State of Washington
Governor's
Salmon Recovery
Office

2004 State of Salmon in Watersheds Report

Governor's Salmon Recovery Office
PO Box 43135
Olympia, WA 98504-3135
www.governor.wa.gov/esa

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COVER ARTWORK

Andrea Biddle
8th Grade student from Gig Harbor

RIGHT PAGE ARTWORK

Jordan Spliethof
9th Grade Student from Everett

PROJECT PHOTOS

Courtesy of Salmon Recovery Funding Board

EDITOR

Chris Drivdahl
Governor's Salmon Recovery Office

PRODUCTION TEAM

Bruce Crawford
Interagency Committee for Outdoor Recreation

Steve Leider
Governor's Salmon Recovery Office

Phil Miller
Governor's Salmon Recovery Office

Dave Price
Washington Department of Fish and Wildlife

Carol Smith
Washington Conservation Commission

Luis Prado
Graphic Designer

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Vision: Restore salmon, steelhead, and trout to healthy harvestable

GOAL AND STRATEGIES

GOAL

Wild salmon populations will be productive and diverse

STRATEGY

- Sustain salmon productivity by providing wild spawner escapement, conserving genetic diversity, and meeting basic needs of salmon for spawning, rearing and migration in watersheds and ecosystems. Stewardship of salmon will be the first priority in managing the resource.
- Meet the goal of the Endangered Species Act to return endangered and threatened species to the point where salmon no longer need the statute's protection.

GOAL AND STRATEGIES

We will have coordinated, science-based salmon recovery efforts

- Achieve cost-effective salmon recovery and use government resources efficiently.
- Use the best available science and integrate monitoring and research with planning and implementation.
- Ensure that citizens, salmon recovery partners and state employees have timely access to information, technical assistance and funding they need to be successful.

levels and improve habitats on which fish rely.

GOAL AND STRATEGIES

Our habitat, harvest, hatchery, and hydropower activities will benefit wild salmon

- Freshwater and estuarine habitats are healthy and accessible.
- Rivers and streams have flows to support salmon.
- Water is clean and cool enough for salmon.
- Hatchery practices meet wild salmon recovery needs.
- Harvest management actions protect wild salmon.
- Compliance with resource protection laws is enhanced.

GOAL AND STRATEGIES

Citizens and salmon recovery partners are engaged

- Create partnerships among governments and citizens. Provide leadership, coordination and technical assistance to create agreements on salmon recovery decision-making frameworks and recovery plans. Integrate scientific data with local knowledge and build in local flexibility and control.
- Inform, build support, involve and mobilize citizens to assist in restoration, conservation and enhancement of salmon habitat.

GOAL AND STRATEGIES

We will meet Endangered Species Act and Clean Water Act requirements

- Strengthen land, water, and fishery management policies, programs, and activities to avoid, minimize, and mitigate human impacts on salmon populations and their habitat.
- Seek Endangered Species Act compliance for state guidelines, regulations, and plans; permitting activities; funding of projects/activities; and state lands, facilities, and infrastructure.

Salmon Recovery Milestones 1990-2004

1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996

1990 Ocean and Puget Sound marine coho and chinook fishing restrictions are underway to address coho population declines coast-wide.

Regional Fisheries Enhancement Groups are created by the Legislature.

1991 Federal government lists Snake River sockeye salmon as endangered.

1992 Federal government lists Snake River summer and fall chinook salmon as threatened.

1993 **Wild Stock Restoration Initiative and Wild Salmonid Policy** adopted by Department of Fish and Wildlife.

The Columbia River hydropower **biological opinion (BiOp)** is issued by federal agencies.

1994 The federal government adopts the **Northwest Forest Plan**.

A federal court rejects the 1993 BiOp.

1995 The federal government initiates overhaul of the way the federal power system is to be operated on the Columbia River.

1996 Department of Natural Resources adopts a **Habitat Conservation Plan** for 1.4 million acres of state-owned forestland.

1997 Governor Locke brings together the state agencies that most affect salmon management in a forum called the **Joint Natural Resources Cabinet**.

The federal government lists Snake River steelhead as threatened and Upper Columbia steelhead as endangered.

1998 Governor Locke and Canadian Fisheries and Ocean Minister Anderson reach agreement to reduce fisheries.

The Legislature establishes the **Governor's Salmon Recovery Office**.

The **Independent Science Panel** is appointed by the Governor from recommendations by the American Fisheries Society.

Watershed Planning Units are created by the Legislature.

Lead Entities are also established by the Legislature.

The **Forests and Fish Agreement** is signed.

Lower Columbia Fish Recovery Board is established by the Legislature in Clark, Cowlitz, Lewis, Skamania, and Wahkiakum counties.

Federal government lists Lower Columbia River steelhead, and Upper Columbia, Northeast Washington, Lower Columbia, and Snake River bull trout as threatened.

1999 Locke/Anderson re-negotiate the landmark **Pacific Salmon Treaty**, providing a federal fund from which salmon restoration activities are to be paid.

The **Forests and Fish Agreement** becomes state law.

The **Salmon Recovery Funding Board** is established by the Legislature.

The **Statewide Strategy to Recover Salmon: Extinction is Not an Option** is completed.

Washington, Oregon, four Columbia River Treaty Tribes, and the federal government sign the **Columbia River Accord**.

Federal government lists Puget Sound Chinook, Hood Canal summer chum, Washington Coastal Lake Ozette sockeye, Lower Columbia River Chinook, Lower Columbia River chum, and Middle Columbia River steelhead as threatened. In addition, Upper Columbia spring Chinook is listed as endangered.

ESA listings of Chinook, coho, chum, and steelhead stocks in Washington now cover over 75% of the state.

1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004

2000 Congress creates a federal hatchery reform initiative and establishes an independent **Hatchery Scientific Review Group**.

National Marine Fisheries Service and US Fish and Wildlife Service re-issue Biological Opinions for Federal Columbia River Power System operations.

The first **State Agency Action Plan**, a biennial implementation plan for the Statewide Strategy, is published.

The state's performance management system—**Salmon Recovery Scorecard**—is published.

The first **State of Salmon Report** is published.

2001 The Legislature mandates development, of a **Comprehensive Monitoring Strategy** and action plan for watershed health with a focus on salmon recovery

2002 **Recovery Plan Model** is published.

2002 State of Salmon Report, the 2001-2003 State Agency Action Plan, and the 1999-2001 Action Plan Accomplishments are released.

The Comprehensive Monitoring Strategy is developed for consideration by the Governor and Legislature.

2003 **Regional Salmon Recovery Organizations** receive funding from the Salmon Recovery Funding Board to develop salmon recovery plans for listed salmon. These groups, working closely with local citizens, are the only organizations developing recovery plans for the purposes of the Endangered Species Act.

A federal judge hands back the 2000 Biological Opinion on operation of the Federal Columbia River Power System for salmon and steelhead to NOAA Fisheries. The federal agency was told to resolve several deficiencies, including reliance on federal mitigation actions that have not undergone section 7 consultation under the Endangered Species Act, and reliance on range-wide off-site non-federal mitigation actions that are not reasonably certain to occur. A new Biological Opinion is expected in September.

The Governor's Salmon Recovery Office produces the **2003-2005 State Agency Action Plan,** the third biennial implementation plan for the Statewide Strategy to Recover Salmon.

2004 The Governor signs Executive Order 04-03, creating the **Governor's Forum on Monitoring**. This Order establishes a coordinating body for monitoring salmon recovery and watershed health.

All Washington sub-basins submit their draft **Fish and Wildlife Sub-basin Plans** to the Northwest Power and Conservation Council on time. Collectively, the plans represent the largest compilation of data on fish, wildlife and environmental conditions ever in the Columbia River Basin.

The federal government issues a **Draft Hatchery Policy**, indicating how hatchery fish will be considered in salmon recovery, and revises its Status Reviews for listed fish in Washington. The latter proposes to down list Upper Columbia steelhead from endangered to threatened, and lists Lower Columbia coho for the first time as threatened. All other listings in Washington are proposed to remain as previously listed.

The Federal Energy Regulatory Commission approves a 50-year **Mid-Columbia Habitat Conservation Plan** as part of the relicensing process for three mid-Columbia dams.

The Lower Columbia Fish Recovery Board completes the **first salmon regional recovery plan** in Washington.

The Governor's Salmon Recovery Office publishes the **2004 State of Salmon in Watersheds Report**.

A letter from the Governor

STEFANI ALLISON

Dear Reader:

Washington residents are surrounded by the beauty of mountain ranges, rocky beaches, woodlands, and arid flatlands, making our state a wonderful place to live. The landscape is so spectacular that at times we fail to notice that some of our fellow inhabitants are struggling for survival.

In 1991, there was a telling sign that the balance between humans and nature had shifted. In that year, the federal government listed the first Pacific Northwest wild salmon as near extinction under the Endangered Species Act. By 1999, wild salmon disappeared from about 40 percent of their historic breeding ranges in Washington, Oregon, Idaho, and California.
In Washington, the numbers had dwindled so much that they had become a faint remnant of once-thriving populations, and were listed as threatened or endangered in nearly three-fourths of the state.

Amid growing concerns that Washington State might lose this icon, and that federal listings might limit development, result in lawsuits, or cripple many Washington businesses, we decided to take matters into our own hands and tackle the issue head on.

We began working together — governments, individuals, and businesses — to restore and protect this precious resource. International treaties were renegotiated to protect the most endangered fish and more fairly distribute the catch for fishers in the United States and Canada. By working with our neighbors in Idaho and Oregon, we established conservation goals in shared rivers. Studying our hatcheries helped us determine how to improve them. And examining our rivers with a focus on improving habitat for salmon led to eliminating barriers that keep salmon from making the pilgrimage from river to ocean and back again. We also planted trees to provide cooling shade and worked to rebuild new habitat statewide.

In every area of the state, we've brought people together to talk about the future of our watersheds, backing discussions with funding and resources to turn their vision into reality. Today, every watershed with salmon has at least one citizens' volunteer group working to

> More than ever, the environmental legacy we leave our children and grandchildren depends on the decisions we make today. By understanding our place in sustaining our environment, and by continuing our commitment to improving it, we can and will succeed in restoring our wild salmon populations.

restore and enhance habitats on which the fish depend. These groups donate over 145,000 hours each year and have been involved in over 480 local projects. The Salmon Recovery Funding Board has provided more than $165 million to support these efforts, and the local funding match exceeds $60 million.

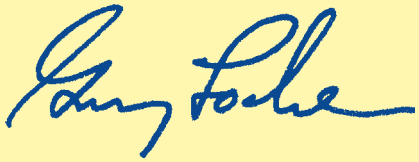
We are making progress and have seen a slowdown in the decline of our salmon populations, thanks to these many years of hard, innovative work, and with the help of improved ocean conditions. By removing blockages that for many years prevented fish from accessing rivers and streams, we've opened more than 1,600 miles of habitat. And we have approved and funded protection and restoration for over 11,000 acres of land that will improve conditions for salmon when they return to their native streams.

It is important that we recognize and celebrate our progress, while continuing our efforts. Increased numbers of salmon returning to our waters indicates success, however, we must remember that many of these are hatchery fish. Wild fish still need places to spawn and young salmon still need good habitat in which to grow.

Building on newfound alliances between businesses and farmers, fishers and photographers, and elected officials and citizens, we must proceed with the work that is helping to ensure recovery of our watersheds and our salmon.

More than ever, the environmental legacy we leave our children and grandchildren depends on the decisions we make today. By understanding our place in sustaining our environment, and by continuing our commitment to improving it, we can and will succeed in restoring our wild salmon populations so that they no longer need protection under the Endangered Species Act.

Sincerely,



GARY LOCKE
WASHINGTON STATE GOVERNOR
DECEMBER 2004

Together, We Will Make a Difference

Salmon in Washington are in trouble. Since the National Marine Fisheries Service (NOAA-Fisheries) listed the first salmon in 1991, thirteen more salmon species have been added and another is proposed for listing by next year.

The Washington Governor's Office and Legislature have responded by creating programs and providing funding to begin the task of recovering these icons of the Pacific Northwest. We are closely watching certain indicators that will likely give us information over time that will help us make good decisions about salmon and their habitats. These indicators are telling us we have reason to be cautiously optimistic in some areas, and that we have much work to do in others.

We know:

- That salmon need sufficient water in rivers and streams for migrating, spawning, and rearing, and that we have returned more than 300,000 acre-feet of water to streams where salmon need it. That's enough water to support the population of Washington for more than four years.
- That salmon need cool, clean water to survive, and that we have completed more than 560 projects to address water quality problems in our watersheds. 57% of our watersheds have a good index of water quality for salmon.
- That salmon need to return to the streams where they were born to spawn, and that since 1999 we have removed more than 1,480 barriers and opened more than 1,600 miles of streams for spawning.
- That our hatcheries should complement needs of wild salmon, and that they have undergone a thorough scientific evaluation of their practices. Today, 64% of our hatchery programs meet the requirements of the Endangered Species Act.
- That our fishing actions should protect wild salmon, and that last year, nearly all of these harvest actions met goals set to comply with the Endangered Species Act.
- And, perhaps most importantly, we know that people in Washington are engaged in the important task of salmon recovery. Last year, they donated more than 150,000 hours of their spare time to serve on task forces, restore salmon habitat, and contribute to many other worthwhile endeavors.

Fluctuations in sea surface temperature affect how well the young and growing salmon survive during the years they are at sea.

The Effect of Ocean Conditions

The North Pacific Ocean is the "grazing" area for our salmon and steelhead. Juveniles migrating from streams where they were born must move through many types of environments, from estuaries, along coasts, to the high seas. Variations in climate affect where, what kind, and how much food is available for them and the predators that feed on these young fish as well. Fluctuations in sea surface temperature affect how well the young and growing salmon survive during the years they are at sea. These fluctuations are known as the Pacific Decadal Oscillation (PDO) and tend to occur every twenty years. When sea surface temperatures are cooler than normal off the coasts of Washington and British Columbia, more salmon survive. Although there can be years in the trend where the temperature may go higher — the so-called "El Niño years"— generally between 1979-1999 warmer surface temperatures prevailed and our fish survival while at sea was low. Since 1999, the sea surface temperature has cooled and Washington salmon and steelhead populations have increased returns to freshwater. With increasing global temperatures, scientists do not know if the 20-year cycle will continue, nor can they say how many years of El Niños will interrupt the cooler ocean temperatures. Thus, it is not possible to predict how many years of good ocean feeding conditions salmon will have before they again face a warmer cycle and depleted food sources during their growing years.

We hope these good news notes will help us overcome some of the more sobering facts:

- That of the 14 fish species listed in Washington, in the last 10 years we only have met our goals for the number of spawners for two of them once, for others never, and for some we don't have information.

Together, we have made a very significant start down the long path to recovery.

- That stream habitat quality for salmon remains poor in half of our watersheds.

- That production — that is, the number of juvenile salmon produced by adults — of our salmon appears to be on the rise, but for all listed species remains below a level that is needed to ensure survival of salmon for the next 100 years.

Detecting verifiable trends in productivity of our watersheds is essential for us to know with reasonable assurance that we are spending our money wisely. Yet, with an animal that is born in our streams then disappears into the ocean for 3 or more years before returning, monitoring success in early stages is challenging. With the introduction of Pacific Coastal Salmon Recovery Funds from the federal government in 1999, we have begun funding salmon recovery projects in earnest. Offspring of Chinook salmon spawning that year would have returned only one or two years ago, thus, it is really very early to know if our efforts are having the desired results. Complicating analysis is the effect of conditions in the ocean on salmon.

Biologists are fond of saying, "It took a hundred years for us to create the problems these fish face, and we're not going to fix them overnight." This is probably true, but Washingtonians care about these Northwest icons and have thrown their hearts and backs into solving the problems. Together, we have made a very significant start down the long path to recovery.

A Readable Dashboard

Measuring progress towards a goal is fundamental in business, in government, in our lives. We are constantly checking a variety of indicators each day, whether it's the Dow Jones averages, the "carb" content in a mid-day snack, or the dashboard on our car. We want to know when we should make changes based on what is before us. But, choosing the right indicators for our objectives is neither simple nor easy.

The multi-habitat, multi-government, multi-needs world of salmon presents an especially vexing problem for those trying to define indicators to measure progress in salmon recovery. This we know: the dials on our dashboard for salmon recovery must be understandable, must be objective, should measure status and trends of things people want to know, and must help tell the stories people want to hear.

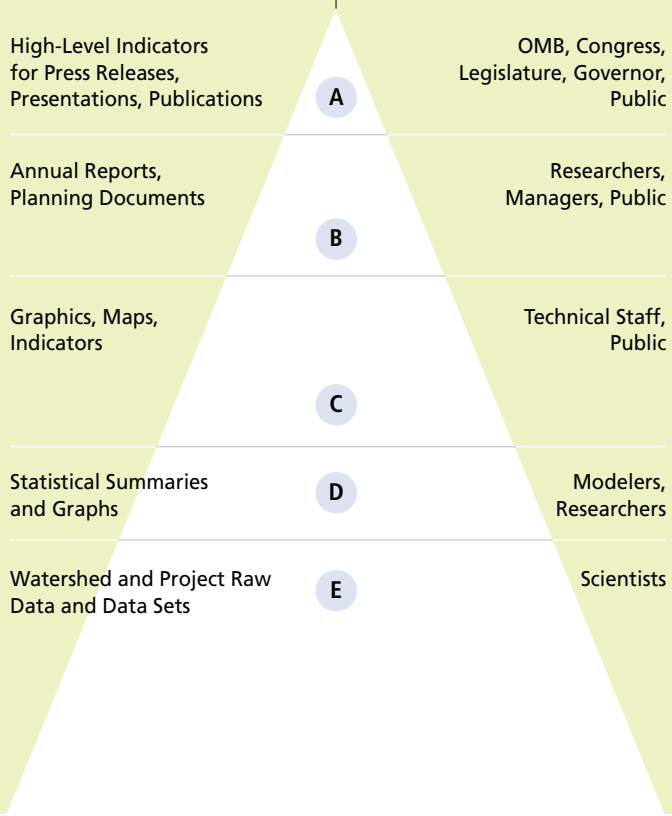
To do these things, in 2000 the Joint Natural Resources Cabinet — a group appointed by Governor Locke that included directors of the natural resource agencies — developed the Salmon Recovery Scorecard after almost a year of work with local, state, federal, and tribal governments. This scorecard, an adaptation of the Harvard-developed "Balanced Scorecard," contained the top 36 biological and administrative measures that state resource managers said should be tracked to ensure we had the information necessary to make decisions about salmon recovery. Unfortunately, there wasn't enough money to implement tracking of all the measures, but in 2002 reports on the 18 highest priority indicators were published.

In 2001 the Legislature asked that we develop a monitoring strategy and action plan would promote coordination of existing activities and would ensure monitoring of the most relevant actions for watershed health and salmon recovery were addressed. In 2002 that Comprehensive Monitoring Strategy and Action Plan were published. These reports used the biological indicators in the original scorecard and recommended additional monitoring to meet more scientific needs. In 2003 the Salmon Recovery Funding Board began to fund some of the highest priority items identified in the Action Plan, including the state's first comprehensive project effectiveness monitoring efforts. This monitoring addresses different types of SRFB-funded projects across the state and will begin to establish a network of watersheds where we can better understand the responses of fish to our salmon recovery actions. The initial results from those projects will be available in 2005.

We have simplified and reduced the number of indicators to a short and easy-to-understand set — the top of the data pyramid. Here, indicators must relate to statewide questions of greatest interest and provide a quick snapshot of where we are and how we are doing.

Monitoring is expensive and hard, and requires extensive cooperation across all agencies and groups to be efficient and effective. Indicating his interest in ensuring this occurs, Governor Locke in 2004 signed an Executive Order on Monitoring Salmon Recovery and Watershed Health.

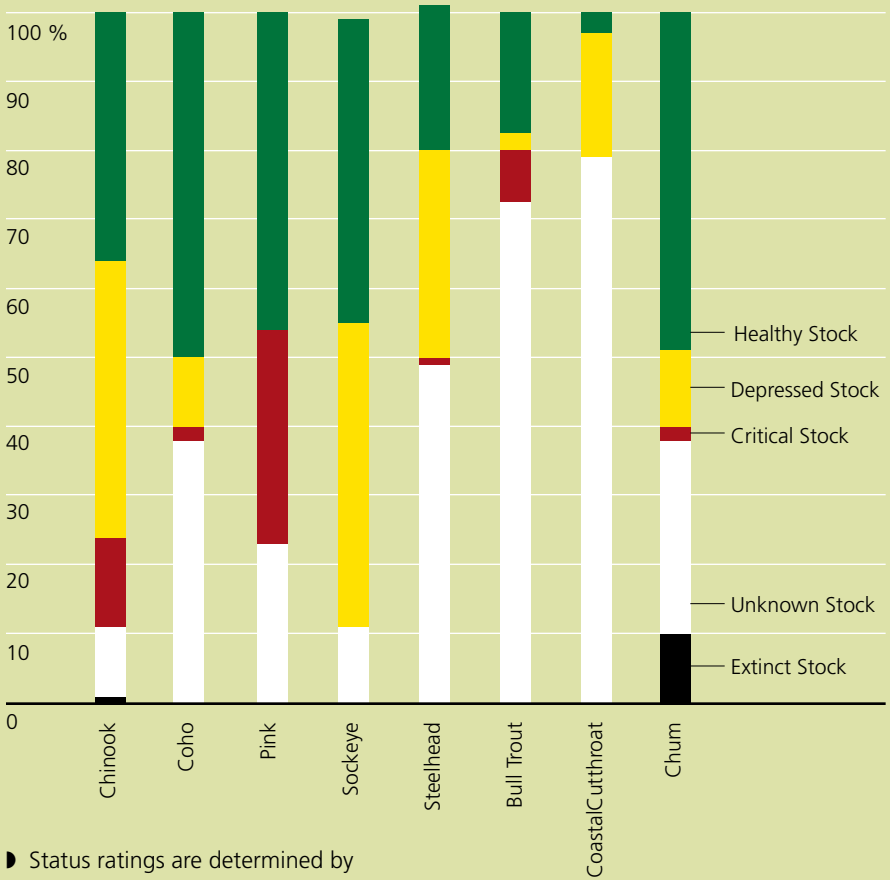
This order created the Governor's Forum on Monitoring and directed state agencies to reach out to others and cooperate in developing, in addition to other tasks, a broad set of measures that will convey results and progress on salmon recovery and watershed health in ways that are easily understood by the public, legislators and Congress.



The Governor's Salmon Recovery Office has continued to collect information from agencies on the original salmon recovery scorecard, pending changes that may stem from the Forum's work. We have simplified and reduced the number of indicators to a short and easy-to-understand set — the top of the data pyramid. Here, indicators must relate to statewide questions of greatest interest and provide a quick snapshot of where we are and how we are doing.

These are the basic "dials" on the dashboard for those "driving" the vehicles of statewide salmon recovery. Wild salmon did not become threatened or endangered overnight; their plight is a result of many decades of decline caused by many factors over more than a century of activities in a growing state. And recovery, too, will take decades. Eventually, as we get better at knowing what to monitor, how, and where, we expect to be able to use more direct indicators. The more detailed underlying information that connects the dials to the lower levels of the pyramid exists in a wide range of technical reports, agency databases and other documents. These are accessible via a data portal at www.swim.wa.gov.

