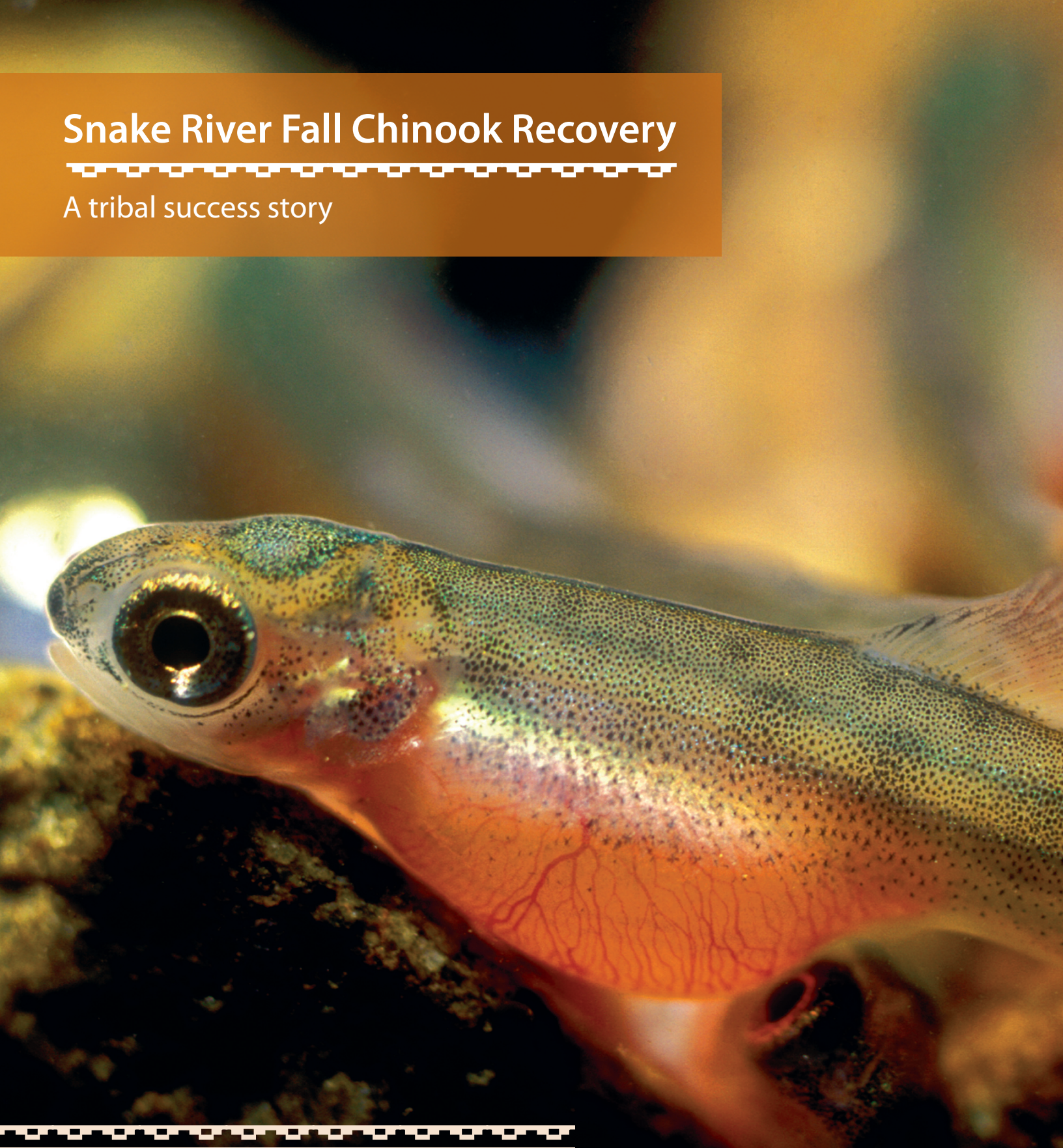
Snake River Fall Chinook Recovery

A tribal success story



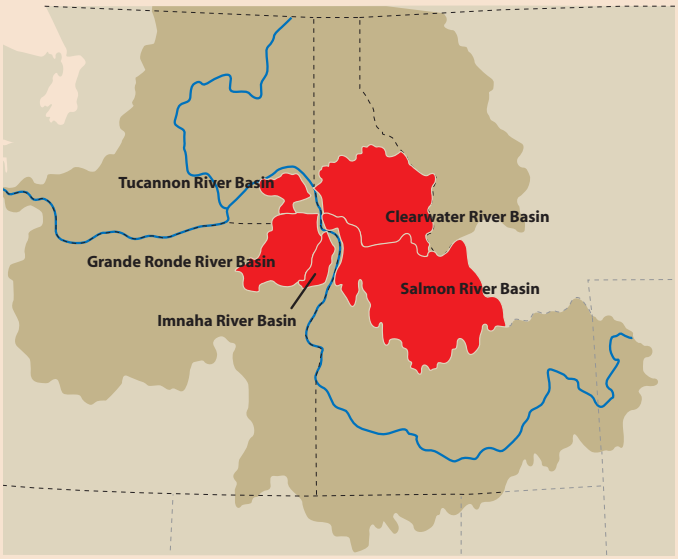
NEZ PERCE TRIBE TREATY OF 1855

NEZ PERCE FISHERIES

YAKAMA NEZ PERCE WARM SPRINGS UMATILLA

To restore Snake River fall chinook salmon, the Nez Perce Tribe, in coordination with Washington Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, Idaho Department of Fish and Game, U.S. Fish and Wildlife Service, NOAA Fisheries, and Oregon Department of Fish and Wildlife has implemented hatchery reform to bring back the fish from the brink of extinction.

