

2012 State of Salmon in Watersheds Executive Summary



### 2012 State of Salmon in Watersheds

# **Executive Summary**

Washington State can be proud of its efforts to recover salmon from near extinction. For more than a decade, people in Washington have come together to fix the problems that have decimated the state's once plentiful salmon runs. We've torn down dams, breached levees, rerouted rivers, planted shorelines, and removed barriers to allow rivers to flow freely once again.

These efforts are returning rivers and streams to more natural conditions and reconnecting the many branches of the state's waterways used by salmon.

Washington's actions are beginning to pay off. Salmon are responding and returning to Washington waters in greater numbers in several areas around the state.

Like the iconic salmon swimming against the current to reach their home waters, Washingtonians still face many challenges before salmon and steelhead will be removed from the Endangered Species Act list. In some areas of the state, growth and development still damage more salmon habitat than is being restored. Climate change is bringing new challenges for salmon. Funding to continue recovery efforts is insufficient to address the long list of needed projects.

Fortunately, Washington has a strong foundation to work through these many obstacles. The "Washington Way" is this state's community driven, locally based approach to recover salmon. This unique approach has served as a powerful example of successful salmon recovery implementation on the West Coast. The work not only improves salmon populations, but also restores natural areas in communities and brings salmon dollars home to businesses and workers.

Salmon recovery demands both dedication among people with different interests, and sustained resources. This biennial report tells the story of the progress made to date and the challenges ahead. For the first time, the full report, including interactive maps and data, is available online at www.stateofsalmon.wa.gov.

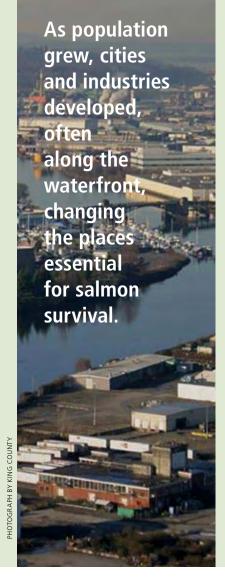


### How Did We Get Here?

As Washington's population grew, cities and industries developed, often along the waterfront, changing the places essential for salmon survival. Dams were built to supply energy to meet the needs of a growing population. Fishing increased and some hatchery practices affected wild salmon. By the 1990s, these changes were so profound and damaging to salmon that the federal government found that many salmon species were in danger of disappearing. It listed these fish as "threatened" or "endangered" under the federal Endangered Species Act, which triggered several planning efforts to protect and restore salmon populations. The federal government, to date, has listed 16 species of salmon, steelhead, and bull trout in Washington as threatened or endangered, determining that salmon across three-quarters of the state are at risk of disappearing forever.

#### **The Washington Way**

In 1998, the Washington State Legislature passed the Salmon Recovery Act and established the state's approach to restoring salmon populations. The Legislature and Governor empowered local watershed groups to work on improving conditions for salmon. Today, local groups all around the state are working with scientists,



farmers, anglers, forest owners, shellfish and commercial fishing business owners, conservationists, fish and wildlife specialists, and representatives from all levels of government—local, state, tribal, and federal—to identify and implement local solutions that will help both people and salmon.

These groups developed plans for restoring salmon populations. The plans were approved by the federal government in seven of Washington's eight salmon recovery regions. Each regional plan is designed to respond to different salmon species, different environmental conditions, different problems limiting salmon survival, and different needs and abilities of the local communities. Each group sets goals to reach, including how many fish are needed to sustain fishing and fish populations.

Today, Washington's foundation for recovery is strong, and the momentum in communities to continue with salmon recovery actions is evident across the state. Washington has developed plans that target money and resources toward the most scientifically valid strategies to recover salmon. Networks of people and organizations are in place to carry out the work, and state agencies and local organizations are tracking progress so that Washington's leaders know what works and what doesn't.