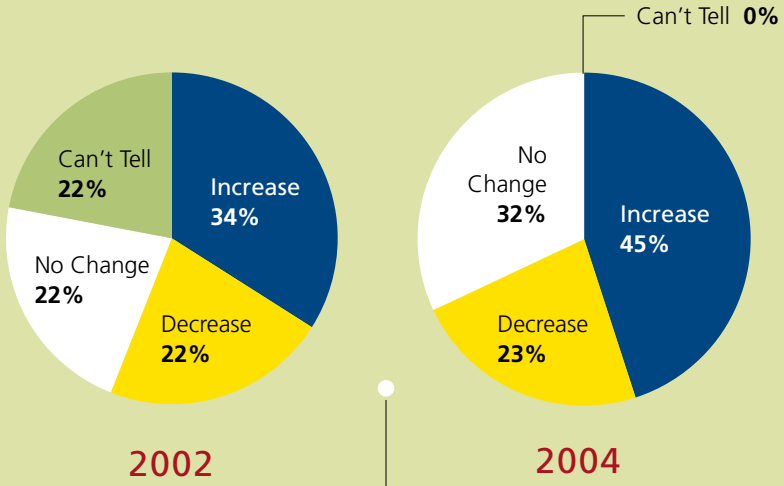
Fish Status Summary



- Status ratings are determined by the Washington Department of Fish and Wildlife and tribes.
- Summary is for 2004.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Trends in Wild Juvenile Salmon Production



- Pie charts represent 32 sampled stocks of all species statewide whose trends were increasing, decreasing, not changing, or unknown.

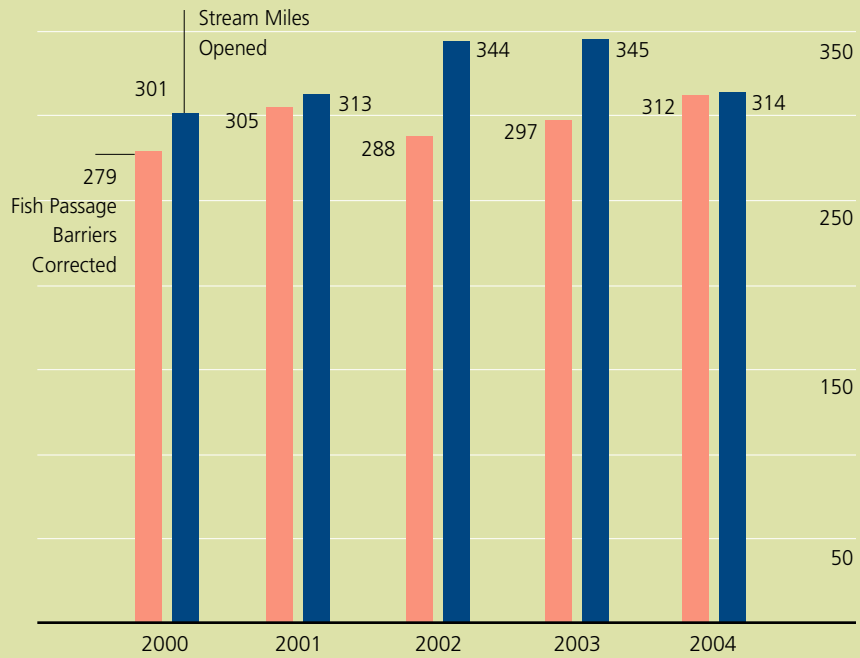
DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Water Quality in Watersheds

- Water quality is measured by **Water Quality Index (WQI)**. This is a number that aggregates water quality data at a monitoring station for temperature, pH, fecal coliform bacteria, dissolved oxygen, nutrients, and sediments over a 12 month period.
- 88 sampling stations are monitored statewide in 62 watersheds.
- A water year runs from October 1 until September 30.
- This graph varies slightly from previous years due to the past inclusion of inappropiate sampling stations. This error has been corrected and all years now reflect accurate information.

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY.

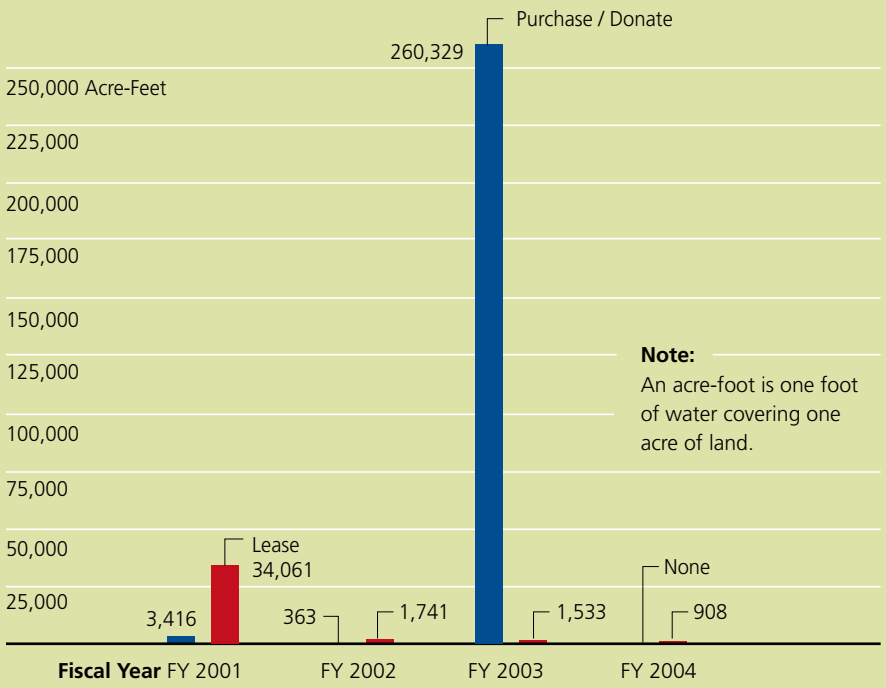
Fish Passage Barriers Corrected and Stream Miles Opened



- Number reflects the estimated number of barriers corrected statewide in a given year. Because of incomplete reporting, these numbers are expected to be lower than actual values.
- Miles reflect the number of miles that are estimated to be opened as a result of barrier correction by year.

DATA SOURCES: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, WASHINGTON DEPARTMENT OF NATURAL RESOURCES, WASHINGTON DEPARTMENT OF TRANSPORTATION, SALMON RECOVERY FUNDING BOARD, FORESTS AND FISH, TRIBES AND LOCAL GOVERNMENTS (US FOREST SERVICE DATA ARE NOT INCLUDED).

Acre-Feet of Water Restored to Streams

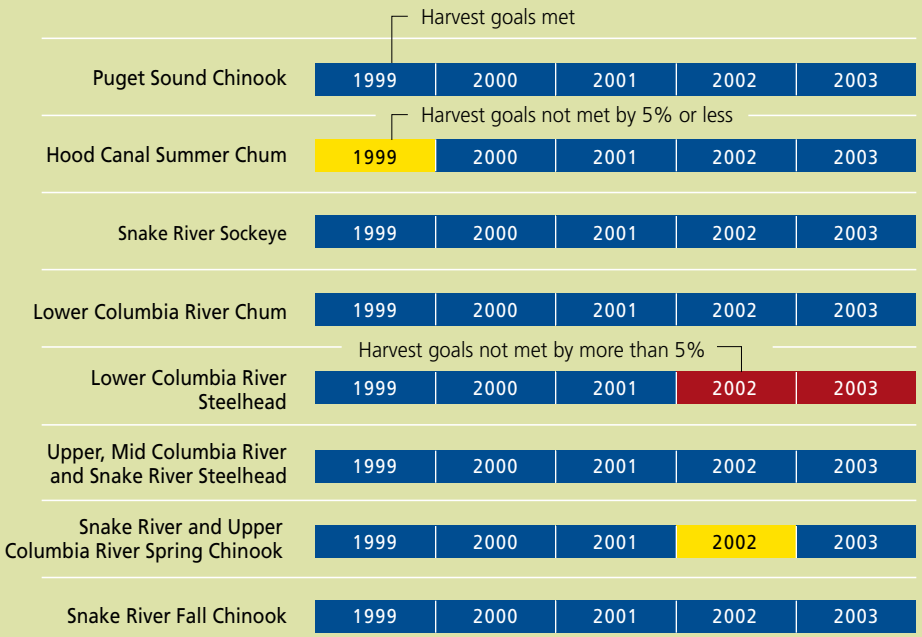


Note: An acre-foot is one foot of water covering one acre of land.

- **Restored water** includes water from purchases, donations, or leases. The focus is on summer low flow periods and instream reaches where water availibility is a limiting factor for fish.
- FY2003 represents a major commitment of federal funds to the Yakima River Enhancement Project.
- 300,000 acre-feet is almost 100,000 billion gallons—enough water to support the population Washington for almost 4 years.

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY.

Endangered Species Act Compliant Harvest Goals

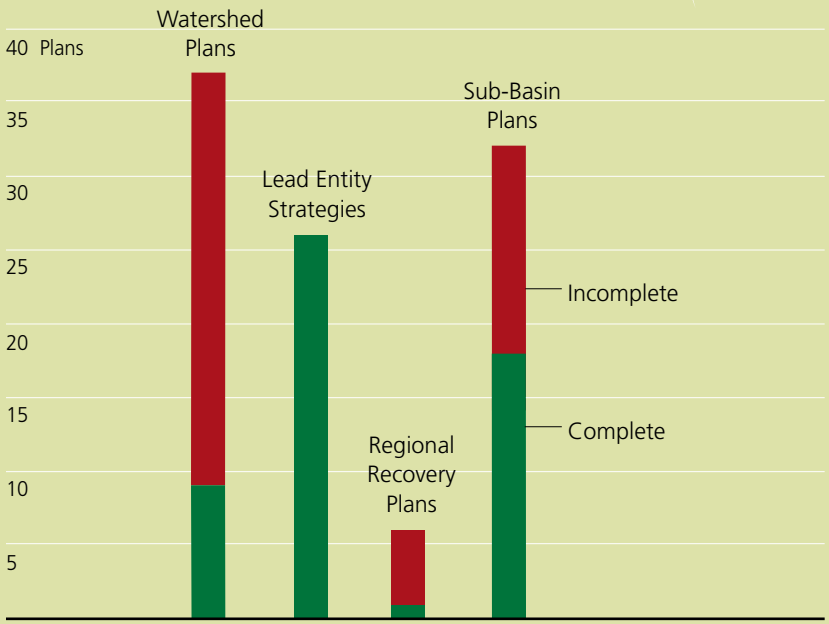


- Data are for non-tribal fisheries.
- NOAA-Fisheries has determined that established harvest protection goals do not negatively impact stocks or the ability to recover them.

- Fisheries met ESA harvest goals approved by NOAA-Fisheries.
- Fisheries exceeded ESA harvest goals approved by NOAA-Fisheries by up to 15%.
- Harvests exceed compliance with NOAA-Fisheries goals by less than 5%.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Salmon Recovery Plan Status



- Watershed plans are developed under the Watershed Planning Act (RCW 90.82). A completed plan is one that has been approved by planning units prior to November 4th.
- Lead Entity Strategies are developed under the Salmon Recovery Act (RCW 77.85). A strategy is a habitat protection and restoration action plan for a watershed(s).
- Regional recovery plans are developed under the Salmon Recovery Act (RCW 77.85) and are due December 2004-June 2005; they include one sub-regional (ESU) plan.
- Sub-basin plans are done under the Northwest Power and Conservation Council. A completed plan is one that has been scheduled for adoption by December 4th by the council.

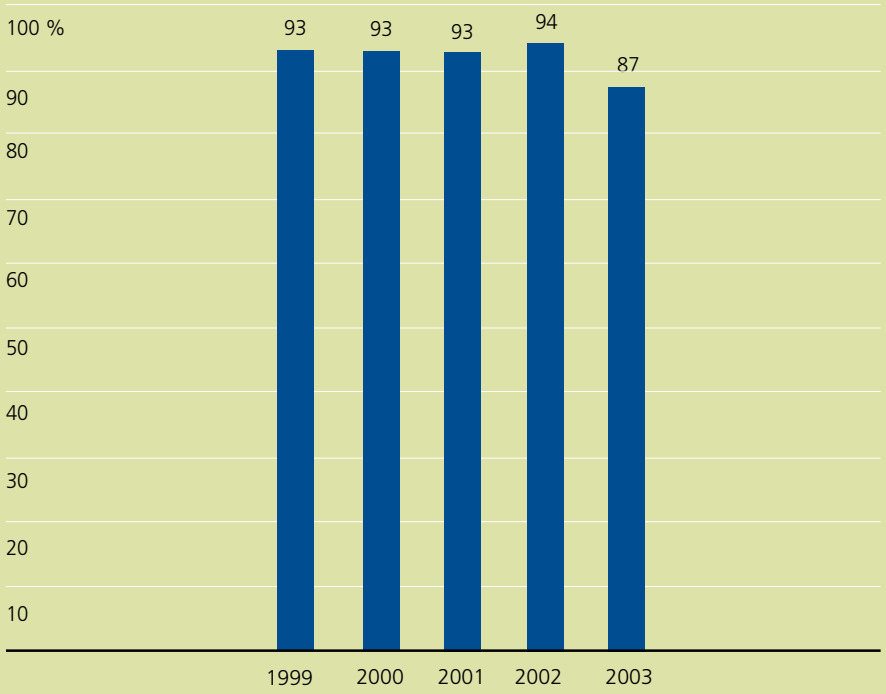
DATA SOURCE: GOVERNOR'S SALMON RECOVERY OFFICE

Acres Acquired for Salmon Restoration (Proposed)

- Funding by Salmon Recovery Funding Board.
- Acres have been approved for purchase but actual numbers may be less.

DATA SOURCE: INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION.

Average Compliance Rate for Salmon and Steelhead Fishers



1999 Compliance based on 2,506 arrests and written warnings during 35,548 contacts.

2000 3,570 arrests and written warnings during 49,603 contacts.

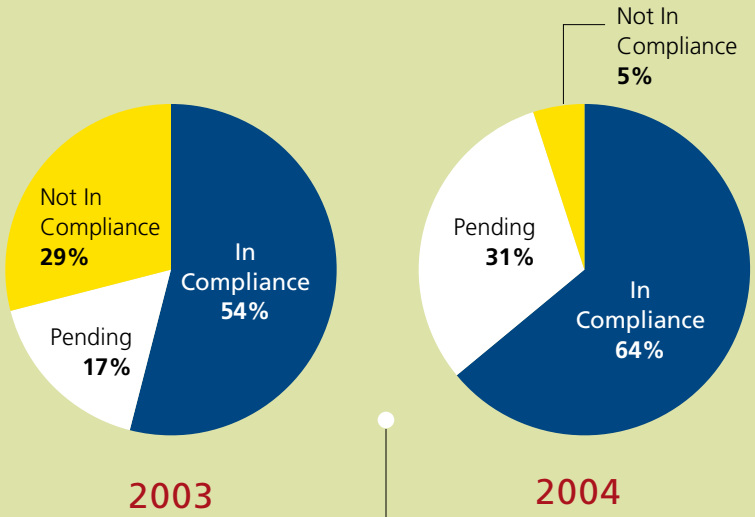
2001 4,168 arrests and written warnings during 57,035 contacts.

2002 2,749 arrests and written warnings during 46,343 contacts.

2003 6,768 violators during 53,189 contacts. **Note:** 2003 data differ from previous years and are reflective of a new activity reporting system for officers and revised definition of "violators."

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Hatchery Management Plans Meeting Endangered Species Act



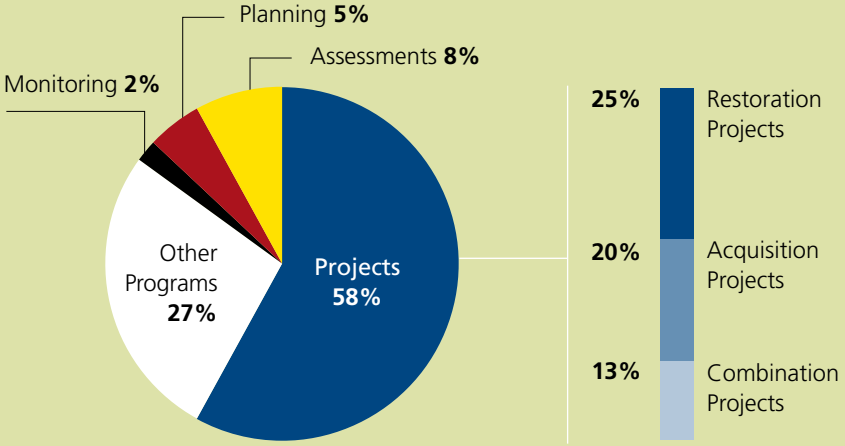
- ESA compliance is measured by Hatchery Genetic Management Plans approved by NOAA-Fisheries and USFWS; a hatchery in compliance with ESA is consistent with wild salmon recovery.
- 418 hatchery programs included.

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Volunteer Hours in Watershed and Salmon Recovery Activities

DATA SOURCES INCLUDE WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, REGIONAL FISHERIES ENHANCEMENT GROUPS, WASHINGTON DEPARTMENT OF ECOLOGY, PLANNING UNITS, REGIONAL PLANNING ORGANIZATIONS, AND CONSERVATION COMMISSION.

Salmon Recovery Funding Board (SRFB) Grants



- Combination projects include both acquisition and restoration work.
- Other programs include those required or recommended by Congress, the Legislature, and NOAA-Fisheries, including Forests and Fish implementation, fish marking, lead entity support and other agency programs.
- FY2000-FY2003
- FY2000-10/11/04 total expenditures $165.1 million not including sponsor matches.
- Sponsor matches exceed $60 million.

DATA SOURCE: INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION.

Regional Views: Mapping Our Progress

Salmon Recovery Planning

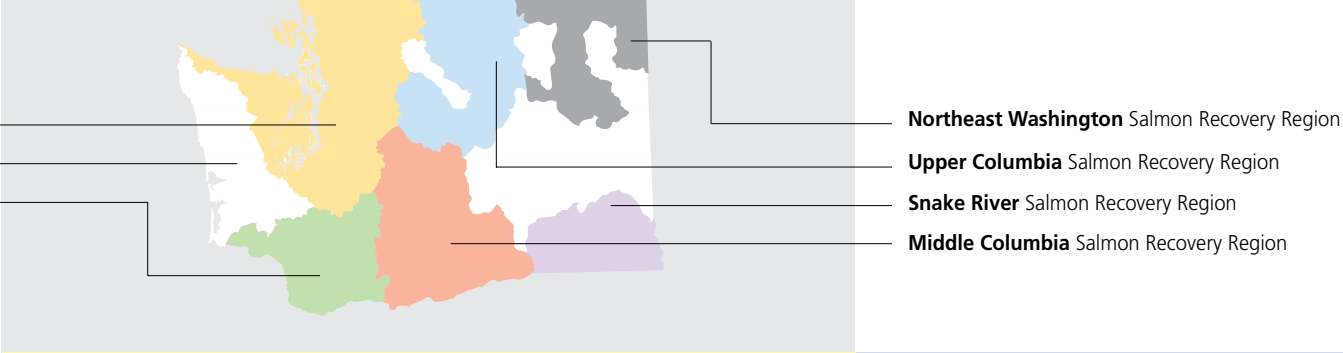
The 1998 Salmon Recovery Act was clear: to save salmon, local and regional activities needed to be integrated into recovery plans. Salmon recovery was defined as healthy sustainable population levels with productive commercial and recreational fisheries. And, the Governor's Salmon Recovery Office was charged with coordinating development of these plans.

Regional recovery organizations are a fundamental element of the Governor's salmon recovery strategy. In consultation with the Washington Department of Fish and Wildlife, NOAA-Fisheries, and U.S. Fish and Wildlife Service, the Governor's Salmon Recovery Office identified seven salmon recovery regions in the state. Salmon recovery region boundaries reflect salmon recovery needs within a specific geographic area, are based on Evolutionarily Significant Units (ESUs), and include federal Endangered Species Act (ESA) listings.

In 1998 the state Legislature also passed, and Governor Locke signed, a statute creating the Lower Columbia Fish Recovery Board, a partnership of Clark, Cowlitz, Lewis, Skamania, and Wahkiakum counties. The Board's mission is to help recover steelhead and other fish listed under the ESA. Thus, they became the first regional organization created for developing salmon recovery plans.

Governor Locke adopted the *1999 Statewide Strategy to Recover Salmon: Extinction is Not an Option* as the state's recovery strategy. It outlined the concept of regional salmon recovery, and with support and encouragement from the Governor's Salmon Recovery Office an additional four regional organizations closely aligned with the geographic regions defined in the *Statewide Strategy* self-initiated. All five regions are actively engaged in developing recovery plans for listed salmonids. They have formed leadership organizations that include local governments, tribal governments, interested organizations, and many others as active participants. The two remaining regions have not formed regional organizations.

+ Local decision-making for salmon recovery creates partnerships among private and public interests, tribes, and all other levels of government.



Regional salmon recovery organizations are preparing recovery plans that gain regional consensus on measurable fish results, integrate actions necessary in harvest, hydropower, habitat, and hatcheries, and gain commitments to achieve results. To do this, they must coordinate many plans and actions across watersheds into one regional plan, and help connect local social, cultural, and economic needs and desires with salmon recovery science and ESA goals. They provide a forum for communities to create a local vision of the goals they are striving to achieve, and promote implementation of the plan's elements by the responsible parties.

Local decision-making for salmon recovery is an effective approach for responding to the ESA. It creates partnerships among private and public interests, tribes, and all other levels of government. It encourages local interest and creativity, and tailors actions to unique needs of each region. Local boards can actively engage the public, make access to the process easier, and promote local economic and cultural values in the products. And, very importantly, regional (i.e., ESU scale) plans will be more readily accepted by NOAA-Fisheries as part of ESA recovery plans. Because of the regional processes that are underway, the work and desires of local people is more likely to be reflected in the formal recovery plans adopted by the federal agencies.

The Search for Simplicity: Finding Indices

In the following sections we have mapped six indicators in each of the five regions writing recovery plans. This information gives us a general picture of conditions for salmon and what actions are being undertaken to address known problems. We have chosen these six indicators because they represent conditions that are directly related to our ability to recover salmon.

The concept of using broad indices to quickly assess progress, conditions, or trends is not new; the Dow Jones Industrial Average is an example of an index that dates back to the turn of the century. What is appealing about indexing is that a large number of sometimes complex factors can be assembled and shortened into a relatively easy to understand picture at a point in time.

Inherently, the simplification that occurs from indexing also can be misinterpreted. For example, where there are few data points in a set, we may draw an inaccurate picture of specific locations within an entire area. As with any generalization, the more information that goes into it the more our conclusions will be supported.

Improving these indicators will be a major focus of the Governor's Forum on Monitoring. Over the coming months the Forum will be examining the data presented here and looking for even better ways to convey progress on salmon recovery accurately and in a manner that is easy to understand.