In the early 1900's, Snake River fall chinook were widely distributed from the mouth of the Snake River upstream to Shoshone Falls in southern Idaho more than 900 miles from the ocean. As late as the 1930's, fall chinook returns in the Snake River numbered 500,000 adults.



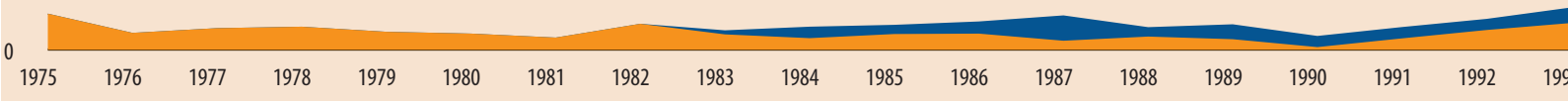
The major Snake River subbasins that are part of this restoration effort are indicated in red.

The construction of dams on the Snake River, beginning with Swan Falls in 1901 and continuing with the Hells Canyon Dam Complex in the 1950s and the Lower Snake River dams in later years eliminated or severely degraded 530 miles, or 80%, of the historical habitat. The most productive of that habitat was upriver from the site of Hells Canyon Dam, which has no fish passage. A precipitous decline of Snake River fall chinook followed with only 78 wild adults observed at Lower Granite Dam in 1990.

NOAA's response to the listing of Snake River fall chinook under the Endangered Species Act in 1992 threatened the tribal fall season fishery, the remaining tribal commercial fishery. In 1994 NOAA sought to restrict the tribal fishery under the ESA setting the stage for a potential landmark conflict between tribal treaty rights and the ESA.

- **NOAA's goal:** cut the tribal fishery to increase the fall chinook at Lower Granite Dam by 24 fish.
- **The tribes' goal:** fairly allocate the burden of conserving the salmon among all sources of mortality, establish a connection between hatcheries and harvest while developing a program that would benefit Snake River fall chinook and allow the tribes to exercise their treaty reserved fishing rights.

With the stage set, U.S. District Court Judge Malcolm Marsh warned the parties that while he was willing to hear this case, not everyone would like the outcome. The tribes were risking their treaties signed in 1855 and the federal government was risking the Endangered Species Act. Taking his warning to heart, both parties began negotiating.
The agreement reached by the parties led to a cutting-edge hatchery program that allows the Nez Perce Tribe to supplement natural chinook populations with hatchery-reared fish of the same stock. The agreement spurred the development and issuance of Secretarial Order #3206 by the secretaries of Interior and Commerce, which



Total hatchery (shown in blue) and natural origin (shown in orange) Snake River fall chinook salmon counts at Lower Granite Dam. The year the Snake River Fall Chinook Recovery Program began is circled in red.

Nez Perce Tribal Hatchery

Located on the banks of the Clearwater River in Idaho, the Nez Perce Tribal Hatchery Complex began operations in 2003. This is the main facility supporting the Clearwater River component of the Snake River fall chinook program. At the facility, the tribe strives to preserve the genetic integrity of affected fish populations while enhancing harvest opportunities for treaty Indian and non-Indian fishers. The Nez Perce Tribal Hatchery Complex uses several semi-natural rearing techniques to encourage hatchery-reared fish to behave like their wild counterparts.

seeks to harmonize the federal government's duties to the tribes and the ESA.

Hatchery Production

The details of the Snake River Fall Chinook Program were refined in 1995 through *U.S. v. Oregon* processes, when the four Columbia River Treaty Tribes reached an agreement with state and federal agencies to begin supplementation of Snake River fall chinook above Lower Granite Dam. The development of numerous rearing and acclimation facilities in the Snake River Basin as well as the Nez Perce Tribal Hatchery were essential to the implementation of the program. The tribes secured the initial funding for the program through the U.S. Congress. In 1996, Congress instructed the U.S. Army Corps of Engineers to construct acclimation facilities under the Lower Snake River Compensation Plan. Today the Nez Perce Tribe operates and maintains three acclimation facilities at Captain John Rapids, Pittsburgh Landing and Big Canyon under the LSRCP in addition to the Nez Perce Tribal Hatchery.

Together, these facilities release approximately 450,000 yearling and 2.8 million sub-yearling fall chinook smolts each year into the Clearwater and Snake rivers. These releases have dramatically increased the number of natural and hatchery origin adult fall chinook returning above Lower Granite Dam. Many of them spawn naturally, their offspring helping to increase the natural origin fish returns.

A Shared Success

The higher returns of Snake River fall chinook in recent years allowed co-managers to open their first fall chinook fishery in the Snake River in 35 years in 2009. This fishery has occurred each year since then.

