



TEN-YEAR REPORT

2008-2017



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

“Putting fish back in the rivers and restoring watersheds where fish live.”



Confederated Tribes of the Warm Springs
Indian Reservation of Oregon



OUR STRENGTH IS FROM THE FISH

The Yakama, Umatilla, Warm Springs, and Nez Perce tribes share a common understanding — that our very existence depends on the respectful enjoyment of the Columbia Basin’s vast land and water resources. We believe our very spirits are inextricably tied to the natural world and its many inhabitants. Among these, none are more important than the salmon enriching the basin’s rivers and streams. We have lived in the Columbia Basin since time immemorial and honor salmon as a staple of life and as a foundation of our culture, economy, and religion.



A First Salmon feast at the Celilo Longhouse circa 1940. Each year, the tribes celebrate the return of the salmon with feasts and thanksgiving prayers.

WORKING TOGETHER TO PROTECT SALMON

Our tribes are brought together by salmon and today we are unified in our efforts to save this sacred First Food along with our culture based on them. In 1995, we released our salmon recovery plan *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Spirit of the Salmon) which combines traditional and modern knowledge of salmon to form a “gravel-to-gravel” management approach to recovery. We implemented and advocated for the plan to save salmon throughout our ceded lands and usual and accustomed fishing locations. These ceded lands cover 84 percent of the present-day range of salmon above Bonneville Dam. The effects of our restoration and management activities extend well beyond our reservation boundaries, benefiting the region and its residents.

My strength is from the fish; my blood is from the fish, from the roots and berries. The fish and game are the essence of my life.

—Chief Weninock, Yakama, 1915

Over the next twenty years, the tribes proved their skill in effective salmon restoration, playing a significant role in reversing the decline of fish runs throughout the Columbia Basin. Several federal agencies including the Bonneville Power Administration recognized this expertise and funded many of the tribal projects. During this same period, the tribes and federal agencies continued to clash over the effect of dam operations on migrating salmon. A cloud of uncertainty hung over

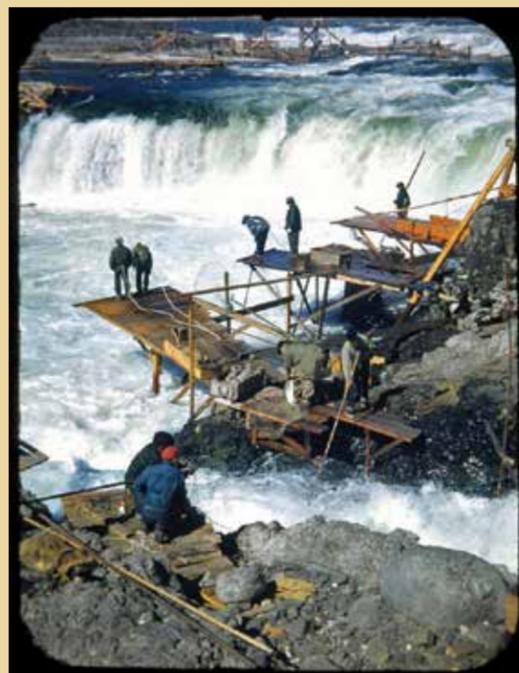
all the parties as to what each new year would bring.

In 2008, a number of tribal, state, and federal partners entered into the Columbia Basin Fish Accords in an effort to bring certainty and stability to fish and wildlife mitigation and hydro operations. This publication is a summary of what the three lower Columbia River tribes have accomplished over the decade-long Accords period.

CELILO FALLS

For millennia, people caught chinook and other fish that struggled upstream through the tumbling waters and swift, narrow channels of Wy-am or Celilo Falls. What was the site of one of the largest salmon fisheries in the world now lies buried beneath the waters behind The Dalles Dam.

The ancient ones left a record of their lives in the ashes of campfires and buried sanctuaries of their dead here. They left tools and weapons, items of adornment, and samples of their art. Their record of habitation proves Wy-am to be one of the longest occupied sites on the continent.



YAKAMA

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION

- Headquarters: **Toppenish, Wash.**
- Tribal enrollment: **10,741**
- Reservation: **1.2 million acres**
- Ceded territory: **11.9 million acres (7.2% of Columbia Basin)**
- Total population within ceded area: **610,699***
- Salmon-accessible river length in ceded area: **2,035 miles (13% of above-Bonneville Dam total)**

UMATILLA

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

- Headquarters: **Mission, Oregon**
- Tribal enrollment: **2,900**
- Reservation: **172,000 acres**
- Ceded territory: **6.6 million acres (4% of Columbia Basin)**
- Total population within ceded area: **333,816***
- Salmon-accessible river length in ceded area: **2,355 miles (15% of above-Bonneville Dam total)**

WARM SPRINGS

CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON

- Headquarters: **Warm Springs, Ore.**
- Tribal enrollment: **5,216**
- Reservation: **640,000 acres**
- Ceded territory: **10.7 million acres (6.4% of Columbia Basin)**
- Total population within ceded area: **241,635***
- Salmon-accessible river length in ceded area: **3,592 miles (24% of above-Bonneville Dam total)**

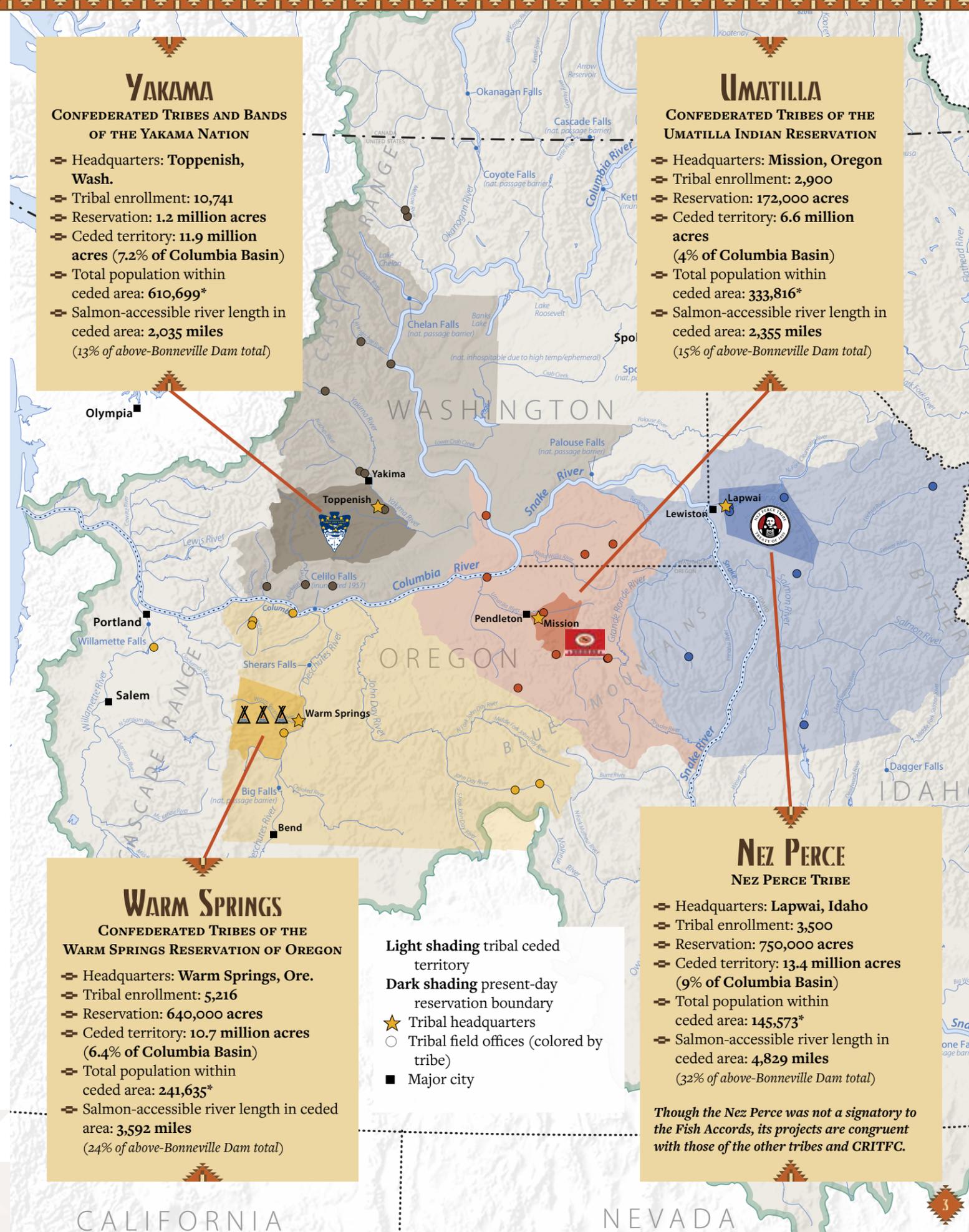
- Light shading tribal ceded territory
- Dark shading present-day reservation boundary
- ★ Tribal headquarters
- Tribal field offices (colored by tribe)
- Major city

NEZ PERCE

NEZ PERCE TRIBE

- Headquarters: **Lapwai, Idaho**
- Tribal enrollment: **3,500**
- Reservation: **750,000 acres**
- Ceded territory: **13.4 million acres (9% of Columbia Basin)**
- Total population within ceded area: **145,573***
- Salmon-accessible river length in ceded area: **4,829 miles (32% of above-Bonneville Dam total)**

Though the Nez Perce was not a signatory to the Fish Accords, its projects are congruent with those of the other tribes and CRITFC.



*2010 United States census

ADAPT, PROTECT, RESTORE

AGE OF PARTNERSHIP

In 2008, the Umatilla, Warm Springs, and Yakama tribes (referred to as the lower river tribes or LRT), Columbia River Inter-Tribal Fish Commission* Bonneville Power Administration, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation signed the Columbia Basin Fish Accords. The partnership they forged ushered in a new era of regional salmon restoration and financial predictability. The Accords provided secure funding for long-term habitat restoration and fish survival and passage improvement projects at the dams. These projects furthered the tribes' *Wy-Kan-Ush-Mi Wa-Kish-Wit* vision to maintain and enhance salmon populations for future generations. The increase and security in stable funding that the Accords provided allowed the tribes to implement more complex and larger projects not possible

COLUMBIA BASIN FISH ACCORDS SIGNING



Representatives from the Umatilla, Warm Springs, and Yakama tribes, CRITFC, Bonneville Power Administration, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation gathered near the *Tsagaglatal* (She Who Watches) petroglyph to sign the Columbia Basin Fish Accords.

under the previous funding methods. The BPA gained a ten-year period of certainty for hydropower generation during which the tribes agreed to not litigate for additional fish protection at the dams or the breaching of the Snake River dams. By working together, the parties shifted

their relationships from adversarial to one based on negotiation and collaboration and the region and salmon benefited as a result.

**Although the Nez Perce Tribe was not a signatory to the agreement, its projects are congruent with those of the other tribes and CRITFC.*

ADAPTIVE MANAGEMENT

Adaptive management is a real-time decision-making process that not only meets current resource management objectives, but also gathers information needed to improve future management and learn more about the system being managed.¹ Adaptive management, coupled with the holistic "gravel-to-gravel" philosophy espoused in the tribe's salmon recovery plan, have guided the development of the tribal projects funded by the Accords. The projects fall into six categories: **Habitat Restoration and Protection; Propagation (Hatchery); Lamprey and Sturgeon; Planning and Coordination; Predator and Invasive Species Control; and Research, Monitoring, and Evaluation.**

Habitat

On-the-ground projects that restore or protect vital ecosystems upon which salmon and other species depend.

Propagation

Construct or modify hatcheries or devise and evaluate fish propagation strategies to maximize conservation and harvest opportunities and direct mitigation efforts for hydrosystem-related fish losses.

Lamprey & Sturgeon

Seek to halt Columbia Basin lamprey and sturgeon decline with the long-term goal of restoration to levels supportive of their unique cultural and ecosystem values.