PUGET SOUND SALMON RECOVERY REGION 28
LOWER COLUMBIA SALMON RECOVERY REGION 36
MID-COLUMBIA SALMON RECOVERY REGION 44
UPPER COLUMBIA SALMON RECOVERY REGION 52
SNAKE RIVER SALMON RECOVERY REGION 60

Index of Water Quality for Salmon and Watersheds

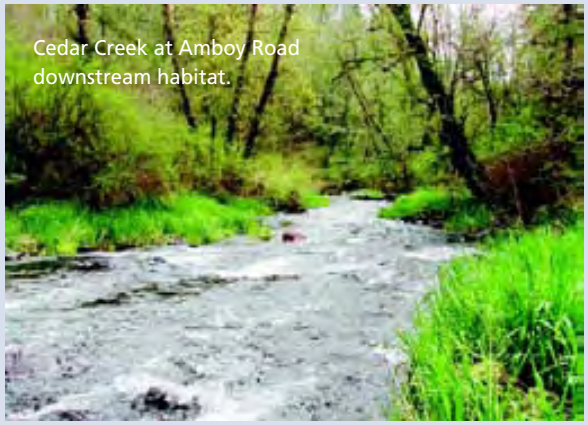
Many Washington waters are not meeting standards for water quality. The state has embarked on development of cleanup plans for polluted water bodies, in compliance with the Clean Water Act. Surface water quality is monitored and reported in the Stream Water Quality Index (WQI). Information on twelve water quality constituents and flow is collected monthly at sixty-two stations across the state. These monitoring stations are generally located in lower reaches of major basins, and thus give only a broad representation of overall water quality of the basin. Some of the monitored components are more important for human health considerations, so for the Salmon and Watersheds Water Quality Index reported on these maps, we have selected the three components most valuable for salmon (dissolved oxygen, pH, and temperature) and one that is primarily for people and watershed health (fecal coliform) from which to construct our index.

On our maps, a good rating means that the average Salmon and Watersheds Water Quality Index for the last five years are of the lowest concern. Waters of moderate concern are rated fair, and waters of highest concern are labeled as poor. Although the index rates overall water quality in a basin, specific locations within the basin may not be meeting one or more of these standards. (See Ecology publication 04-03-033 or visit their website at http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html.)

And what we are doing to address the factors

Our maps show

- Clean up plans (or TMDLs for total maximum daily loads) completed or underway, as well as the remaining number needed in those watersheds as of the 2002 list.


Cedar Creek at Amboy Road downstream habitat.

PUGET SOUND SALMON RECOVERY REGION 29
LOWER COLUMBIA SALMON RECOVERY REGION 37
MID-COLUMBIA SALMON RECOVERY REGION 45
UPPER COLUMBIA SALMON RECOVERY REGION 53
SNAKE RIVER SALMON RECOVERY REGION 61

INDICATOR

Index of Low Flows for Salmon

Fish need water in adequate amounts and at the right times. Natural stream flows vary greatly from year to year, seasonally, and on a daily basis. Fish have adapted over thousands of years to this natural flow regime in their individual watersheds. Natural flow conditions, however, have been affected by human activities. This has resulted in some streams being over-appropriated — that is, permission has been granted to divert or withdraw more water from a river than is actually available — and flows that are well below natural flow levels. The reduction of flows can have a direct impact not only on water quantity, but also on water quality and riparian habitat necessary to support fish. Sustained low flow conditions during juvenile life stages of fish are used to predict the number of adult fish likely to return to spawn, and flow levels affect other life stages as well.

In our maps, a "water-critical basin" is an over-appropriated watershed where more water could be withdrawn from rivers and streams in the watershed, especially in late summer and early fall when flows are naturally low, potentially leaving little water for ESA listed fish species for migration, spawning and rearing.

A "low flow" basin is one experiencing significant pressure for increased water use and rapidly declining flows for fish.

And what we are doing to address the factors

Our maps show

- Where instream flow rules have already been set or watersheds are closed to further water appropriation;
- Where flows have not been set or no or limited closures to further water appropriation exist, but where instream flow rules are planned;
- Watersheds in which water was purchased, leased, or donated to restore instream flows;
- Stream gauges for flow monitoring by Ecology or the US Geological Survey; and,
- Where projects to improve irrigation efficiency have been completed.

PUGET SOUND SALMON RECOVERY REGION 30
LOWER COLUMBIA SALMON RECOVERY REGION 38
MID-COLUMBIA SALMON RECOVERY REGION 46
UPPER COLUMBIA SALMON RECOVERY REGION 54
SNAKE RIVER SALMON RECOVERY REGION 62

Erdman and Culvert Creek Culvert Replacement

Index of Stream Habitat Quality for Salmon

The 1998 Salmon Recovery Act authorized the Washington Conservation Commission to evaluate conditions that limit the ability of habitat to fully sustain populations of salmon. Known as the Limiting Factors Analyses, or LFAs, these technical evaluations were assembled by the Conservation Commission for each Water Resource Inventory Area (WRIA) in consultation with local governments, treaty tribes, and others with appropriate expertise.

Our index provides a single salmon habitat rating for each WRIA that produces salmon or steelhead. This rating is a distillation of numerous ratings in individual LFA reports for floodplain, sedimentation, riparian, and instream conditions (See http://salmon.scc.wa.gov for LFA reports, or www.governor.wa.gov/esa for methodology and access to data).

Clearly, as mentioned previously, a single rating does not allow for the often varying conditions found within each WRIA and between each rated category, but the single rating is useful for a broad, overall perspective on conditions for salmon spawning and rearing at a coarse scale. While federal lands were included in the original LFA reports, we have not rated them here because federal land managers may use different criteria to display habitat quality on federal lands. It is also important to note that significant progress has been made in assessing habitat limiting factors since the LFAs were completed. Many watersheds now have in-depth analyses and these assessments will be available in individual recovery plans planned for publication in June 2005.

And what we are doing to address the factors

Our maps show

- Projects funded by the Salmon Recovery Funding Board, tribes, or the US Forest Service that are intended to improve stream habitat conditions.

Gosnell Creek Culvert and Riparian Restoration

Family Forest Fish Passage Program

The 2003 Legislature created the Family Forest Fish Passage Program to provide funding for small, private forest landowners to correct barriers to fish migration. More than four million acres of forests are small, family owned operations that are often located in highly productive lower elevations. These areas are major keys to improving fish habitat and restoring salmon. The program provides family forest landowners up to 100% of the cost of fixing culverts, dams, and other artificial barriers. Since it began operations in November 2003, the program has received applications for more than 200 projects; twenty-six projects that collectively opened over forty-four miles of high quality rearing and spawning habitat have been funded.

PUGET SOUND SALMON RECOVERY REGION 32
LOWER COLUMBIA SALMON RECOVERY REGION 40
MID-COLUMBIA SALMON RECOVERY REGION 48
UPPER COLUMBIA SALMON RECOVERY REGION 56
SNAKE RIVER SALMON RECOVERY REGION 64

INDICATOR

Barriers to Salmon

Impaired access to streams is one of the more significant factors limiting salmon production in many watersheds. Salmon need access to spawning and rearing habitat, and unimpeded migration to and from the ocean. Unnatural physical barriers interrupt adult and juvenile salmon passage in many streams in the state, which reduces productivity and eliminates some populations. Barriers may also cause poor water quality and unnatural sediment deposition. Unscreened or inadequately screened surface water diversions, whether associated with a physical barrier or not, are a serious source of salmon mortality and injury.

Man-made blockages to salmon can include culverts, dams, tide gates, dikes, bridges, or any blockage that prevents either adults or juveniles from moving within their stream environment. Sometimes the blockage is obvious, such as a culvert that is perched a foot above the stream bed because of erosion.

Other times it may not be readily apparent why fish are having trouble navigating; for example, a culvert may change the flow dynamics of a stream such that fish are unable to navigate as juveniles trying to return to the sea. Or, a poorly constructed screen may create velocities that impinge young fish. For whatever the causes, blockages are significant in the life cycle of fish and we have chosen to map them independent from the index of stream habitat quality.

For our maps, we depict only blockages affecting anadromous fish. We have not shown bull trout blockages because information is scarce.

And what we are doing to address the factors

Our maps show

- Completed projects funded by the Salmon Recovery Funding Board, Washington Department of Transportation, Washington Department of Natural Resources, local governments, or US Forest Service that remove barriers for anadromous fish. The effort to document locations of fish passage barriers repaired since 1999 was just initiated this year (2004), so some projects may not be displayed on these maps. We expect ongoing mapping efforts will continue to reveal projects.

PUGET SOUND SALMON RECOVERY REGION 31, 33
LOWER COLUMBIA SALMON RECOVERY REGION 39, 41
MID-COLUMBIA SALMON RECOVERY REGION 47
UPPER COLUMBIA SALMON RECOVERY REGION 55, 57
SNAKE RIVER SALMON RECOVERY REGION 63, 65

Spawner Abundance: Measuring Our Progress

Spawners are the building blocks for future fish populations. They are one of the most important indicators of our progress toward recovery. Other components important to recovery include productivity, distribution, and diversity.

Spawners have survived high seas, nearshore, and freshwater fisheries, as well as predators and other stresses they may have encountered on their long journey home. Without adequate numbers of successful spawners our streams will be unable to produce juvenile salmon whether habitat conditions improve or not.

It is difficult to get good measurements of spawner abundance, and it is expensive. We do not have the resources to measure all stocks of all species in the state. So we must make the best use of the information we have and bolster it where we can. The amount of information available varies across the state. In some salmon recovery regions we have information for most of the stocks, and in other regions our information is limited. Whether limited or not, this information is the best representation of spawner abundance that we have.

The graphs in this section of the report show spawner abundance trends since 1991 for a composite of the listed fish species for which we have specific data. Also shown on the graphs are draft or interim recovery goals for that same composite of stocks. These recovery goals are those being developed by regional recovery organizations or NOAA-Fisheries. The recovery goals finally adopted for each region will be larger because they will include stocks that are not now monitored but are components of the ESU.

Those stocks having the greatest amount of information tend to be the strongest and largest, where historical commercial and sport fisheries have required detailed information to meet allocation requirements under various federal court rulings.

Smolt trap on Nooksack River.

JEFF CEDERHOLM

PUGET SOUND SALMON RECOVERY REGION 31
LOWER COLUMBIA SALMON RECOVERY REGION 39
UPPER COLUMBIA SALMON RECOVERY REGION 55
SNAKE RIVER SALMON RECOVERY REGION 65

INDICATOR

Index of Juvenile Salmon Freshwater Production

With information on spawners in view, it is important to gauge freshwater productivity, or how well our watersheds function to produce the next generation of salmon. The most direct measure of this is to assess freshwater production. Freshwater production is the number of juveniles produced and migrating from freshwater to saltwater. Functional freshwater habitat is critical to producing the maximum possible number of juvenile salmon from the fish that spawn.

For the first time, included here is a freshwater production index, developed to frame the information in a single assessment of freshwater juvenile production by salmon recovery region. In the past, freshwater production estimates were developed and published in annual reports on a watershed-by-watershed basis.

Just like spawner abundance, there are limits to our ability to assess freshwater production. Both technical and cost constraints exist that preclude having information from all of the stocks in the state. In this report are graphs with information from nineteen juvenile trap sites across the state. They are not necessarily representative of all stocks statewide, but provide some indication about patterns and trends in what we do know. Information from these sites has typically been used to monitor freshwater production from the individual streams, assess the influence of biological and environmental changes on salmon, and for fishery management purposes. (For the full report on spawner abundance and juvenile salmon freshwater production, see http://www.iac.wa.gov/srfb).

Functional freshwater habitat is critical to producing the maximum possible number of juvenile salmon from the fish that spawn.

For the first time, included here is a freshwater production index, developed to frame the information in a single assessment of freshwater juvenile production by salmon recovery region.

Seattle, King County

Puget Sound Salmon Recovery Region Indicators

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, Nooksack, Stillaguamish, Jamestown S'Klallam, Muckleshoot, Nisqually, Port Gamble S'Klallam, Lower Elwha S'Klallam, Puyallup, Samish, Sauk-Suiattle, Skokomish, Squaxin Island, Stillaquamish, Suquamish, Swinomish, Tulalip, Upper Skagit.

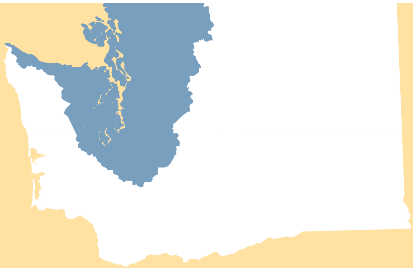
Listed Fish: Chinook (threatened), Hood Canal summer chum (threatened), bull trout (threatened).

Regional Recovery Organization: Puget Sound Shared Strategy (http://www.sharedsalmonstrategy.org/). For Hood Canal summer chum, Hood Canal Coordinating Council (http://www.hccc.cog.wa.us/).

Recovery Planning Status: Currently preparing recovery plans—with drafts due in June 2005—for Puget Sound Chinook and, through the Hood Canal Coordinating Council, for Hood Canal summer chum.

WRIAs / Water Resource Inventory Areas

1. Nooksack
2. San Juan
3. Lower Skagit
4. Upper Skagit
5. Stillaguamish
6. Island
7. Snohomish
8. Cedar / Sammish
9. Green / Duwamish
10. Puyallup / White
11. Nisqually
12. Chambers / Clover
13. Deschutes
14. Kennedy / Goldsborough
15. Kitsap
16. Skokomish / Dosewallips
17. Quilcene / Snow
18. Elwha / Dungeness



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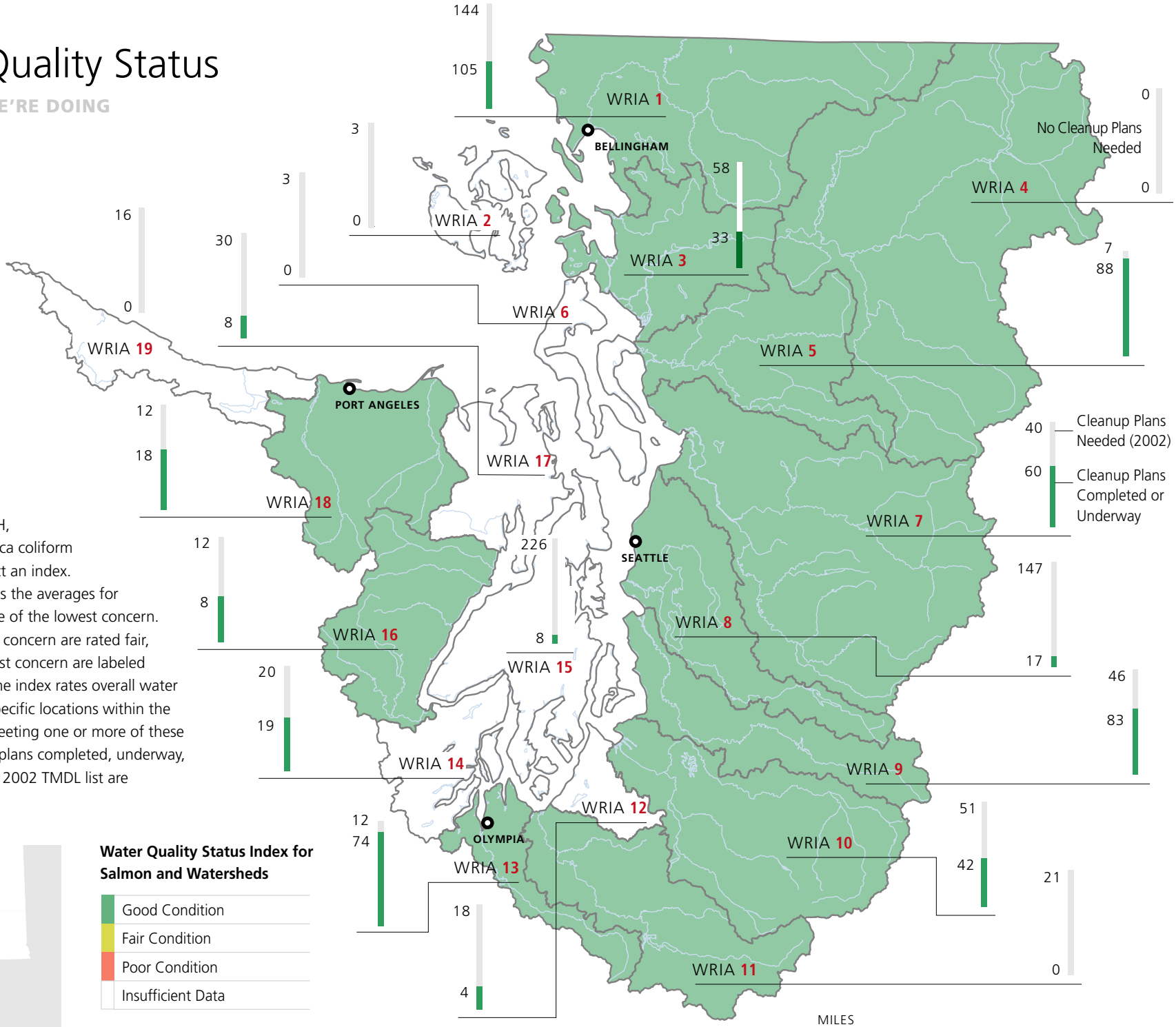
Water Quality Status

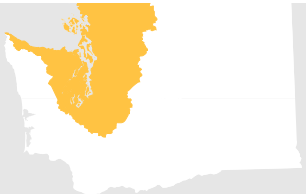
AND WHAT WE'RE DOING



On our map
dissolved oxygen, pH, temperature, and feca coliform are used to construct an index. A good rating means the averages for the last five years are of the lowest concern. Waters of moderate concern are rated fair, and waters of highest concern are labeled as poor. Although the index rates overall water quality in a basin, specific locations within the basin may not be meeting one or more of these standards. Cleanup plans completed, underway, or remaining on the 2002 TMDL list are shown by WRIA.

Water Quality Status Index for Salmon and Watersheds

- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data

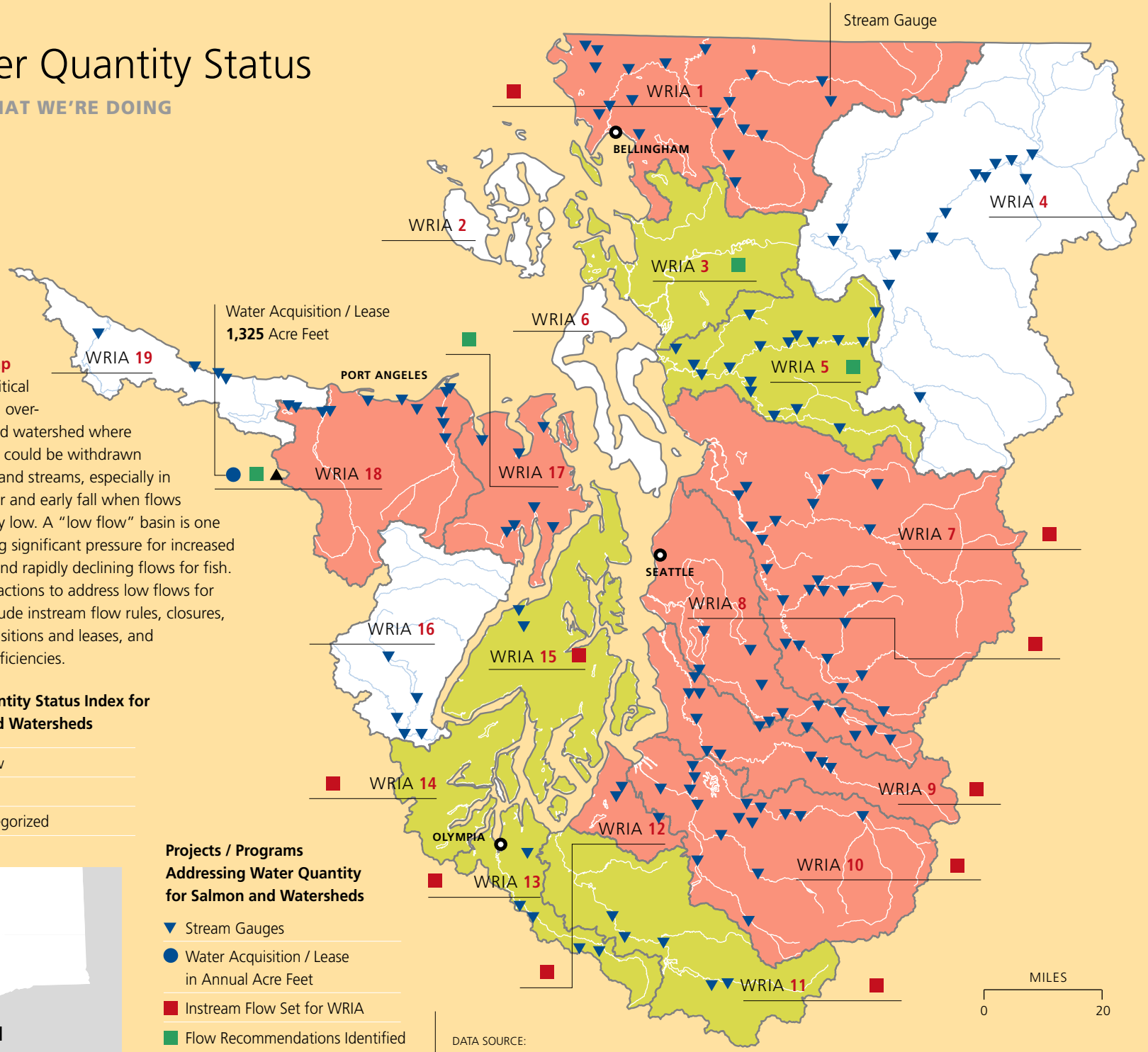


Puget Sound Salmon Recovery Region

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

Water Quantity Status

AND WHAT WE'RE DOING



On our map
a "water-critical basin" is an over-appropriated watershed where more water could be withdrawn from rivers and streams, especially in late summer and early fall when flows are naturally low. A "low flow" basin is one experiencing significant pressure for increased water use and rapidly declining flows for fish. Significant actions to address low flows for salmon include instream flow rules, closures, water acquisitions and leases, and irrigation efficiencies.