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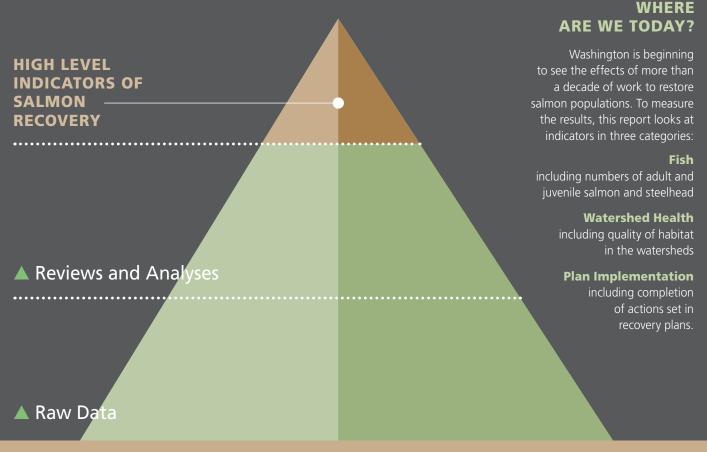
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#### 2012 State of Salmon in Watersheds

# Indicators of Salmon Recovery

This pyramid gives a broad picture of the state's monitoring and adaptive management strategy. High level, "driving" questions form the base. Complex raw data are collected from many sources—state, federal, tribal, and local—at multiple scales—watershed, salmon recovery region, and statewide—to help answer those questions.

After being organized, analyzed, and included in technical or management reports, the information then is compiled into the indicators in this report and used to track progress of salmon recovery. These indicators of salmon recovery were determined by scientists, community leaders, governments, tribes, and others, and are described in the state's comprehensive monitoring strategy documents online at: rco.wa.gov (look in documents, salmon recovery monitoring.)



A DRIVING
QUESTIONS
TO HIGH LEVEL
INDICATORS

#### Fish

Are listed populations abundant and productive?

#### Watershed Health

- Is water clean enough to support wild salmon?
- Are freshwater and estuarine habitats healthy and productive?
- Do rivers and streams have flows that support wild salmon?
- Are hydroelectric facilities operating in a fish friendly manner?

#### **Plan Implementation**

- Are streams accessible to wild salmon?
- Do hatchery practices protect wild salmon?
- Does harvest management protect wild salmon?

## Are Wild Salmon Increasing in Numbers?

The answer is mixed, but generally better than a decade ago. In most areas of the state, fish are increasing or staying the same while in a few areas, fish are slightly decreasing. This chart illustrates some indications of increases and decreases during the past decade in the abundance of fish listed under the Endangered Species Act.

#### **Abundance of Juvenile Fish**

The abundance of juvenile salmon is one of several measures that tells scientists about the health and productivity of freshwater river systems. Knowing how many wild fish return to spawn and how many of their offspring survive to reach saltwater environments allows scientists to separate survival into both freshwater and marine life stages. Juvenile abundance is not collected for every population and a statewide rollup of freshwater productivity is not available. However, in 2012 state agencies advanced the development of a standardized juvenile abundance estimate to allow for comparisons across years, populations, and species in different watersheds. Some juvenile abundance summaries for individual populations can be viewed in the full version of the online report.

### Adult Fish Abundance



#### **INCREASING**

- Hood Canal summer chum
- Snake River fall Chinook

## SLIGHTLY INCREASING

- Middle Columbia River steelhead
- · Lake Ozette sockeye
- Snake River spring and summer Chinook
- Upper Columbia
   River steelhead

#### **NO CHANGE**

- Lower Columbia
  River fall Chinook
- Lower Columbia River spring Chinook
- Lower Columbia River steelhead
- Puget Sound steelhead
- Snake River steelhead



#### SLIGHTLY DECREASING

- Lower Columbia River chum
- Puget Sound Chinook
- Upper Columbia River spring Chinook

## INSUFFICIENT DATA

Lower Columbia River coho

of the state, fish are increasing or staying the same while in a few areas, fish are slightly decreasing.