Planning & Coordination

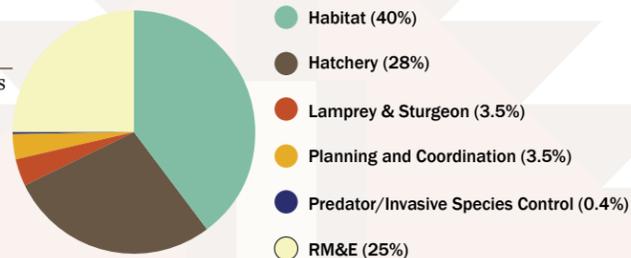
Ensure measures and projects are implemented in a cost-effective and informed manner and are integrated with and complement existing regional management programs, foster partnerships, recast the public perception of salmon protection and restoration, and promote a greater understanding of and interest in salmon and healthy rivers.

Predator & Invasive Species Control

Conduct efforts to reduce impacts of pinniped and avian predation on salmonids.

Research, Monitoring, & Evaluation

Improve the understanding of Columbia Basin salmon stocks and their environment, monitor stock abundance, assess impacts on individual stocks as they migrate through the system, evaluate the accuracy of escapement estimates, aid our understanding of catch composition, and provide tribal fishing regulation enforcement for responsible fisheries management.



SALMON RETURNS AND HARVEST

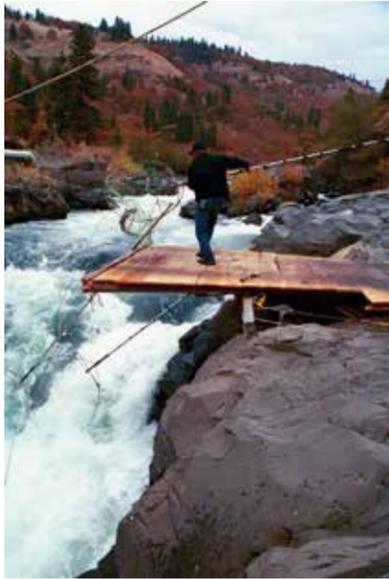
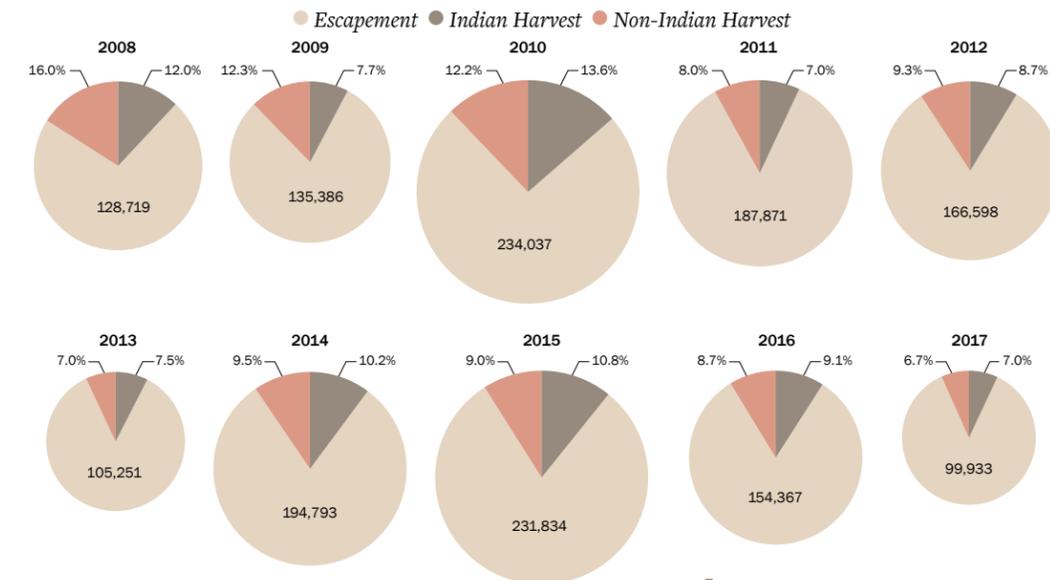
Indian fishers are legally entitled to half the harvestable surplus of fish in the Columbia River. Indian fishing is regulated under the ongoing U.S. District Court litigation known as *U.S. v. Oregon*. The 2008-2017 *U.S. v. Oregon* Management Agreement adopted an abundance-based or "sliding scale" harvest management approach so that

when returns were larger, a larger percentage of the run was harvested and fishing was restricted when returns were smaller.

As an example, the charts below show the relative size of the returning spring chinook run and the allocation of mainstem harvest in recent years.

Columbia River Upriver Spring Chinook Run Sizes and Mainstem Harvest Percentage

Diameter of each graph reflects the size of the year's total upriver run of spring chinook.



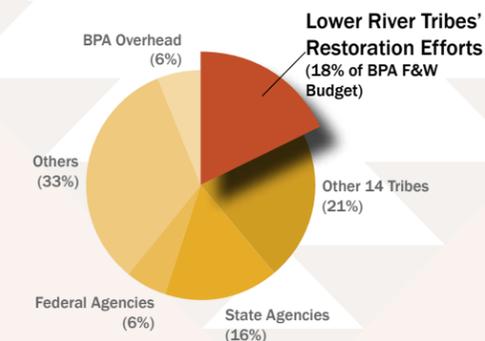
Yakama tribal member Leonard Dave fishes from a scaffold on the Klickitat River.

FISH & WILDLIFE SPENDING

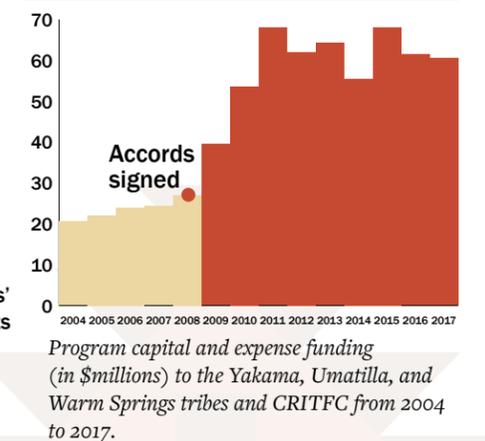
During the term of the Fish Accords, BPA spent an average of \$487 million annually for all fish and wildlife actions. BPA funds projects consistent with the Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program. Additionally, BPA reimburses the federal Treasury for expenditures by USACE, Bureau of Reclamation, and U.S. Fish and Wildlife Service for investments in fish passage and fish production, including funding operations and maintenance expenses of federal fish hatcheries. BPA makes payments on amortized capital investments for fish and wildlife, purchases power for fish operations, and calculates foregone revenue due to fish operations. BPA receives a credit from the federal Treasury for obligations of the other federal agencies that operate the federal Columbia River power system (FCRPS) dams for purposes other than hydropower (i.e. flood control, navigation, irrigation, recreation).

Consistent with the Northwest Power Act, each year BPA expended around \$261 million to support the NPCC Fish and Wildlife Program. BPA contracts with state and federal agencies, tribes, universities, local groups, and other private and non-profit organizations to implement the NPCC's Fish and Wildlife Program.

Fish & Wildlife Program Budget (2008-2017)



Lower River Tribes Accord Funding (2004-2017)



(Source: Northwest Power and Conservation Council 2016 Columbia River Basin Fish and Wildlife Program Costs Report: 16th Annual report to the Northwest governors. NPCC 2017-2. May 10, 2017.)

¹Holling, C.S. (1978). *Adaptive Environmental Assessment and Management*. John Wiley & Sons.

FISH STATUS & TRENDS

The status of anadromous fish in the Columbia Basin is determined by a myriad of variables such as habitat and water quality, ocean conditions, and passage accessibility. Restoration efforts to undo the damage to the fish runs will take considerable time and effort. The projects made possible by the Fish Accords are just one part of this regional effort. While ten years is too early to determine long-term trends, the stock information presented here gives a current snapshot of how the fish runs are doing.

CHINOOK SALMON ABOVE BONNEVILLE

In the Interior Columbia Basin above Bonneville Dam there are remnants of eight evolutionarily significant units and distinct population segments of Pacific salmon and steelhead listed as threatened or endangered under the Endangered Species Act (ESA). The ESA requires that the National Marine Fisheries Service review the status of listed species under its authority at least every five years and determine whether any species should be removed from the list or have a change in listing status. The most recent review occurred in 2015. At that time, most of the listed stocks were doing well for various reasons including a cycle of favorable ocean conditions. There are some indications that the Accords habitat actions, required spill operations at the dams, and improved hatchery operations contributed to the recent success in abundance and productivity improvements. However, none of the listed populations are doing well enough to be removed from the endangered species list.

There are also several non-listed salmon populations in the Columbia River above Bonneville Dam that support tribal



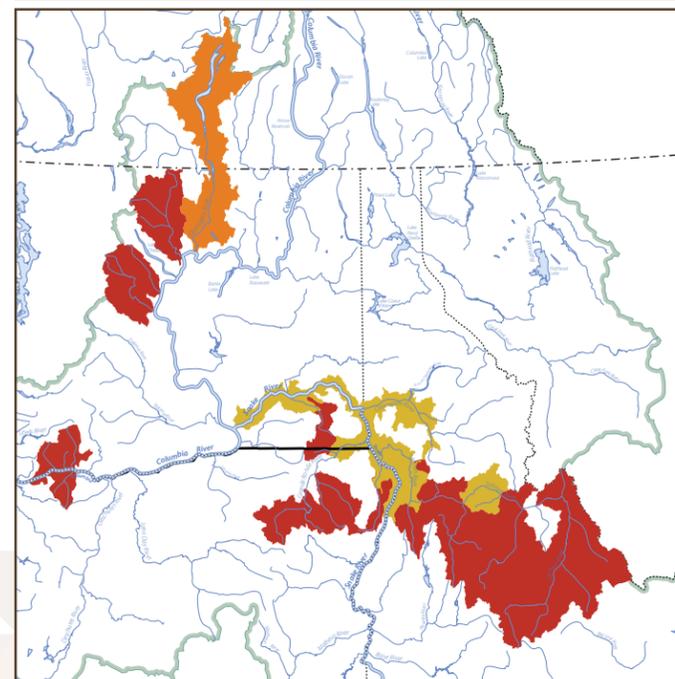
ceremonial, subsistence, and commercial fisheries. These stocks were reviewed and did not merit listing under the ESA. Salmon and steelhead returns are inherently cyclical. While most runs declined in the past three years, this is assumed to be largely due to unfavorable conditions in the ocean compounded with poor in-river conditions in 2015.

Columbia River mouth run sizes for natural-origin **Snake River spring/summer chinook** averaged just under 28,000 per year for the last 10 years, which is very similar to the average return over the previous 10 years.

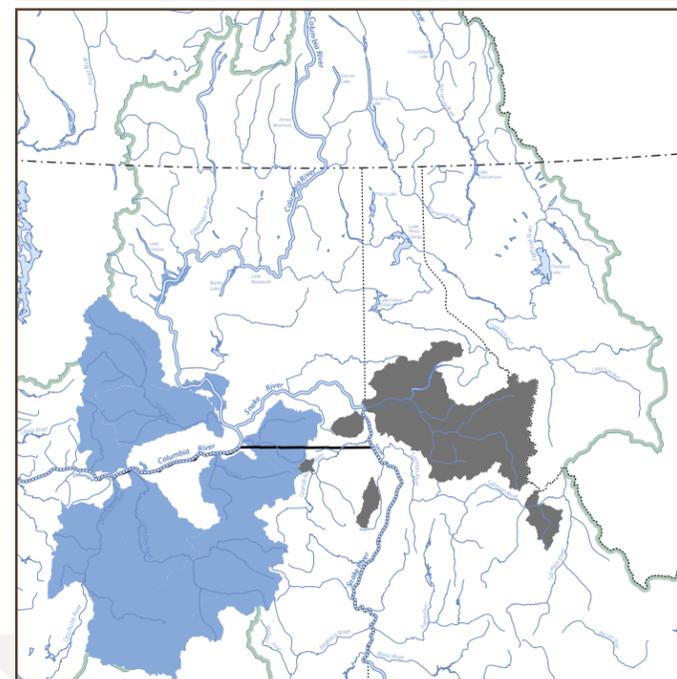
Columbia River mouth run sizes for natural-origin **upper Columbia spring chinook** averaged just under 4,000 per year for the last 10 years, which is almost double the average over the 10 years prior.