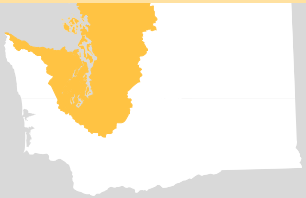
Water Quantity Status Index for Salmon and Watersheds

- Low Flow
- Critical
- Not Categorized

Projects / Programs Addressing Water Quantity for Salmon and Watersheds

- ▼ Stream Gauges
- ● Water Acquisition / Lease in Annual Acre Feet
- ■ Instream Flow Set for WRIA
- ■ Flow Recommendations Identified
- ▲ Irrigation Efficiency Projects

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

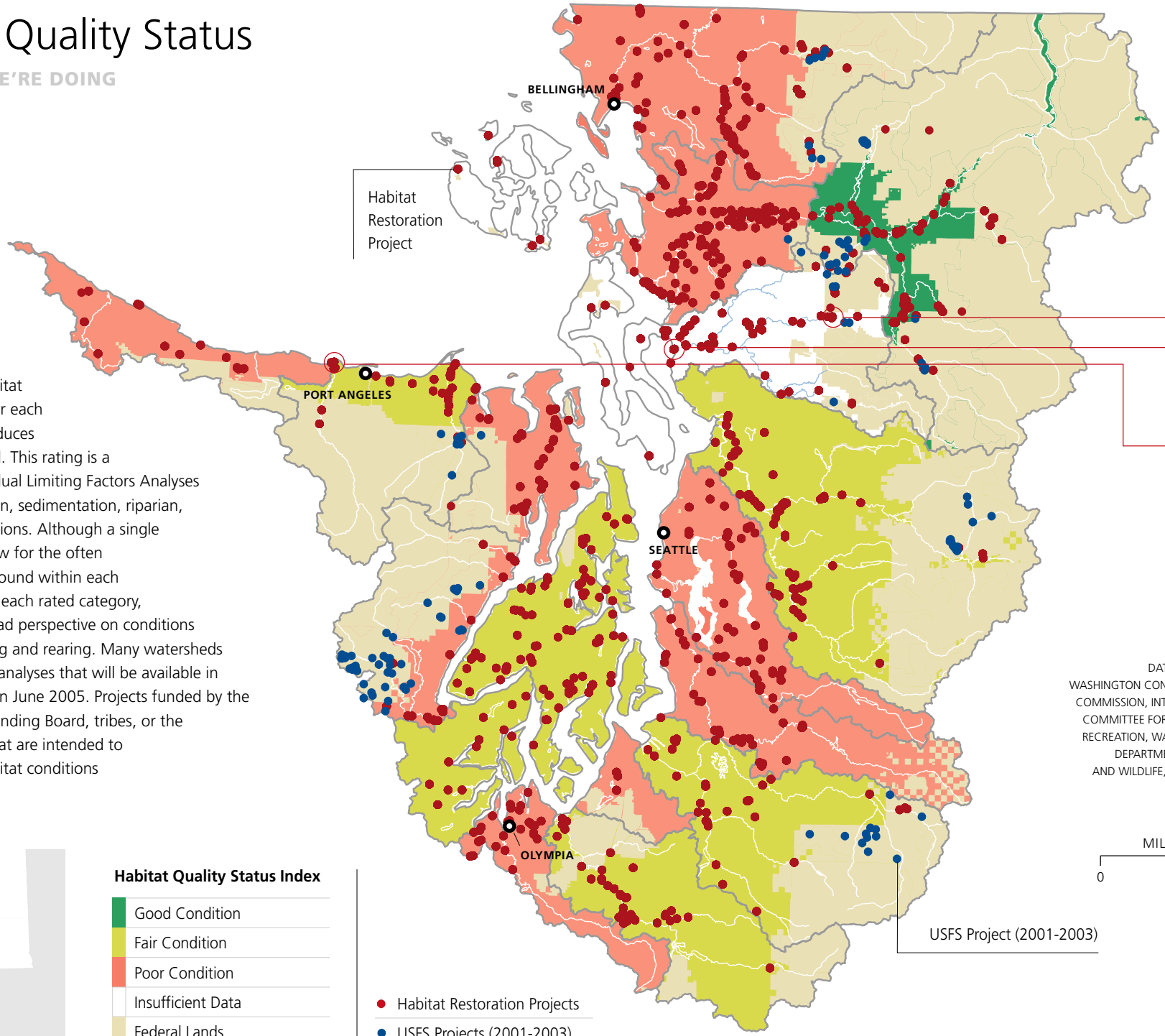


Puget Sound Salmon Recovery Region

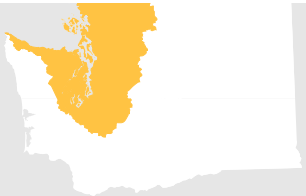
Habitat Quality Status

AND WHAT WE'RE DOING

On our map
a single salmon habitat rating is depicted for each watershed that produces salmon or steelhead. This rating is a distillation of individual Limiting Factors Analyses reports for floodplain, sedimentation, riparian, and instream conditions. Although a single rating does not allow for the often varying conditions found within each WRIA and between each rated category, it is useful for a broad perspective on conditions for salmon spawning and rearing. Many watersheds now have in-depth analyses that will be available in recovery plans due in June 2005. Projects funded by the Salmon Recovery Funding Board, tribes, or the US Forest Service that are intended to improve stream habitat conditions are shown.



DATA SOURCE: WASHINGTON CONSERVATION COMMISSION, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE



Puget Sound Salmon Recovery Region

Habitat Quality Status Index

- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data
- Federal Lands

- Habitat Restoration Projects
- USFS Projects (2001-2003)

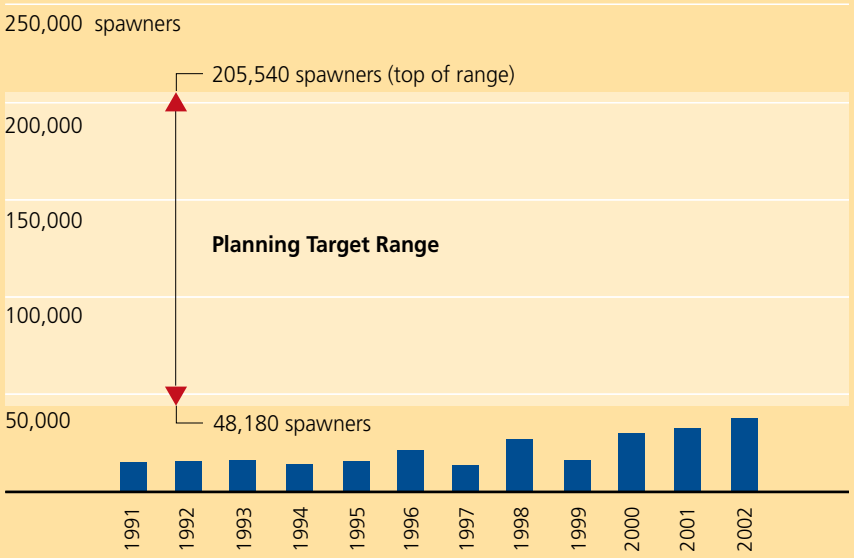
Stillaguamish Engineered Log Jam Monitoring
Volunteers are monitoring benefits to salmon from instream habitat projects.

Port Susan Bay Acquisition and Restoration Assesment
The Nature Conservancy identified and designed restoration actions for an acquisition of private tidal and estuarine wetlands.

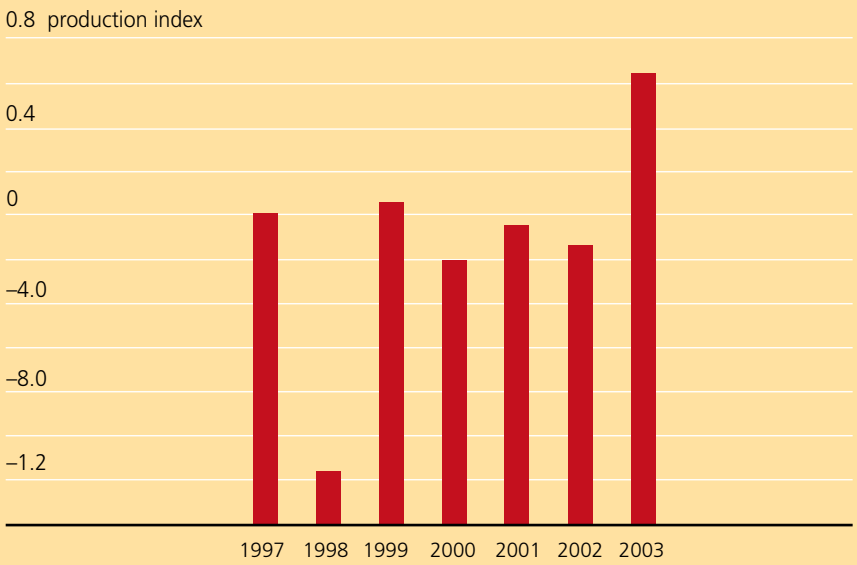
Elwha River Floodplain Restoration
The Lower Elwha Klallam Tribe improved natural habitats in the lower portion of the Elwha River.

Puget Sound Chinook

- Composite spawner abundance and planning target range for 14 of 22 populations.
- Planning Target Range from Puget Sound Shared Strategy.



Puget Sound Wild Chinook Smolt Production Index

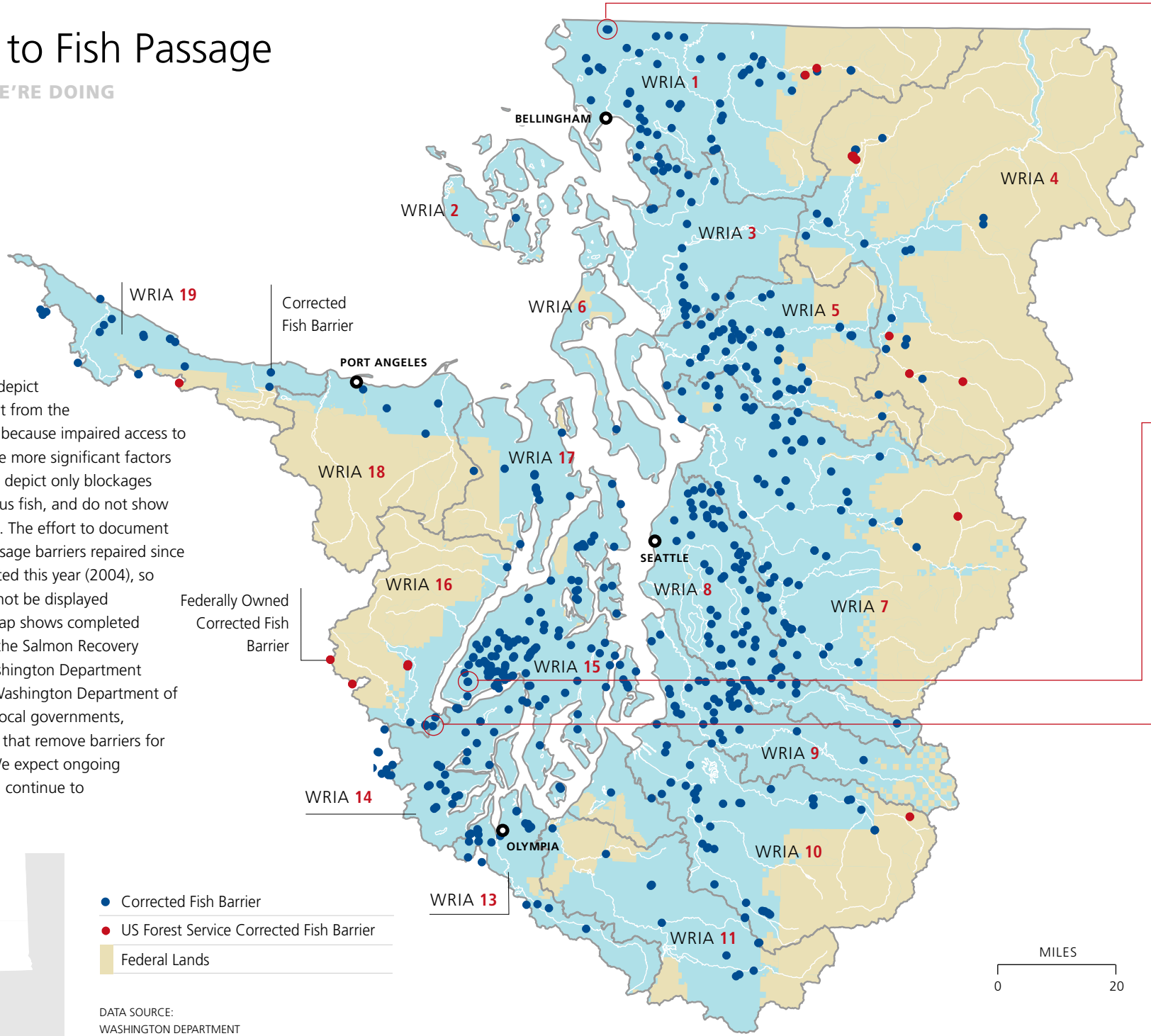


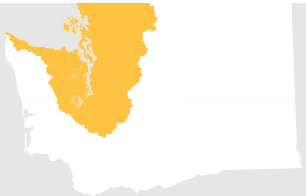
DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Barriers to Fish Passage

AND WHAT WE'RE DOING

On our map we have chosen to depict barriers independent from the habitat quality map because impaired access to streams is one of the more significant factors limiting salmon. We depict only blockages affecting anadromous fish, and do not show bull trout blockages. The effort to document locations of fish passage barriers repaired since 1999 was just initiated this year (2004), so some projects may not be displayed on this map. This map shows completed projects funded by the Salmon Recovery Funding Board, Washington Department of Transportation, Washington Department of Natural Resources, local governments, or US Forest Service that remove barriers for anadromous fish. We expect ongoing mapping efforts will continue to reveal projects.





Puget Sound Salmon Recovery Region

- Corrected Fish Barrier
- US Forest Service Corrected Fish Barrier
- Federal Lands

DATA SOURCE: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE.

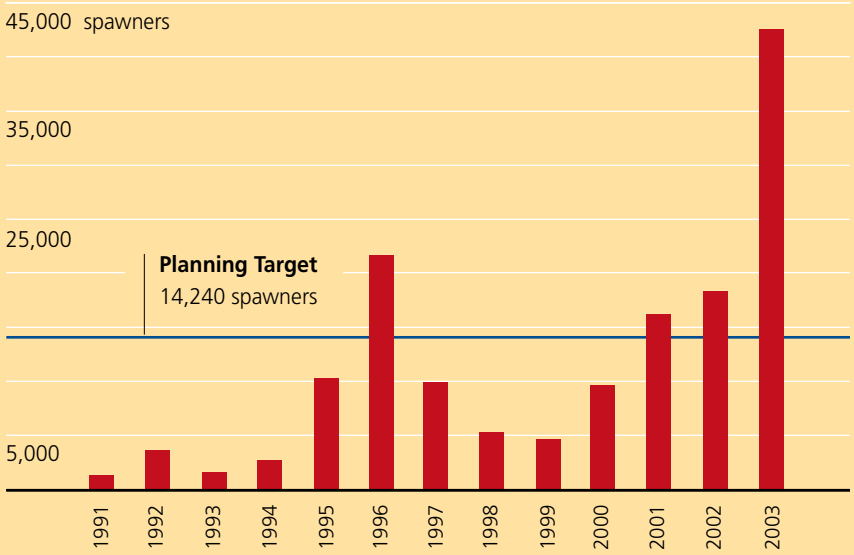
Leidi-Bertrand Creek Culverts
Bertrand Creek is a major tributary to the Nooksack River in Whatcom County. Through the Family Forest Fish Passage Program, two culverts were removed on tributaries to the creek, improving spawning and rearing conditions for almost 1/2 mile for coho and cutthroat trout.

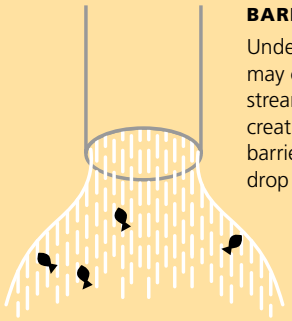
Erdman and Haven Creek Culvert
This project, part of the Family Forest Fish Passage Program (FFFPP), replaced two undersized culverts in the Hog Ranch road community of the Tahuya Peninsula in Mason County. Over six miles of stream were made accessible by the project.

Gosnell Creek Culvert and Riparian Restoration
An RFEG replaced two fish blockages and reduced flooding.

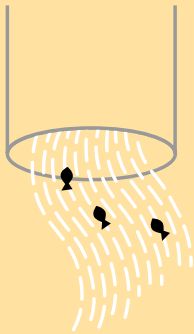
Hood Canal Summer Chum

- Composite spawner abundance and planning target for 15 of 15 populations.
- Planning target from Technical Recovery Team.





BARRIER
Undersized culverts may concentrate stream flow, thereby creating a velocity barrier and/or outfall drop



NON-BARRIER
Proper fish passage structures should be wider than the stream

DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Yale Lake, Clark County

Lower Columbia Salmon Recovery Region Indicators

Human Population: 544,500

Counties: Clark, Cowlitz, Lewis, Skamania, and Wahkiakum, and portions of Pacific and Klickitat.

Treaty Tribes: Treaty Tribes: No Treaty Tribe Reservations are located in this Region. Cowlitz Tribe is federally recognized.

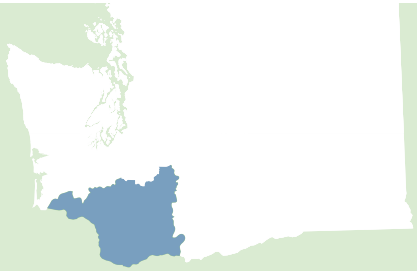
Listed Fish: Chinook (threatened), chum (threatened), steelhead (threatened), coho (proposed), bull trout (threatened).

Regional Recovery Organization: Lower Columbia Fish Recovery Board (http://www.lcfrb.gen.wa.us/).

Recovery Planning Status: Draft recovery plan for Washington portion of lower Columbia Chinook, steelhead, chum, bull trout, and coho delivered to NOAA-Fisheries December 2004.

WRIAs / Water Resource Inventory Areas

24 Willapa (Chinook and Wallicut rivers)
25 Grays-Elokoman
26 Cowlitz
27 Lewis
28 Salmon-Washougal
29 Wind/White Salmon



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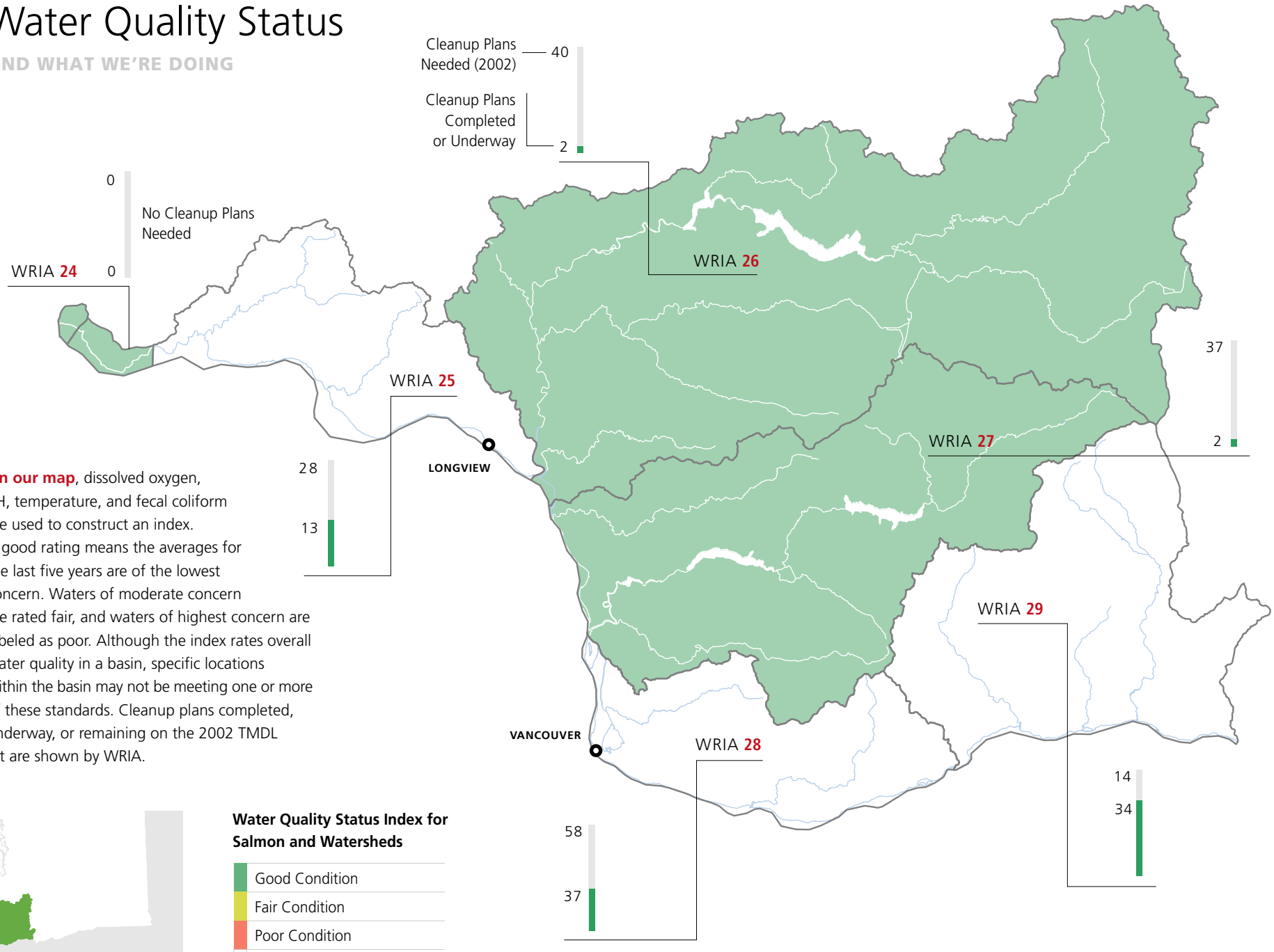
Water Quality Status

AND WHAT WE'RE DOING



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Water Quality Status Index for Salmon and Watersheds

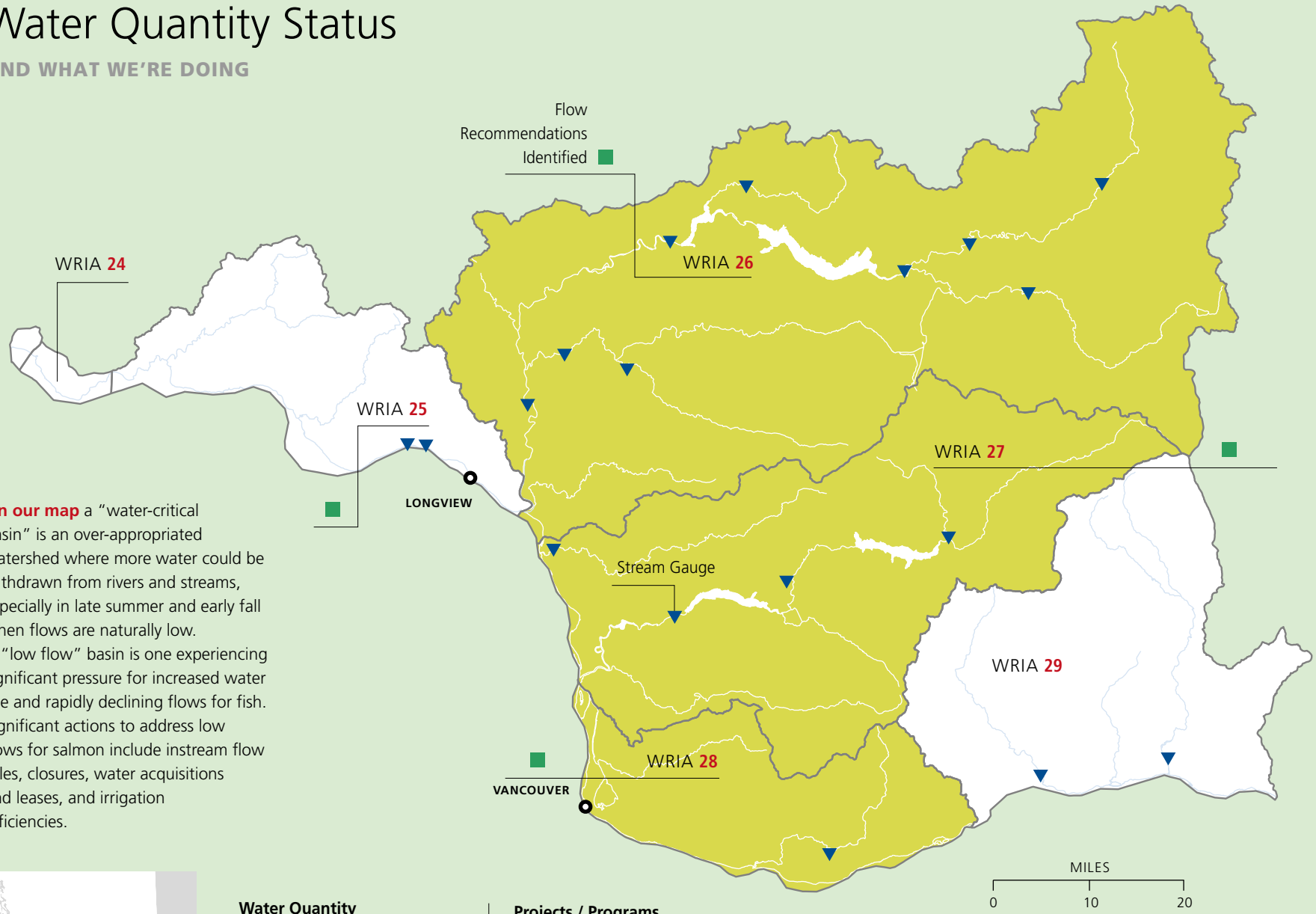
- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data

Lower Columbia Salmon Recovery Region

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY.