**Data Sources:** Washington Department of Fish and Wildlife and regional salmon recovery organizations. These non-statistical observations are compiled by the salmon recovery regions from data provided by the Washington Department of Fish and Wildlife and are for adult wild fish abundance only. They do not reflect other biological parameters (productivity, spatial structure, and diversity) considered by the National Oceanic and Atmospheric Administration when conducting status reviews. The "No Change" category reflects fish numbers that are too variable to determine whether the numbers are increasing or decreasing.



EXPLORE THE COMPLETE INTERACTIVE REPORT ONLINE: www.stateofsalmon.wa.gov

## Is Habitat Improving to Support Salmon?

#### **Habitat Status**

Salmon and steelhead need a variety of habitats for spawning, rearing, and transitioning to and from saltwater. A key question is how much habitat for salmon exists and how much is in good shape. The state's ability to track development and other land uses, such as farming and logging, that affect the waterways where salmon and steelhead live has improved in recent years. The Washington Department of Fish and Wildlife has developed tools that provide information on precise locations of different types of land use, improving over previous years when estimates for entire watersheds were based on a few parameters.

The rate of land changes due to development in and near cities is similar in eastern and western Washington but outside of the cities, the rate of change due to development is more than eight times higher in western Washington. Generally, development seems to have decreased since 2006. Two factors are in play here: first, the population pressure is higher in Puget Sound than in the rest of Washington, and second, the economic downturn has reduced housing construction and development compared to past decades.

Tracking the rate at which land is developed helps determine whether habitat restoration and protection actions are working, or if more habitat is lost than restored.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE



## Is the Water Clean Enough for Salmon?

#### **Water Quality**

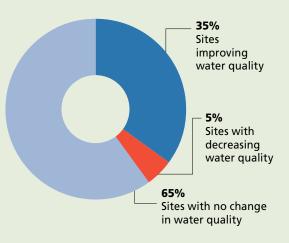
The overall quality of Washington's waters, not considering toxics, has improved slightly since 1992. The water quality at 35 percent of long-term water quality monitoring sites is improving, while only 5 percent saw declines.

#### **Water Quantity**

While the quality might be improving, a common concern is that many rivers and streams are too warm for salmon. This often is attributed to less water in the streams or loss of trees along the shorelines that would otherwise shade and cool the water.

Measurements of the amount of water in streams and rivers show increasing trends or no trends at 57 percent of monitoring stations in western Washington, and at 45 percent of the monitoring stations in eastern Washington. It should be noted that federal and state agencies only monitor water flow at a limited number of rivers and streams. More long-term flow monitoring stations are needed in fish-bearing rivers across the state to give a clearer picture of trends related to fish needs.

#### **WATER QUALITY**



The state's watershed planning efforts are attempting to address these concerns and have helped to better manage—through such things as in-stream flow agreements—the amount of water flowing in streams for fish, irrigation, and recreation. Across the state, these efforts have aided in restoring and protecting some stream flows, implementing water use efficiency and conservation measures, improving public engagement, and creatively increasing water supplies with local partners and stakeholders.

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY



## Are Recovery Plans Being Implemented?

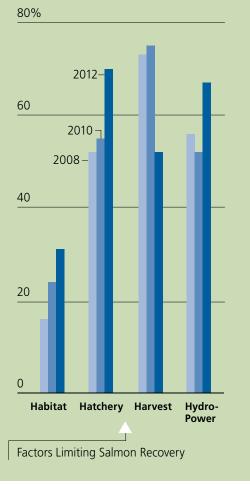
PLAN IMPLEMENTATION

#### Recovery Plan Implementation

Washington's recovery partners continue to make progress implementing actions in recovery plans to restore and protect priority habitat, improve hatcheries, and make dams more fish friendly. Implementation of some recovery plans is further along than others, but all are making good progress.