The Columbia River mouth run size for natural-origin **Snake River fall chinook** averaged over 18,000 per year from 2008-2017, which is more than double the average of 7,200 for the ten years prior.

ESA-listed Chinook above Bonneville



Non-ESA-listed Chinook above Bonneville



- High-risk population
- Moderate, maintained population
- Highly viable population
- Reintroduced population
- Non-listed population
- Extirpated population

COHO & SOCKEYE STATUS

Sockeye

Although Columbia Basin sockeye salmon declined substantially from their historic levels, 2014 saw the largest return to the Columbia River since the construction of Bonneville Dam with over 645,000 passing the dam. These fish originate from the Okanagan River in British Columbia, Wenatchee River in Washington, and the Snake River in Idaho. About 85 percent return to the Okanagan. While the Okanagan and Wenatchee stocks are considered healthy populations, the Snake River stock was federally-listed as endangered in 1991. The Snake River run, a mix of hatchery and natural-origin fish, averaged over 1,400 a year from 2008-2017 which is a significant improvement over the average of 78 per year for the 10 years prior. Sockeye are

being reintroduced in the Yakima River in Washington and the Deschutes River in Oregon.

Coho

Coho salmon were declared extirpated in the mid- and upper Columbia River above McNary Dam in the 1990s. The CRITFC tribes successfully reintroduced coho into a number of rivers and streams. Returns above Bonneville Dam averaged over 117,000 per year from 2008-2017. This is above the average return for the 10 years prior. These counts are a combination of hatchery and natural-origin fish.



LAMPREY STATUS

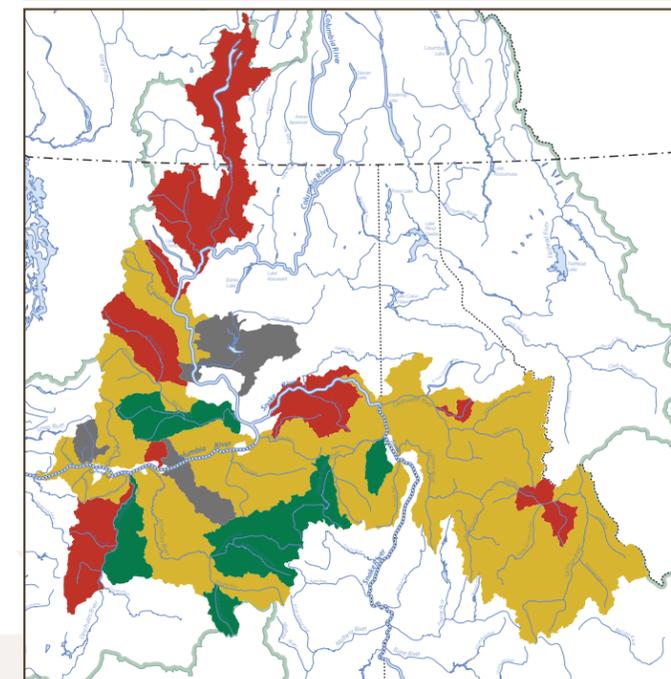
Today, Pacific lamprey return to the Columbia Basin at a fraction of their historical numbers. Daytime counts of adult Pacific lamprey at Bonneville Dam declined from an estimated 400,000 in the 1960s and 1970s to lows of under 10,000 in 2009 and 2010. Daytime counts at Bonneville Dam increased steadily from 2011 through 2017, but still remain below historic levels. At Willamette Falls, a traditional harvest location on the Willamette River, estimates of commercial harvest declined

from about 375,000 adults in the 1940s to about 11,000 in 2001 when the commercial harvest ended. More recently, adult abundance estimates from 2010-2017 at Willamette Falls ranged from 64,388 to 336,305 adults. Regional lamprey restoration efforts, including efforts under the Accords, aim to improve their migration corridor so that a higher percentage of adults are able to migrate successfully throughout their range.



STEELHEAD ABOVE BONNEVILLE

ESA-listed Steelhead above Bonneville



Summer steelhead are counted at Bonneville from April 1 through October 31. Winter steelhead are counted from November 1 through March 31. A- and B-Index steelhead which comprise most of the steelhead destined for upstream of The Dalles Dam are counted from July 1 through October 31. These fish have an extended migration and do not spawn until the late winter and early spring of the following year. Natural-origin run sizes generally increased since low run years in the mid-1990s, but remain cyclical. Average run sizes from 1984-2007 were 67,645. The average since 2008 is 95,105. Low returns in 2016 and 2017 are generally associated with poor ocean conditions since 2015. Efforts to improve conditions for steelhead through the Accords helped build resilience especially through the use of the kelt reconditioning program (see project description on page 16). Improved resilience provided by Accords funded kelt reconditioning should allow natural-origin steelhead to improve much more rapidly as ocean conditions improve.

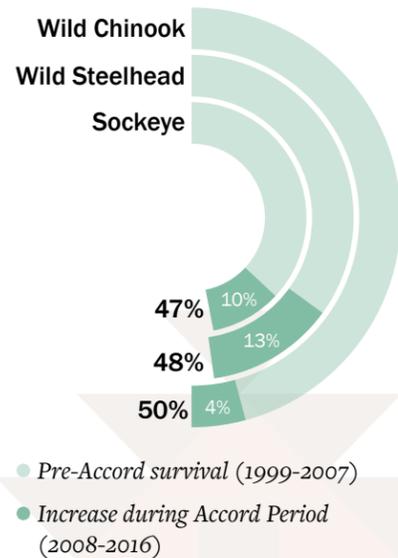
Information derived from Northwest Fisheries Science Center. 2015. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest.

- ➔ **\$2.7 billion** 2008-2017 BPA Foregone Revenues and Power Purchases*
- ➔ **\$1.7 billion** 2008-2016 USACE Columbia River Fish Mitigation (CRFM) Program

HYDROPOWER OPERATIONS

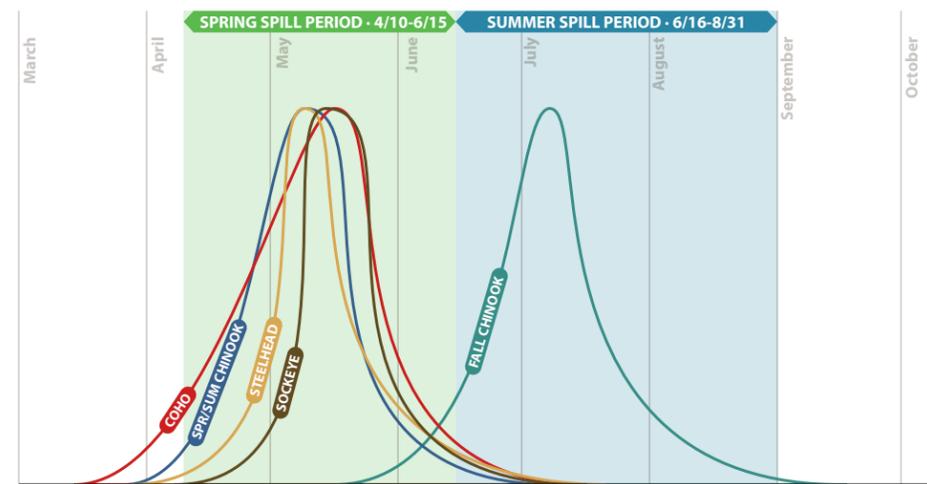
The construction and operation of hydroelectric dams in the Columbia Basin significantly impacted fish and wildlife populations and forever changed the Columbia River ecosystem. Without mitigation for losses, the dams jeopardize the existence of the tribes' treaty trust natural resources. As a result, the BPA, USACE, and U.S. Bureau of Reclamation are taking actions to improve dam facilities for fish passage and modify dam operations to support increased upstream and downstream survival of anadromous fish.

Average Annual Juvenile Survival for Snake River Stocks from Lower Granite to Bonneville



James R. Faulkner et al. 2017. *Survival Estimates for the Passage of Spring-Migrating Juvenile Salmonids through Snake and Columbia River Dams and Reservoirs, 2016. Report of research for Bonneville Power Administration, Contract 40735, Project 199302900.*

Smolt Passage Timing at Bonneville Dam



Graph shows generalized peak of each species' outmigration.

SPILL

Spill is considered the safest and most preferred route past the dams. To increase survival, spill has been mandated by court order and guaranteed through the Accords to occur during the juvenile outmigration period from April 10 through August 31 at most of the federal Columbia Basin dams. The tribes continue to seek improved spill regimes during juvenile outmigration periods.

TRAVEL TIME/SURFACE VELOCITY

River flows, along with configuration and operations at dams, are critical elements that influence how quickly juvenile fish migrate to the ocean. Reducing travel time with increased flow improves survival by reducing exposure to predators, warm water, and other stressors. The average travel time has been significantly reduced due to surface spill measures.

FISH PASSAGE CENTER

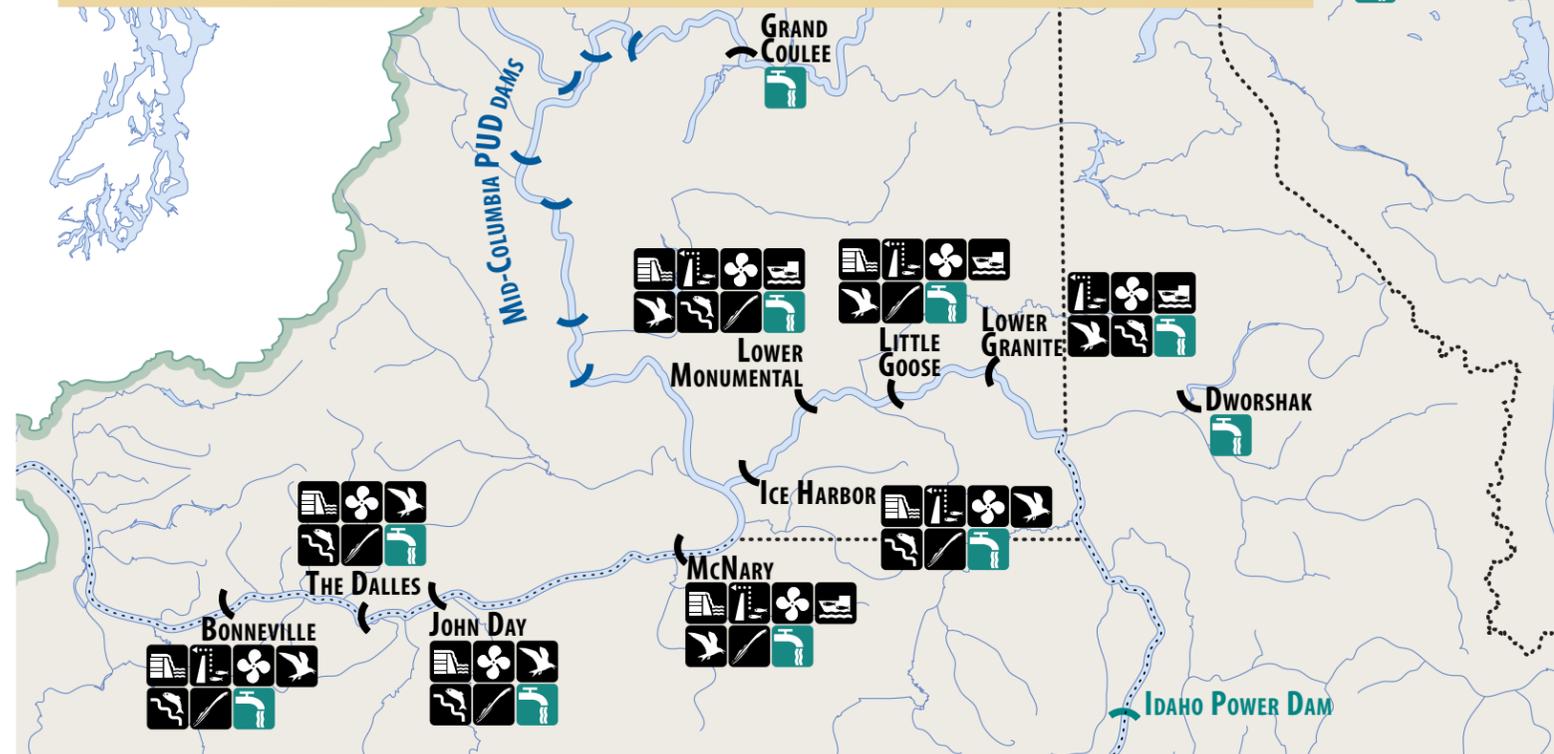
The Fish Accords secured funding for the Fish Passage Center, Smolt Monitoring Project, and Comparative Smolt Survival Study. These projects provide critical information necessary to guide day to day river operations, evaluate fish benefits and survival through the hydro-power system, and develop alternative operation scenarios for discussion in hydrosystem operations coordinating groups.