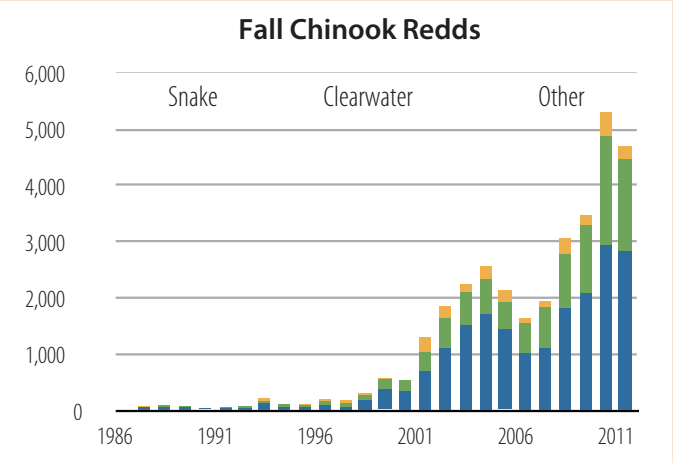
Although there has been a significant increase in the number of fall chinook adult returns and redds as a result of tribal efforts, the productivity of natural and hatchery origin fall chinook returns is still being evaluated. In the meantime, local Indian and non-Indian fishers in the Snake River are experiencing a bounty unseen since the construction of the dams.

The Road to Recovery

Adult fall chinook salmon returns have increased from less than 1,000 adults to Lower Granite Dam annually from 1975-1995 to a record count of more than 41,000 in 2010. The natural origin adult return in 2010 was just under 10,000 fish, which was a record since the construction of Lower Granite Dam in 1975. The 2011 return was the second highest at just under 8,000 natural origin adults.

Multiple salmon nests or "redds" are visible on this stretch of the Clearwater River. Photo courtesy Nez Perce Tribal Fisheries.

NOAA has discussed an abundance goal of 2,500-3,000 natural origin Snake River fall chinook for potential de-listing even though no formal recovery criteria has been established. The progeny of the Fall Chinook Acclimation Program and the Nez Perce Tribal Hatchery spawners are considered listed under the Endangered Species Act when they return to spawn. The tribal program will aid in ESA recovery of the Snake River fall chinook while helping support Snake River, Columbia River, and ocean fisheries.



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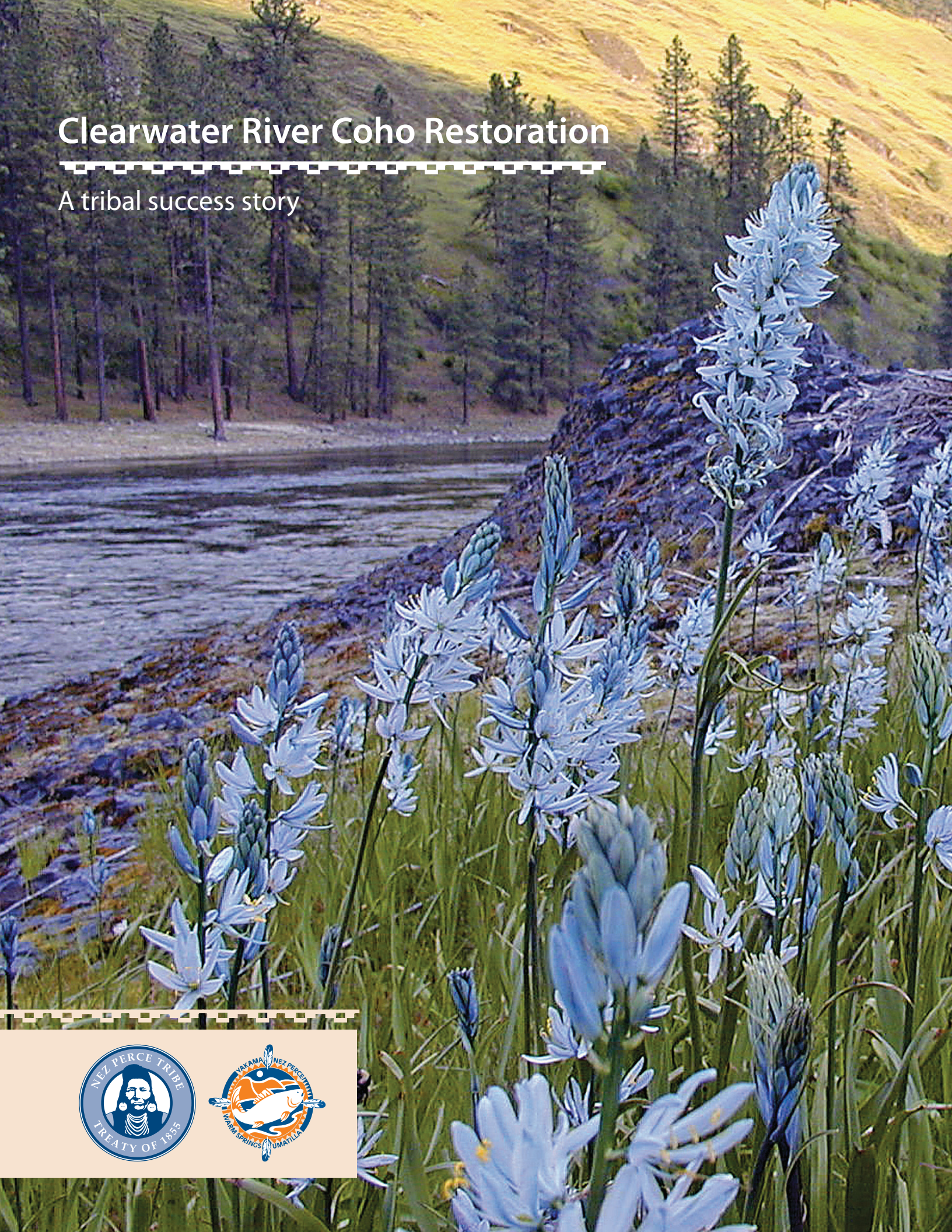
Clearwater River Coho Restoration

