td>
<td></td>
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<tr>
<td>River Chinook</td>
<td></td>
<td></td>
<td></td>
<td>Habitat loss, especially degradation and loss of lower floodplain, estuary, and nearshore marine; over-harvest; stream flow changes</td>
</tr>
<tr>
<td>Lower Columbia</td>
<td></td>
<td>Threatened</td>
<td></td>
<td></td>
</tr>
<tr>
<td>River Steelhead</td>
<td></td>
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<tr>
<td><strong>HOOD CANAL</strong></td>
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<tr>
<td>Hood Canal</td>
<td></td>
<td>Threatened</td>
<td>High for all categories</td>
<td></td>
</tr>
<tr>
<td>Summer Chum</td>
<td></td>
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</tr>
<tr>
<td><strong>PUGET SOUND</strong></td>
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<tr>
<td>Puget Sound</td>
<td></td>
<td>Threatened</td>
<td>Moderately high for all 4 factors</td>
<td></td>
</tr>
<tr>
<td>Chuminoook</td>
<td></td>
<td></td>
<td></td>
<td>Passage obstructions; forest management; agricultural practices; urban and rural development; stormwater; toxics; flow conditions; channel function; dredging in estuaries and lower mainstem; floodplain functions; nearshore processes; harvest; enforcement of existing regulations; hatcheries</td>
</tr>
<tr>
<td>Puget Sound</td>
<td></td>
<td>Currently under review</td>
<td>Under review</td>
<td></td>
</tr>
<tr>
<td>Steelhead</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COASTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ozette Lake</td>
<td></td>
<td>Threatened</td>
<td>Moderately high for all 4 factors</td>
<td></td>
</tr>
<tr>
<td>Sockeye</td>
<td></td>
<td></td>
<td></td>
<td>Stream and beach sedimentation; loss of riparian areas; loss of large woody debris</td>
</tr>
</tbody>
</table>
Six Washington salmon recovery organizations have completed draft recovery plans and submitted them to NMFS and USFWS.

Under ESA section 4(f) a recovery plan must include the following:

- Site-specific management actions necessary for the conservation and survival of the species,
- Objective, measurable criteria which, when met, would result in a determination that the species be removed from the list (i.e., de-listing), and
- Estimates of the time required and cost to carry out those measures needed to achieve recovery

In addition to the statutory requirements, NMFS requires that recovery plans contain a more general statement of goals and a recovery strategy that describes the overall approach to recovery for the species.

Washington’s recovery plans follow an outline developed by the state and approved by NMFS, and meet criteria established in the ESA. The plans do not obligate any party other than NMFS, and are not enforceable or regulatory. They set goals and identify actions that would, if implemented, lead to recovery of the listed species. In developing these plans through local groups, we believe it is more likely that the actions identified reflect local circumstances and will be undertaken. Thus, we have a better chance of recovering species because of this local ownership.
ESA de-listings occur at a point when a listed species and its ecosystem are restored and the future is safeguarded so that protections under the ESA are no longer needed. Decisions to de-list are based on a species’ biological status (the biological de-listing criteria) and on the status of the listing factors (both threats and limiting factors) to the species, as identified in ESA section 4(a)(1).

The ESA listing factors, and not recovery plans, are the legal basis upon which de-listing decisions will be made. These listing factors were published in the Federal Register on June 14, 2004 for all west coast salmonid ESUs. In this notice, NMFS described its process for making listing determinations, including scientific analyses that evaluated ESU viability, factors for decline, and efforts being made to protect the ESU.

NMFS must conduct status reviews of all listed ESUs at least once every 5 years to determine whether the ESUs should be removed from the list or changed in status.

Criteria for Review Include:

- Technical analyses and recommendations regarding viability criteria, including
  - Number of viable populations
  - Status of core populations
  - Distribution of viable populations relative to the range of historical conditions supporting viable populations
  - Linkages and connectivity among viable populations
  - Diversity of life history and phenotypes expressed
  - Considerations regarding catastrophic risk

- Any new information on population and ESU status and new advances in risk evaluation methodologies

- Analysis of listing factors (threats) criteria, including
  - Present or threatened destruction, modification, or curtailment of a species’ habitat or range
  - Over-utilization for commercial, recreational, or educational purposes
  - Disease or predation
  - Inadequacy of existing regulatory mechanisms
  - Other natural or man-made factors affecting continued existence

Fish Biological Factors

- Do we know that the ESU is viable?

  - In major groups of populations
    - Abundance
    - Productivity
    - Distribution
    - Diversity

Human-Related Factors

- Have we addressed the factors that lead to the listings?

  - ESA listing factors (threats)
    - Habitat
    - Hydropower
    - Harvest
    - Disease / predation
    - Regulatory mechanisms
    - Hatcheries
    - Natural threats

If yes

- De-List
Puget Sound Salmon Recovery Region Plan Chinook

**GOAL**

To recover self-sustaining, harvestable salmon runs in a manner that contributes to the overall health of Puget Sound and its watersheds and allows us to enjoy and use this precious resource in concert with our region’s economic vitality and prosperity.

A fundamental assumption of this plan is that local watershed efforts are the engine that will lead the region to recovery.

**Plan Timeframe**

50 years

**Estimated Cost**

$1.42 billion for first 10 years

**Actions Identified to Implement Plan**

More than 1000

**Status**

Harvest, hatchery, habitat plan submitted to NMFS 06/2005

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CHRIS DRIVDAHL

RECOVERING SALMON THE WASHINGTON WAY 12
Human Population
4,093,500

Counties
All or parts of Whatcom, Skagit, Island, San Juan, Snohomish, King, Pierce, Thurston, Mason, Kitsap, Jefferson, and Clallam

Treaty Tribes
Lummi Nation, Nooksack, Stillaguamish, Jamestown S’Klallam, Muckleshoot, Nisqually, Port Gamble S’Klallam, Lower Elwha S’Klallam, Puyallup, Sauk-Suiattle, Skokomish, Squaxin Island, Suquamish, Swinomish, Tulalip, Upper Skagit

Listed Fish
Chinook, bull trout

Regional Recovery Organization
Puget Sound Shared Strategy

MAJOR FACTORS LIMITING RECOVERY

- Degraded floodplain and in-river channel structure
- Degraded nearshore/marine and estuarine conditions and loss of associated habitat
- Riparian area degradation and loss of in-river large woody debris
- Excessive sediment in spawning gravels
- Degraded water quality and temperature
- Impaired instream flows
- Barriers to fish passage

KEY ACTIONS RECOMMENDED TO RECOVER FISH

January 2006 to June 2007

- Implement high priority habitat actions in estuaries, floodplains, and riparian areas
- Protect most seriously threatened habitats and processes and coordinate protection plans across watersheds
- Identify restoration and protection priorities for nearshore
- Initiate programs to help farmers and other landowners protect salmon on private lands
- Define watershed and regional adaptive management procedures
- Integrate habitat actions with co-manager harvest goals and all hatcheries

Long Term

- Protect functioning habitat and habitat-forming processes
- Implement habitat restoration actions according to key factors and threats limiting recovery
- Remove major fish barriers across region
- Coordinate adaptive management and monitoring programs at regional and watershed levels
- Manage hatcheries for benefit of wild fish
- Reduce harvest of listed fish
- Develop robust regulatory and incentive programs to improve habitat protection on private property

1 USFWS previously published a bull trout recovery plan (2004). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State’s plan into the federal plan.
Chinook

Key Actions

Puget Sound Salmon Recovery Region

Although each watershed area has its own individualized, tailored plan, there are common types of actions that all watersheds included in their chapters. These actions are related to the threats or limiting factors affecting salmon.