*The total BPA Power Purchases and Foregone Revenue does not reflect a credit of \$823.5 million from the federal Treasury related to fish and wildlife costs in 2008-2016 that Bonneville is required to take under Section 4(h)(10)(C) of the Northwest Power Act. The annual credit reduces BPA's costs for fish and wildlife by 22.3%.

Information for this section of the report adapted with permission from the Yakama Nation Status and Trend Annual Report project available at: yakamafish-nsn.gov/restore/projects/star

THE DALLES SPILLWAY WALL

Approximately 80 percent of the juvenile salmon and steelhead that migrate past The Dalles Dam pass over the spillway. Concentrations of predatory fish and birds in the tailrace severely limited juvenile survival in this area. In 2010, the USACE built a \$51 million guidance wall extending 850 feet downstream from the spillway, guiding juvenile fish into the deepest, fastest, and safest water below the dam and away from predators. With the spillway wall in place, 96 percent of tagged yearling chinook successfully passed The Dalles Dam, a four-percent increase compared to studies in 2004 and 2005. While displacing several tribal fishers, this project achieved the largest increase in survival of any of the hydrosystem improvements implemented during the term of the Accords.



COLUMBIA RIVER FISH MITIGATION PROGRAM EFFORTS

Major improvements to fish passage structures at hydroelectric dams in the Columbia Basin led to improved survival of juvenile salmon and steelhead. Since 2001, the U.S. Army Corps of Engineers spent significant funding to study and improve juvenile fish passage and survival through federal Columbia River hydroelectric dams.



Surface Passage Improvements

Installation of surface passage structures (e.g. spillway weirs) and modified spill operations to improve juvenile survival.



Fish Screens & Turbine Bypass Improvements

Installation and maintenance of fish screens that divert fish away from turbines and into improved fish bypass system.



Turbine Survival Upgrades

Improved turbines and turbine operations that reduce harm to fish.



Juvenile Fish Transportation

Barges and trucks to transport fish past the dams.



Predator Control Structure

Predator control mgmt. (e.g. Sea Lion Exclusion Devices at Bonneville and bird wires and hazing at all mainstem dams.)



Adult Passage Improvements

Modification and maintenance of adult fish ladders and dam operations to improve adult fish passage.



Lamprey Passage Improvements

Initial modifications for improved lamprey passage.



Flow Augmentation and Spill (BPA operation)

Flow augmentation (spring-summer operations including spill to speed juvenile migrations and improve survival.)



40% of Accords funding
\$224 million from 2008-17

HABITAT PROJECTS

Over one-third of the lower river tribes' Accords funding went to watershed restoration efforts. The certainty of funding allowed the tribes to leverage millions of dollars from additional sources including the Pacific Coastal Salmon Recovery Fund and other federal, state, tribal, public utility district and private foundations. Overcoming 150 years of development and land-use impacts, watershed restoration in the Columbia Basin remains a giant work-in-progress.

The goal for these projects is watershed-scale habitat restoration to increase egg-to-smolt survival of naturally-spawning salmon and steelhead and to help restore these populations to levels where ESA viability criteria or *Wy-Kan-Ush-Mi Wa-Kish-Wit* goals and objectives are met. Depending on the scope of damage, active habitat restoration is performed at scales ranging from repair of specific stretches of stream channels to broader work on a waterway's riparian zone, floodplain, or its entire watershed.

CRITFC and others estimate that hundreds of millions more dollars are needed annually for Columbia Basin watershed restoration, land protections, elimination of passage barriers, instream flows, water quality, program operations, monitoring, outreach and education, and regulatory actions. Additional restoration funding is needed to offset rapidly occurring impacts from both climate change and continuing human development which threaten to undo gains already made.

The Great Spirit, in placing men on the earth, desired them to take good care of the ground and to do each other no harm.
—Young Chief, Cayuse, 1855

BY THE NUMBERS

Over the past ten years, the tribes used Columbia Basin Fish Accords funding to achieve some major accomplishments in protecting the ecosystems that support healthy salmon populations. 14,586 in-stream actions and 404 out-of-stream actions resulted in:

37.3 BILLION GALLONS
water protected and conserved each year
(114,542 acre-feet)

7,236 MILES
stream protected or improved

968,621 ACRES OF HABITAT
protected, treated, or maintained
(an area the size of Rhode Island)

10.5 MILES
dikes modified or removed

662 MILES
road or trail improved
or decommissioned

192 MILES
fence installed

81,705 LBS.
trash collected

31 FISH SCREENS
installed or modernized

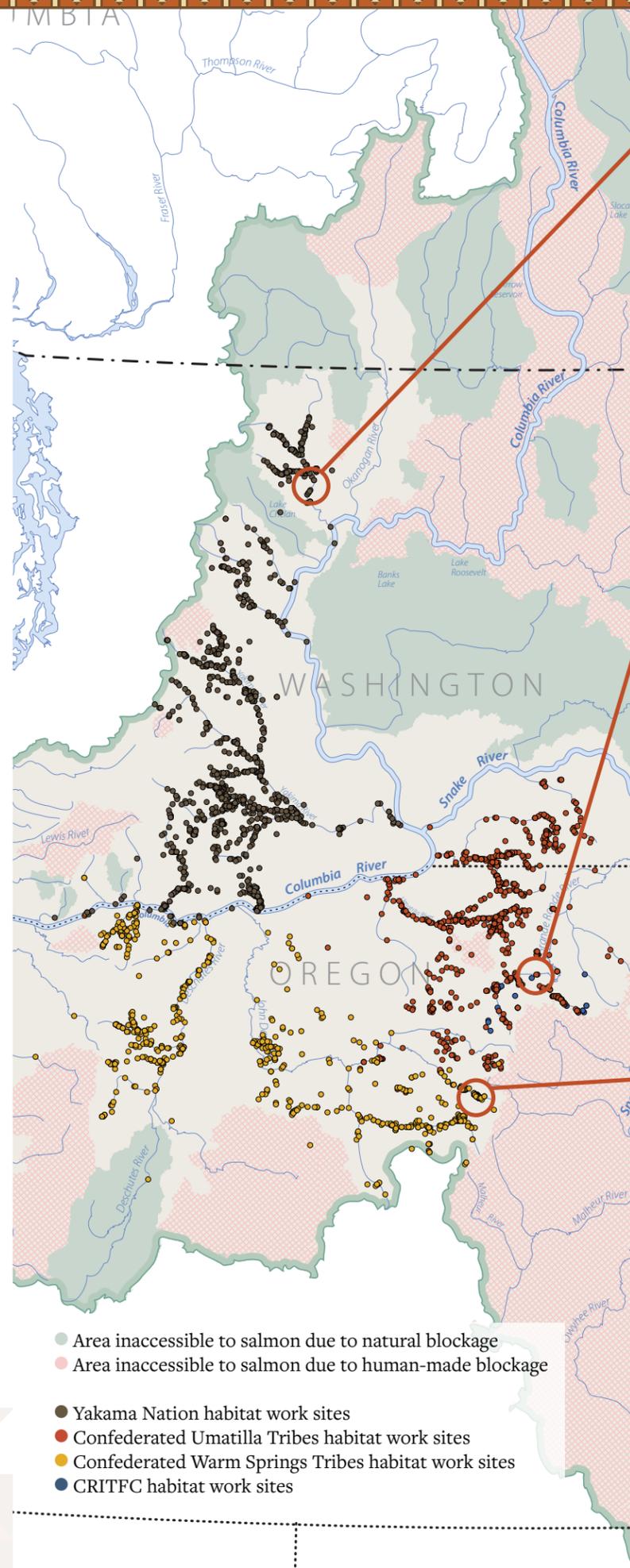
397 BARRIERS
improved or removed



161 BEAVERS RELEASED
Encouraging beavers to build dams and create ponds is an affordable, effective, and sustainable habitat restoration technique.

4,195 JOBS CREATED*

*Habitat restoration projects created, on average, 17 jobs per million dollars spent which is much higher than extractive industries. In addition, habitat restoration has longer-term economic benefits, including future job creation in rebuilt fisheries and tourism, and benefits to local economies with higher property values and better water quality. Reference: P.E.T. Edwards, A.E. Sutton-Grier and G.E. Coyle. 2013. Investing in nature: Restoring coastal habitat blue infrastructure and green job creation. *Marine Policy* 38 (2013) 65-71.



UNDOING PAST DAMAGE

1890s Side Channel Restoration

This salmon habitat project was the first in the Upper Columbia region to restore side channel habitat using a groundwater infiltration gallery system. A long conveyance pipe captures a natural spring near the Methow River and delivers it to a ¾-mile-long perennial spring creek bed in the old 1890s river channel. The project created habitat complexity through the spring creek channel and restored riparian/wetland conditions to an area previously confined behind a levee.



Southern Cross Conservation Property

In 2015, CTUIR purchased the Southern Cross Ranch near Union, Oregon as part of a broader stream restoration effort on Catherine Creek in the Grande Ronde Basin. The CTUIR River Vision concept of providing sustainable First Foods through dynamic river systems was applied to the project. The results transformed a channelized reach into a connected, sinuous floodplain. Today, adult and juvenile Snake River ESA-listed chinook and steelhead are found in the restored stream and chinook spawn here. The CTUIR received a Stream Project Award from the Oregon State Land Board for the project.



Middle Fork John Day River Oxbow Project

The John Day Basin is the only remaining major Columbia River tributary that has not been dammed or stocked with hatchery fish. A restoration highlight is the Warm Springs Tribe's Oxbow Project, where the tribe purchased property and reconstructed a one-mile reach of the Middle Fork John Day River that had been straightened and confined by extensive mine tailings. The project reconnected tributaries flowing from the Malheur National Forest to the river and restored access to cold-water rearing sites for bull trout, chinook salmon, and steelhead. The Warm Springs Tribe received a US Forest Service Rise to the Future Award for the project.