Water Quantity Status

AND WHAT WE'RE DOING



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A "low flow" basin is one experiencing significant pressure for increased water use and rapidly declining flows for fish. Significant actions to address low flows for salmon include instream flow rules, closures, water acquisitions and leases, and irrigation efficiencies.

Lower Columbia Salmon Recovery Region

Water Quantity Status Index for Salmon and Watersheds

- Low Flow
- Critical
- Not Categorized

Projects / Programs Addressing Water Quantity for Salmon and Watersheds

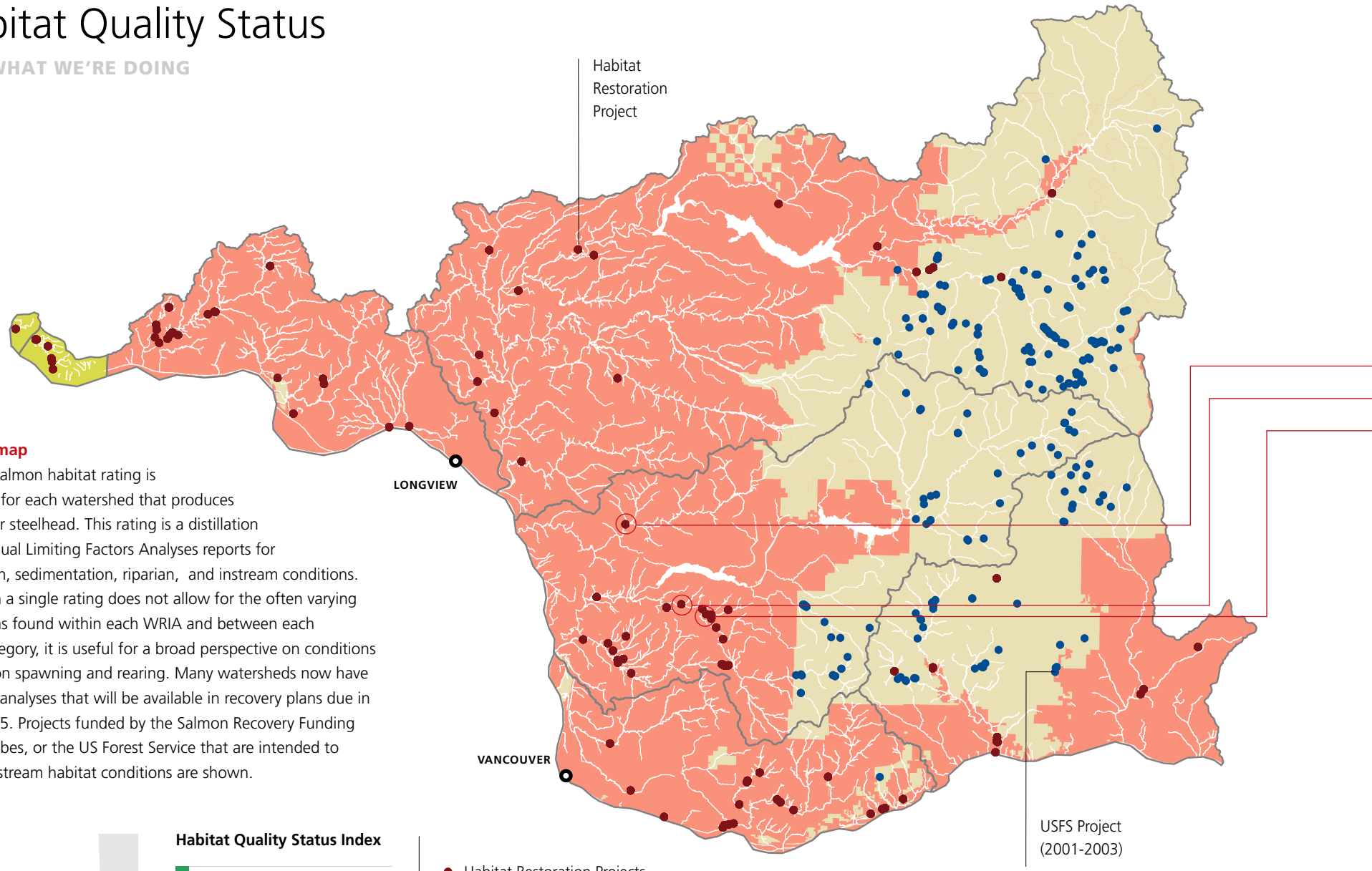
- Stream Gauges
- Flow Recommendations Identified

Region may share in annual 33,322 AF from various Columbia River leases.

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

Habitat Quality Status

AND WHAT WE'RE DOING



On our map
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Lower Columbia Salmon Recovery Region

Habitat Quality Status Index

- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data
- Federal Lands

- Habitat Restoration Projects
- USFS Projects (2001-2003)

DATA SOURCE:
WASHINGTON CONSERVATION COMMISSION, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE

MILES
0 10 20

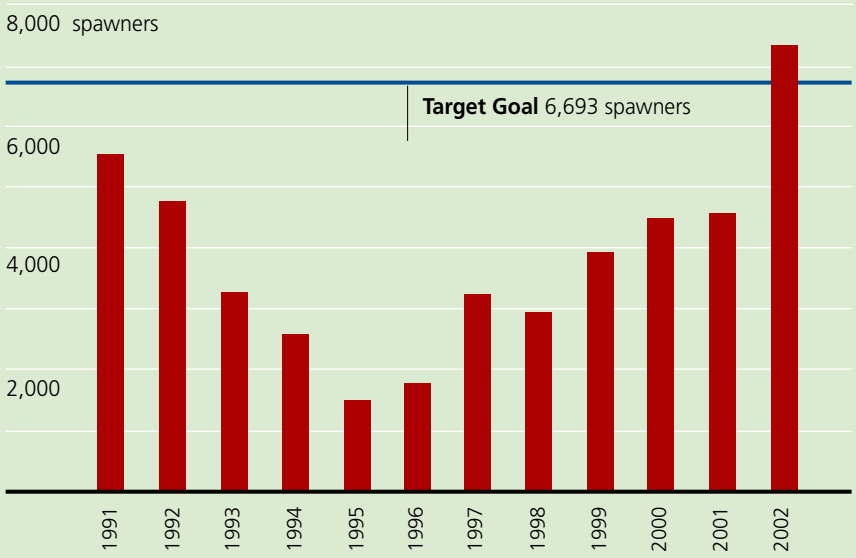
Skook Creek Barrier Removal
The project removed barriers and added streamside trees along a small tributary to the Cowlitz River. 10.8 miles of stream habitat historically used by anadromous fish were opened.

Doty Creek Habitat Restoration
Volunteers from Fish First restored stream complexity in over 4200 feet of a small creek.

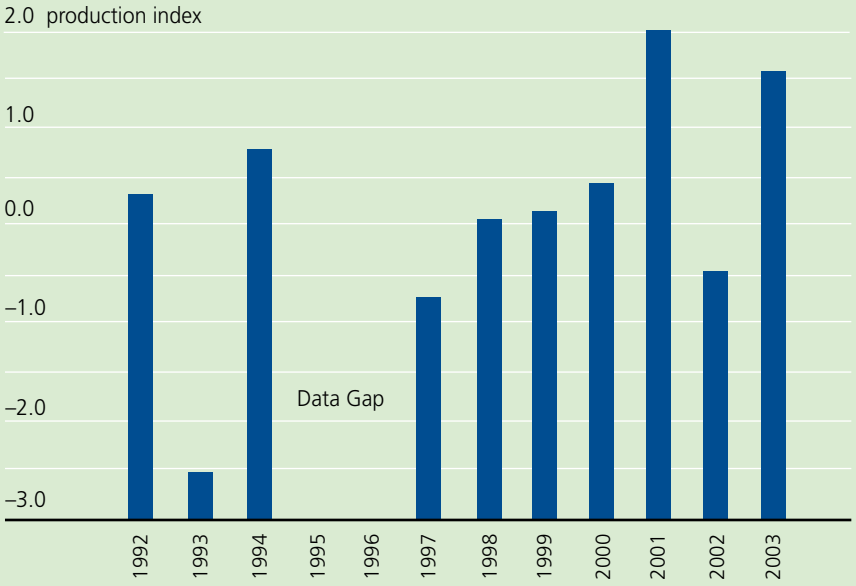
Cedar Creek at Amboy Road
Removal and replacement of an old culvert opened up 4 miles of quality habitat in Cedar Creek, a major spawning and rearing area for steelhead, coho, and sea-run cutthroat trout.

Lower Columbia River Wild Steelhead

- Composite spawner abundance and target goal for 10 of 29 populations.
- Target goal from Lower Columbia Fish Recovery Board.



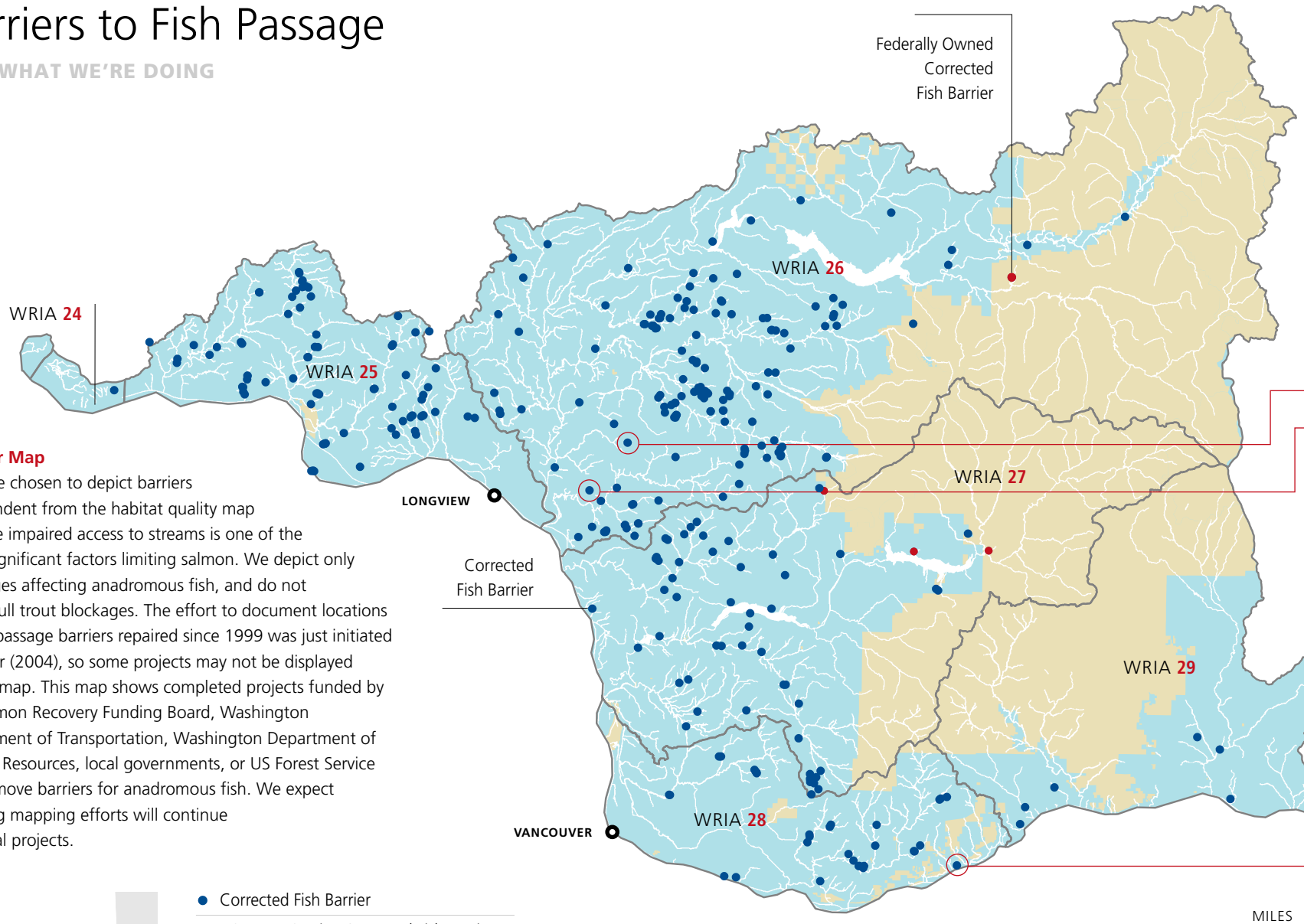
Lower Columbia River Wild Steelhead Smolt Production Index



DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Barriers to Fish Passage

AND WHAT WE'RE DOING



On Our Map
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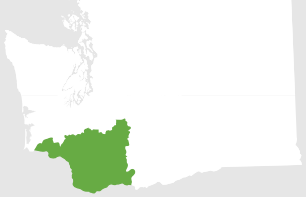
- Corrected Fish Barrier
- US Forest Service Corrected Fish Barrier
- Federal Lands

MILES
0 10 20

DATA SOURCE:
WASHINGTON DEPARTMENT
OF FISH AND WILDLIFE,
US FOREST SERVICE.



Lower Columbia Salmon Recovery Region

Unnamed Tributary to Coweeman River
The partners on this project included the Family Forest Fish Passage Program, Cowlitz Conservation District, Washington Department of Fish and Wildlife, and a landowner. Together they restored access to over 1/2 mile for coho, searun cutthroat, and steelhead.

Beaver Creek Fish Passage
The Family Forest Fish Passage Program provided funding to open up over six miles of Beaver Creek for use by coho, cutthroat, and steelhead by removing two culverts.

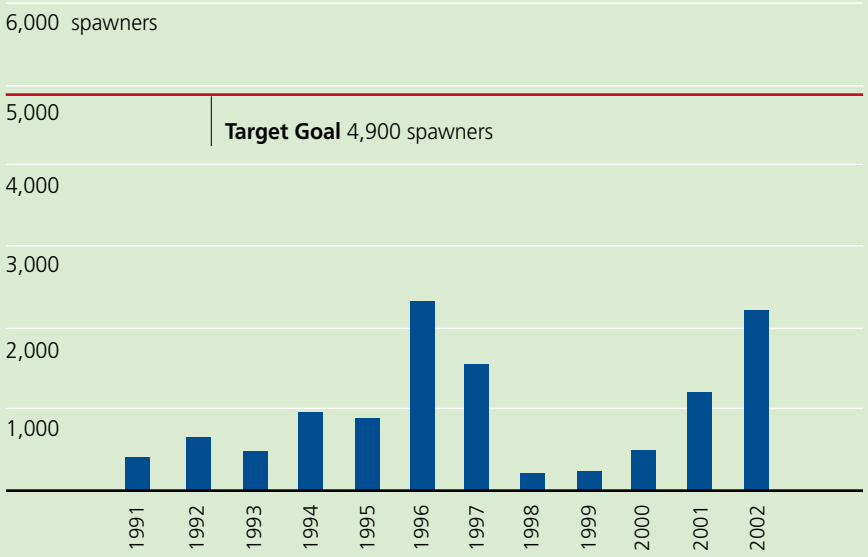
Duncan Creek Dam Fish Restoration
This project restored passage through a dam for chum, coho, and sea-run cutthroat trout. Duncan Creek is one of only a handful of streams on the Columbia River that have supported chum production.

Lower Columbia River Wild Chum

- Composite in terms of spawners per mile for 2 of 10 populations.
- Target goal from Lower Columbia Fish Recovery Board.

Lower Columbia River Wild Chinook

- Composite spawner abundance and target goal for 2 of 20 populations.
- Target goal from Lower Columbia Fish Recovery Board.



DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Yakima River, Yakima County

Mid-Columbia Salmon Recovery Region Indicators

Human Population: 431,700

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

Treaty Tribes: Yakama Nation.

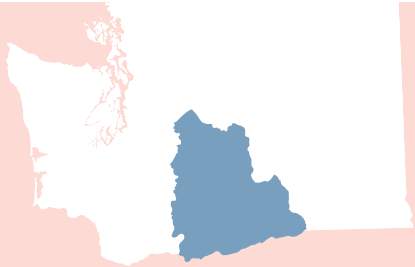
Listed Fish: steelhead (threatened) and bull trout (threatened).

Regional Recovery Organization: Yakima Sub-basin Fish and Wildlife Planning Board (http://www.co.yakima.wa.us/yaksubbasin/).

Recovery Planning Status: Draft recovery plan for Yakima basin portion of mid-Columbia steelhead and bull trout due in June 2005.

WRIAs / Water Resource Inventory Areas

30 Klickitat
31 Rock-Glade
37 Lower Yakima
38 Naches
39 Upper Yakima
40 Alkali-Squilchuck



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Water Quality Status

AND WHAT WE'RE DOING

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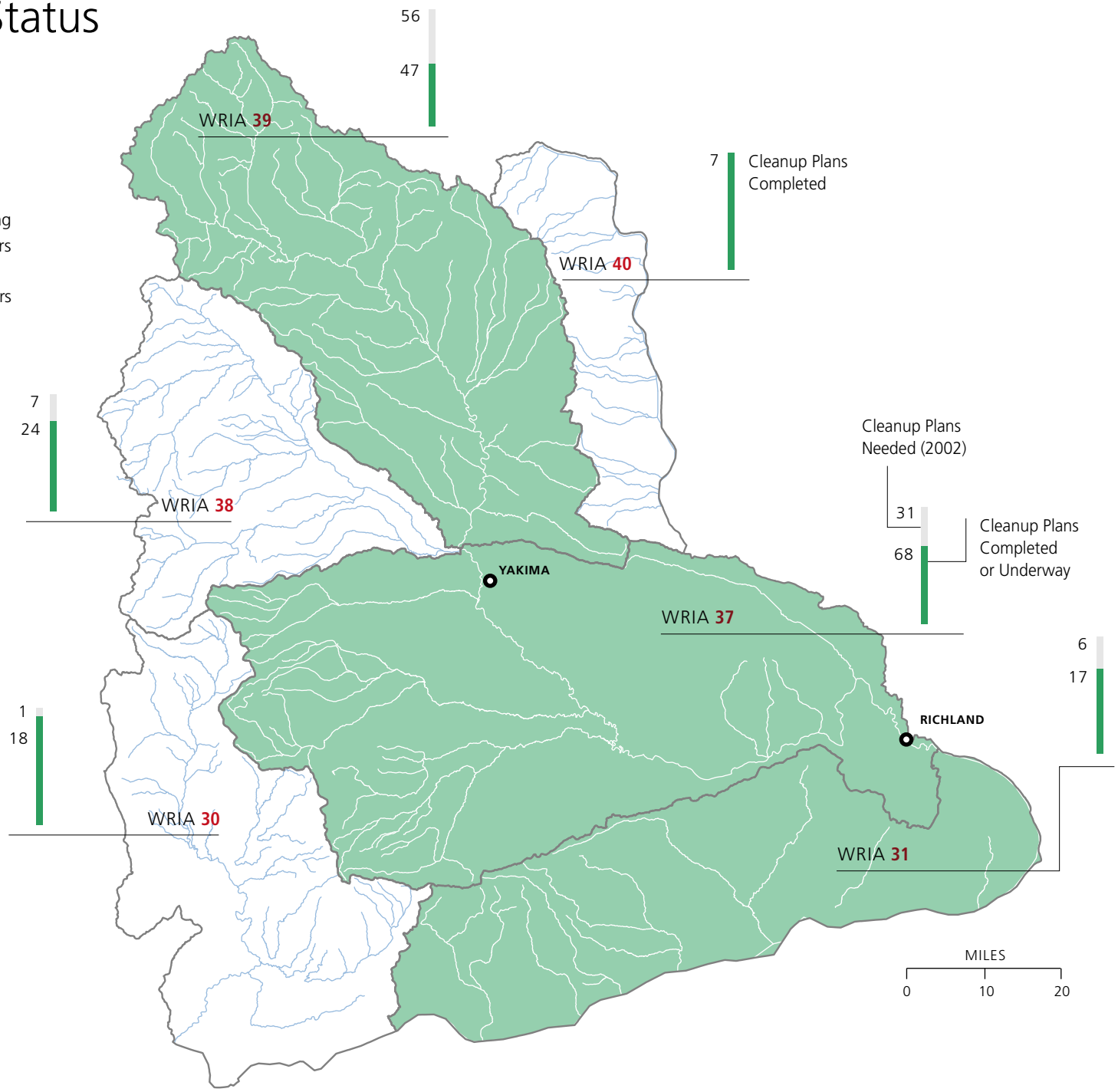
Water Quality Status Index for Salmon and Watersheds

- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY.