1. **Floodplain Reconnection**

Reconnecting two oxbows in the White River ($4.5M) will open over 100 acres of floodplain habitat to juvenile fish. Floodplain projects are one of the White’s best chances at reducing the risk of extinction of early run Chinook, a population critical to regional success. Setting back dikes and levees to reconnect mainstem rivers with their floodplains is a priority in over half of the Puget Sound watersheds.
Fish Barriers
Removing the Middle Fork Diversion Dam on the Nooksack River ($5M) will open up 16 miles of habitat and increase the North Fork Nooksack population by over 30%. Opening access for fish—from the Elwha Dam to hundreds of road culverts—has immediate benefits and is an important short-term element in most Puget Sound strategies.

Landowner Incentives
Across the densely populated Puget Sound, watersheds will work to engage landowners and communities in restoring the resource. For example, Hood Canal stakeholders are developing a creative program that provides materials and support to nearshore landowners to improve habitat conditions and reduce nonpoint pollution.

Marine Shorelines
In the next few years, scientists will have assessed 2,500 miles of Puget Sound marine shoreline to identify the highest priority sites for restoration and protection. Soon stakeholders will begin implementing the top projects identified. Nearshore habitats that provide food and shelter to migrating salmon are a vital piece of the regional recovery strategy, and their protection requires close partnerships among agencies, tribes, nonprofits, and landowners.

Estuaries
Estuary restoration is one of the most important actions Sound-wide, with over 3/4 of the watersheds ranking it a top priority. Restoring and protecting 2,720 acres in Snohomish estuary ($25M) will double the area of functioning habitat in the estuary, a key watershed priority for increasing survival rates of juvenile fish.

Habitat Protection
With a strategic combination of voluntary conservation easements, land acquisition, and regulatory approaches, the Nisqually watershed aims to achieve a formal commitment to protection in 95% of estuary habitat, 90% of mainstem river shoreline, and 85% of shorelines in two major tributaries. As the population of the region steadily increases, protecting functioning habitat and watershed processes will be a critical element of every watershed strategy.
Puget Sound Salmon Recovery Region Chinook

**Chinook Spawner Abundance**

<table>
<thead>
<tr>
<th>Population</th>
<th>1996-2000</th>
<th>Low Productivity Target</th>
<th>High Productivity Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>NF Nooksack</td>
<td>120</td>
<td>16,000</td>
<td>3,800</td>
</tr>
<tr>
<td>SF Nooksack</td>
<td>200</td>
<td>9,100</td>
<td>2,000</td>
</tr>
<tr>
<td>Lower Skagit</td>
<td>2,300</td>
<td>16,000</td>
<td>3,900</td>
</tr>
<tr>
<td>Upper Skagit</td>
<td>8,920</td>
<td>26,000</td>
<td>5,380</td>
</tr>
<tr>
<td>Upper Cascade</td>
<td>330</td>
<td>1,200</td>
<td>290</td>
</tr>
<tr>
<td>Lower Sauk</td>
<td>660</td>
<td>5,600</td>
<td>1,400</td>
</tr>
<tr>
<td>Upper Sauk</td>
<td>370</td>
<td>3,030</td>
<td>750</td>
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<tr>
<td>Suiattle</td>
<td>420</td>
<td>610</td>
<td>160</td>
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<tr>
<td>NF Stillaguamish</td>
<td>660</td>
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<td>240</td>
<td>15,000</td>
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<td>Skykomish</td>
<td>1,700</td>
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<tr>
<td>Snoqualmie</td>
<td>1,200</td>
<td>25,000</td>
<td>5,500</td>
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<tr>
<td>North Lake WA</td>
<td>194*</td>
<td>4,000</td>
<td>1,000</td>
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<tr>
<td>Cedar</td>
<td>398*</td>
<td>8,200</td>
<td>2,000</td>
</tr>
<tr>
<td>Green</td>
<td>7,191*</td>
<td>27,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>White</td>
<td>329*</td>
<td>Unknown</td>
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<tr>
<td>Puyallup</td>
<td>2,400</td>
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<td>5,300</td>
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<tr>
<td>Nisqually</td>
<td>890</td>
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<tr>
<td>Skokomish</td>
<td>1,500*</td>
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<tr>
<td>Mid-Hood Canal</td>
<td>389</td>
<td>5,200</td>
<td>1,300</td>
</tr>
<tr>
<td>Dungeness</td>
<td>123*</td>
<td>4,700</td>
<td>1,200</td>
</tr>
<tr>
<td>Elwha</td>
<td>1,319*</td>
<td>17,000</td>
<td>6,900</td>
</tr>
<tr>
<td>Total</td>
<td>32,853</td>
<td>271,640</td>
<td>60,580</td>
</tr>
</tbody>
</table>

* DATA 1987-2001

1 This is one adult fish returning from the ocean for each spawner.

2 This is the number of spawners at the point where the population provides the highest sustainable yield for every spawner.

---

**Chinook Productivity**

<table>
<thead>
<tr>
<th>Population</th>
<th>Present (Short Term Trend)</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>NF Nooksack</td>
<td>1.42</td>
<td>3.40</td>
</tr>
<tr>
<td>SF Nooksack</td>
<td>1.07</td>
<td>3.60</td>
</tr>
<tr>
<td>Lower Skagit</td>
<td>1.06</td>
<td>3.00</td>
</tr>
<tr>
<td>Upper Skagit</td>
<td>1.06</td>
<td>3.80</td>
</tr>
<tr>
<td>Upper Cascade</td>
<td>1.05</td>
<td>3.00</td>
</tr>
<tr>
<td>Lower Sauk</td>
<td>1.03</td>
<td>3.00</td>
</tr>
<tr>
<td>Upper Sauk</td>
<td>0.97</td>
<td>3.00</td>
</tr>
<tr>
<td>Suiattle</td>
<td>1.00</td>
<td>2.80</td>
</tr>
<tr>
<td>NF Stillaguamish</td>
<td>1.06</td>
<td>3.40</td>
</tr>
<tr>
<td>SF Stillaguamish</td>
<td>1.00</td>
<td>3.30</td>
</tr>
<tr>
<td>Skykomish</td>
<td>1.07</td>
<td>3.40</td>
</tr>
<tr>
<td>Snoqualmie</td>
<td>1.10</td>
<td>3.60</td>
</tr>
<tr>
<td>North Lake WA</td>
<td>1.04</td>
<td>3.00</td>
</tr>
<tr>
<td>Cedar</td>
<td>0.97</td>
<td>3.10</td>
</tr>
<tr>
<td>Green</td>
<td>1.05</td>
<td>Unknown</td>
</tr>
<tr>
<td>White</td>
<td>1.14</td>
<td>Unknown</td>
</tr>
<tr>
<td>Puyallup</td>
<td>0.96</td>
<td>2.30</td>
</tr>
<tr>
<td>Nisqually</td>
<td>1.06</td>
<td>2.30</td>
</tr>
<tr>
<td>Skokomish</td>
<td>1.04</td>
<td>Unknown</td>
</tr>
<tr>
<td>Mid-Hood Canal</td>
<td>1.11</td>
<td>3.00</td>
</tr>
<tr>
<td>Dungeness</td>
<td>1.07</td>
<td>3.00</td>
</tr>
<tr>
<td>Elwha</td>
<td>0.97</td>
<td>4.60</td>
</tr>
</tbody>
</table>

1 Calculated on all spawners.

---

**Abundance goal:**
This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

**Productivity:**
Population growth rate. This is the number of fish returning for each fish that spawns. A population must have productivity greater than 1 to increase over time.

**Present abundance:**
This is expressed as an average over a specified period of time.
Chinook
Puget Sound Salmon Recovery Region

Chinook
Oncorhynchus tshawytscha
Live 3-6 years; majority leave freshwater during their first year, making extensive use of protected estuary and nearshore habitats

DATA SOURCE: NOAA-FISHERIES AND SHARED STRATEGY FOR PUGET SOUND
Puget Sound Salmon Recovery Region Plan
Hood Canal Summer Chum

GOAL

To protect, restore and enhance the productivity, production and diversity of Hood Canal/Eastern Strait of Juan de Fuca summer chum salmon and their ecosystems to provide surplus production sufficient to allow future directed and incidental harvests of summer chum salmon. The HCCC Board, in considering a recovery plan that can be implemented and meets the desires of the land-use (Counties) and Tribal authorities, further adds that a summer chum salmon recovery plan be designed to provide the Counties with as much certainty as is possible regarding development, growth and land use; as much certainty as is possible for Tribal goals and objectives; and as much certainty as is possible for private landowners.