Data Source: Regional salmon recovery organizations. Percentages are statewide averages based on estimates made by each recovery region of its progress implementing actions in recovery plans. These regional estimates are based on best professional judgment. The estimates describe progress in implementing recovery plan actions, and do not reflect the biological response of fish. The information is generated from the seven recovery regions that are implementing recovery plans. Because hydropower is not an issue in one region, that percentage is based on the remaining six regions. Two other regions do not have 2012 harvest data so the percentage is based on the remaining five regions.

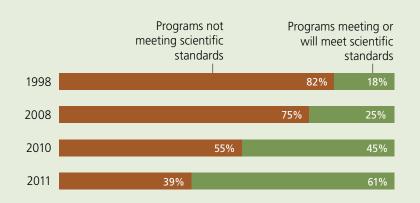
## ESTIMATED PROGRESS IN IMPLEMENTING RECOVERY ACTIONS



## Do Hatchery Practices Protect Wild Salmon?

## HATCHERY PROGRAMS MEETING SCIENTIFIC STANDARDS

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE STATEWIDE HATCHERY PROGRAMS



#### **Hatchery Status**

Congress, in recognition of the role that hatcheries play in meeting harvest and conservation goals for salmon and steelhead, established a hatchery review initiative in 2000. The initiative's independent Hatchery Scientific Review Group made recommendations for improving hatchery programs in Washington. Washington's Department of Fish and Wildlife hatchery programs have shown steady progress toward meeting scientific standards.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE



## Does Harvest Management Protect Wild Fish?

Washington has been managing fishing to ensure that salmon and steelhead species at risk of extinction are not over harvested. In the past ten years, Endangered Species Act limits to the amount of fish that can be caught have been met 90 percent of the time, for all but one population.

For salmon and steelhead populations listed under the federal Endangered Species Act, the Washington Department of Fish and Wildlife, in cooperation with tribal co-managers, federal agencies, and other states, sets rates for harvest and for conservation. These rates are specific to each fish population, and limit the impact on each population. Harvest management strategies have focused on achieving sustainable fishing opportunities while meeting population-specific conservation objectives. Harvest outside of Washington—in Alaska, Canada, southern U.S. marine waters, and southern U.S. freshwater accounts for much of the total harvest of salmon that return to Washington waters. Harvest of steelhead in Washington primarily is directed at hatchery-origin populations.

DATA SOURCE: WASHINGTON DEPARTMENT

Limits to the amount of fish that can be caught have been met 90 percent of the time for most populations.

## How Much Money Has Been Spent?

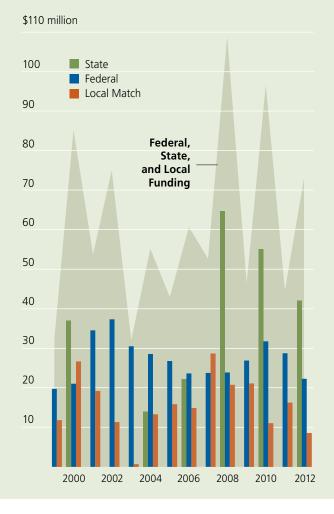
Recovering salmon takes a commitment of sustained resources. The investment provides multiple benefits for fish, people, watersheds, businesses, and the environment.

Since 1999, the Salmon Recovery Funding Board and the Recreation and Conservation Office have distributed \$860 million for salmon recovery from state, federal, and local sources. The annual funding topped \$109 million in 2008 and has been declining since. It should be noted that salmon recovery work also is funded by other entities, such as the Bonneville Power Administration, and those dollars are not reflected here.

The majority of the funding through the Salmon Recovery Funding Board has been for restoration projects to repair damaged habitat, followed by projects to acquire more pristine areas important for salmon. Other funding has been spent for monitoring, hatchery reform, and planning.

DATA SOURCE: WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE

## SALMON RECOVERY FUNDING





## Are Streams Accessible to Wild Salmon?

Recovery partners have made the greatest progress in fixing barriers to fish passage. They have made the least amount of progress in the more complex and expensive habitat projects to reconnect floodplains with river channels.