Mid-Columbia Salmon Recovery Region

Water Quantity Status

AND WHAT WE'RE DOING

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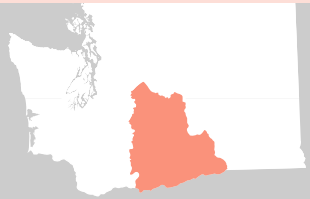
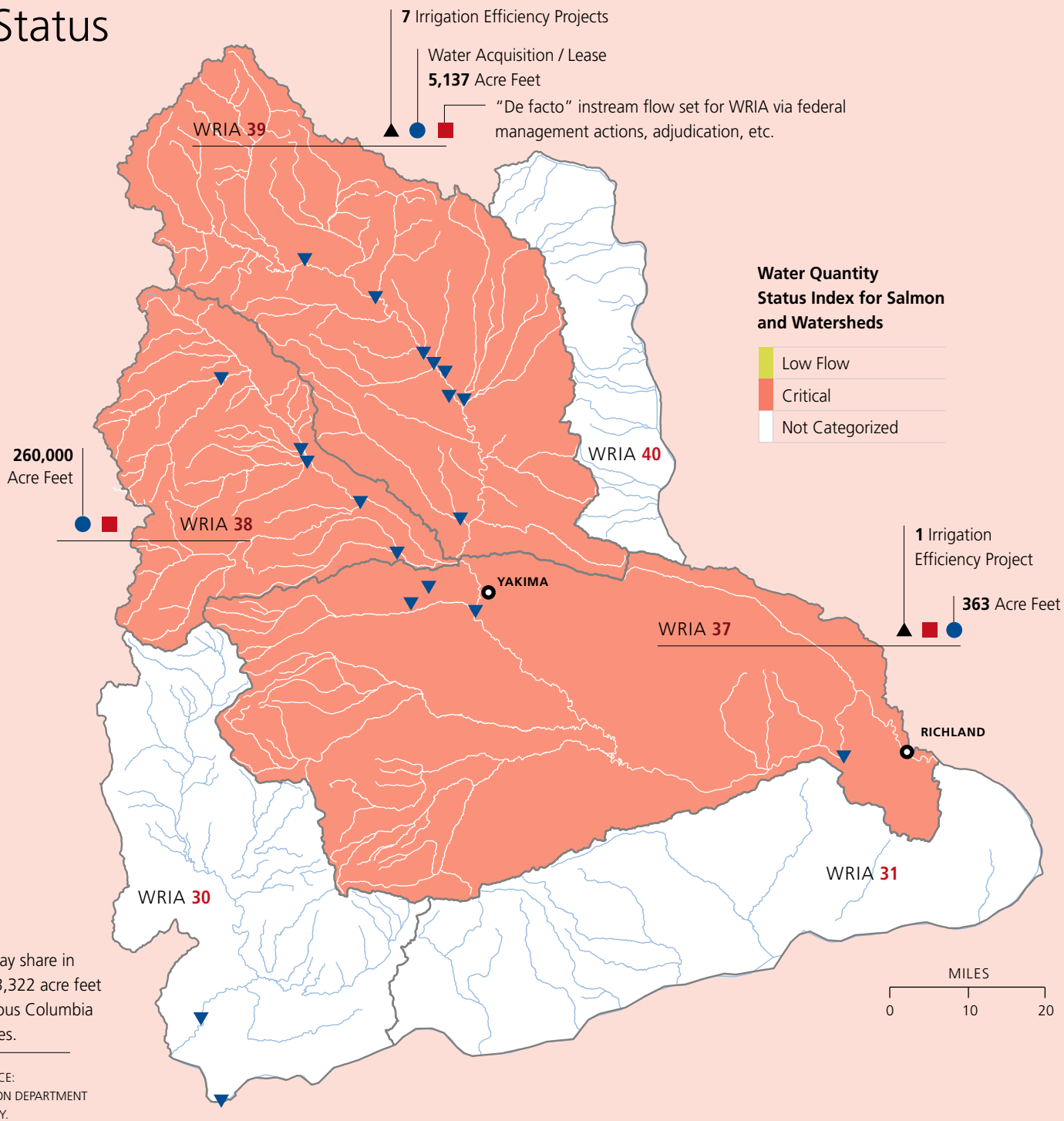
Projects / Programs Addressing Water Quantity for Salmon and Watersheds

- ▼ Stream Gauges
- ● Water Acquisition / Lease in Annual Acre Feet
- ■ Instream Flow Set for WRIA
- ▲ Irrigation Efficiency Projects



Mid-Columbia Salmon Recovery Region

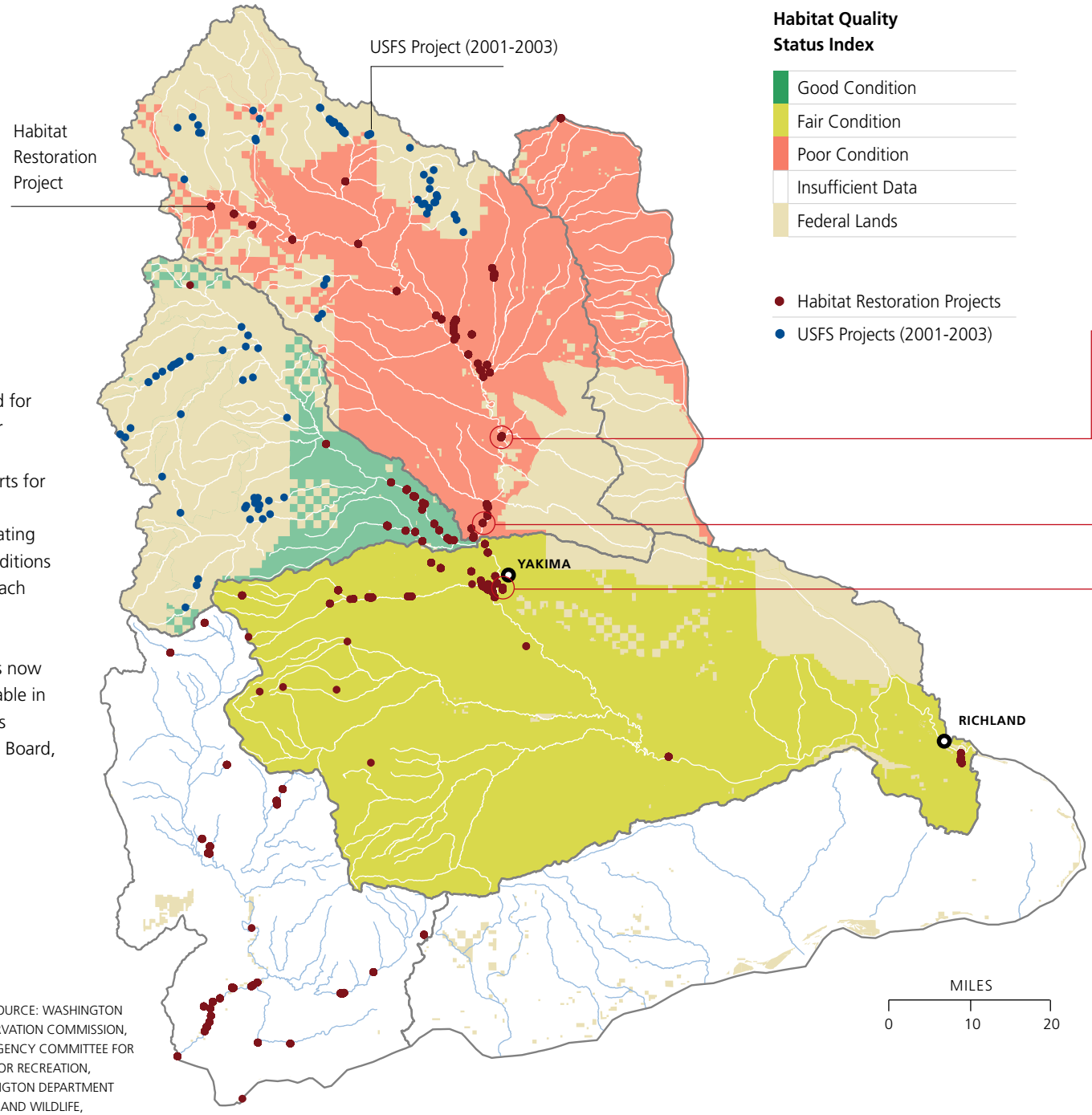


Region may share in annual 33,322 acre feet from various Columbia River leases.

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY.

Habitat Quality Status

AND WHAT WE'RE DOING



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Mid-Columbia Salmon Recovery Region

DATA SOURCE: WASHINGTON CONSERVATION COMMISSION, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE.

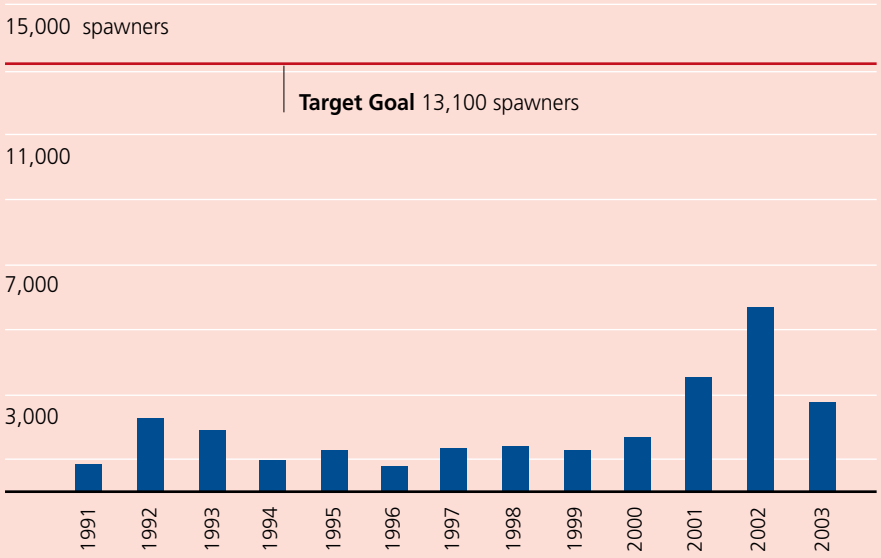
Lmuma Creek Reparian Restoration
This tributary provides the best opportunity for off-channel rearing of salmon in the Yakima Canyon.

Sprayfield Riparian Enhancement Project
Tree Top Inc. generates wastewater as a byproduct of fruit processing. This water now irrigates vegetation and trees planted to stabilize the stream banks of the Yakima River.

West Valley Community Park
The Wide Hollow Creek Restoration project, located in Yakima's West Valley Community Park, is a project designed to improve over 3/4 of a mile of degraded habitat. It will also be used to educate students and the public about salmon habitat needs.

Mid-Columbia River Wild Steelhead Spawners

- Composite spawner abundance and target goal for 2 of 6 populations.
- Target Goal from NOAA-Fisheries.



Volunteers Contributed to Many Projects
Youngsters from the Northwest Service Academy volunteered in the Lmuma Creek project to build fences and place rootwads.

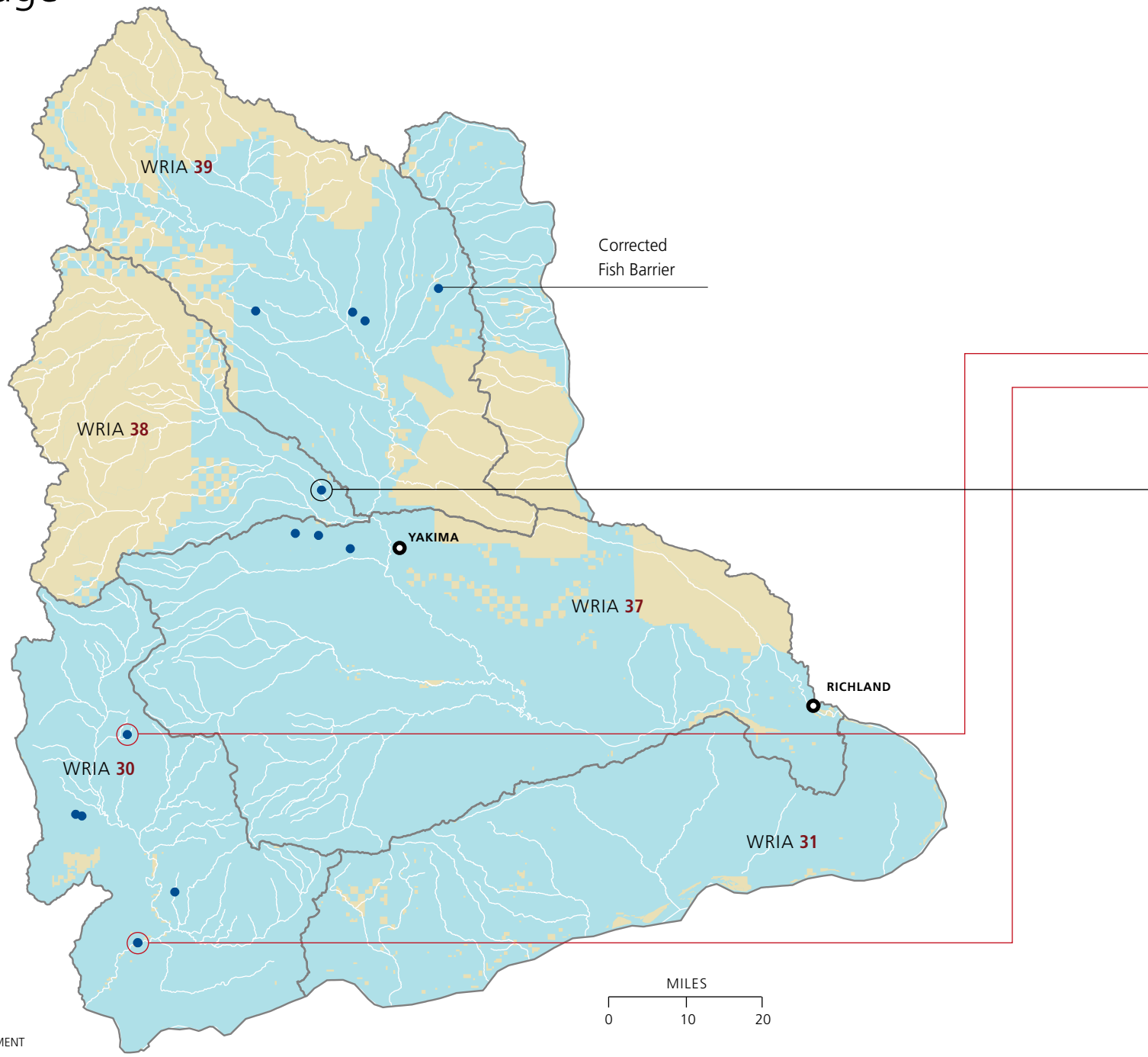
DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Barriers to Fish Passage

AND WHAT WE'RE DOING

On our map
we have chosen to depict barriers independent from the habitat quality map because impaired access to streams is one of the more significant factors limiting salmon. We depict only blockages affecting anadromous fish, and do not show bull trout blockages. The effort to document locations of fish passage barriers repaired since 1999 was just initiated this year (2004), so some projects may not be displayed on this map. This map shows completed projects funded by the Salmon Recovery Funding Board, Washington Department of Transportation, Washington Department of Natural Resources, local governments, or US Forest Service that remove barriers for anadromous fish. We expect ongoing mapping efforts will continue to reveal projects.

- Corrected Fish Barrier
- Federal Lands



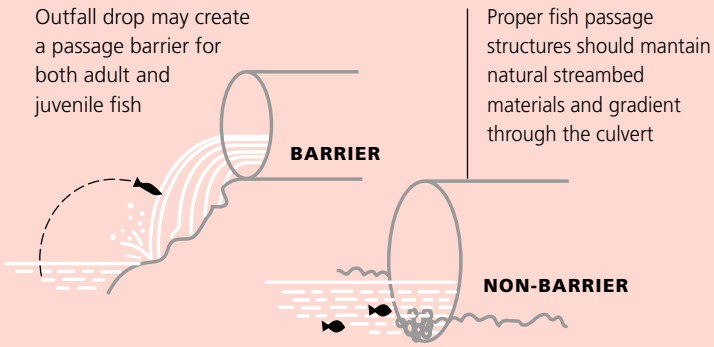
Mid-Columbia Salmon Recovery Region

DATA SOURCE:
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE.

Surveyors Creek Fish Enhancement
This project was designed to give spring Chinook and steelhead access to the excellent juvenile rearing conditions found along upper reaches of Surveyors Creek.

An improperly placed, undersized culvert blocking fish passage was replaced with this one that now allows the creek to function naturally.

Logging Camp Creek Fish Passage
Logging Camp Creek is a tributary of the Klickitat River. This project re-established historic steelhead access to spawning areas by creating a channel for the fish.



Naches River Fish Screen
The city of Yakima reduced impacts on salmon from maintenance with the installation of fish screens.

Wenatchee River, Chelan County

Upper Columbia Salmon Recovery Region Indicators

Human Population: 142,200

Counties: Chelan, Douglas, and Okanogan.

Treaty Tribes: Colville Confederated Tribes and Yakama Nation.

Listed Fish: steelhead (endangered), spring Chinook (endangered), bull trout (threatened).

Regional Recovery Organization: Upper Columbia Regional Salmon Recovery Board.

Recovery Planning Status: Draft recovery plan for upper Columbia bull trout, steelhead, and Chinook due in June 2005.

WRIAs / Water Resource Inventory Areas

44 Moses Coulee
45 Wenatchee
46 Entiat
48 Methow
49 Okanogan
50 Foster

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Water Quality Status

AND WHAT WE'RE DOING

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Water Quality Status Index for Salmon and Watersheds

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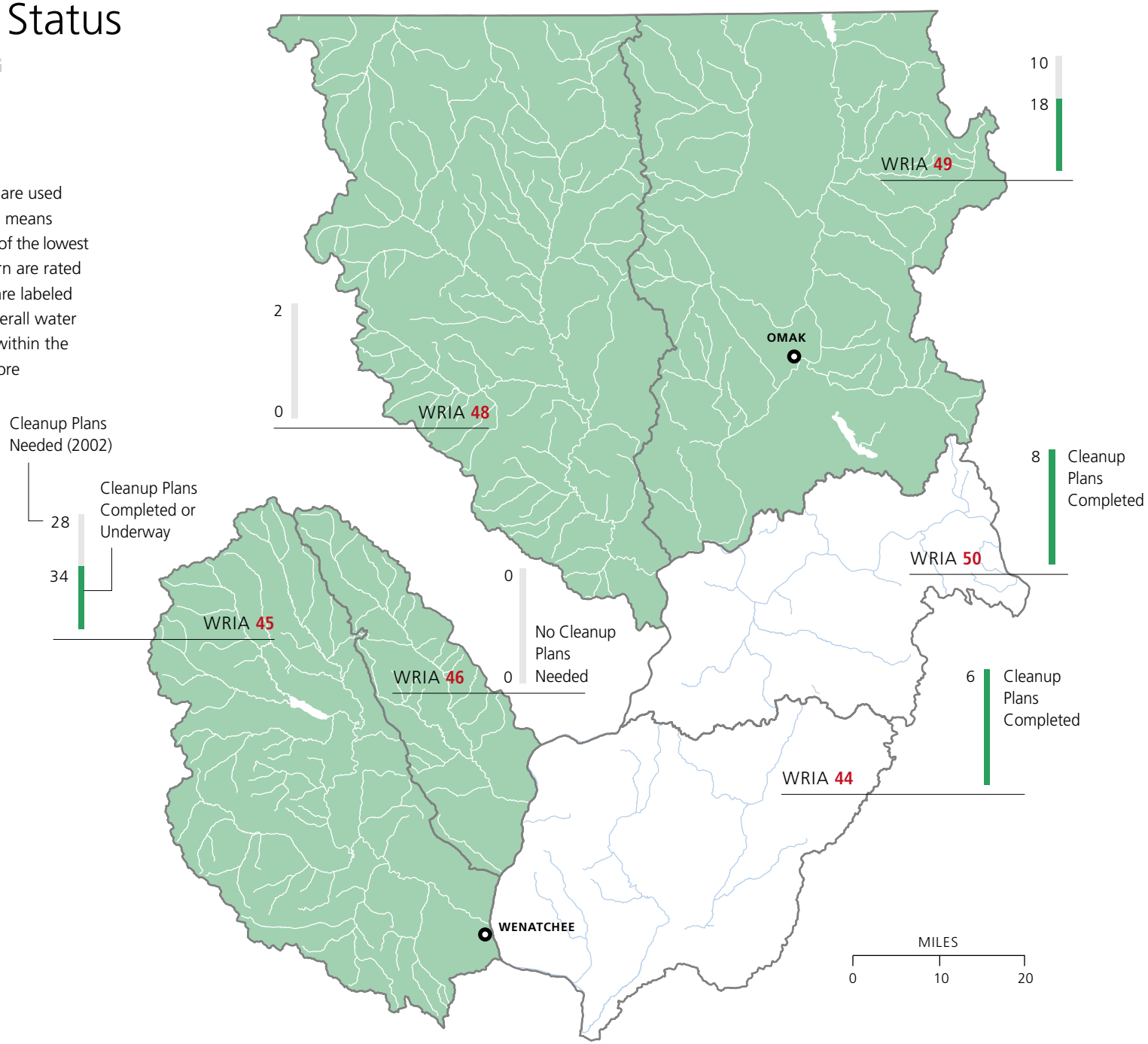

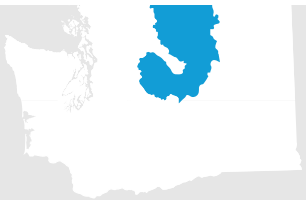

Upper Columbia Salmon Recovery Region

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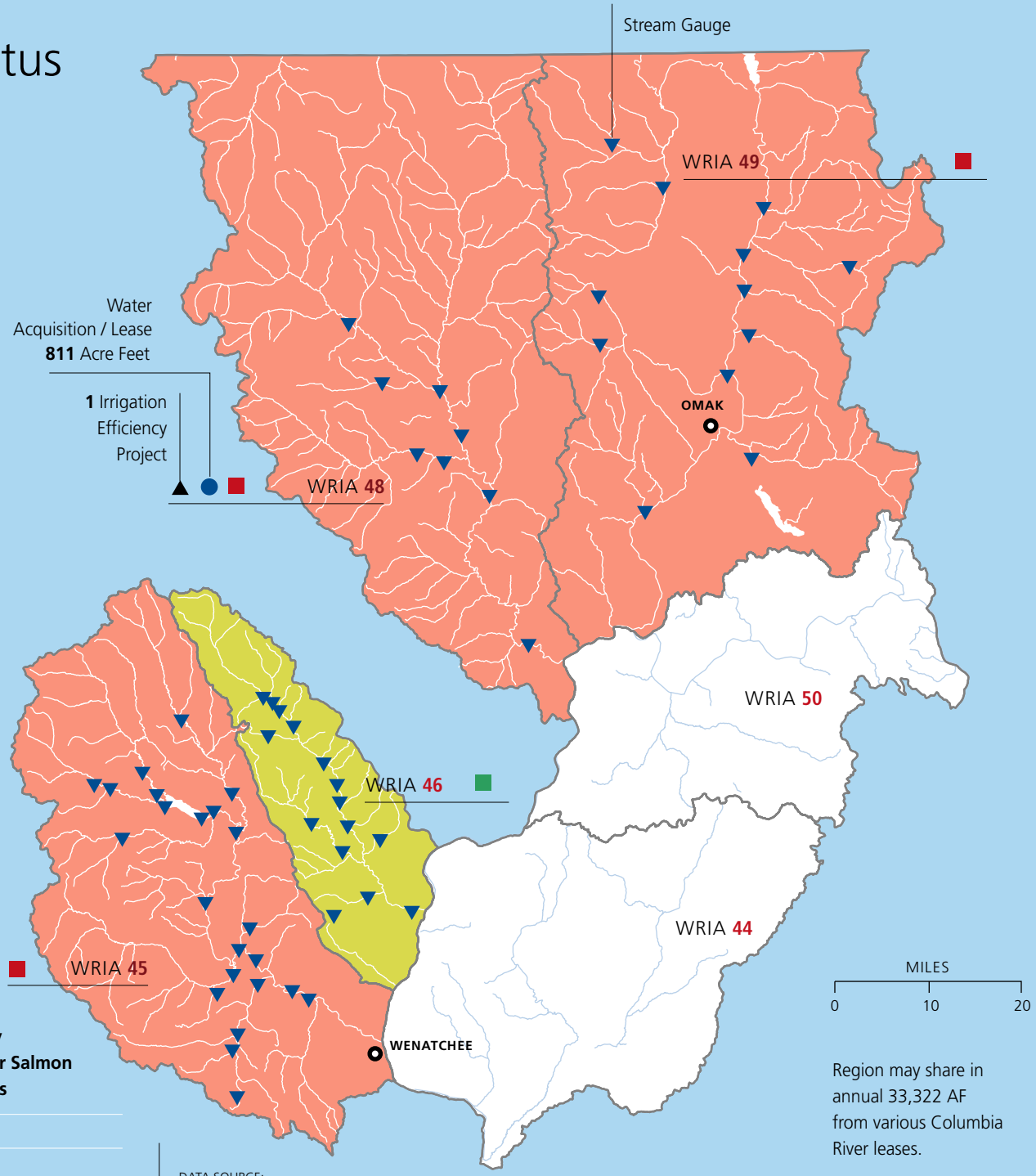
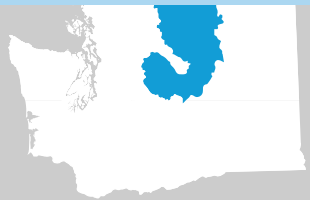
Projects / Programs Addressing Water Quantity for Salmon and Watersheds

- ▼ Stream Gauges
- ● Water Acquisition / Lease in Annual Acre Feet
- ■ Instream Flow Set for WRIA
- ■ Flow Recommendations Identified
- ▲ Irrigation Efficiency Projects



Region may share in annual 33,322 AF from various Columbia River leases.