...the Summer Chum Recovery Plan will provide a logic and rationale for recovery of summer chum salmon populations that can be understood by County Commissioners, Tribal governments, local and regional decision-makers and the public.

HOOD CANAL COORDINATING COUNCIL

Plan Timeframe
Initial focus is 12 years

Estimated Cost
$136.1 million

Actions Identified to Implement Plan
179

All H plan submitted to NMFS 11/2005
Human Population
71,391

Counties
Parts of Mason, Kitsap, Jefferson, and Clallam

Treaty Tribes
Skokomish, Port Gamble S’Klallam, Jamestown S’Klallam, Lower Elwha Klallam, Suquamish

Listed Fish
summer chum, bull trout, Chinook

Regional Recovery Organization
Hood Canal Coordinating Council

MAJOR FACTORS LIMITING RECOVERY

- Loss of estuary / nearshore/freshwater habitat
- Altered floodplain and channel morphology
- Sedimentation
- Riparian and instream degradation
- Altered hydrology due to habitat loss

KEY ACTIONS RECOMMENDED TO RECOVER FISH

Janauary 2006 to June 2007

- Riparian and estuary restoration
- County land use enforcement analysis/needs assessment
- Support zoning regulations that foster salmon recovery
- Floodplain comprehensive management plans
- Analysis of bulkheads regulations and alternative technologies
- Develop wetland rating system
- Develop public benefit rating system programs for counties
- Expand the geographic reach of the Community Nearshore Restoration Program

Long Term

- Address floodplain and estuarine habitat loss along Highway 101 and Seabeck Highway NW
- Implementation of US Forest Service road maintenance and road abandonment plan
- Voluntary actions to remove railroad grade, fill, dikes, and levees
- Expand geographic reach of the Community Nearshore Restoration Program throughout the ESU
- Support zoning regulations that foster salmon recovery
- Monitor effectiveness of actions to facilitate adaptive management

1 Hood Canal Coordinating Council has asked that the summer Chum ESU be designated a salmon recovery region; the request is being evaluated by GSRO.

2 USFWS previously published a bull trout recovery plan (2004). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State’s plan into the federal plan.
**Puget Sound Salmon Recovery Region**

**Hood Canal Summer Chum**

**Evolutionarily Significant Unit (ESU) and Context Area**

<table>
<thead>
<tr>
<th>Population</th>
<th>Present*</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quilcene</td>
<td>Analyses in Progress</td>
<td>2,860</td>
</tr>
<tr>
<td>Dosewallips</td>
<td>Analyses in Progress</td>
<td>1,930</td>
</tr>
<tr>
<td>Duckabush</td>
<td>Analyses in Progress</td>
<td>2,060</td>
</tr>
<tr>
<td>Hama Hama</td>
<td>Analyses in Progress</td>
<td>3,790</td>
</tr>
<tr>
<td>Lilliwaup</td>
<td>Analyses in Progress</td>
<td>1,960</td>
</tr>
<tr>
<td>Union</td>
<td>Analyses in Progress</td>
<td>340</td>
</tr>
<tr>
<td>Salmon/Snow</td>
<td>Analyses in Progress</td>
<td>970</td>
</tr>
<tr>
<td>Jimmycomelately</td>
<td>Analyses in Progress</td>
<td>330</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17,670</strong></td>
<td><strong>14,240</strong></td>
</tr>
</tbody>
</table>

**Total Spawner Abundance Present**

17,670 (124% of Goal)

**Abundance goal**

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

**Present abundance**

This is expressed as an average from 1993 to 2004.

**Summer Chum Productivity**

<table>
<thead>
<tr>
<th>Population</th>
<th>Present*</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quilcene</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Dosewallips</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Duckabush</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Hama Hama</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Lilliwaup</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Union</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Salmon/Snow</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td>Jimmycomelately</td>
<td>Analyses in Progress</td>
<td>1.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Analyses in Progress</strong></td>
<td><strong>1.60</strong></td>
</tr>
</tbody>
</table>

*Expected Summer 2006

**Productivity:** Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Puget Sound Salmon Recovery Region

Hood Canal Summer Chum

Eastern Strait of Juan de Fuca

MPG Key Actions

- Restore Jimmycomelately Creek-Sequim Bay Estuary
- Enforce and monitor zoning for Jimmycomelately watershed
- Implement USFS road maintenance and abandonment plans
- Implement community nearshore restoration program for Discovery Bay
- Remove fill, levees along estuary and nearshore to restore marsh and tide flats
- Decommission USFS roads
- Purchase remaining estuary parcels, floodplain
- Restore nearshore and estuarine habitats
- Restore freshwater rearing and spawning habitats

No Population

Priority Habitat

Population

Major Population Group (MPG)

ESU Boundary

Hood Canal MPG Key Actions

- Remove dikes, landfill, and bulkheads as feasible and restore nearshore and estuarine habitats
- Protect spawning and rearing flows in lower Big Quilcene
- Monitor Lilliwaup Creek, Union/Tahuya, Quilcene and Hama Hama Rivers summer chum supplementation
- Develop comprehensive floodplain management and restoration plan for Lower Hama Hama, Duckabush, Skokomish watersheds

* Hood Canal Coordinating Council has petitioned the Governor’s Salmon Recovery Office for status as a region.

DATA SOURCE: NOAA FISHERIES AND HOOD CANAL COORDINATING COUNCIL

STATEWIDE STRATEGY TO RECOVER SALMON

21

WASHINGON TROUT

Priority Habitat

Puget Sound Salmon Recovery Region Hood Canal Summer Chum

Hood Canal Coordinating Council has petitioned the Governor’s Salmon Recovery Office for status as a region.

DATA SOURCE: NOAA FISHERIES AND HOOD CANAL COORDINATING COUNCIL

STATEWIDE STRATEGY TO RECOVER SALMON

21
GOAL

Washington lower Columbia salmon, steelhead, and bull trout are recovered to healthy, harvestable levels that will sustain productive sport, commercial, and tribal fisheries through the restoration and protection of the ecosystems upon which they depend and the implementation of supportive hatchery and harvest practices; and the health of other native fish and wildlife species in the lower Columbia will be enhanced and sustained through the protection of the ecosystems upon which they depend, the control of non-native species, and the restoration of balanced predator/prey relationships.

The Lower Columbia Fish Recovery Board is committed to finding solutions that restore fish and provide for the needs of the citizens of the region.