A tribal success story

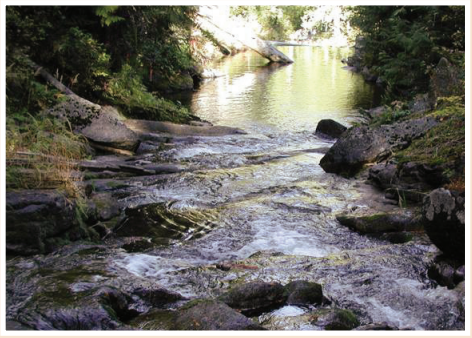


Coho salmon were officially declared extirpated, or non-existent, in 1986 in the Clearwater and other Snake River subbasins in Idaho. This was unacceptable to the Nez Perce Tribe. Understanding the cultural and ecological significance of coho to the Clearwater River, the Nez Perce Tribe worked hard and has been successful in bringing these fish back.

Abundant numbers of coho once returned to the Clearwater River, but the installation of the Lewiston Dam in 1927 eliminated their return. Idaho Fish and Game's efforts to restore them during the 1960s failed. Plagued by ice formation, dewatering, flooding, and siltation, the state-run restoration program was the last and only attempt at rebuilding coho populations until the 90s.

Nez Perce Tribe's Clearwater River Basin Coho Restoration Project

The Nez Perce Tribe initiated its Clearwater River Basin Coho Restoration Project in 1994. The result of an agreement under *U.S. v. Oregon*—between the tribes and state and federal agencies—allowed the tribe to use surplus coho eggs from the lower Columbia River to reintroduce the species in the Clearwater River Basin.



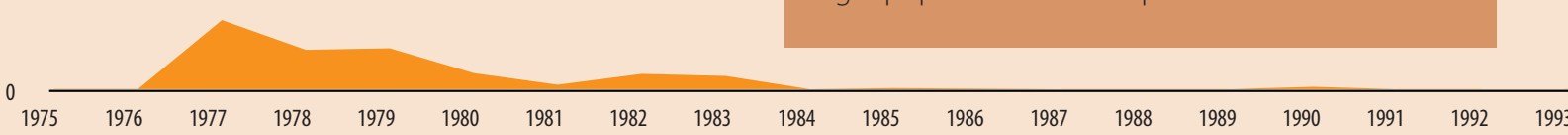
Yoosa Creek, a Lolo Creek tributary of the Clearwater River

After a few years, the Nez Perce tribe began replacing some of the lower Columbia fish with juveniles produced from inbasin returning adults. By choosing the fish that had demonstrated the ability to migrate hundreds of miles to and from the ocean, pass eight dams, and return to their Clearwater tributaries, the tribe hoped to create a broodstock that was better adapted to local conditions.

As anticipated, survival rates for smolts from this new localized broodstock have been greater than for lower Columbia River smolts, providing evidence that the naturalization process is indeed occurring.

Supplementation is a component of the tribal coho reintroduction effort

The Regional Assessment of Supplementation Project (RASP) in 1992 defined supplementation as the use of artificial propagation in an attempt to maintain or increase natural production while maintaining the long-term fitness of the target population and keeping the ecological and genetic impacts on non-target populations within specified limits.



Coho production under this program

Returning adult coho are collected at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and Lapwai Creek. The adult fish are then spawned at Kooskia National Fish Hatchery. Approximately 300,000 juvenile coho are incubated, hatched, and reared at the Dworshak and Kooskia hatchery facilities. An additional 650,000 eyed Clearwater River coho eggs are transferred to Eagle Creek National Fish Hatchery in Oregon.