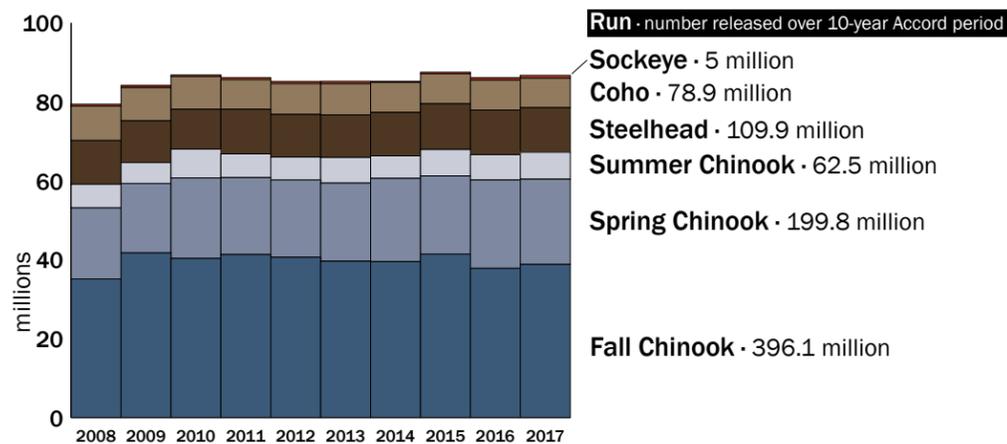


28% of Accords funding
\$157 million from 2008-17

PROPAGATION

Columbia Basin salmon runs are heavily supported by hatchery programs to mitigate for lost production associated with the hydrosystem. Most hatcheries upstream of Bonneville Dam fulfill this role, supporting fisheries throughout the basin. As outlined in *Wy-Kan-Ush-Mi Wa-Kish-Wit*, the tribes also use hatcheries to help rebuild natural populations through supplementation. Abundance levels of natural populations throughout the interior basin are too depressed to support significant harvest and, in many cases, are so low that the long-term sustainability of the populations are threatened. Unlike conventional programs, supplementation uses adults captured in-river for broodstock, including a portion that are natural-origin. The progeny are reared in the hatchery and released at natural spawning areas where they will return as adults to spawn. A web of funding sources and the complexity of programs makes it difficult to tease out the specific Accords propagation efforts from the overall effort. The chart above shows total Columbia Basin releases from all tribal, state, and federal fish hatcheries regardless of funding source.

Total Columbia Basin Hatchery Releases Above Bonneville from 2008-2017*



TRIBAL PROGRAM HIGHLIGHTS

HOOD RIVER PRODUCTION PROGRAM

A joint effort of the Warm Springs Tribe and Oregon Department of Fish and Wildlife, the Hood River Production Program provides sustainable tribal and non-tribal harvest of spring chinook and winter steelhead while re-building wild summer and winter steelhead, coho and fall chinook salmon runs through habitat enhancement and protection, and harvest management. Broodstock are collected in the West and East forks of Hood River. Spring chinook are reared primarily in-basin at the tribally operated Parkdale Fish Hatchery¹ while winter steelhead are reared at the ODFW operated Oak Springs Hatchery². Spring chinook are acclimated and released into the West Fork Hood River and winter steelhead in the East Fork Hood River.

UMATILLA RIVER

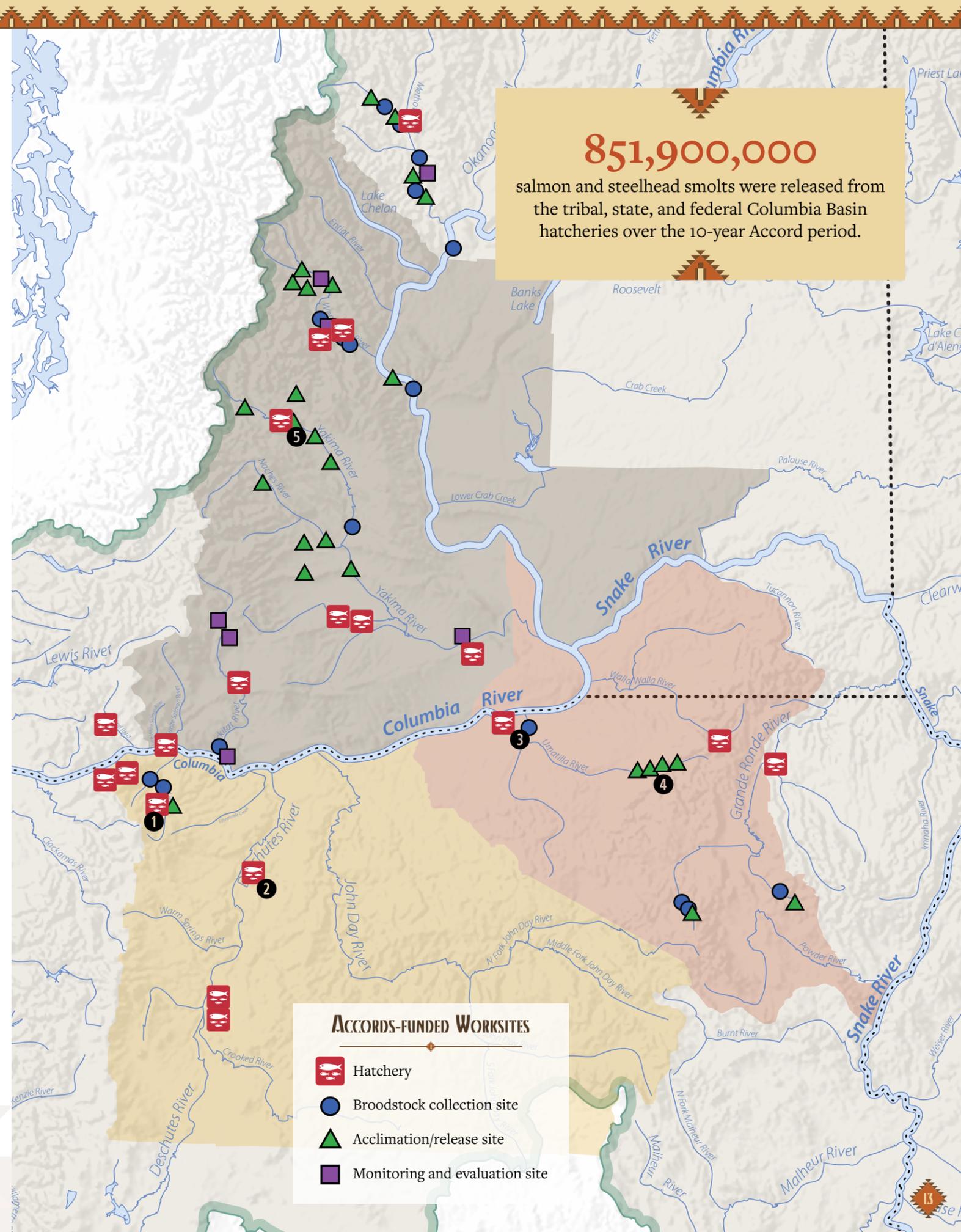
The Umatilla River hatchery program combines harvest and conservation efforts to mitigate the loss of fish due to habitat degradation and the hydropower system. The program also works to restore fish populations into areas where runs were extirpated. The program consists of the Umatilla Hatchery³ for fish production and satellite facilities⁴ for adult holding and spawning as well as juvenile acclimation and release.



YAKIMA KLICKITAT FISHERIES PROJECT

The Yakima Klickitat Fisheries Project was established to restore sustainable and harvestable populations of salmon, steelhead, and other at-risk species in the Yakima and Klickitat subbasins. The project is evaluating all stocks historically present and, using principles of adaptive management, applying a combination of habitat protection, habitat restoration, and hatchery supplementation or reintroduction strategies. The Cle Elum Hatchery⁵ integrates its operations with natural fish production to boost wild fish numbers through supplementation techniques and to evaluate the program's long-term success.

Unloading juvenile spring chinook at a Umatilla Hatchery satellite facility.



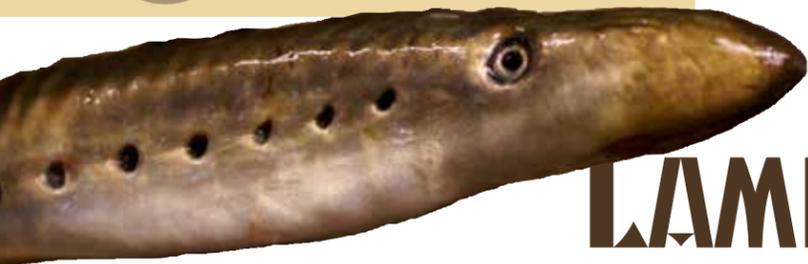
851,900,000
salmon and steelhead smolts were released from the tribal, state, and federal Columbia Basin hatcheries over the 10-year Accord period.

ACCORDS-FUNDED WORKSITES

- Hatchery
- Broodstock collection site
- Acclimation/release site
- Monitoring and evaluation site



- 3.5% of Accords funding
- \$19.5 million from 2008-17
- \$47.8 million 2008-16 CRFM capital improvements at the dams



LAMPREY

FORGOTTEN FISH

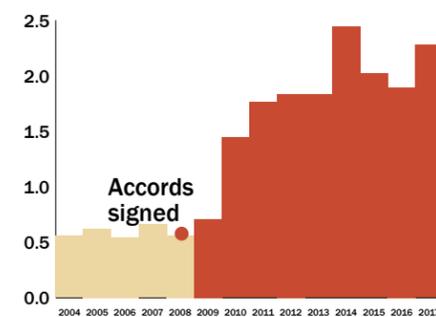
For thousands of years, the Pacific lamprey provided an important source of food for the tribes of the Columbia Basin, who prized them for their rich, fatty meat. They are served alongside salmon at tribal feasts and celebrations. The tribes maintained their connection to this ancient fish as the numbers of returning lamprey declined throughout the Columbia Basin. This decline was met with significant alarm from the tribes, who consider them a sacred fish.

Thanks to tribal efforts, the plight of this little-understood and maligned fish is beginning to be addressed, not only in public perception, but also in a better understanding of their life history, a translocation program, habitat restoration projects, and capital improvements in the hydrosystem.

Since the fish is not listed under the Endangered Species Act and does not enjoy the political support of the more economically important salmon, the tribes struggled to obtain funding for restoration work and dam improvements for lamprey. This changed with the Accords, which formalized funding and dam passage improvements for lamprey.

During the Accords period, the tribes developed best management practices and protocols for the artificial propagation of Pacific lamprey; contributed to a better understanding of adult, larval, and juvenile passage issues and solutions in various subbasins; assessed larval/juvenile entrainment issues; completed extensive status, trend, and exploratory surveys for lamprey; collected extensive genetics information on Pacific lamprey and *Lampetra* species; developed and enhanced larval lamprey identification guides and tagging methods; established strong outreach and education programs; worked to reestablish lamprey in

ceded area tributaries through adult translocation; monitored the increased distribution of larval lamprey and out-migration of juvenile lamprey; provided abundance and escapement estimates at Willamette Falls (Willamette River) and Sherars Falls (Deschutes River); developed an improved baseline for water quality and contaminant accumulation in lamprey; improved local and regional perceptions of Pacific lamprey; and provided leadership in the development and implementation of alternative forms of restoration (e.g. translocation and artificial propagation).



BPA and federal lamprey project funding (in \$millions) from 2004 to 2017.

LAMPREY FUNDING THROUGH USACE

Under the Accords, USACE made commitments to improve Pacific lamprey passage as a part of the 10-year Plan to benefit lamprey affected by the Federal Columbia River Power System (FCRPS). The Corps committed to:

- 1) Employ an adaptive management approach.
- 2) Work with the tribes and the USFWS to develop its existing 5-year lamprey plan into a 10-year plan, covering both adult and juvenile passage issues with specific actions that can be taken at USACE dams along the lower Columbia and Snake rivers.

- 3) Allocate \$1.8 million for lamprey projects in 2008, increasing from \$2 million to \$5 million per year for 10 years to improve hydrosystem passage.