LOWER COLUMBIA FISH RECOVERY BOARD

Plan Timeframe
25 years

Estimated Cost
Under development

Actions Identified to Implement Plan
More than 650

Status
All H interim recovery plan for Washington adopted by NMFS 2/2006

CHRIS DRIVDAHL
MAJOR FACTORS LIMITING RECOVERY

- Degraded floodplain and channel structure
- Stream flows in tributaries altered
- Impaired passage in tributaries
- Excessive sediment and temperatures in tributaries
- Altered channel morphology
- Degraded riparian habitat
- Hatchery impacts
- Harvest impacts
- Predator harassment of spawners

KEY ACTIONS RECOMMENDED TO RECOVER FISH

January 2006 to June 2007

- Update plan to address coho listing
- Develop and initiate research, monitoring, and adaptive management
- Implement regulations and programs to protect existing habitat
- Ensure harvest supports recovery
- Eliminate adverse impacts of hatcheries on wild fish
- Complete regional barrier inventory and prioritization
- Restore key reaches for primary and contributing populations
- Promote public participation in recovery

Long Term

- Establish regional priorities for habitat
- Correct fish passage to high quality habitat
- Rebuild listed populations with hatchery supplementation
- Implement harvest measures that ensure protection of listed fish
- Manage streamflow and water rights in priority reaches
- Monitor progress, effectiveness, and trends
- Promote public participation in recovery

1 USFWS previously published a bull trout recovery plan (2002). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State’s plan into the federal plan.
## Lower Columbia Salmon Recovery Region
### Chum

#### Evolutionary Significant Unit (ESU) and Context Area

**ESU in Washington**

- **Major Population Group (MPG)***

**ESU in Oregon**

---

### Chum Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>960</td>
<td>6,000</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>&lt;150</td>
<td>1,100</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>&lt;150</td>
<td>1,100</td>
</tr>
<tr>
<td>Cowitz</td>
<td>&lt;150</td>
<td>600</td>
</tr>
<tr>
<td>Kalama</td>
<td>&lt;150</td>
<td>150</td>
</tr>
<tr>
<td>Lewis</td>
<td>&lt;150</td>
<td>1,100</td>
</tr>
<tr>
<td>Salmon</td>
<td>&lt;150</td>
<td>75</td>
</tr>
<tr>
<td>Washougal</td>
<td>&lt;150</td>
<td>5,200</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>542</td>
<td>2,800</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>&lt;100</td>
<td>600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>&lt;2,650</td>
<td>18,725</td>
</tr>
</tbody>
</table>

#### Total Spawner Abundance Goal

18,725

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

#### Total Spawner Abundance Present

<2,650 (14.5% of Goal)

This is expressed as an average over a specified period of time.

---

### Chum Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>2.3</td>
<td>6.4</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>1.9</td>
<td>2.7</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>1.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Cowitz</td>
<td>1.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Kalama</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Lewis</td>
<td>2.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Salmon</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Washougal</td>
<td>1.5</td>
<td>9.6</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>2.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>&lt;1.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>

#### Productivity:

Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Chum
Lower Columbia Salmon Recovery Region

Lower Columbia River Chum
- ESU in Washington
- Major Population Group (MPG)
- Population
- Primary Population
- Contributing Population
- Priority Habitat

Cascade MPG Key Actions
- Create/restore off-channel and side-channel habitat in middle Lower Cowlitz River
- Restore floodplain in mainstem Lower Cowlitz
- Restore hill slopes of Toutle, Coweeman, Kalama, lower NF Lewis, EF Lewis, and Washougal Rivers
- Restore riparian area in Toutle, Kalama, and EF Lewis Rivers
- Enhance instream habitat in Toutle and Coweeman Rivers
- Restore floodplain forest along lower mainstem Coweeman River
- Remove abandoned pipeline on Kalama River
- Remove levees on mainstem EF Lewis River

Gorge MPG Key Actions
- Restore hill slopes in Gorge and Wind River
- Restore stream channel, riparian areas, and floodplain for Hamilton Creek
- Restore riparian conditions and stream temperature in Wind River
- Restore fish passage in Wind River

Coast MPG Key Actions
- Restore channel, riparian area, floodplain, channel migration zone and off-channel habitat in mainstream Grays River and valley bottom tributaries
- Restore hill slopes of Elochoman River and Skamokawa, Mill, Abernathy and Germany Creeks
- Restore Elochoman River floodplain and riparian area
- Restore floodplain, riparian, instream, and off-channel habitat in Abernathy and Germany Creeks

Live 3-5 years; utilize lower reaches, slow-moving water, side channels of mainstem or tributaries; spawn mid fall to early spring; spend little time in freshwater after emerging from redds, but up to 4 months in estuaries
Steelhead Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>150</td>
<td>600</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>150</td>
<td>400</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>150</td>
<td>600</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Upper Cowlitz</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Cispus</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Tilton</td>
<td>0</td>
<td>150</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>453</td>
<td>1,600</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>176</td>
<td>700</td>
</tr>
<tr>
<td>Coweeman</td>
<td>228</td>
<td>800</td>
</tr>
<tr>
<td>Kalama</td>
<td>541</td>
<td>650</td>
</tr>
<tr>
<td>Kalama (Summer)</td>
<td>291</td>
<td>700</td>
</tr>
<tr>
<td>NF Lewis</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>NF Lewis (Summer)</td>
<td>Unknown</td>
<td>75</td>
</tr>
<tr>
<td>EF Lewis</td>
<td>77</td>
<td>600</td>
</tr>
<tr>
<td>EF Lewis (Summer)</td>
<td>463</td>
<td>200</td>
</tr>
<tr>
<td>Salmon</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Washougal</td>
<td>421</td>
<td>500</td>
</tr>
<tr>
<td>Washougal (Summer)</td>
<td>136</td>
<td>700</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>Unknown</td>
<td>200</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>Unknown</td>
<td>50</td>
</tr>
<tr>
<td>Upper Gorge (Summer)</td>
<td>391</td>
<td>1,600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,627</td>
<td>11,625</td>
</tr>
</tbody>
</table>

Total Spawner Abundance Goal: 11,625

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

Total Spawner Abundance Present: 3,627 (31%)

This is expressed as an average over a specified period of time.

Steelhead Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>3.6</td>
<td>4.5</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>3.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>4.1</td>
<td>5.2</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Upper Cowlitz</td>
<td>&lt;1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Cispus</td>
<td>&lt;1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Tilton</td>
<td>&lt;1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>2.9</td>
<td>8.5</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>2.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Coweeman</td>
<td>2.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Kalama</td>
<td>3.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Kalama (Summer)</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td>NF Lewis (Winter)</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>NF Lewis (Summer)</td>
<td>Not Determined (ND)</td>
<td>ND</td>
</tr>
<tr>
<td>EF Lewis</td>
<td>2.1</td>
<td>2.7</td>
</tr>
<tr>
<td>EF Lewis (Summer)</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Salmon</td>
<td>1.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Washougal (Winter)</td>
<td>2.2</td>
<td>5.1</td>
</tr>
<tr>
<td>Washougal (Summer)</td>
<td>2.9</td>
<td>17.7</td>
</tr>
<tr>
<td>Lower Gorge (Winter)</td>
<td>11.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Upper Gorge (Winter)</td>
<td>2.6</td>
<td>17.7</td>
</tr>
<tr>
<td>Upper Gorge (Summer)</td>
<td>2.7</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Productivity:

Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Steelhead
Lower Columbia Salmon Recovery Region

Coast MPG Key Actions
- Restore channel, riparian, channel migration zone, and off-channel habitat in mainstem Grays River
- Restore hill slopes in Grays, and Elochoman Rivers, and Skamokawa, Mill, Abernathy, and Germany Creeks.

Cascade MPG Key Actions
- Restore floodplain in Upper Cowlitz and Cispus Rivers
- Restore watershed sediment supply and runoff conditions in Upper Cowlitz, Cispus, and Toutle Rivers.
- Restore riparian areas in Upper Cowlitz, Cispus, Toutle, Kalama, and Washougal Rivers, Upper NF Lewis mainstem tributaries, and Muddy River and tributaries
- Create/restore off-channel and side-channel habitat in middle Lower Cowlitz
- Restore floodplain in mainstem Lower Cowlitz

ELOCHOMAN
- Enhance instream habitat in Toutle and Coweeman Rivers, Upper NF Lewis mainstem tributaries, Muddy River and tributaries
- Restore hill slopes of Coweeman, Kalama, Upper and Lower NF Lewis, EF Lewis and Washougal Rivers
- Stabilize stream banks of upper NF Lewis mainstem tributaries
- Correct tributary passage barriers in Washougal River

Gorge MPG Key Actions
- Restore hill slopes of Gorge and Wind River
- Restore stream channel, riparian areas, and floodplain for Hamilton Creek
- Restore riparian conditions and stream temperatures in Wind River
- Restore fish passage at barriers in Wind River