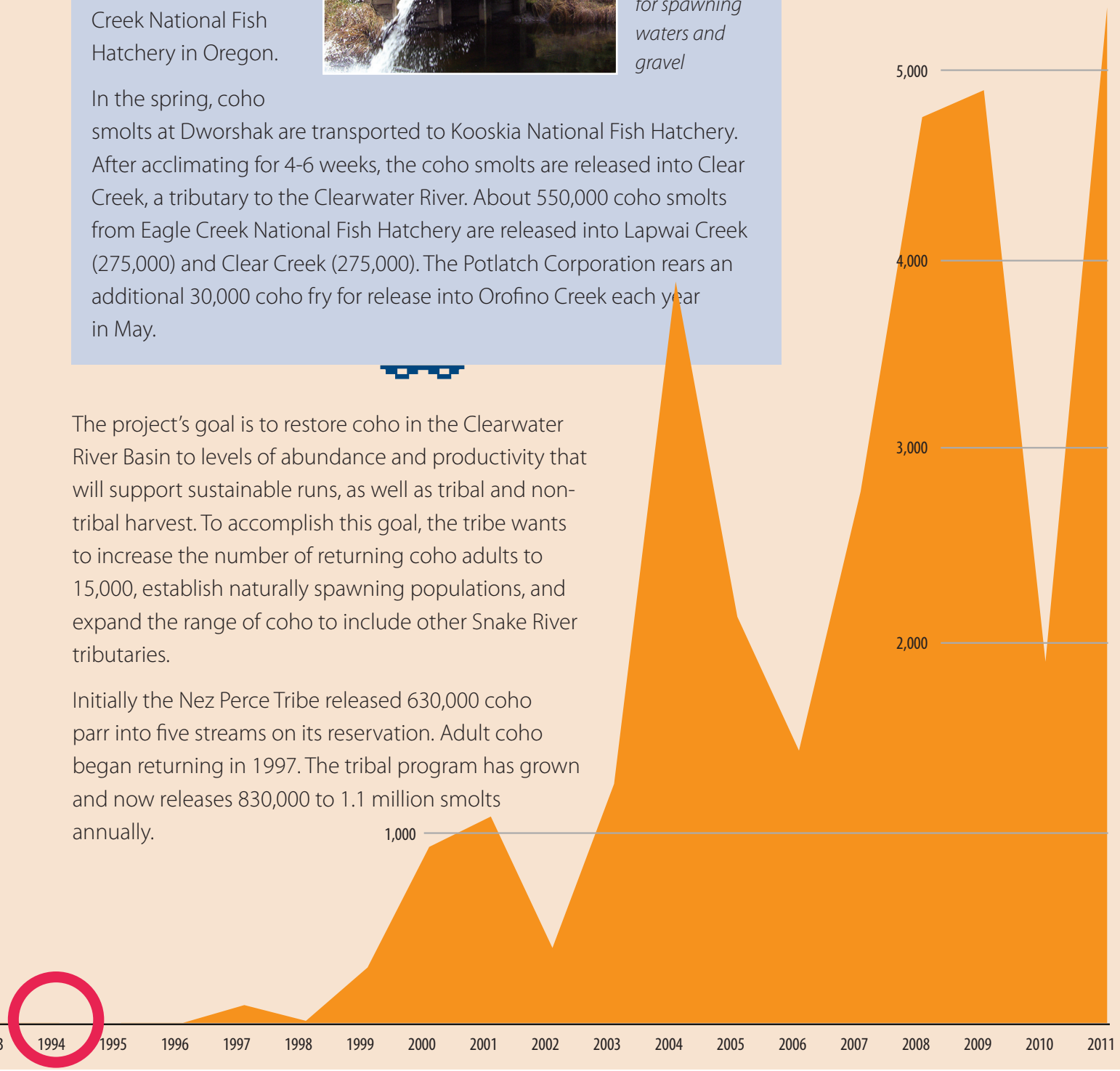
Adult coho released into Lolo Creek, where they quickly spread out looking for spawning waters and gravel

In the spring, coho smolts at Dworshak are transported to Kooskia National Fish Hatchery. After acclimating for 4-6 weeks, the coho smolts are released into Clear Creek, a tributary to the Clearwater River. About 550,000 coho smolts from Eagle Creek National Fish Hatchery are released into Lapwai Creek (275,000) and Clear Creek (275,000). The Potlatch Corporation rears an additional 30,000 coho fry for release into Orofino Creek each year in May.

The project's goal is to restore coho in the Clearwater River Basin to levels of abundance and productivity that will support sustainable runs, as well as tribal and non-tribal harvest. To accomplish this goal, the tribe wants to increase the number of returning coho adults to 15,000, establish naturally spawning populations, and expand the range of coho to include other Snake River tributaries.

Initially the Nez Perce Tribe released 630,000 coho parr into five streams on its reservation. Adult coho began returning in 1997. The tribal program has grown and now releases 830,000 to 1.1 million smolts annually.

Total returns of Clearwater River coho (Lower Granite Dam counts). The year Clearwater coho reintroduction began is circled in red.



Pacific Coastal Salmon Recovery Fund

Critical to the Nez Perce Tribe's success in returning coho populations has been the Pacific Coast Salmon Recovery Fund (PCSRF), the only source of funding for this project since 2000. The PCSRF program makes funding available to Washington, Oregon, Idaho, Nevada, California, and Alaska and to the federally recognized tribes of the Columbia River and Pacific Coast, including Alaska, for projects necessary to conserve salmon and steelhead populations.

Finding Success in the Clearwater River

Data collected from PIT (passive integrated transponder) tags in 2011 indicated that 15,000 Clearwater coho adults passed Bonneville Dam. The same year, over 5,300 adult coho passed Lower Granite Dam. Tribal biologists counted over 200 coho redds in Clearwater tributaries in 2011. Although most juvenile releases were to Lapwai and Clear Creeks on the reservation, natural production of coho salmon has been documented in Lolo Creek, Potlatch River, Catholic Creek, and in the North Fork Clearwater River (all tributaries to the Clearwater River), and also in the Tucannon River (a tributary to the Snake River).

The Clearwater Coho Restoration Project provides benefits to the tribe and the region. Returning adult coho support a tribal and non-tribal fishery along the Columbia River and provide the tribal hatchery program with a local broodstock. Because of this program, tribal members are exercising their treaty reserved fishing right, and coho are once again spawning in the wild.