Fish passage barriers, such as inadequate culverts beneath road crossings and deteriorated fish ladders at dams, prevent salmon from reaching spawning habitat. When barriers are removed, salmon quickly return to their historical spawning grounds, which can provide an instant boost to salmon production and population stability into the future.

During the past 13 years, more than 5,000 fish passage barriers have been replaced with fish-friendly culverts and bridges in Washington streams. This work has opened more than 4,800 miles of fish-spawning habitat statewide. While a substantial number of barriers remain to be fixed, strong partnerships among regional recovery organizations and state agencies continues to open an average of 360 miles of habitat a year.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE









### Our Approach to

# Salmon Recovery

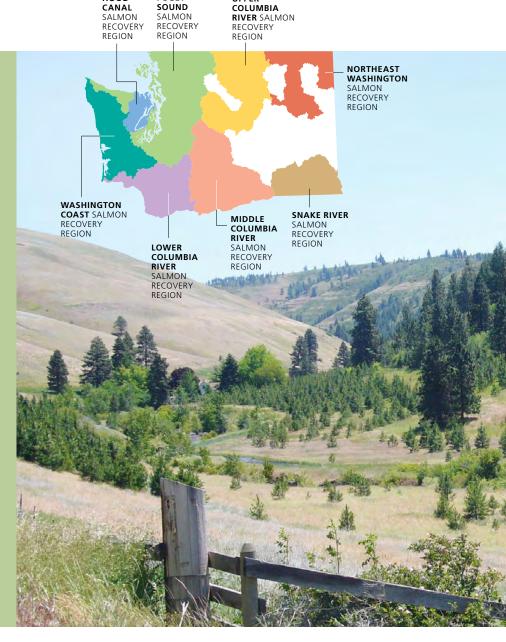
The Salmon Recovery Act set the course for action and decision-making at the local level to tap into the knowledge and creativity of people living and working in the watersheds. This approach is characterized by a strong emphasis on local control, guided by strategic principles from state and federal agencies.

Much of the work to develop and implement recovery plans is in the hands of regional and local agencies and community groups. These groups work together, providing a cost-effective and efficient approach to salmon recovery.

Washington State established eight regions to respond to Endangered Species Act listings. Seven of those have a regional organization that works with local watershed groups and other community groups to reach consensus on fish population goals; to develop strategies for addressing harvest, habitat, and hatchery issues; and to build commitment to achieve results. The regional organizations work with the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service to assure the recovery plans are approved by the

federal government. They also work to find resources for salmon recovery work, build commitments for projects, develop financing plans, and design monitoring and adaptive management activities.

The variety of partnerships and the complexity of issues that regional recovery organizations face vary across the state. They have different species of listed salmon, different geography and weather, different political perspectives, different funding levels, and different organizational approaches to fostering and maintaining their regional and local partnerships.



UPPER

HOOD

**PUGET** 

## Washington Coast Salmon Recovery Region

## **Hood Canal** Salmon Recovery Region



The Washington Coast Salmon Recovery Region has some of the healthiest

and most productive salmon rivers in the country, yet there are continued problems affecting salmon in the region, such as impacts from roads and the invasion of knotweed. Lake Ozette sockeye salmon and bull trout are both listed. Water quality has improved greatly in the Chehalis River, and with the hatchery supplementation program, wild salmon have increased at Lake Ozette. The federally approved Lake Ozette Recovery Plan is being implemented, and the Washington Coast Sustainable Salmon Plan will be completed soon.