Lower Columbia Steelhead
- Live 4-7+ years; typically spawn mid winter to late spring in rivers and tributaries in upper watersheds; spend 1-3 years in freshwater river and tributary main channels.
- ESU in Washington
- Major Population Group (MPG)
- Population
- Primary Population
- Contributing Population
- Priority Habitat
- Not in ESU, but in Plan

DATA SOURCE: NOAA FISHERIES AND LOWER COLUMBIA FISH RECOVERY BOARD
STATEWIDE STRATEGY TO RECOVER SALMON
27
## Chinook Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>73</td>
<td>1,400</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>140</td>
<td>1,400</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>250</td>
<td>1,100</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>602</td>
<td>2,300</td>
</tr>
<tr>
<td>Upper Cowlitz (Fall)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Upper Cowlitz (Spring)</td>
<td>365</td>
<td>5,400</td>
</tr>
<tr>
<td>Cispus</td>
<td>150</td>
<td>1,800</td>
</tr>
<tr>
<td>Tilton</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>150</td>
<td>800</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Coweeman</td>
<td>425</td>
<td>3,600</td>
</tr>
<tr>
<td>Kalama (Fall)</td>
<td>1,192</td>
<td>1,300</td>
</tr>
<tr>
<td>Kalama (Spring)</td>
<td>105</td>
<td>1,400</td>
</tr>
<tr>
<td>NF Lewis (Late Fall)</td>
<td>6,493</td>
<td>11,600</td>
</tr>
<tr>
<td>NF Lewis (Spring)</td>
<td>300</td>
<td>2,200</td>
</tr>
<tr>
<td>Lewis/Salmon</td>
<td>235</td>
<td>2,900</td>
</tr>
<tr>
<td>Washougal</td>
<td>1,225</td>
<td>5,800</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>Unknown</td>
<td>700</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>138</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>12,993</td>
<td>44,950</td>
</tr>
</tbody>
</table>

### Total Spawner Abundance
- **Goal**: 44,950
- This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

### Total Spawner Abundance Present
- **Present**: 12,993 (29% of Goal)
- This is expressed as an average over a specified period of time.

## Chinook Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Upper Cowlitz (Fall)</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Upper Cowlitz (Spring)</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Cispus</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Tilton</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Coweeman</td>
<td>1.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Kalama (Fall)</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Kalama (Spring)</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>NF Lewis (Late Fall)</td>
<td>2.6</td>
<td>11.4</td>
</tr>
<tr>
<td>NF Lewis (Spring)</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Lewis/Salmon</td>
<td>1.5</td>
<td>5.9</td>
</tr>
<tr>
<td>Washougal</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>Unknown</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

### Productivity
- **Population growth rate.**
- This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Chinook
Lower Columbia Salmon Recovery Region

Coast MPG Key Actions
- Restore channel, riparian, floodplain, channel migration zone, and off-channel habitat in mainstem Grays River, Abernathy and Germany Creeks
- Restore Elochoman River floodplain and riparian areas

Cascade MPG Key Actions
- Restore floodplain of Upper Cowlitz and Cispus Rivers
- Restore watershed sediment supply and runoff conditions in Upper Cowlitz and Cispus Rivers
- Restore riparian areas in Upper Cowlitz, Cispus, Toutle, Kalama, EF Lewis River (and remove bank riprap), and Washougal Rivers, Upper NF Lewis mainstem tributaries, and Muddy River and tributaries
- Create/restore off-channel and side-channel habitat in middle Lower Cowlitz River
- Restore floodplain of mainstem Lower Cowlitz.

Gorge MPG Key Actions
- Restore hill slopes of Gorge tributaries.
- Restore stream channel, riparian areas, and floodplain for Hamilton Creek.

Lower Columbia River Chinook
- ESU in Washington
- Major Population Group (MPG)
- Population
- Primary Population
- Contributing Population
- Priority Habitat
- Not in Plan, but in MPG and ESU

Lower Yellow Jacket Creek

State Boundary

DATA SOURCE: NOAA FISHERIES AND LOWER COLUMBIA FISH RECOVERY BOARD

29 STATEWIDE STRATEGY TO RECOVER SALMON
### Lower Columbia Salmon Recovery Region Coho

**Coho Spawner Abundance**

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Upper Cowlitz</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Cispus</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Tilton</td>
<td>Unknown</td>
<td>150</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Coweeman</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Kalama</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>NF Lewis</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>EF Lewis</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Salmon</td>
<td>Unknown</td>
<td>75</td>
</tr>
<tr>
<td>Washougal</td>
<td>Unknown</td>
<td>300</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>Unknown</td>
<td>600</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Unknown</td>
<td>7,725</td>
</tr>
</tbody>
</table>

**Total Spawner Abundance Goal**

7,725

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

1 BOX = 1%

1 Lower Columbia Fish Recovery Board is working to supplement this information. Coho were listed after the plan was submitted to federal agencies.

### Coho Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grays/Chinook</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Elochoman/Skamokawa</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Mill/Abernathy/Germany</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Lower Cowlitz</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Upper Cowlitz</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Cispus</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Tilton</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>SF Toutle</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>NF Toutle</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Coweeman</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Kalama</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>NF Lewis</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>EF Lewis</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Salmon</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Washougal</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Lower Gorge</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
<tr>
<td>Upper Gorge</td>
<td>Unknown Not</td>
<td>Determined</td>
</tr>
</tbody>
</table>

**Productivity:**

Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Lower Columbia Salmon Recovery Region

Coho
Lower Columbia Salmon

Coast MPG Key Actions
- Restore channel, riparian, channel migration zone, and off-channel habitat in mainstem Grays River
- Restore hill slopes in Grays, and Elochoman Rivers, and Skamokawa, Mill, Abernathy, and Germany Creeks.

Cascade MPG Key Actions
- Restore floodplain in Upper Cowlitz and Cispus Rivers
- Restore watershed sediment supply and runoff conditions in Upper Cowlitz, Cispus, and Toutle Rivers
- Restore riparian areas in Upper Cowlitz, Cispus, Toutle, Kalama, Washougal, and EF Lewis Rivers (and remove bank riprap), and Muddy River and tributaries
- Create/restore off-channel and side-channel habitat in middle Lower Cowlitz River
- Restore floodplain in mainstem Lower Cowlitz

Gorge MPG Key Actions
- Restore hill slopes in Lower Gorge and Wind River
- Restore stream channel, riparian areas, and floodplain for Hamilton and Duncan Creeks
- Restore riparian conditions and stream temperature in Wind River
- Restore fish passage at barriers in Wind River

DATA SOURCE: NOAA Fisheries and Lower Columbia Fish Recovery Board

STATEWIDE STRATEGY TO RECOVER SALMON

Not in Plan, but in MPG and ESU

ESU in Washington
Major Population Group (MPG)
Population
Primary Population
Contributing Population
Priority Habitat
Not in Plan, but in MPG and ESU

Lower Columbia River Coho

Wildhorse Creek Restoration

Lower Columbia FISHERIES AND LOWER COLUMBIA FISH RECOVERY BOARD
Mid-Columbia Salmon Recovery Region Plan

VISION

Yakima Basin communities have restored the Yakima River basin sufficiently to support self-sustaining and harvestable populations of indigenous fish and wildlife while enhancing the existing customs, cultures, and economies in the basin. Decisions that continuously improve the river basin ecosystems are made in an open and cooperative process that respects different points of view and varied statutory responsibilities and benefits current and future generations.

GOAL

Ensure long-term persistence of viable populations of naturally produced steelhead and bull trout across their native range.