Coho Restoration in the Wenatchee, Methow, and Yakima Rivers

Similar coho reintroduction and restoration has occurred in the Wenatchee, Methow, and Yakima river basins. The Yakama Nation's Yakima River Coho Re-Introduction Study and its Wenatchee and Methow coho reintroduction program are successful, with results comparable to the Nez Perce Tribe's Clearwater coho restoration. Despite starting with out-of-basin hatchery stock, the Clearwater, Yakima, Wenatchee, and Methow rivers are seeing increasing returns of natural origin coho—fish that are adapting to their new environment and establishing spawning populations in new habitat areas.

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Johnson Creek Summer Chinook Supplementation

A tribal success story

Researchers found hatchery-reared salmon that spawned with wild salmon had the san success as salmon left to spawn in the wild, according to a study of the Nez Perce Tribe's Artificial Propagation Enhancement Project. The study focused on a population of sumr natal stream is located in central Idaho, almost 700 miles upstream of the Pacific Ocean

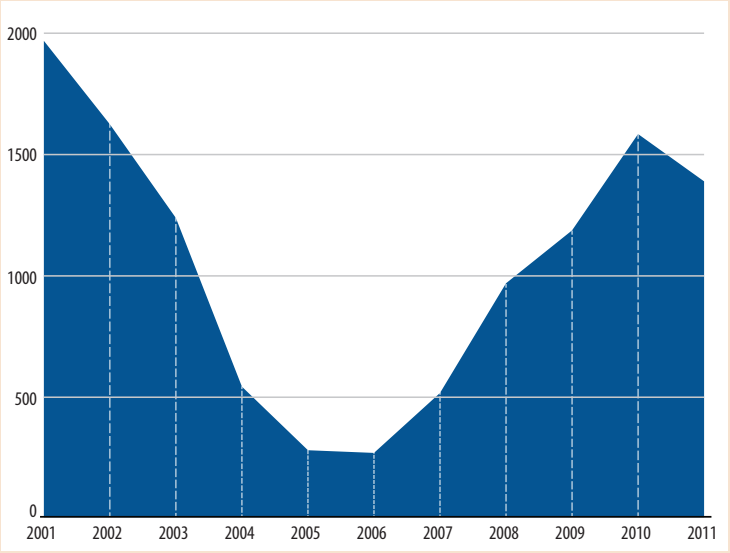
From 10 to 1,000 Summer Chinook

The Nez Perce Tribe began the Johnson Creek Artificial Propagation Enhancement Project in 1998 after tribal biologists observed critically low numbers of returning adult chinook to Johnson Creek, a tributary to the South Fork of the Salmon River. The stream is located in central Idaho, almost 700 miles upstream of the Pacific Ocean and eight large dams. By 1995 the number of spawning fish pairs in Johnson Creek had been reduced to five.

Adult return numbers are now consistently meeting the Johnson Creek project's short-term abundance goal of 350 returning adults, with the project already returning more than 1,000 summer chinook adults in some years. A limited harvest will be allowed when the tribe reaches a goal of 6,900 adults returning to Johnson Creek. The long-term ecological return or escapement goal is 19,000 summer chinook. The Nez Perce Tribe believes that by continuing the careful work of the Johnson Creek Artificial Propagation Enhancement Project these goals stand a good chance of being met.

Johnson Creek spring runoff

Johnson Creek is the red area.



Total returns from 2001 to 2011.

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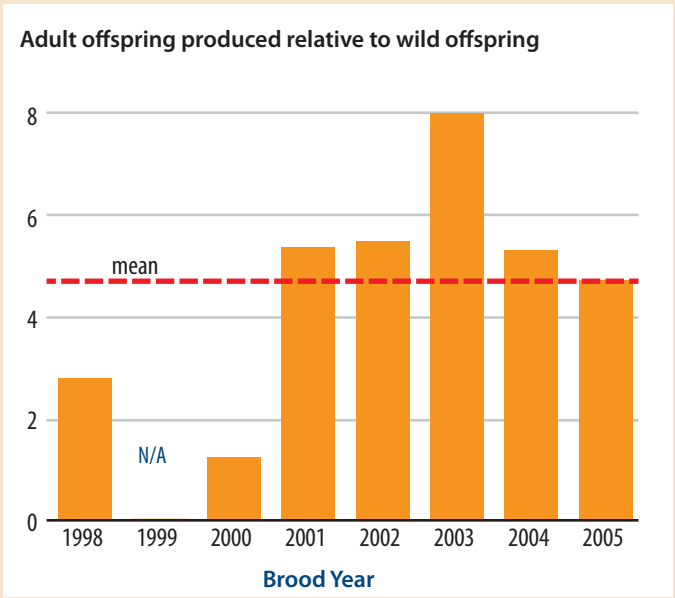
The results of the Johnson Creek artificial propagation study refute a commonly held misconception and some previous research suggesting that interbreeding of hatchery-reared fish with wild fish will always decrease productivity and fitness of the wild populations. In fact, the Johnson Creek research demonstrates how supplementation programs are able to increase populations and minimize impacts to wild fish populations.

The study used DNA from all returning adults collected over a 13-year period to track parents and their offspring and to determine how successful hatchery fish were at mating in the wild when compared to wild fish. The study showed a clear boost to the number of adult salmon returning to the population from supplementation: Fish taken into the hatchery produced an average of nearly

Juvenile salmon smolts



On average fish taken into the hatchery produced nearly 5x more adult offspring than naturally producing fish.