This salmon recovery region, surrounded by the Puget Sound Salmon Recovery Region, is a region-

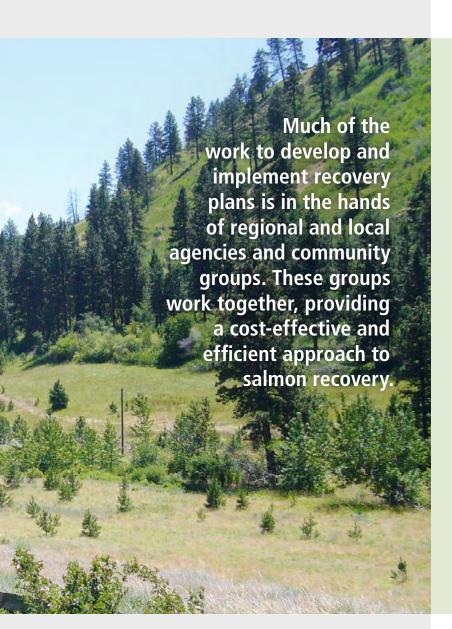
within-a-region. Summer chum salmon are on the rebound in Hood Canal and the Strait of Juan de Fuca, and there is reason to believe they can be recovered. There has been about an eight-fold increase in Hood Canal summer chum returns since the initiation of conservation measures in 1992. This is encouraging; however, habitat conditions are not yet healthy enough to meet long-term recovery goals.

### Northeast Washington Salmon Recovery Region



Recovery groups are removing fish barriers and improving

stream habitat for bull trout, even though a federally adopted recovery plan is not yet in place. A regional salmon recovery organization has not formed in this region.



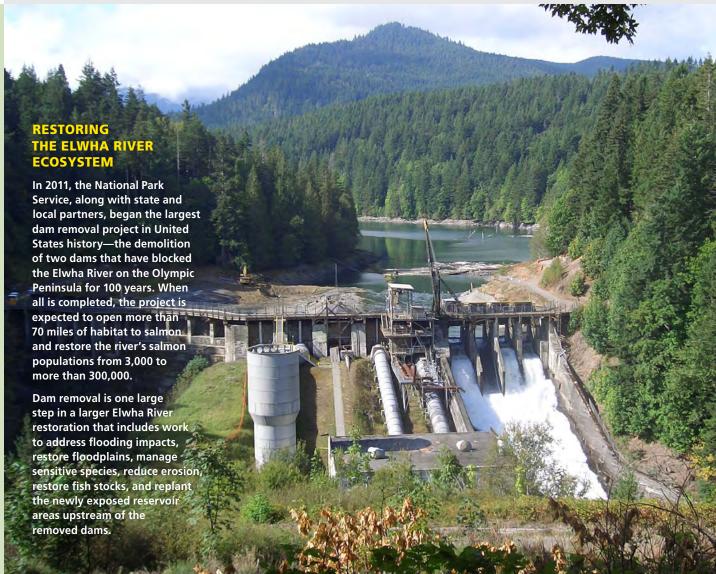
### Puget Sound Salmon Recovery Region

Puget Sound is home to twothirds of the state's people, which presents major

challenges for salmon recovery. The Puget Sound Chinook salmon recovery plan is in place, but Puget Sound Chinook salmon continue to face a moderate risk of extinction. Their overall abundance remains very low; only one of 22 populations has increased in the past 5 years. Listed steelhead do not appear to be improving, and a recovery plan for Puget Sound steelhead is being developed. In 2007, the Puget Sound Partnership became the state agency responsible for recovery of salmon and restoration of the Puget Sound ecosystem. In 2012, the partnership completed an updated strategic plan for the restoration and protection of Puget Sound. One of the state's most noteworthy projects occurred in this region—removal of the Elwha and Glines Canyon dams on the Elwha River. Removal of the dams will open more than 70 miles of habitat to salmon and is expected to restore the river's salmon populations from 3,000 to more than 300,000.

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## Lower Columbia River Salmon Recovery Region

## Middle Columbia River Salmon Recovery Region

## Upper Columbia River Salmon Recovery Region



The Lower Columbia Salmon Recovery Region is home to five listed species: Chinook,

chum, and coho salmon, steelhead, and bull trout. All together, these species are comprised of 74 distinct populations, more than any other salmon recovery region in the state. Almost every population is estimated to be at high to very high risk of extinction. Recovery plans are being implemented for all of the listed species. Although the abundance of listed species appears to be unchanged or on the rise in most cases, a lack of data limits complete understanding of the status of wild fish in some areas of the region.