Plan Timeframe
10-30 years

Estimated Cost
$160 million

Actions Identified to Implement Plan
153

Status
Habitat portion of plan submitted to NMFS/USFWS 10/2005

YAKIMA SUBBASIN FISH AND WILDLIFE PLANNING BOARD

The Board’s vision that implementing the plan will be inclusive, transparent, collaborative, cooperative, and voluntary, is borne of the conviction that only a process based on these attributes can be successful.
Human Population
431,700

Counties
Benton, Kittitas, Yakima, parts of Chelan and Klickitat

Treaty Tribes
Yakama Nation

Listed Fish
Steelhead and bull trout

Regional Recovery Organization
Yakima Subbasin Fish and Wildlife Planning Board

MAJOR FACTORS LIMITING RECOVERY
- Hydropower system mortality on Columbia River
- Reduced stream flows in tributaries
- Impaired passage in tributaries
- Excessive sediment
- Degraded water quality
- Altered channel morphology
- Degraded riparian habitat

KEY ACTIONS RECOMMENDED TO RECOVER FISH

January 2006 to June 2007
- Improve fish passage
- Restore stream flows
- Restore habitat
- Reintroduce indigenous species
- Assess surface-ground-water connections
- Evaluate rainbow trout-steelhead interactions

Long Term
- Protect areas with high ecological integrity and natural ecosystem processes
- Maintain connectivity throughout range of listed fish
- Restore and maintain suitable stream flows
- Protect and restore water quality
- Monitor effectiveness of actions

1 All H recovery plan integration is underway, including focus on out-of-sub-basin impacts. This process, involving the NMFS, Regional Board, WDFW, and GSRO is expected to be complete no later than June 2006. Roll up of entire ESU (Oregon portions) underway.

2 USFWS previously published a bull trout recovery plan (2006). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State’s strategy and the Board’s plan into the federal plan.
### Steelhead Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satus</td>
<td>454</td>
<td>1,000</td>
</tr>
<tr>
<td>Toppenish</td>
<td>549</td>
<td>1,000</td>
</tr>
<tr>
<td>Naches</td>
<td>412</td>
<td>1,500</td>
</tr>
<tr>
<td>Upper Yakima</td>
<td>83</td>
<td>2,250</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,498</td>
<td>5,750</td>
</tr>
</tbody>
</table>

**Total Spawner Abundance Goal**

5,750 (100%)

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

**Total Spawner Abundance Present**

1,498 (26% of Goal)

This is expressed as an average from 1993 to 2004.

### Steelhead Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satus</td>
<td>1.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Toppenish</td>
<td>.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Naches</td>
<td>.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Upper Yakima</td>
<td>.6</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Productivity**: Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Steelhead
Mid-Columbia Salmon Recovery Region

STEELHEAD
Oncorhynchus mykiss
Live 4-7+ years; typically spend 1-3 years in ocean before returning in late summer/early fall to spawn; most of the Yakima Basin fish spend winter in the Yakima River and spawn in tributaries in late March to mid May.

Yakima MPG Key Actions
- Improve habitat in lower Satus Creek
- Improve floodplain/channel in Satus Creek next to US 97
- Improve grazing management in Satus Creek
- Restore passage to Shands Creek and provide passage and screens on Simcoe Creek
- Expand forest road closures in Satus and Toppenish Creek watersheds
- Improve access upstream from Toppenish Creek agricultural areas
- Reduce diversions from Toppenish and Simcoe Creeks
- Restore rearing habitat in lower Toppenish and Simcoe Creeks and improve rearing habitat in upper Yakima
- Improve flow in lower Naches River
- Protect and restore habitat in lower and upper Naches
- Restore population range in upper Tieton River spawning areas
- Improve juvenile migration past Roza Dam
- Improve understanding of relations of resident anadromous forms in upper Yakima
- Respond to threats from human population increases and development in upper Yakima

Statewide Strategy to Recover Salmon

Yakama Nation Steelhead Kelt Conditioning Project

Data Source: NOAA Fisheries and Yakima Sub-Basin Fish and Wildlife Planning Board Board
Upper Columbia Salmon Recovery Region Plan

**VISION**

Develop and maintain a healthy ecosystem that contributes to the rebuilding of key fish populations by providing abundant, productive, and diverse populations of aquatic species that support the social, cultural, and economic well being of the communities both within and outside the recovery region.

**GOAL**

Ensure long-term persistence of viable populations of naturally produced spring Chinook and steelhead distributed across their native range. Ensure long-term persistence of self-sustaining, complex, interacting groups of bull trout distributed across the native range of the species.

---

If you think you are a stakeholder, then you are.

**Plan Timeframe**
10-30 years

**Estimated Cost**
$95 million

**Actions Identified to Implement Plan**
296 (of which 146 are habitat actions)

**Status**
Habitat portion of plan submitted to NMFS/USFWS 12/2005
Human Population
142,200

Counties
Chelan, Douglas, Okanogan

Treaty and Executive Order Tribes
Colville Confederated Tribes, Yakama Nation

Listed Fish
Steelhead, spring Chinook, and bull trout

Regional Recovery Organization
Upper Columbia Salmon Recovery Board

MAJOR FACTORS LIMITING RECOVERY

- Hydropower system mortality on Columbia River
- Reduced stream flows in tributaries
- Impaired passage in tributaries
- Excessive tributary sediment
- Degraded tributary water quality
- Degraded floodplain and channel morphology
- Degraded riparian habitat
- Harvest

KEY ACTIONS RECOMMENDED TO RECOVER FISH

January 2006 to June 2007

- Protect high integrity areas.
- Restore connectivity.
- Establish, restore, and protect instream flows.
- Protect and restore water quality.
- Protect and restore riparian function.

Long Term

- Integrate habitat actions with hatchery, hydropower, and harvest actions identified in other planning processes.
- Continue short-term habitat actions, modified through adaptive management.
- Monitor effectiveness of all actions, primarily using freshwater productivity as an indicator of success.

1 All H recovery plan integration is underway, including focus on out-of-sub-basin impacts. This process, involving the NMFS, Regional Board, WDFW, and GSRO is expected to be complete no later than June 2006.
2 USFWS previously published a bull trout recovery plan (2002). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State's strategy and the Board's plan into the federal plan.
Steelhead Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okanogan</td>
<td>50</td>
<td>500 (US)</td>
</tr>
<tr>
<td>Methow</td>
<td>200</td>
<td>1,000</td>
</tr>
<tr>
<td>Entiat</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Wenatchee</td>
<td>700</td>
<td>1,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,050</td>
<td>3,000</td>
</tr>
</tbody>
</table>

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible, it is expressed in natural spawner numbers.

Total Spawner Abundance Present
1,050 (35% of Goal)
This is expressed as an average from 1993 to 2004.

Steelhead Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okanogan</td>
<td>.90</td>
<td>1.20</td>
</tr>
<tr>
<td>Methow</td>
<td>.90</td>
<td>1.10</td>
</tr>
<tr>
<td>Entiat</td>
<td>.69</td>
<td>1.20</td>
</tr>
<tr>
<td>Wenatchee</td>
<td>.69</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Productivity: Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Steelhead
Oncorhynchus mykiss

Live 4-7+ years; may spawn more than once; utilize all parts of a river basin; adults return in late summer and early fall, spawn in late spring the following year; juveniles spend 1-3 years in freshwater before migrating to ocean.

Upper Columbia Steelhead

- ESU Boundary
- Major Population Group (MPG)
- In ESU, not in Plan
- Population
- Priority Habitat
- Primary Population
- Contributing Population

Wenatchee-Methow MPG Key Actions
- Protect high integrity areas in upper watersheds
- Restore connectivity for fragmented habitats in middle watersheds
- Restore and protect instream flows in middle and lower watersheds
- Protect and restore water quality in lower watersheds
- Protect and restore riparian function throughout entire watersheds
Chinook Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methow</td>
<td>700</td>
<td>2,000</td>
</tr>
<tr>
<td>Entiat</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Wenatchee</td>
<td>500</td>
<td>2,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,300</td>
<td>4,500</td>
</tr>
</tbody>
</table>

Total Spawner Abundance Goal
4,500 (100%)

Total Spawner Abundance Present
1,300 (29% of Goal)

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

Chinook Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methow</td>
<td>.51</td>
<td>1.2</td>
</tr>
<tr>
<td>Entiat</td>
<td>.76</td>
<td>1.4</td>
</tr>
<tr>
<td>Wenatchee</td>
<td>.74</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Productivity:** Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
Upper Columbia Chinook

Chinook

Oncorhynchus tshawytscha

Live 3-6 years; life histories vary greatly, but spawn mainly in mainstem rivers; adults begin returning in early spring, spawning in late summer; juveniles spend 1 year in freshwater before migrating to ocean.