Upper Columbia Salmon Recovery Region

Water Quantity Status Index for Salmon and Watersheds

- Low Flow
- Critical
- Not Categorized

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

Habitat Quality Status

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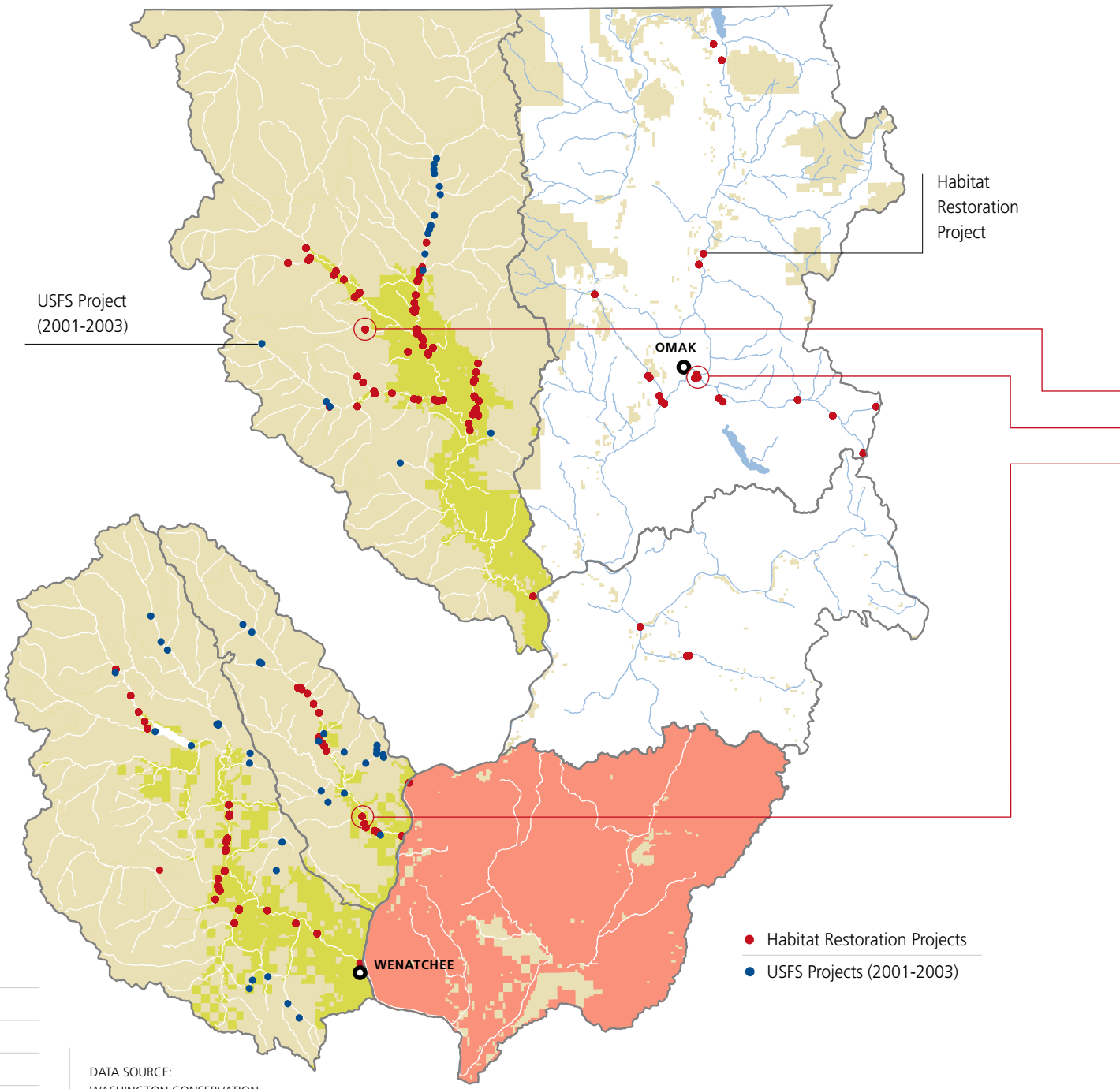
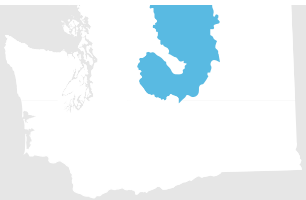




Upper Columbia Salmon Recovery Region

Habitat Quality Status Index

- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data
- Federal Lands

DATA SOURCE:
WASHINGTON CONSERVATION COMMISSION, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE.

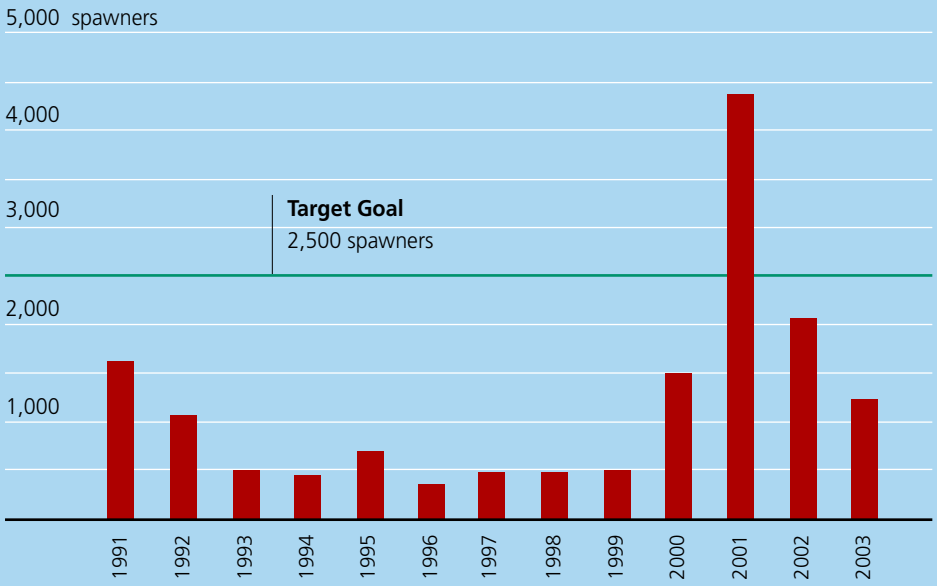
Wolf Creek Fish Screen
The Yakima Screen Shop designed, built, and installed a screen and by-pass system that will allow steelhead, Chinook, and bull trout to move along this tributary to the Methow River.

Omak Creek Restoration
The Colville Tribe, working with local timber mill owners, restored a section of Omak Creek to improve riparian habitat and reduce bank erosion.

Entiat River Rock Vortex Weirs
Landowners, working with the Chelan County Conservation District, placed these structures in the Entiat River as part of a plan to restore the river.

Upper Columbia River Wild Steelhead

- Spawner abundance for 1 of 3 populations.
- Target Goal from NOAA-Fisheries.



DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Barriers to Fish Passage

AND WHAT WE'RE DOING

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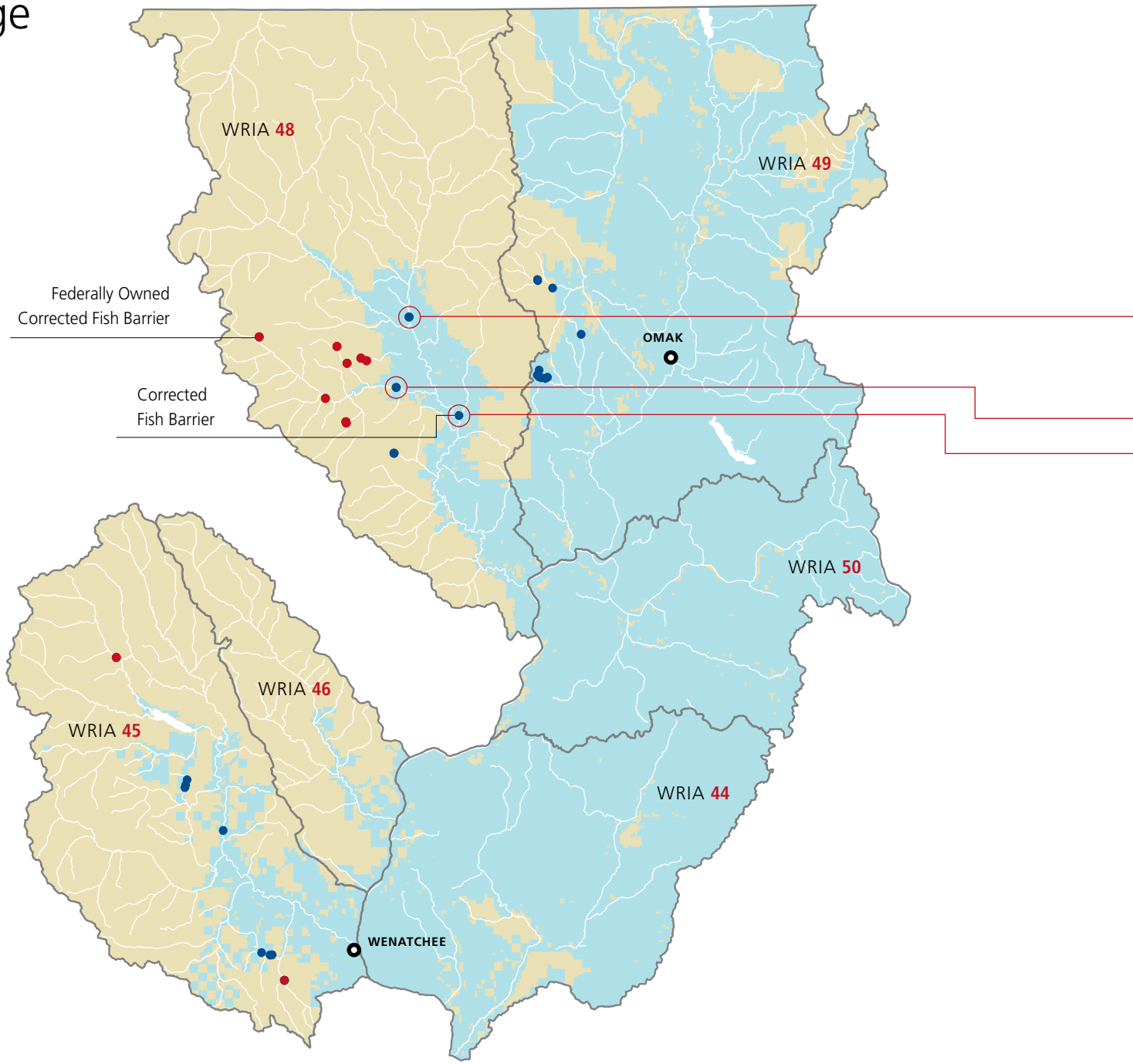
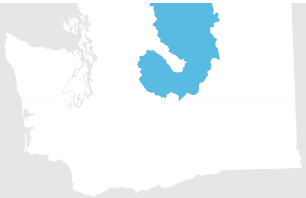
- Corrected Fish Barrier
- US Forest Service Corrected Fish Barrier
- Federal Lands





Upper Columbia Salmon Recovery Region

DATA SOURCE:
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE,
US FOREST SERVICE

MILES
0 10 20

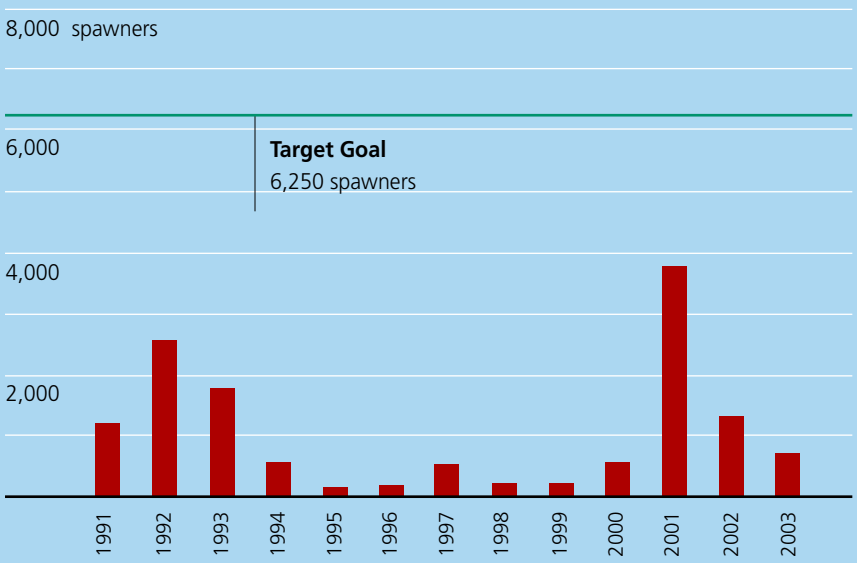
Fulton Canal Fish Screen
Specialists from the Yakima Screen Shop replaced an old fish screen that did not meet state or federal standards and was harming fish.

Twisp Power Ditch Fish Screen
This new screen replaces an old one that was causing problems for juvenile Chinook, steelhead, and bull trout on the Twisp River.

Beaver Creek Watershed Fish Passage
Three new fish screens are being installed to replace inadequately or unscreened diversions on Beaver Creek, helping steelhead, Chinook, and bull trout.

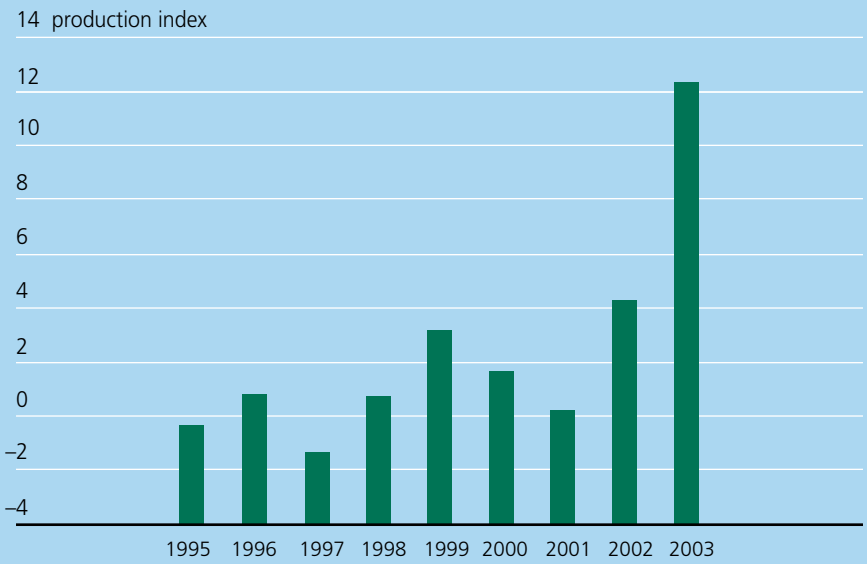
Upper Columbia River Wild Spring Chinook

- Composite spawner abundance and target goal for 3 of 12 populations.
- Target Goal from NOAA-Fisheries



DATA SOURCE: CRAWFORD AND VOLHARDT (2004)

Upper Columbia River Wild Spring Chinook Smolt Production Index



Tucannon Valley, Columbia County

Snake River Salmon Recovery Region Indicators

Human Population: 85,700

Counties: Asotin, Columbia, Garfield, Walla Walla, and parts of Franklin and Whitman.

Treaty Tribes: Confederated Tribes of the Umatilla Indian Reservation and Nez Perce Tribe.

Listed Fish: sockeye (endangered), fall Chinook (threatened), spring-summer Chinook (threatened), steelhead (threatened), bull trout (threatened).

Regional Recovery Organization: Snake River Salmon Recovery Board (http://www.snakeriverboard.org/).

Recovery Planning Status: Draft recovery plan for Washington portion of Snake River Chinook, sockeye, steelhead, and bull trout due in June 2005.

WRIAs / Water Resource Inventory Areas

32 Walla Walla
33 Lower Snake
35 Middle Snake

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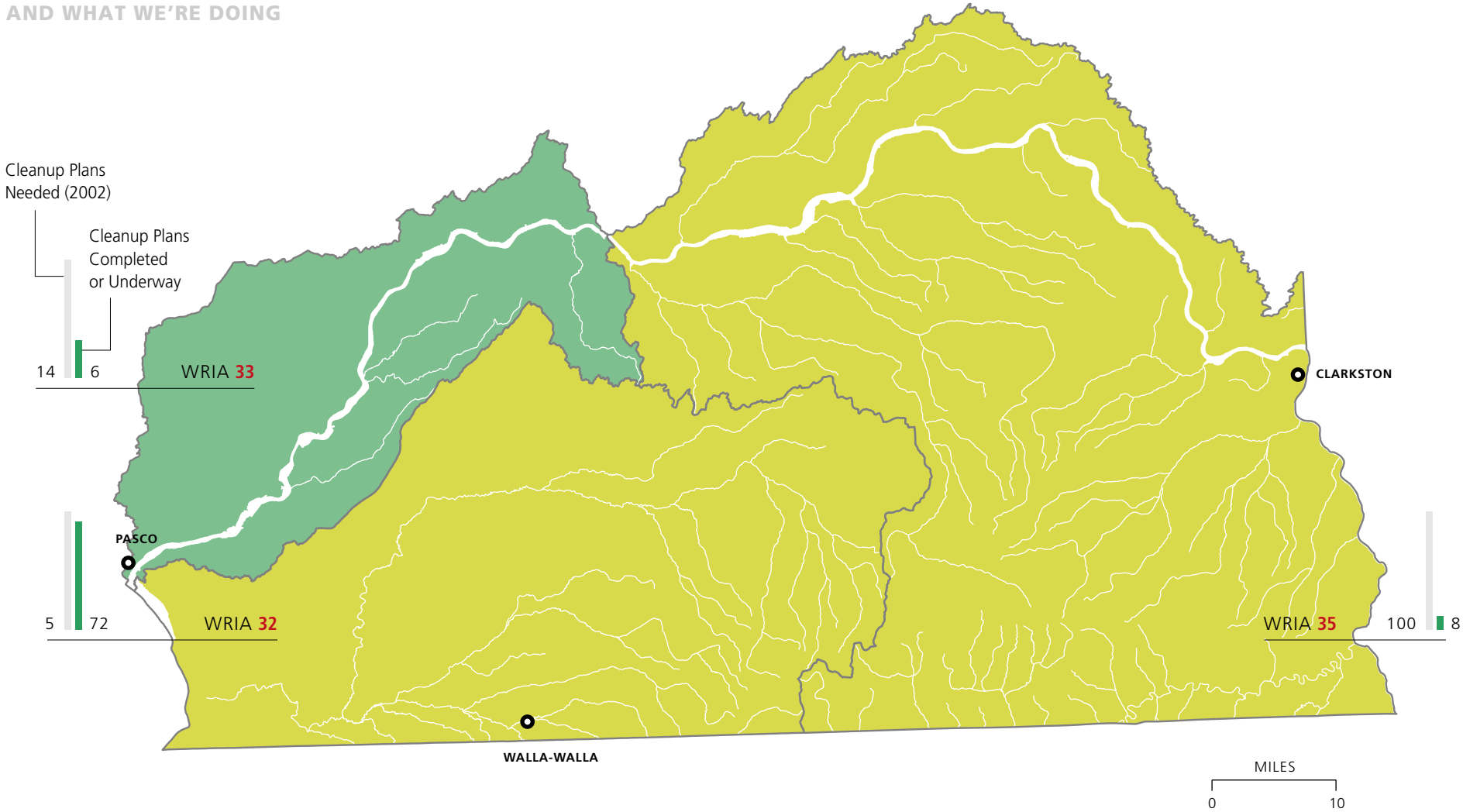
Water Quality Status

AND WHAT WE'RE DOING



Snake River Salmon Recovery Region

On our map, dissolved oxygen, pH, temperature, and fecal coliform are used to construct an index. A good rating means the averages for the last five years are of the lowest concern. Waters of moderate concern are rated fair, and waters of highest concern are labeled as poor.

Although the index rates overall water quality in a basin, specific locations within the basin may not be meeting one or more of these standards. Cleanup plans completed, underway, or remaining on the 2002 TMDL list are shown by WRIA.