One of the major accomplishments in this region is removal of Condit Dam, which is about 3 miles upstream from the confluence of the White Salmon and Columbia Rivers. PacifiCorp, owner of the Condit Dam, worked with the National Oceanic and Atmospheric Administration, the Yakama Nation, and many other partners to remove the dam and open 33 miles of new spawning and rearing grounds for steelhead and 14 miles for salmon.



Steelhead are approaching recovery targets set under the Endangered

Species Act in this region, Chinook runs have improved, and once-extirpated coho and sockeye salmon are again returning. Implementation of the recovery plan for listed steelhead is underway, and a local action plan has been developed for listed bull trout in the Yakima River Basin. Although the overall outlook is promising, significant challenges remain. Some bull trout populations are on the verge of disappearing, and continuing improvement for other species will require ongoing efforts to protect and enhance habitat. While fish passage is being restored in many tributaries, significant investments are needed to improve main stem conditions where passage is still affected, and provide full access to the headwaters. The effort to recover middle Columbia River steelhead is shared with the Snake River Salmon Recovery Region, where the Walla Walla and Touchet Rivers populations of the middle Columbia River steelhead reside.



Listed spring Chinook salmon and steelhead remain below recovery goals in

all populations of the upper Columbia. Increases in steelhead abundance in recent years have been encouraging. Efforts to address limiting factors, particularly low water levels in streams and fish passage barriers, have been moving forward rapidly and appear to be having success. In spite of increases in steelhead abundance, increasing adult spring Chinook abundance remains one of the largest challenges in this region.



There are five salmon recovery regions in the Columbia River Basin. Dams, predation on fish as they pass through the lower Columbia River estuary on their way to and from the ocean, and complex fishing and hatchery activities involving neighboring states are all issues for these regions.









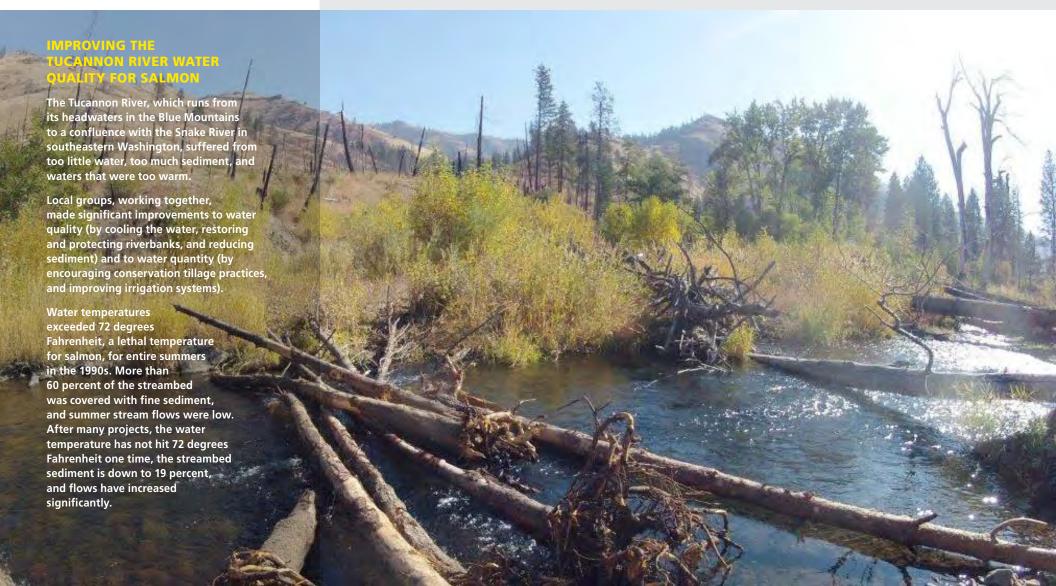
**Snake River** Salmon Recovery Region



Listed spring and summer Chinook salmon are increasing but, along with steelhead, are below their recovery goals. Water temperatures are cooler, there is more water—with less silt and mud—in streams, and fish are responding. Implementation of habitat

recovery actions is moving forward, with good progress in addressing sediment and fish passage issues.