Wenatchee-Methow

MPG Key Actions

- Protect high integrity areas in upper watersheds
- Restore connectivity for fragmented habitats in middle watersheds
- Restore and protect instream flows in middle and lower watersheds
- Protect and restore water quality in lower watersheds
- Protect and restore riparian function throughout entire watersheds

Wenatchee Methow MPG Key Actions

DATA SOURCE: NOAA FISHERIES AND UPPER COLUMBIA SALMON RECOVERY BOARD

DATA SOURCE: NOAA FISHERIES AND UPPER COLUMBIA SALMON RECOVERY BOARD

Dreyden Fish Enhancement Project

Upper Columbia Chinook

ESU Boundary

Major Population Group (MPG)

Population

Priority Habitat

Primary Population
GOAL

Develop and maintain a healthy ecosystem that contributes to the rebuilding of key fish populations by providing abundant, productive, and diverse populations of aquatic species that support the social, cultural, and economic well-being of the communities both within and outside the recovery region.

Recovery plans are a vital part of the effort to combat the decline of salmon...

SNAKE RIVER SALMON RECOVERY BOARD

Plan Timeframe
15 years

Estimated Cost
$115 million

Actions Identified to Implement Plan
264

Status
Habitat portion of plan submitted to NMFS/USFWS
10/2005
Human Population
213,508

Counties
Walla Walla, Columbia, Garfield, Asotin, and portions of Whitman

Treaty Tribes
Nez Perce and Confederated Tribes of the Umatilla Reservation

Listed Fish
Sockeye, steelhead, Chinook, and bull trout

Regional Recovery Organization
Snake River Salmon Recovery Board

MAJOR FACTORS LIMITING RECOVERY
- Hydropower system mortality on Columbia River
- Reduced summer stream flows
- Over harvest of fish
- Excessive sediment
- Elevated water temperatures
- Altered channel morphology
- Degraded riparian habitat
- Fish passage blockages

KEY ACTIONS RECOMMENDED TO RECOVER FISH

January 2006 to June 2007
- Reduce sediment
- Improve and protect riparian areas
- Improve fish passage
- Properly screen diversions
- Increase stream habitat complexity

Long Term
- Restore and maintain suitable stream flows
- Improve uplands
- Improve channel and floodplain conditions
- Improve riparian functions
- Monitor effectiveness of actions

1 All H recovery plan integration is underway, including focus on out-of-sub-basin impacts. This process, involving the NMFS, Regional Board, WDFW, and GSRO is expected to be complete no later than June 2006. Roll up of entire ESU (Oregon and Idaho portions) underway.
2 Sockeye do not reside in the region and are not addressed in the plan.
3 The ICTRT has not yet developed criteria for Snake River fall Chinook, so they are not yet addressed in the plan.
4 USFWS previously published a bull trout recovery plan (2002). The status of bull trout is currently under review and is expected to be complete by early 2006. At that time, USFWS will work with the Regional Board, WDFW, GSRO to incorporate elements of the State’s strategy and the Board’s plan into the federal plan.
Steelhead Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touchet</td>
<td>310</td>
<td>701</td>
</tr>
<tr>
<td>Walla Walla</td>
<td>905</td>
<td>1,432</td>
</tr>
<tr>
<td>Total</td>
<td>1,215</td>
<td>2,133</td>
</tr>
</tbody>
</table>

Total Spawner Abundance Goal
2,133 (100%)

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

Total Spawner Abundance Present
1,215 (57% of Goal)

1 BOX = 1%

1 Goal established by recovery organization as habitat contribution to recovery. These goals are interim (15 years) and long range goals may exceed them.

Steelhead Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touchet</td>
<td>1.2</td>
<td>1.30</td>
</tr>
<tr>
<td>Walla Walla</td>
<td>1.4</td>
<td>1.45</td>
</tr>
</tbody>
</table>

Productivity: Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.
MID-COLUMBIA

Steelhead
Snake River Salmon Recovery Region

Wall Walla MPG Key Actions

- Irrigation efficiency projects on 2,600 acres
- Lease/purchase 27 CFS annually
- 750 AF storage in Walla Walla
- 60,000 acres upland BMPs
- 3 miles bank stabilization in priority riparian areas
- 29 miles instream habitat modification
- Remove all passage barriers

STEELHEAD
Oncorhynchus mykiss

- Live 4-7+ years; typically spend 1-3 years in ocean before returning in late summer/early fall to spawn; in the Snake River system, steelhead are found in the Walla Walla and Touchet River systems, including Patit Creek + tributaries, Dry and Pine-Dry Creeks.

In ESU, Covered by Mid-Columbia Plan

In ESU, Not in Plan; NMFS Doing Recovery Plan

In ESU, Covered by Mid-Columbia Plan

Priority Habitat

Population

Major Population Group (MPG)

ESU Boundary

WALLA WALLA

TOUCHET

Removal of Kooskooskie Dam on Mill Creek

DATA SOURCE: NOAA FISHERIES AND SNAKE RIVER SALMON RECOVERY BOARD
Snake River Region Chinook

Evolutionarily Significant Unit (ESU) and Context Area

- ESU in Washington
- Major Population Group (MPG)
- ESU in Oregon and Idaho

Chinook Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucannon River</td>
<td>527</td>
<td>907</td>
</tr>
<tr>
<td>Asotin Creek</td>
<td>254</td>
<td>569</td>
</tr>
<tr>
<td>Wenaha River</td>
<td>334</td>
<td>337</td>
</tr>
<tr>
<td>Total</td>
<td>1,115</td>
<td>1,813</td>
</tr>
</tbody>
</table>

1 BOX = 1%

Total Spawner Abundance Goal 1,813 (100%)

Total Spawner Abundance Present 1,115 (61.5% of Goal)

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

1 Goal established by recovery organization as habitat contribution to recovery. These goals are interim (15 years) and long range goals may exceed them.

Chinook Productivity

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucannon River</td>
<td>1.26</td>
<td>1.39</td>
</tr>
<tr>
<td>Asotin Creek</td>
<td>1.27</td>
<td>1.37</td>
</tr>
<tr>
<td>Wenaha River</td>
<td>1.5</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Productivity: Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.

Tucannon River Riparian Habitat Improvement from 1982 to 2004
Chinook
Snake River Salmon Recovery Region

Snake River Chinook
MPG Key Actions
- 13 miles Tucannon River channel improvements
- 20,000 acres Tucannon and Asotin watersheds improved for water quality
- 2,000 acres riparian buffer and improvements in Tucannon and Asotin watersheds

DATA SOURCE: NOAA FISHERIES AND SNAKE RIVER SALMON RECOVERY BOARD
Steelhead Spawner Abundance

<table>
<thead>
<tr>
<th>Population</th>
<th>Present</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucannon River</td>
<td>900</td>
<td>1,348</td>
</tr>
<tr>
<td>Asotin Creek</td>
<td>435</td>
<td>712</td>
</tr>
<tr>
<td>Grande Ronde</td>
<td>1,516</td>
<td>1,681</td>
</tr>
<tr>
<td>Joseph Creek</td>
<td>558</td>
<td>1,658</td>
</tr>
<tr>
<td>Total</td>
<td>3,409</td>
<td>5,399</td>
</tr>
</tbody>
</table>

**Total Spawner Abundance Goal**
5,399 (100%)

This is the number of adults needed on the spawning grounds to achieve recovery. Wherever possible it is expressed in natural spawner numbers.