5 times the number of returning adults compared to the fish that were left in the wild to spawn. A key finding of the Johnson Creek study was that a hatchery-origin fish spawning naturally with a wild fish had the equivalent reproductive success as two wild fish, suggesting that chinook salmon reared for a single generation in the hatchery did not reduce the fitness of the wild fish. Similarly, productivity of two hatchery fish spawning naturally was not significantly lower than for two wild fish.

Juvenile chinook with a tiny transpnder to track its migration to and from the ocean

In 2012, the journal *Molecular Ecology* published the results of the research conducted on the Johnson Creek Artificial Propagation Enhancement Project. The lead author on the study was Maureen Hess, a geneticist with the Columbia River Inter-Tribal Fish Commission. Scientists conducted genetic research at the Hagerman Lab, a project of the University of Idaho and CRITFC. The article is available online at http://onlinelibrary.wiley.com/doi/10.1111/mec.12046/abstract.

The Supplementation Tool

The Johnson Creek study is only one example of several supplementation programs playing a significant role in the recovery of Columbia Basin salmon runs.

The tribes have argued that supplementation hatcheries are an effective restoration tool when they incorporate natural-origin fish as broodstock in their hatchery programs and place fish back in their natural spawning areas.

The Nez Perce and other tribes are convinced that hatcheries will be needed as long as dams exist on the Columbia River. If the region wants healthy and sustainable salmon returns, the goal, they say, should be wiser use of hatcheries. The results of the Johnson Creek study set a new benchmark to guide hatchery management in the Columbia Basin and in the region.

McCall Fish Hatchery used in Johnson Creek supplementation

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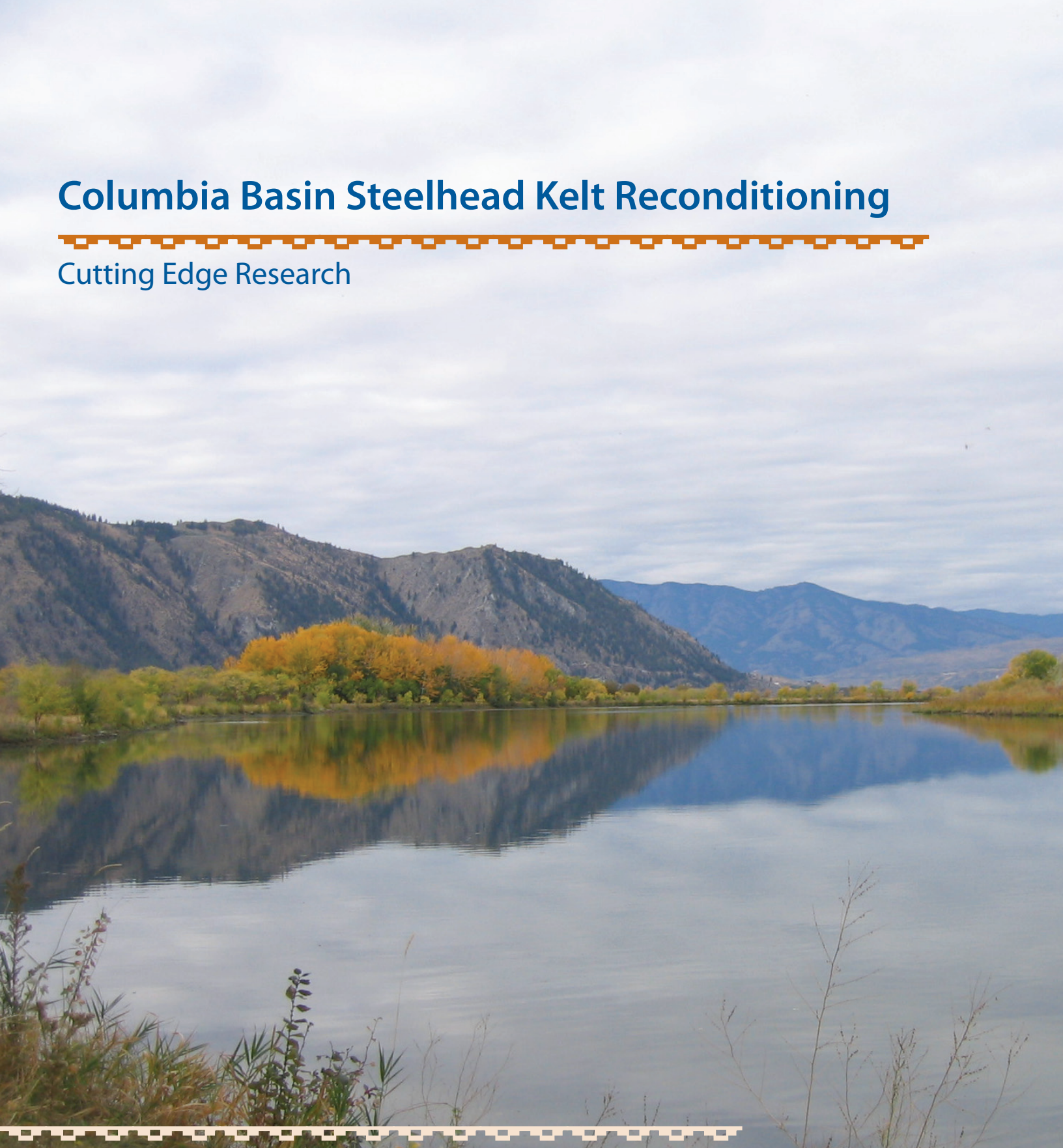
Columbia Basin Steelhead Kelt Reconditioning