LAMPREY PASSAGE IMPROVEMENTS

Lamprey have significant life history differences from salmon and steelhead. Unfortunately, the fact that lamprey are less capable swimmers in high velocity flows was not considered when fish passage facilities were built. Velocities associated with fish ladders are often too high for lamprey to navigate without repeated burst swimming, reattaching, and resting. In addition, their swimming behavior makes it difficult to migrate up fish ladders that have sharp corners and turns. Poor passage can also be attributed to turbulence, poor attraction, unnatural flows, and predators. Challenges associated with dam passage is considered a significant reason for the decline of lamprey. To improve adult upriver passage, fish passage facilities have been modified to address the needs of lamprey. This has been made possible through modifications to the ladder entrances, installation of lamprey passage systems at problem areas, and adding velocity reduction structures.

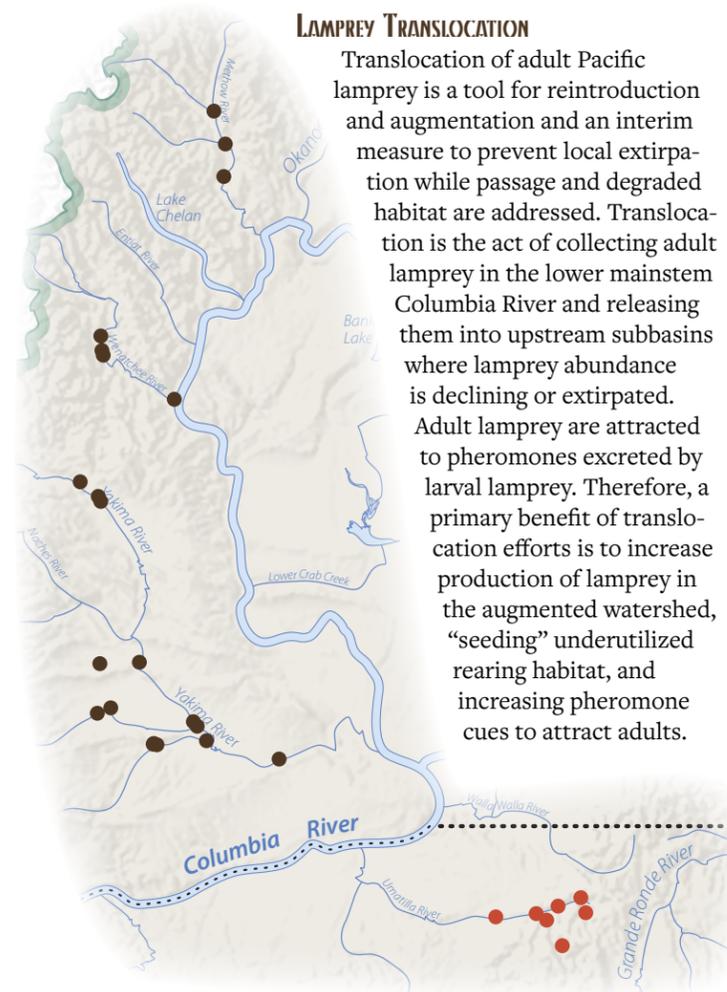


A Pacific lamprey climbing the new lamprey passage system at Bonneville Dam. ▶

Photo: Jayson FiveCrows, CRITFC

LAMPREY TRANSLOCATION

Translocation of adult Pacific lamprey is a tool for reintroduction and augmentation and an interim measure to prevent local extirpation while passage and degraded habitat are addressed. Translocation is the act of collecting adult lamprey in the lower mainstem Columbia River and releasing them into upstream subbasins where lamprey abundance is declining or extirpated. Adult lamprey are attracted to pheromones excreted by larval lamprey. Therefore, a primary benefit of translocation efforts is to increase production of lamprey in the augmented watershed, “seeding” underutilized rearing habitat, and increasing pheromone cues to attract adults.



Lamprey Translocation Sites

- Yakama translocation sites
- Umatilla translocation sites

STURGEON



White sturgeon are the largest freshwater fish in the Columbia Basin, capable of growing to more than 1,000 pounds and 10 feet in length. They grow slowly and can live up to a century.

White sturgeon range from northern Mexico to the Aleutian Islands. They historically inhabited the full length of the Columbia River to British Columbia and the Snake River to Shoshone Falls in Idaho. While overfishing decimated their numbers around the turn of the century, construction and operation of hydropower dams and the creation of reservoirs isolated their populations and substantially reduced the ability to rebuild the population. White sturgeon still inhabit most of their historical range

in the Columbia Basin. An estimated 600,000 are in the free-flowing stretch of the Columbia from the mouth to Bonneville Dam; another 300,000 are estimated between Bonneville and McNary dams. Only a few thousand remain above McNary Dam in the Columbia and Snake rivers. Current production remains far below the historical levels.

With Accords funding, CRITFC developed a project to provide guidance for the next phase of sturgeon conservation, management, and restoration in the mid-Columbia and lower Snake reservoirs based on past research, monitoring, and evaluation completed by regional fish managers and partners. The project:

- Completed a collaborative and comprehensive strategic plan for sturgeon conservation, restoration, and management that includes habitat protection and restoration, natural and hatchery production, fishery management, research, monitoring, and evaluation.
- Completed a sturgeon hatchery review.
- Facilitated, monitored, and evaluated implementation of appropriate hatchery actions in collaboration with other regional sturgeon conservation, management, and restoration projects.



25% of Accords funding
\$139 million from 2008-17

RESEARCH, MONITORING, AND EVALUATION

Some examples of tribal research and monitoring exclusively or partially funded through the Fish Accords:

SUPPLEMENTATION

BASIN-WIDE SUPPLEMENTATION EVALUATION
Evaluate escapement, genetic stock identification, productivity, and relative reproductive success in tribal programs involving reintroduction and supplementation of anadromous fish populations.

KELT RECONDITIONING
Evaluate strategies to increase iteroparity (repeat spawning) in inland steelhead populations as both a safety net and a method for species recovery. Repeat spawning increases lifetime reproductive success and offers a spread-the-risk strategy that can provide potential benefits not possible through any other existing or proposed action.

HARVEST

ENFORCEMENT
Implement tribal and intertribal harvest and habitat law enforcement within the Zone 6 of the mainstem Columbia River and treaty fishing areas to reduce the illegal take of salmon, steelhead, and resident fish and aid in the rebuilding of native fish populations.

EXPANDED TRIBAL CATCH SAMPLING
Enhance the monitoring and catch sampling for the treaty mainstem fishery and test the feasibility and utility of sampling tribal harvest for PIT tags.



A Umatilla Fisheries crew electrofishing to monitor habitat improvement effectiveness, Meacham Creek.

HABITAT

SPRING CHINOOK RECOVERY MONITORING
Assess whether cumulative restoration actions in study watersheds over a period of decades has led to improving trends in salmon habitat quality and quantity. Evaluate trends in relation to ongoing land use actions known to degrade habitat quality and in the context of expected climate change impacts. The results will inform the region as to whether these habitat restoration actions, conducted in lieu of additional modifications to hydrosystem operations, are improving overall trends in salmon viability.

INFORMATION MANAGEMENT

INTER-TRIBAL MONITORING DATA PROJECT
Assists CRITFC and its member tribes in the capture, storage, processing, and dissemination of fish and habitat data for management purposes. The project aims to assist in the production and curation of long-term monitoring data sets.

STREAMNET LIBRARY
The StreamNet Regional Library serves the Pacific Northwest natural resource community and researchers working in cooperation with the region's fish and wildlife recovery efforts. The library places particular emphasis on collecting less commonly available "gray" or "black" literature, such as consultant and NGO reports and governmental documents.

GENETICS

CRITFC operates and maintains a state-of-the-art genetics laboratory in Hagerman, Idaho. The tribes, in collaboration with their fellow co-managers, are developing genetic resources (markers and baselines) to enable accurate identification of specific fish stocks as they migrate through the Columbia River and are harvested in various fisheries. These genetic tools offer the ability to enhance our understanding of abundance and run-timing of specific stocks to improve fisheries conservation and management in the region. The lab is also developing genetic tools to screen natural populations of salmonids for local adaptation and traits related to long-term persistence (e.g., thermal tolerance, smoltification, disease resistance, adult migration timing), and evaluate potential of populations in the Columbia Basin to adapt to changing environments. These new genetic monitoring tools provide the opportunity to non-lethally sample hatchery- and natural-origin fish, and to estimate the abundance, migration-timing, and harvest composition among specific stocks.



Hagerman Genetics Lab technician Vanessa Morman conducting genetic research on samples of salmon tissue.

LAMPREY GENETICS
The Hagerman Genetics Lab has also developed genetic markers specific to Pacific lamprey. The ability to extract genetic information from very tiny tissue samples has created opportunities to use parentage analysis to infer the ages of lamprey offspring and to relate this information to morphometric measures, sampling locations, and life stage.

Since 2013, nearly all adults that have been outplanted by three tribal translocation programs into tributaries of the interior Columbia Basin distributed across Idaho, Oregon, and Washington, have been tissue sampled and genotyped for creation of a regional implementation of Parentage Based Tagging (PBT) database. This powerful PBT technology provides the opportunity for future recaptures of progeny of these translocations at older life stages, possibly even returning adults. Numerous juvenile sampling programs are now in place throughout the streams and rivers receiving translocated adults and at Columbia mainstem dams. The Hagerman Genetics Lab, through its lamprey PBT database, has already documented reproductive success of multiple groups of outplanted adults across release years. Data generated from this ongoing monitoring may be used to adaptively manage restoration efforts being employed for Pacific lamprey, and further characterize their migratory life cycle.

HYDROSYSTEM OPERATIONS

UPSTREAM MIGRATION TIMING
Assess migration timing and survival of adult sockeye and chinook salmon and steelhead through the Columbia River hydrosystem. Also assess species stock composition for ESA and harvest management.

HABITAT EFFECTIVENESS

The tribes are working with other co-managers to develop a quantitative means to evaluate current and potential spring chinook salmon viability factors for selected listed populations, focusing on key limiting habitat factors. Studies are evaluating whether improving trends in spring chinook salmon habitat quality and quantity are occurring in response to



Yakama Fisheries technician Scott Spino gathering sampling data on a wild spring chinook at the Lyle Falls fishway facility on the Klickitat River.

Photo by Yakama Fisheries Biologist Shawn Bechtol.

restoration actions and whether those improvements are large enough to counter the expected negative impacts of climate change on fish populations.

PRODUCTION MONITORING

The tribes conduct monitoring to provide relevant data on population status and trends as well as effectiveness of habitat and hatchery actions by conducting spawning ground surveys, adult salmonid migration monitoring, juvenile outmigration monitoring, juvenile and resident salmonid population surveys, habitat surveys, and tagging and monitoring of hatchery fish populations.

CLIMATE CHANGE

See *Growing Concerns*, pages 20-21.

SEA LIONS

See *Growing Concerns*, pages 18-19.