## Threats to Salmon Recovery

There are many challenges ahead. Salmon habitat continues to be lost to development. The state in recent years has seen less snowpack, meaning less water in rivers for fish. Sea levels are rising from melting ice caps and warming ocean waters, resulting in more flooding of estuaries and shorelines. People work hard to restore, protect, and study salmon and their watersheds, but funding is scarce in the current economy.

The results of climate change, development, and loss of funding are the most serious threats for salmon recovery. Efforts are underway to address these and other threats, such as over-fishing, dams blocking migration, and some hatchery practices. Another major concern is the lack of complete data about habitat. Work to recover salmon must be informed by data about both fish and watershed health. The lack of data continues to limit the state's ability to determine long-term trends or to know the extent of the effects restoration has on habitat processes.

#### **Conclusions**

Washington State is at a pivotal point in the history of salmon recovery. Local watershed groups have worked persistently for more than a decade, faced serious challenges, and done very well to build the foundation for long-term salmon recovery. The current threats are not insurmountable. Washington has the human infrastructure in place to continue this work, and is seeing some promising results.

Salmon habitat restoration and protection helps fish, but it also helps businesses, communities, and the environment. Thanks to salmon recovery work, Washington has reduced pollution, restored rivers, replenished salmon populations, and replanted riverbanks. Some wild salmon populations are improving.

The work is not complete. Salmon recovery demands a long-term commitment of resources, a good strategy, thoughtful stewardship, sustained monitoring, and the willingness of communities to work together at many levels to recover this iconic species.



Salmon Recovery is Good for Fish, People, and Watersheds

16.374

JOBS SUPPORTED



A Washington Department of Fish and Wildlife study in 2006

pegged the economic benefits of commercial and recreational fishing in Washington as supporting an estimated 16,374 jobs and \$540 million in personal income.

OF GRANT MONEY **STAYS IN COUNTY** 



Recent Oregon studies showed that every

\$1 million spent on watershed restoration results in 15-33 new or sustained jobs, \$2.2 million to \$2.5 million in total economic activity, and that 80 percent of grant money is spent in the county where the project was located.

\$640

IN ECONOMIC



Using the Oregon formula, salmon

recovery funding has resulted in more than 4.400 new or sustained iobs and more than \$640 million in total economic activity.

More examples can be found in the regional chapters of the online report at stateofsalmon.wa.gov Governor's Salmon Recovery Office Recreation and Conservation Office P.O. Box 40917

Olympia, Washington 98504-0917 Web site: rco.wa.gov/salmon\_recovery

E-mail: gsro@rco.wa.gov Telephone: (360) 902-3000

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#### www.stateofsalmon.wa.gov

If you would like copies of this document in an alternative format, please contact the Governor's Salmon Recovery Office at the address listed above.

Development of this report is not possible without data from many individuals. Especially significant are contributions from the Washington Department of Fish and Wildlife, Washington Department of Ecology, salmon recovery regions, lead entities, tribes, and the Salmon Recovery Funding Board.

COVER PHOTOGRAPH BY WET PLANET RAFTING & KAYAKING ON WHITE SALMON AND KLICKITAT RIVERS. ICONS FROM THE NOUN PROJECT: GEARS ICON DESIGNED BY MARC ANDRE RATH, MONEY ICON DESIGNED BY LUIS PRADO, WORKER ICON DESIGNED BY OLIVIER GUIN. GRAPHIC DESIGN BY LUIS PRADO.