**Total Spawner Abundance Present**
3,409 (63.14% of Goal)

1 BOX = 1%

<table>
<thead>
<tr>
<th>Population</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucannon River</td>
<td>1.27</td>
<td>1.32</td>
</tr>
<tr>
<td>Asotin Creek</td>
<td>1.20</td>
<td>1.30</td>
</tr>
<tr>
<td>Grande Ronde</td>
<td>1.42</td>
<td>1.43</td>
</tr>
<tr>
<td>Joseph Creek</td>
<td>1.08</td>
<td>1.28</td>
</tr>
</tbody>
</table>

Steelhead Productivity

**Productivity**: Population growth rate. This is how many fish return for each fish that spawns. A population must have productivity greater than 1 to increase over time.

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<tr>
<td>Joseph Creek</td>
<td>1.08</td>
<td>1.28</td>
</tr>
</tbody>
</table>
Steelhead
Snake River Salmon Recovery Region

**Snake River Steelhead MPG Key Actions**
- 13 miles Tucannon River and Asotin Creek channel improvements
- 50,000 acres upland BMPs
- 5,500 acres riparian buffers, 14,200 acres riparian areas fenced and improved
- Irrigation efficiency projects on 300 acres
- Lease/purchase 1.3 CFS annually
- 300 AF storage

**Steelhead**
*Oncorhynchus mykiss*
Live 4-7+ years; may spawn more than once; utilize all parts of a river basin; found in Tucannon and Grande Ronde Rivers, Asotin Creek, and major tributaries

**DATA SOURCE:** NOAA Fisheries and Snake River Salmon Recovery Board

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Snake River Salmon Recovery Region

Curl Lake Fish Barrier

ESU Boundary
Major Population Group (MPG)
Population
Priority Habitat
Primary Population

MILES

0 10 20

STATEWIDE STRATEGY TO RECOVER SALMON
DATA SOURCE: NOAA FISHERIES AND SNAKE RIVER SALMON RECOVERY BOARD
Implementing Recovery Plans

Now that plans are complete or nearly so, regional organizations and others desire to move forward to do what we said we would do in these plans. There is agreement that regional organizations together with lead entities and other interested parties are in position to tackle this enormous undertaking: they bring the right people to the table in a forum that allows healthy discussion about local issues; they have a common goal that they have created; and they know their plan and its relation to other efforts going on in their areas. They know that recovery actions hit the ground at the local watershed scale, but it is ultimately at the ESU or regional scale at which recovery must be measured and coordinated. And, they know that this is new territory, but we need to act in the face of uncertainty and learn from our mistakes and successes as we proceed.
It is ultimately at the ESU or regional scale at which recovery must be measured and coordinated. This is new territory, but we need to act in the face of uncertainty and learn from our mistakes and successes as we proceed.

**Relationship of Regional Structures to Lead Entities, Planning Units, and Others Engaged in Salmon Recovery Within the Region**

The regional groups have stepped forward and said they are committed and ready to continue the work they began years ago. They held meetings with lead entities in their recovery area and discussed roles, responsibilities, and relationships. Generally, lead entities will continue in their legislatively directed roles relative to habitat project development. Actions are underway in the Yakima to bring the lead entity and regional organization together into one body; this will result in four of six regions where the lead entity and regional organization are the same: Hood Canal, Lower Columbia, Yakima, and Snake. In Puget Sound and the Upper Columbia Regions there is acknowledgement that recovery plans will guide project recommendations from lead entities.

**Structure to Implement Plans**

In general, all regions are proposing a model that uses the policy structure that created the recovery plan, a small technical arm to provide continuing advice on scientific matters, and a minimal staff to complete the plan adoption process with NMFS; coordinate implementation of recovery plan actions with implementing partners to ensure their partners’ programs reflect the actions and science embodied in recovery plans; track and report progress; implement, convene, coordinate, and/or facilitate key regional programmatic actions; coordinate development and implementation of funding strategies to support plan implementation; and provide a focal point for information sharing and public outreach. Some regions may contract with local governments, conservation districts, PUDs, and others to assist with these functions. In Puget Sound, the Governor has asked a panel to develop a broad initiative on the overall health of the Sound and recommend how to incorporate and support salmon recovery.

**Funding Recovery Plans**

Funding implementation of all actions in these recovery plans will take more than the state and federal dollars available to the SRFB. Even with all existing sources tapped, it’s likely we will be short of the funding needs that have been identified. These regional organizations are committed to seeking new sources, leveraging existing sources to improve synergy, and better aligning actions to ensure we are doing the most important projects in the highest priority places and in the right sequence.

Funding for regional organization structures to accomplish these tasks is an important consideration for the future. The GSRO will work with the Office of Financial Management, Council of Regions, Lead Entity Advisory Group, and the SRFB to develop a recommended funding strategy supported by those involved in salmon recovery. We intend that process to yield recommendations that will be presented to the Governor, legislature, and the SRFB for deliberation and action in 2007.
Implementing Recovery Plans

Monitoring

**Monitoring Salmon Recovery**

Monitoring is the fulcrum for success in salmon recovery. Information from monitoring will tell us how well salmon are doing, and help us understand whether our actions are having the desired effect, so that adjustments can be made if needed.

NMFS has produced a decision framework that outlines what kinds of things lead to listings under the ESA, and what recovery efforts will need to achieve for de-listing. That framework is consistent with the state Comprehensive Monitoring Strategy and helps organize our approaches to monitoring recovery. Given the diverse situations across Washington, each recovery plan must establish an implementation structure and process that will bring together monitoring information to track and report progress toward recovery goals, objectives, and key milestones, and to make adjustments in direction where needed based on new information. This is called adaptive management. The implementation structure must ensure that the appropriate decisions can be made and that monitoring addresses the most important questions in an efficient manner.

Finally, data associated with recovery monitoring need to be accessible and shared both within and outside each regional planning area to meet the needs of local and statewide reporting.

The Governor’s Forum on Monitoring Salmon Recovery and Watershed Health (Forum) emphasized these monitoring needs in guidance to salmon recovery regions in December 2005. These recommendations are also consistent with the state’s 2002 Comprehensive Monitoring Strategy and federal monitoring guidance.

**Monitoring Needs to Address Key Questions Associated with Each Recovery Plan**

We must monitor:

- Viability of fish populations in each ESU — adults and juveniles, productivity, distribution, and diversity — asking, “Are fish numbers increasing?”
- Reduction in major threats and limiting factors — habitat, harvest, hatcheries, hydropower — asking, “Is habitat improving?”
- Our recovery actions, asking, “Did we do what we said we would do?” “Are recovery actions effective in meeting their local objectives?”

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**Regional Monitoring**

Each of Washington’s regional salmon recovery plans contains adaptive management and monitoring components. Each region is improving and refining these components to address local needs and state and federal monitoring guidance.

Aspects that all regional recovery plans currently emphasize include:

- Adaptive management processes
- Monitoring trends in fish and their viability
- Habitat status and trends monitoring
- Implementation monitoring and reporting

The Forum has helped coordinate and resolve technical and policy issues in support of salmon recovery monitoring and reporting at the regional and statewide scales and produced its first biennial report of activities in January 2006.

The Forum, with its state, tribal, federal, local, and regional recovery partners, brings needed expertise and resources to salmon recovery monitoring. For example:

- The Salmon Recovery Funding Board monitors the effectiveness of categories of habitat projects, determines cause-effect relationships of actions to fish responses in a few intensively monitored watersheds, and funds development of habitat and water quality status and trends information
- The Washington Department of Fish and Wildlife and tribal co-managers monitor numbers and other trends of fish
- The Department of Ecology monitors water quality and quantity
- The Department of Natural Resources and US Forest Service monitor forested lands
- The Salmon and Watersheds Information Management Technical Advisory Committee helps coordinate data management issues for the Forum

The initial phase of the Natural Resources Information Portal provides an approach for statewide access to state agency data.

The Forum is also coordinating an effort by state agencies and OFM to develop recommendations to the Governor and legislature for improving or eliminating monitoring activities related to salmon recovery and watershed health.

A progress report is due in March 2006, with a final report due by September 2006.