0.4% of Accords funding
\$2 million from 2008-17

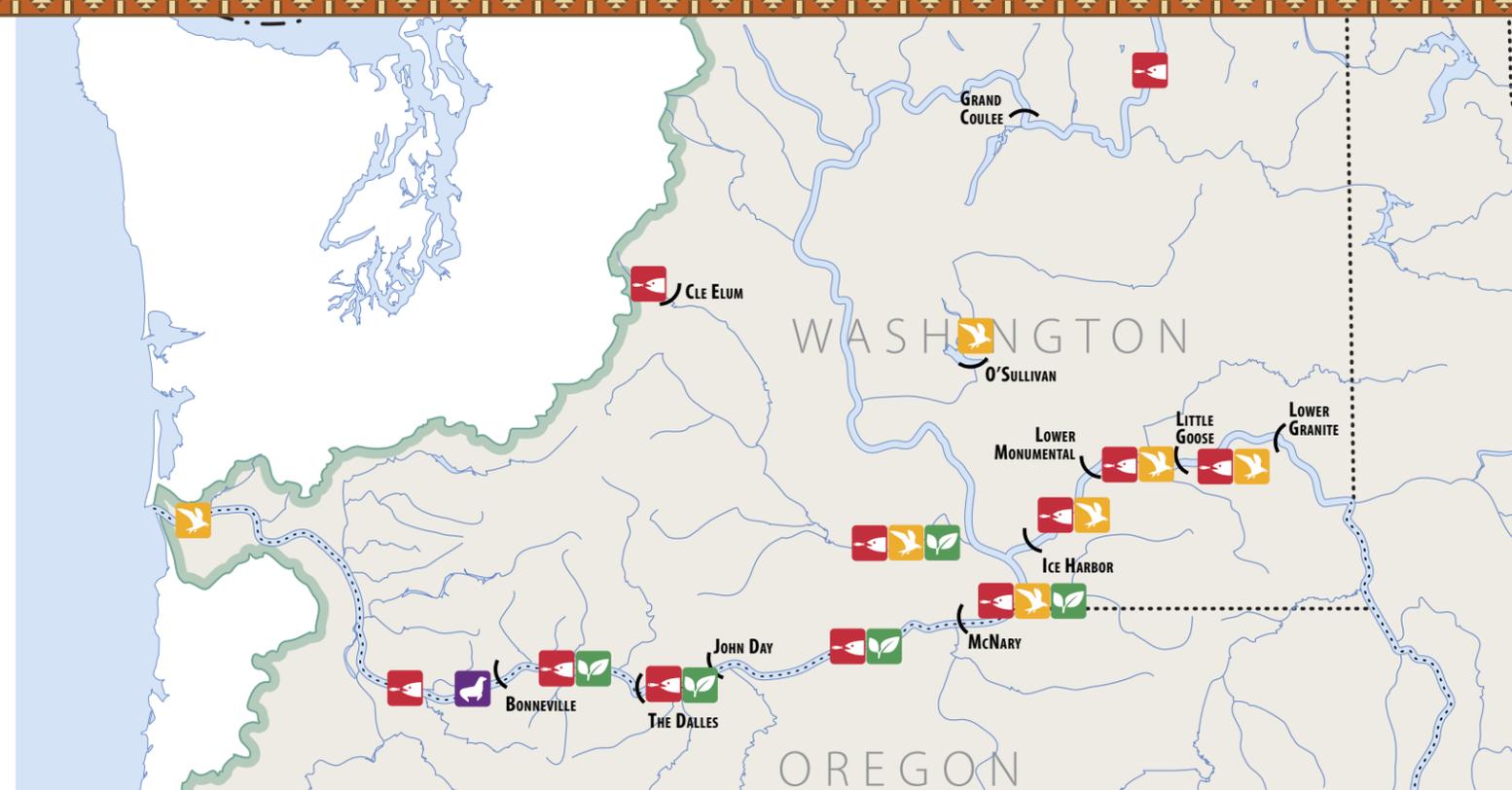
GROWING CONCERNS

PREDATORS & INVASIVE SPECIES

Along with competition, migration, and immigration, predation is a keystone agent that controls fish population dynamics. Although predation occurs naturally, management becomes necessary in a highly modified environment such as the Columbia Basin. Since the publication of *Wy-Kan-Ush-Mi Wa-Kish-Wit* in 1995, an alarming increase in predation of salmon, lamprey and juvenile sturgeon by birds, marine mammals and other fish has occurred. In the basin, newly created habitat from dredge spoils increased predacious bird populations; a lack of historical primary food sources brought more hungry sea lions upriver; and changes in the flow regime and the introduction of exotic species gradually expanded piscivorous fish populations. These

negative changes in avian, mammalian, and fish species population dynamics have tipped the predator/prey balance to the point that active management is required to rebalance predator populations and reduce salmon, lamprey, and sturgeon losses.

Controlling predators in order to improve the survival of juvenile and adult salmon and steelhead have been going on for decades. Some of these efforts are described below. The Fish Accords provided additional funding to continue or expand some of these projects over the past ten years, however climate change, habitat alterations, and other factors make it highly likely that this problem will grow worse and require even more resources in the future.



Map and supporting information adapted from the Yakama Nation Status and Trend Annual Report project.



PISCIVOROUS FISH

“Piscivorous” means fish eating. The native northern pikeminnow evolved with salmonids, however environmental changes resulting from the hydrosystem led to increased predation on out-migrating juvenile salmonids. Research conducted in the 1980s revealed that predation by northern pikeminnow exceeded that of other piscivorous fish. In response, BPA created a sport-reward fishery program that pays sport anglers for every pikeminnow longer than 10 inches removed from the system. Predation on juvenile salmonids by northern pikeminnow has been reduced by up to 40% since the program began.

Other piscivorous fishes that impact juvenile salmonids include bass, walleye, and channel catfish. These non-native predators thrive in the human-engineered habitat created by the hydrosystem. Their abundance and distribution expanded considerably since the 1980s. In response, the states of Oregon and Washington removed the bag, size, and possession limits on these species in the mainstem Columbia River recreational fishing and several tributaries to reduce their impact on juvenile salmon and steelhead.



SEA LIONS

Columbia River salmon, steelhead, white sturgeon, and lamprey face threats from sea lions below Bonneville Dam. In recent years, the number of sea lions preying on salmon and steelhead between February and June increased significantly. Sea lions annually consume thousands of returning adult fish. In addition, sea lions eat a significant number of white sturgeon and have been observed eating lamprey.

Predation Research: Prior to the Fish Accords, there were no scientifically valid methods for estimating sea lion abundance and predation rates in the lower

Columbia River. Using Accords funding, the tribes developed techniques to accomplish this goal in order to quantify the extent of the impact sea lions are having on the Columbia Basin salmon runs. CRITFC researchers initially evaluated videography for abundance and predation estimations, but this failed to work due to the size of the survey area. The current technique using tandem boat surveys has proven much more promising. CRITFC also studies the effects of its hazing efforts. Short-term responses to hazing indicate positive effects, however long-term impacts are difficult to evaluate.



Sea lion eating a salmon below Bonneville Dam.



AVIAN PREDATOR

Caspian tern and double-crested cormorant populations increased significantly in the last 30 years. Between 2010-2013, the estimated annual smolt consumption by cormorants and terns was 19 million and 5 million, respectively.

Estuary: Efforts are underway at East Sand Island in the Columbia River estuary to reduce the size of the Caspian tern and double-crested cormorant populations and move portions of those populations out of the Columbia Basin. The Caspian tern population declined substantially, but approximately 7,000 spend their summers in the estuary, eating between 3 and 5 million smolts each year.



Caspian tern with a salmon smolt in its beak. Photo by Julie Carter, CRITFC

Inland: Scattered colonies of Caspian terns nest in several locations in the upper basin, the largest colony nesting on the Blalock Islands complex in John Day reservoir in numbers exceeding 1,000 adults and hundreds of nests. These terns eat approximately 1 million smolts every year. Double-crested cormorants also nest in the inland basin, but pose less of an impact due to smaller numbers, nesting locations, and diversity of prey. Several species of gulls nest throughout the Columbia Basin. In some locations, particularly Miller Island between The Dalles and John Day dams, gulls are a significant source of predation, particularly on juvenile steelhead.

Dams: Wires have been installed at most of the mainstem Snake and Columbia dams to dissuade avian predation by making it difficult for the birds to fly over the outflows from the turbines and spillways. Water cannons and other active techniques are used to deter avian predation at or near the projects. Boat-based hazing crews using pyrotechnics may be used in areas not covered by bird wires or water cannons.



AQUATIC INVASIVE SPECIES

Currently, the greatest non-native invasive species concern is the potential infestation of Quagga and zebra mussels. Entering the Great Lakes in the mid-1980s on commercial vessel traffic, they spread throughout the country except for the Columbia Basin. A network of monitoring efforts, highway check stations, and education and outreach efforts have been in place for over a decade in an effort to keep them from entering the basin on commercial and recreational watercraft. An infestation would create significant permanent impacts to salmon habitat and fish passage structures used by juvenile and adult salmon and steelhead to navigate around the dams. The mussels are also effective filter feeders, capable of substantially altering the food webs that salmon fry and smolts depend on.

Invasive aquatic plants like flowering rush have the potential to colonize shallow areas in the Columbia and its tributaries. Heavy aquatic plant growth slows water currents, alters water chemistry, creates havens for piscivorous fishes, and increases water temperatures. Climate change will accelerate the growth of these aquatic plants.

CLIMATE CHANGE

The First Foods—water, salmon, game, roots, and berries—have been the cornerstone of tribal sustenance and culture for thousands of years. Over time, under relatively stable climatic conditions, the tribes gathered the knowledge to maintain and nurture these resources for each succeeding generation.

With a shifting climate, this ecological balance has been disturbed. Harvest timing, animal migration patterns, and other impacts are being noted throughout the region.

Climate change impacts affect ecological systems at broad spatial scales including the First Food resources and habitats.



The First Foods surround water, which gives them all life.

PROJECTED CLIMATE CHANGE IMPACTS

- Higher summer water temperatures in waterways and reservoirs will **stress both juvenile and adult fish**, affecting migration timing and survival and may benefit non-native predatory fish evolved to warmer climates.
- Lower summer flows will **increase competition for limited water supplies** in tributaries and mainstem rivers for different uses (hydropower, irrigation, fish migration).
- Higher peak winter flows will cause erosion of sediment that can **damage salmonid spawning areas**, scour eggs, and “wash out” the emerging fry of fall-spawning populations.
- Earlier spring runoff will **alter smolt migration timing** in snowmelt-dominated systems. Migration patterns naturally evolved to move juveniles to the ocean at the same time that ocean upwelling delivers important food sources.
- Fish populations at the greatest risk of extinction will likely be those already in habitats that are **near the limits of their thermal tolerance** and with less resilience and diversity.
- Changing ocean conditions (warmer and increased acidification) will **alter the marine food web**, impacting salmonids.
- Sea level rise will likely **reduce coastal estuarine habitats** used by juvenile salmon.

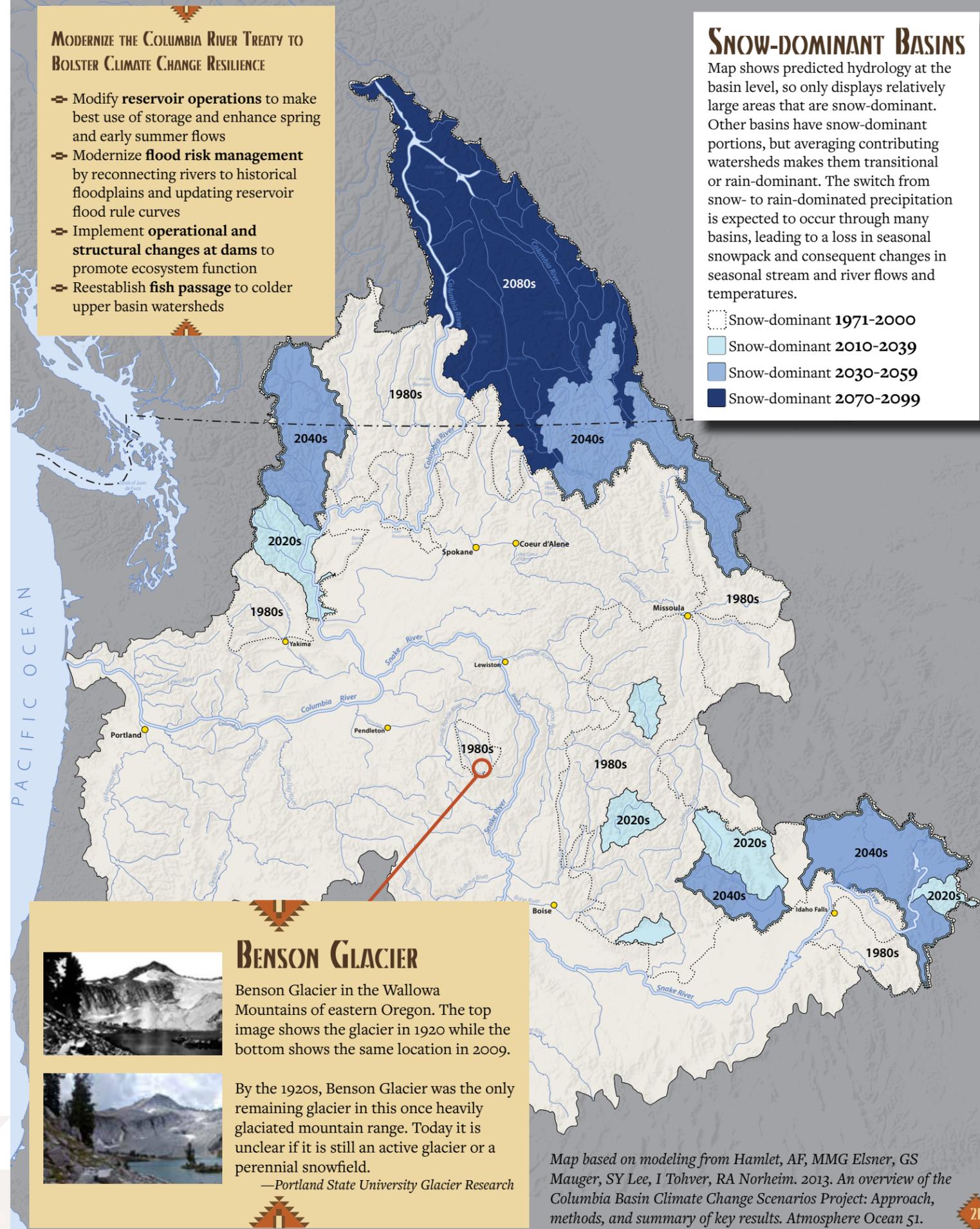
Climate change is real and, unfortunately, the effects appear to be in motion. We are witnessing changes in the seasons. Our roots and berries must be gathered sooner, and salmon returns are less predictable. Our people notice less snow in the mountains now, and there is less cool water during the summer when it was once abundant. The changes we see may not bode well for our future. Over the years to come, we may lose natural resources that are important to our culture and our heritage. Some of these losses may be irreversible.