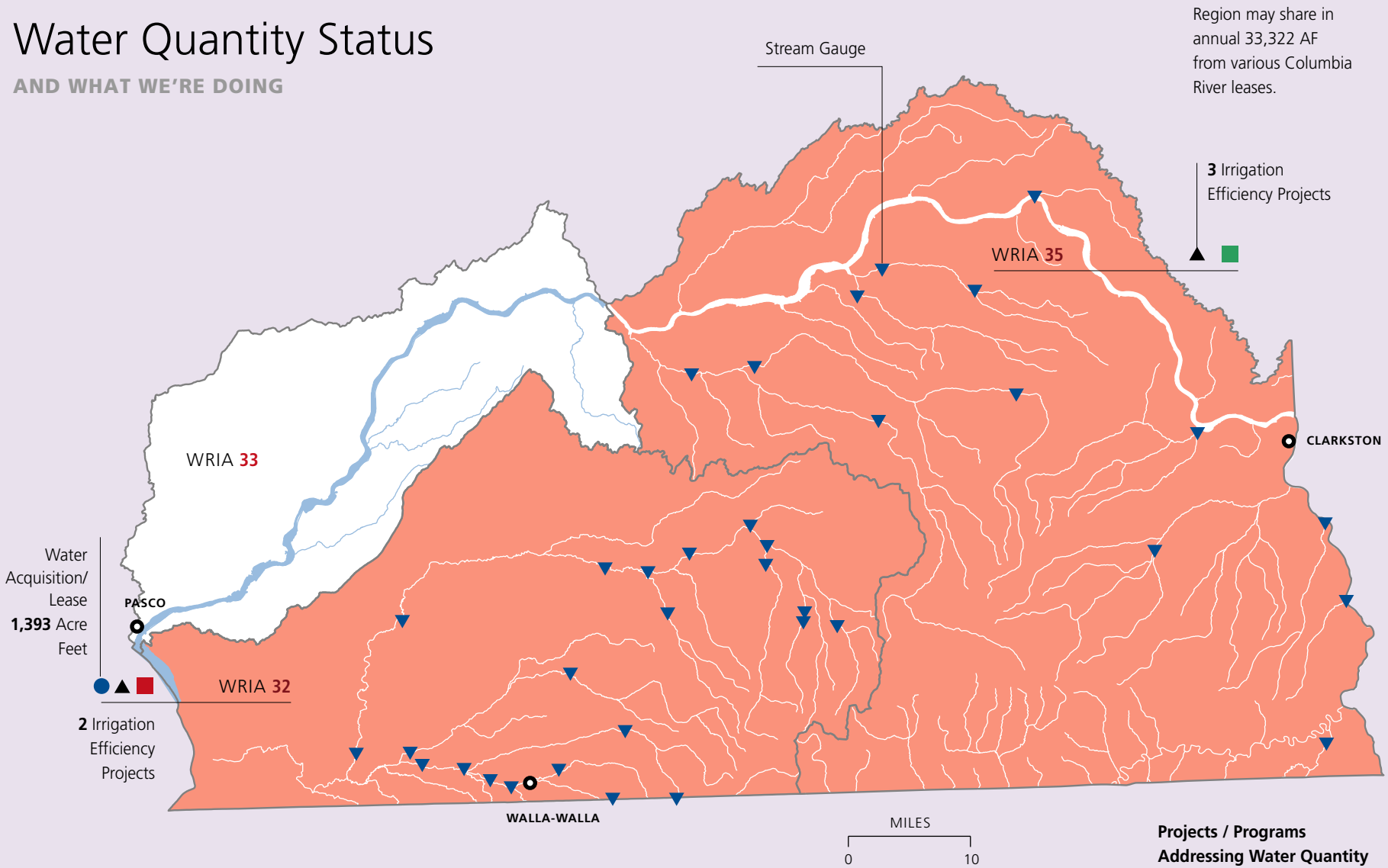
Water Quality Status Index for Salmon and Watersheds

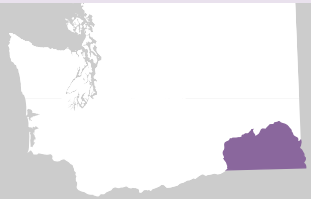
- Good Condition
- Fair Condition
- Poor Condition
- Insufficient Data

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

Water Quantity Status

AND WHAT WE'RE DOING





Snake River Salmon Recovery Region

On our map a "water-critical basin" is an over-appropriated watershed where more water could be withdrawn from rivers and streams, especially in late summer and early fall when flows are naturally low. A "low flow" basin is one experiencing significant pressure for increased water use and rapidly declining flows for fish. Significant actions to address low flows for salmon include instream flow rules, closures, water acquisitions and leases, and irrigation efficiencies.

Water Quantity Status Index for Salmon and Watersheds

- Low Flow
- Critical
- Not Categorized

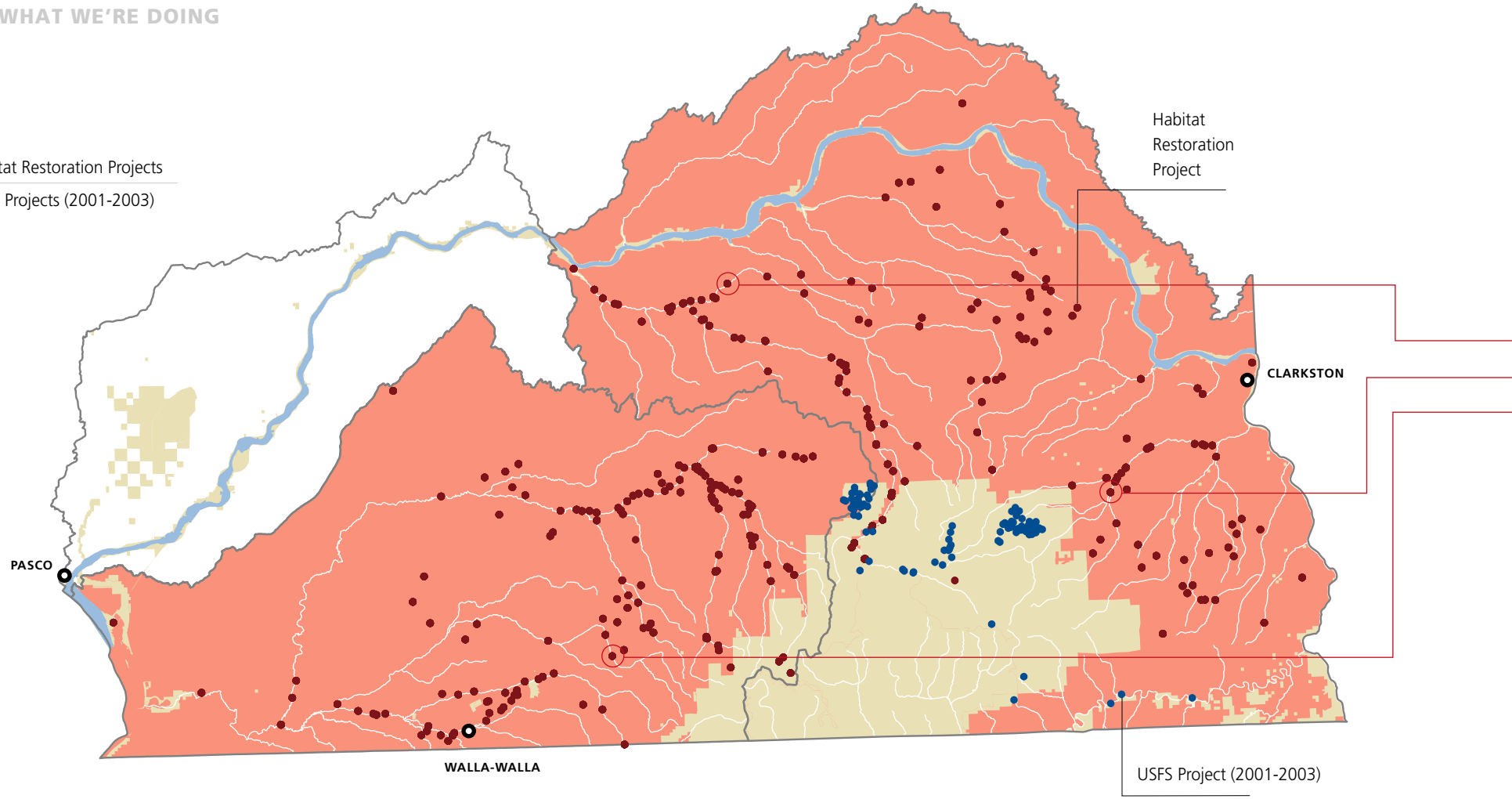
Projects / Programs Addressing Water Quantity for Salmon and Watersheds

- Stream Gauges
- Water Acquisition / Lease in Annual Acre-Feet
- Instream Flow Set for WRIA (closed)
- Irrigation Efficiency Projects
- Flow Recommendations Identified

DATA SOURCE: WASHINGTON DEPARTMENT OF ECOLOGY

Habitat Quality Status

AND WHAT WE'RE DOING



Snake River Salmon Recovery Region

On our map,
a single salmon habitat rating is depicted for each watershed that produces salmon or steelhead. This rating is a distillation of individual Limiting Factors Analyses reports for floodplain, sedimentation, riparian, and instream conditions. Although a single rating does not allow for the often varying conditions found within each WRIA and between each rated category, it is useful for a broad perspective on conditions for salmon spawning and rearing. Many watersheds now have in-depth analyses that will be available in recovery plans due in June 2005. Projects funded by the Salmon Recovery Funding Board, tribes, or the US Forest Service that are intended to improve stream habitat conditions are shown.

Habitat Quality Status Index

- Poor Condition
- Insufficient Data
- Federal Lands

MILES
0 10

DATA SOURCE: WASHINGTON CONSERVATION COMMISSION, INTERAGENCY COMMITTEE FOR OUTDOOR RECREATION, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, US FOREST SERVICE

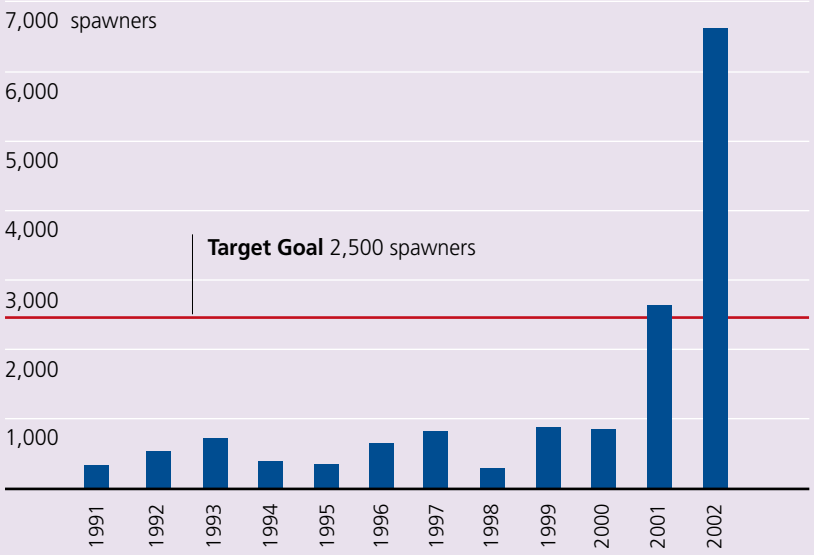
BLC Riparian Enhancement
The goal of this project is to decrease stream temperatures in Pataha Creek, a major tributary of the Tucannon River, by planting native vegetation and to increase filtering of sediments that now cloud the creek. A gate also keeps cattle from entering the streamside areas.

Schlee Ranch Acquisition
The SRFB provided funding to do some riparian plantings on an important habitat acquisition project benefiting many fish and wildlife species in Asotin County.

South Fork Coppei Creek Riparian Buffer
Local landowners, Mr. and Mrs. Hansen, working with partner agencies, created valuable projects and protected more than 5 miles of habitat for endangered steelhead.

Snake River Wild Fall Chinook

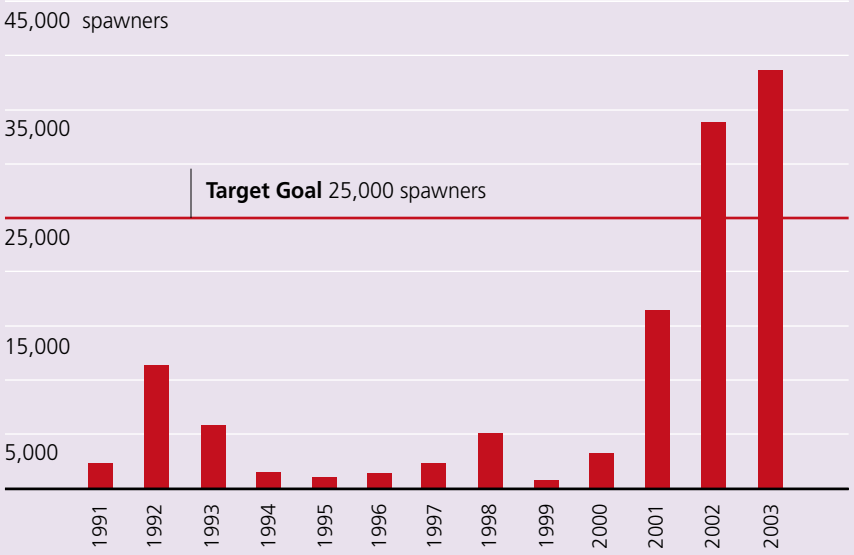
- Composite spawner abundance and target goal from counts at Lower Granite dam.
- Target Goal from NOAA-Fisheries.



DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

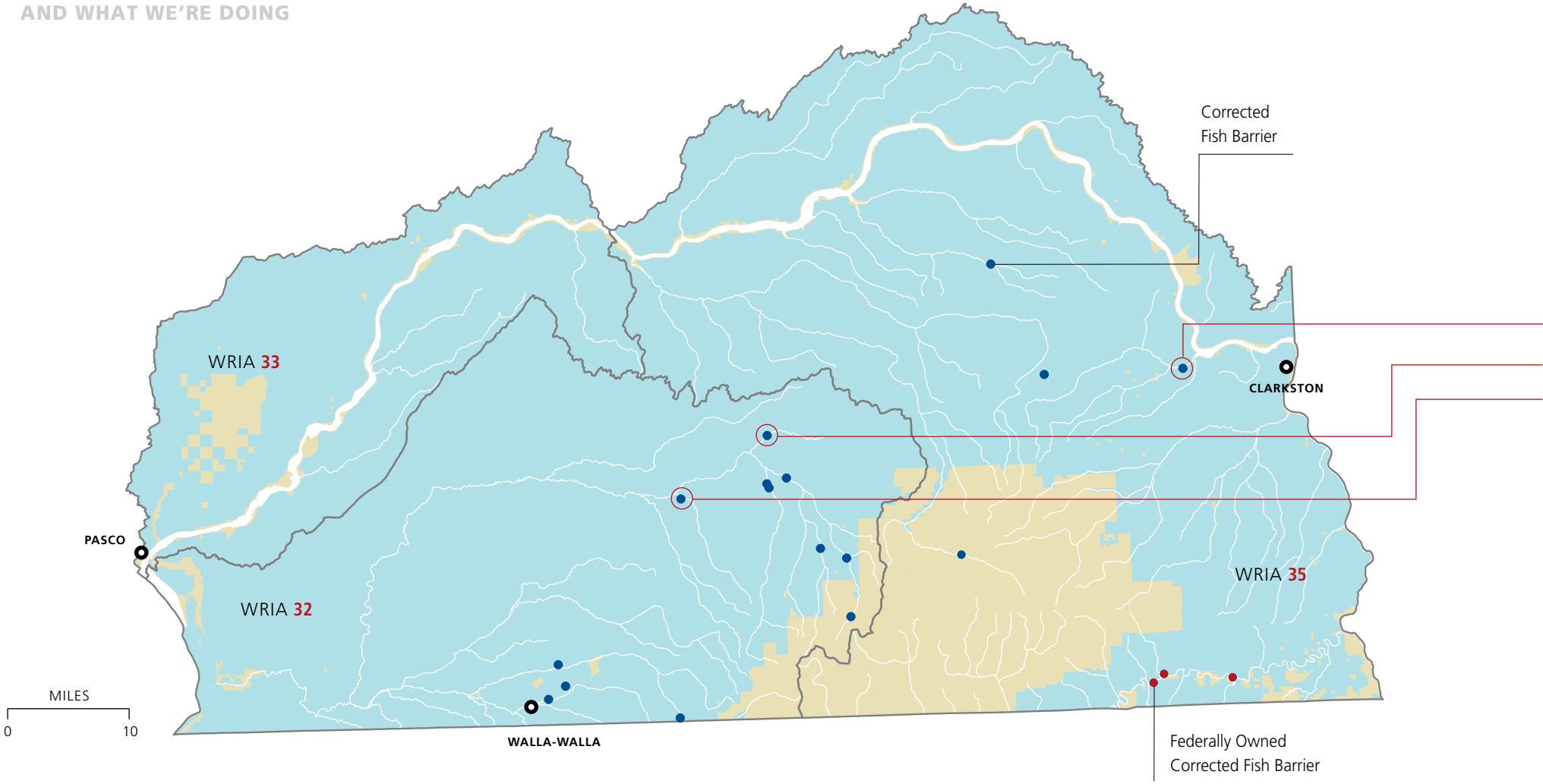
Snake River Wild Spring Chinook

- Composite spawner abundance and target goal from counts at Lower Granite dam.
- Target Goal from NOAA-Fisheries.



Barriers to Fish Passage

AND WHAT WE'RE DOING



Snake River Salmon Recovery Region

On our map
we have chosen to depict barriers independent from the habitat quality map because impaired access to streams is one of the more significant factors limiting salmon. We depict only blockages affecting anadromous fish, and do not show bull trout blockages. The effort to document locations of fish passage barriers repaired since 1999 was just initiated this year (2004), so some projects may not be displayed on this map. This map shows completed projects funded by the Salmon Recovery Funding Board, Washington Department of Transportation, Washington Department of Natural Resources, local governments, or US Forest Service that remove barriers for anadromous fish. We expect ongoing mapping efforts will continue to reveal projects.

- Corrected Fish Barrier
- US Forest Service Corrected Fish Barrier
- Federal Lands

DATA SOURCE:
WASHINGTON DEPARTMENT
OF FISH AND WILDLIFE, US FOREST SERVICE.

Wilson Banner Ranch Irrigation Dam
Migration problems for steelhead have been removed by constructing new water extraction devices for the ranch.

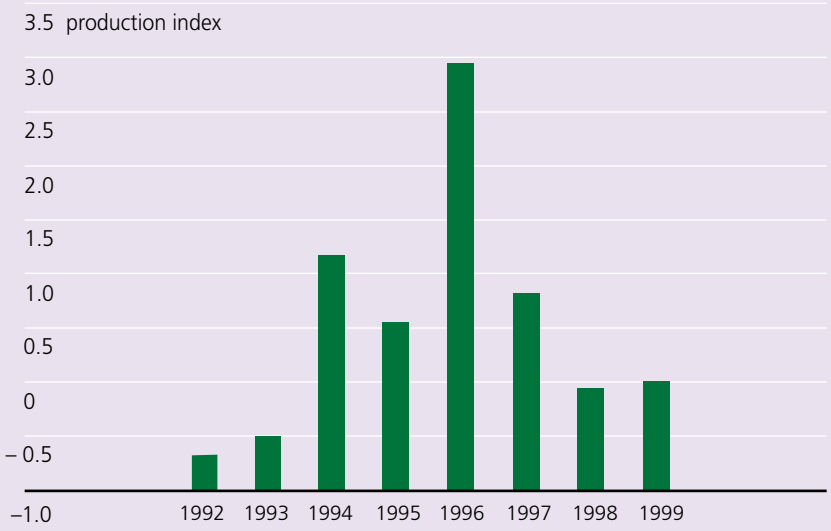
Patit Creek Barrier Removal
Patit Creek is home to steelhead trout. This project removed a dam that had blocked both adult upstream and juvenile downstream passage for the fish.

Whiskey Creek Restoration
Whiskey Creek is a tributary to the Touchet River and home to steelhead and bull trout. This project modified a barrier, placed instream woody debris for habitat, and opened up more than 10 miles of habitat for spawning and rearing.

Snake River Wild Steelhead

- Composite spawner abundance and target goal for 2 of 5 populations.
- Target Goal from NOAA-Fisheries.

Snake River Wild Steelhead Smolt Production Index



DATA SOURCE: CRAWFORD AND VOLKHARDT (2004)

Conclusions

ARTWORK: ANDREA BIDDLE, 8TH GRADE STUDENT FROM GIG HARBOR

The decline of wild salmon began over a hundred years ago. As the Pacific Northwest saw settlements by Euro-Americans, people changed the landscape by farming, logging, and developing land and water to support their growing population. Unfavorable natural conditions such as droughts and fires contributed additional stress.

1991 brought the first listings of salmon in Washington under the federal Endangered Species Act, and within eight years over 75% of the state had salmon populations listed. In 1998 the Legislature and Governor Locke undertook some aggressive programs and funding to address the causes of decline, and by 1999 projects were being implemented on the ground to tackle the problems. Fishing was reduced, and hatcheries were being evaluated to discover what they could do to contribute to solving the salmon crisis.

Today we have made some remarkable progress:

- We have returned more than 300,000 acre-feet of water to streams where salmon need it.
- We have removed more than 1,480 barriers and opened more than 1,600 miles of habitat to salmon for spawning.
- More than 64% of our fish hatcheries meet requirements of the ESA.
- More than half of the watersheds in our salmon recovery regions have a good index of water quality for the needs of salmon.
- We have funded more than 480 projects to restore and protect salmon habitat.

Because it takes salmon two or more years to grow, travel to the sea, and return to freshwater, we have limited information to judge the success of our efforts. It is just too early to tell if we are recovering fish for the long-term; for example, adult Chinook from areas that saw habitat improvement projects completed in 1999 have only been returning for one or two years. We know that more juveniles are surviving in freshwater habitat, and we know that we are removing barriers and opening significant amounts of habitat for spawning and rearing.

While we have made some significant progress, we have much left to do to recover these fish. The first salmon recovery plans are just being completed, and they will have many gaps. We must fill in the holes of our knowledge about the landscapes in which these fish spend their time, and how our actions can affect processes that change the habitat they rely upon. We must apply that information to developing and implementing the best practices possible to restore and protect the territory we share with these

> The food chain links us all. It starts with the salmon, but ends with us. Don't watch them all go down the drain. Swim, swim, swim... They feed us all, they feed the world. Our ecosystem won't be the same without them. Salmon are alive, keep it that way.
>
> —**LIZ KOSSMAN**, 12TH GRADE STUDENT FROM PUYALLUP

creatures. We must continue to change our hatchery practices to ensure we are complementing wild fish survival, not competing with it. We must allow sufficient numbers of fish to return to improved habitats to spawn, thus giving ourselves a margin of safety to protect against natural events over which we have no control. And, perhaps most importantly, we must monitor what we are doing, study the relationships between cause and effect, and use the information to make better choices about the future of salmon.

But, how will we know when salmon have recovered? What does salmon recovery look like?

The answer to that question likely depends on your viewpoint.

- If you are a salmon, recovery means you have access to sufficient cool, clean water and streambeds to create your nests, lay your eggs, and die in your native stream. Your young have quiet areas where they can feed and grow and prepare for the profound physical changes necessary to travel to the sea. At sea, the oceans will feed and sustain you until, as adults, your kind will repeat the cycle and return as your parents did to spawn in the streams of your birth.

- If you are a fisher, recovery means fishing seasons that promise a catch in your creel or the hold of your boat. It means you can pass on the joy of fishing to your children, along with the love of being outdoors and seeking that wily prize.

- If you are a landowner, recovery means you can grow crops, build and enjoy your home and community with the knowledge that you are not harming fish. You know that you are a good steward of the land, and your actions contribute to the continuing well-being of creatures that rely on the land and nearby waters.

- And, for the next generation to whom we pass this legacy, in the words of 19-year old Liz Kossman from Puyallup Washington:

"We all live downstream... Helping salmon helps ourselves. Food, water, life, air, earth, universe. The food chain links us all. It starts with the salmon, but ends with us. Don't watch them all go down the drain. Swim, swim, swim... They feed us all, they feed the world. Our ecosystem won't be the same without them. Salmon are alive, keep it that way."

ARTWORK DETAIL: TAMARA SLATER, 10TH GRADE STUDENT FROM ANACORTES

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