—Introduction to Climate Adaptation Plan for the Territories of the Yakama Nation

CLIMATE CHANGE RESEARCH

CRITFC has assisted its member tribes in development of adaptive management strategies and tools to help protect their First Foods, including salmon and lamprey, in a changing climate. The research also evaluates efforts designed to mitigate climate change-related effects such as increased water temperatures though projects designed to provide cold water refuge for migrating salmon, lamprey, and sturgeon.

Research efforts focused on modeling future changes to water temperature in certain Columbia River subbasins and assessing impacts on fish species and communities. The CRITFC Information System (CIS) simulation tool was created to analyze the impacts of future climate change scenarios on Columbia Basin river flows and their implication for hydroregulation and fish habitat and survival. The CIS model development was done in collaboration with BPA staff and the 15 Columbia Basin tribes. More information can be found at <http://www.critfc.org/climate>.





3.5% of Accords funding
\$19.6 million from 2008-17

PARTNERSHIPS AND COORDINATION

During the past 40 years, institutions have been established to manage restoration of anadromous fish in the Columbia Basin as well as to manage fisheries. Using the authorities of their participating governments, these structures are intended to focus personnel and resources on the tasks of restoration in an efficient and effective manner.

Participation in the LRT Fish Accords, NPCC Fish and Wildlife Program, regional fish and wildlife programs and processes, and harvest management forums requires significant and extensive coordination and collaboration. Tribal staff participate in over a hundred different workgroups, workshops, and education and outreach opportunities. A few of the most significant collaboration forums are listed below.

FEDERAL COLUMBIA RIVER POWER SYSTEM OPERATIONS

The CRITFC member tribes participate in many coordination forums related to the operation and maintenance of the Federal Columbia River Power System to support benefits for salmon and steelhead.

Regional Implementation Oversight Group

The Regional Implementation Oversight Group (RIOG) provides sovereign policy review for implementing the NOAA Fisheries and US Fish & Wildlife Service's Federal Columbia Power System (FCRPS) biological opinions. The RIOG brings together federal, state, and tribal agencies with the common aim of salmon protection as it relates to hydro system operations. The RIOG structure includes technical subgroups (e.g., the TMT) to support regional review. Through this structure, RIOG explores the issues relevant to the effects of the FCRPS on ESA-listed species and ensures that the new and emerging scientific data are identified, reviewed, and available to inform the agency decisions.

Technical Management Team

The Technical Management Team (TMT) is responsible for coordinating dam and reservoir operations to comply with the FCRPS biological opinions. It

meets weekly during the fish passage season to adjust spill and flow levels at the FCRPS dams. The TMT also develops an annual water management plan that addresses runoff forecasts and flood control operations, as well as fish operation requirements in the biological opinions.

System Configuration Team

The System Configuration Team (SCT) is responsible for planning and oversight of structural improvements to fish passage facilities and related studies called for in the FCRPS biological opinions. Each fiscal year, the SCT goes through a process of selecting, setting priorities for, and budgeting fish passage projects and related research.

Fish Passage Operations and Maintenance

The Fish Passage Operations and Maintenance (FPOM) workgroup provides a forum for regional coordination, gathering information and

development of recommendations on the operation, maintenance and construction procedures or activities which may affect fish passage through eight lower FCRPS dams.

Fish Passage Advisory Committee

The Fish Passage Advisory Committee (FPAC) provides coordinated, technical, fish passage, and hydrological recommendations to assist the salmon managers and regional forums in making management decisions that protect, mitigate, and enhance fish and wildlife. FPAC serves as a technical forum to exchange, review, and analyze fish passage, river operations, mainstem research, and related information. FPAC works collaboratively with all entities within the FCRPS and Columbia basin to coordinate and provide the best possible seasonal management of the available water for the benefit of anadromous and resident fish throughout the basin.

COLUMBIA RIVER FISH AND WILDLIFE PROGRAM

The majority of work conducted under the Northwest Power and Council's Fish and Wildlife Program is focused directly on protecting, mitigating and enhancing salmon and steelhead affected by the development and operation of the hydroelectric dams in the Columbia Basin.

Northwest Power and Conservation Council (NPCC)

The mission of the NPCC is to ensure, with public participation, an affordable and reliable energy system while enhancing fish and wildlife in the Columbia River Basin. The CRITFC member tribes send representatives to attend and participate in the monthly meetings of the NPCC.

NPCC Fish and Wildlife Committee

The NPCC Fish and Wildlife Committee meets monthly in an effort to strengthen the NPCC's position as a recognized, credible, and objective hub for regional fish and wildlife planning information and analysis. The CRITFC member tribes send representatives to attend and participate in the monthly meetings of the committee.

NPCC Workshops and Workgroups

The NPCC's 2014 F&W Program is committed to an adaptive management approach that uses research and monitoring data to understand, at multiple scales, how program projects and measures are performing, and to assess the status of focal species and their habitat. The NPCC hosts numerous workshops and workgroups to coordinate input from the tribes and others into the many facets of developing, implementing, and evaluating the Fish and Wildlife Program.

UNITED STATES v OREGON FISHERIES MANAGEMENT AGREEMENT

Fisheries in the Columbia River are managed subject to provisions of United States v. Oregon under the continuing jurisdiction of the federal court. The previous 2008-2018 and the current 2018-2027 United States v. Oregon Management Agreement provides the framework for managing fisheries and hatchery programs in much of the Columbia Basin.

US v OR Technical Advisory Committee

The US v OR Technical Advisory Committee (TAC) was established to develop, analyze, and review data pertinent to the Agreement and to make reports and technical recommendations regarding harvest management. Members are qualified fisheries scientists familiar with harvest management of Columbia River

fish runs and include active participation by the CRITFC tribes.

US v OR Production Advisory Committee

The US v OR Production Advisory Committee was established to coordinate information, to review and analyze existing and future natural and artificial production programs pertinent to the

management agreement, and to submit recommendations to the management entities. Members are qualified fisheries scientists familiar with Columbia River artificial and/or natural fish production and include active participation by the CRITFC member tribes. Coordination of production and harvest management is essential to the successful implementation of the agreement.

FUTURE OF OUR SALMON CONFERENCE

The Future of Our Salmon workshops and conferences brought together tribal, First Nation, federal, provincial, state, city, and utility representatives, Indian and non-Indian sport and commercial fishers, environmental organizations, NGOs, and the interested public to tackle complex technical and policy issues in the Columbia Basin. As we look at transboundary governance and management issues, these conferences were instrumental in facilitating dialogue, creating a common vision for restoration, and developing a unified strategy among the entire region. Each conference had a theme:

- 2011: A Vision of Restoration in the Columbia River Basin
- 2012: A Focus on Hatchery Policy
- 2014: Restoring Fish to all Historic Locations in the Columbia River Basin (co-hosted by fifteen US tribes and seventeen Canadian First Nations)
- 2016: Healthy Floodplains, Living Rivers (co-hosted by fifteen US tribes and seventeen Canadian First Nations)



Future of Our Salmon Conference 2016 Executive Panel

LOOKING FORWARD

COMPLETED IN 1995 and updated in 2014, *Wy-Kan-Ush-Mi Wa-Kish-Wit: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes* provides a framework for regional fish restoration. Its goal is simple: put the fish back into the rivers. As our tribes continue to make strides in implementing our 25-year plan, the Columbia Basin Fish Accords have been instrumental in providing the resources necessary to not only carry out the restoration work, but also facilitate finding new or expanded solutions to our plan's institutional, technical, and community development recommendations. The Fish Accords also helped streamline regional decision-making and greatly improved coordination and relationships among the tribes and federal and state governments. As we face increasing uncertainties regarding the future of our salmon, it is now more important than ever that we continue to come together as a region to coordinate our efforts.

Without the Fish Accords, the tribes would have faced significant uncertainty in implementing their vision to maintain and enhance salmon populations outlined in *Wy-Kan-Ush-Mi Wa-Kish-Wit*. The Fish Accords brought a level of certainty and stability by providing guaranteed funding for ten years for a wide variety of tribal projects benefiting listed and non-listed fish affected by the Federal Columbia River Power System.

The cooperative relationship the Fish Accords fostered allowed all the partners to work together on our mutual commitments and to resolve issues regarding FCRPS compliance with the Northwest Power Act, Endangered Species Act, Clean Water Act, and other applicable laws. The long-term funding commitments called for in the Accords improved project implementation and secured projects that could not have been accomplished otherwise. The tribes established strong working relationships with local partners through implementation of large complex projects that protect habitat for salmon, steelhead, and lamprey. The Accords ensured adequate

Salmon and the rivers they use are part of our sense of place. The Creator put us here where the salmon return. We are obliged to remain and protect this place.

spill and passage measures for juvenile fish and supported research to improve spill operations in the future.

As the Fish Accords period ends, the tribes are considering the best path forward. The tribes are experts in working in their watersheds. The tribes have expertise understanding physical, biological and cultural resources at stake in protecting and restoring fish and wildlife in their traditional homelands. BPA has expertise in assuring compliance with federal law and policy in bringing projects to fruition. By working together, the tribes and BPA are bringing their respective areas of expertise together for the benefit of all.

In addition to all of this, the BPA is facing a rapidly changing energy market that is challenging its ability to provide power at competitive rates. In January 2018, BPA adopted a Strategic Plan that describes the actions it will take over the next several years to become more competitive and responsive to customer needs, to leverage and enable industry change through modernized assets and system operations, and to deliver on their public responsibilities through a commercially successful business.

The actions described in this summary report must continue. While the FCRPS faces considerable uncertainty, there is no question that the fate of salmon, steelhead, lamprey, and sturgeon in the Columbia River face an even greater uncertainty. The tribes will continue to strongly advocate for adequate funding and certainty of actions. We will work with our numerous partners through collaborative efforts to ensure benefits to the fish, wildlife, and environment continue for future generations.



Bobby Begay, Yakama