Cutting Edge Research

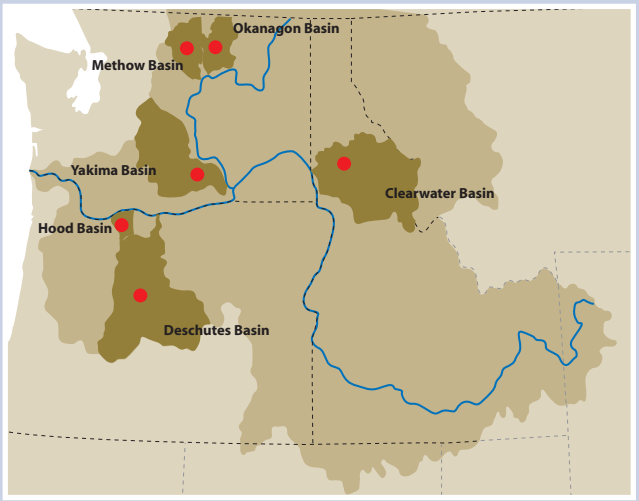


Confederated Tribes of the Warm Springs
Indian Reservation of Oregon

Unlike other anadromous fish, steelhead are able to spawn a second time. Around 2% of the Columbia Basin steelhead population successfully spawns twice. These repeat spawners are called "kelts." Thousands try to migrate to the ocean after spawning but die before getting there. Limitations on downstream adult fish passage at the Columbia River hydroelectric dams pose serious barriers to outmigrating kelts. As a result, fewer kelts are found in the upper Columbia than elsewhere in the basin. By increasing their survival, more kelts have the potential to be a valuable contributor to ESA-listed steelhead populations.

In 1999 the Yakama Nation and the Columbia River Inter-Tribal Fish Commission (CRITFC) partnered on a project to explore how innovative strategies could improve the successful repeat spawning of steelhead kelts in the Yakima River. The Yakama Nation's kelt reconditioning program has been so successful that similar programs have been started by the Colville tribe in northern Washington, the Warm Springs tribe in Oregon, and the Nez Perce tribe in Idaho. The tribes started these concurrent programs for the upper and lower Columbia and Snake rivers to explore whether reconditioned kelts could provide additional steelhead to the spawning grounds and aid in steelhead recovery. Steelhead from these rivers are listed as threatened under the Endangered Species Act (ESA). The tribes' common

Measuring a steelhead smolt



Reconditioning is occurring in these named subbasins. Red areas are kelt control release sites.

The Control Group

In-river releases involve collecting kelts, tagging them, and releasing them back into the river. These control groups provide tribal biologists with return estimates to compare against various management scenarios. These releases have occurred on the Yakima River at Prosser Dam, on the Snake River at Little Goose and Lower Granite dams, and on the Columbia River at John Day Dam.

Conducting an ultrasound scan of a steelhead kelt

The Reconditioning Process

The reconditioning process entails collecting outmigrating kelts in the spring, holding and feeding them until early October, then releasing them into the stream where they were collected as the steelhead run is coming upriver. Kelt reconditioning requires careful feeding regimes enabling kelts to survive and rebuild energy reserves required for repeat spawning. The fish are fed a diverse diet including krill and squid. Adults are treated with antibiotics to help rebuild their immune system and avoid infections. Adult steelhead may be held for 6-9 months until they are released to spawn.

goal: determine if reconditioning is a useful tool for steelhead recovery in the Columbia River Basin.

Research Yields Positive Results

Tribal research on wild steelhead kelts includes testing feed types that not only maximize survival but also quicken the rate of re-maturation. The tribes and CRITFC are using new approaches in physiological testing to quantify re-maturation status and to direct the utilization of therapeutics and their applications to increase kelt survival. The

tribes' cutting edge genetic techniques at Hagerman laboratory are able to identify which tributaries in the Snake and Yakima basins are producing the most kelts. Genetic research applications are helping to verify the presence of kelt reproduction in Columbia River tributaries. Research at the Parkdale Fish Facility suggests that kelts are just as reproductively viable as maiden spawning fish. This means that every kelt has the potential to be a valuable contributor to ESA-listed steelhead populations.

Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon)

To this day, the tribes remain the only fishery managers conducting steelhead kelt reconditioning research in the Columbia Basin. These programs have been successful in discovering which reconditioning strategies and methods work best at decreasing post-spawning mortality and improving re-maturation. The project has shown that reconditioned kelts are reproductively viable and capable of reproducing in the wild. Tribal programs can improve wild steelhead survival by negating mortality caused by crossing as many as nine mainstem dams, predation, and unpredictable ocean conditions. By collecting and reconditioning kelts the tribal programs are acquiring wild steelhead spawners from a group of fish that most likely would have died.

It's the Simple Things That Matter

In kelt reconditioning, it's the simple things that matter. The most successful method is to provide a nutritious and varied diet as well as minimal interaction with people as the means to rejuvenate the veteran spawners. The Yakama Nation and CRITFC are coordinating with the Chelan Public Utility District. Douglas Public Utility District and the U.S. Fish and Wildlife Service to construct an "isolation building" at the Winthrop National Fish Hatchery in Winthrop, Washington for kelt reconditioning. Not accessible to the public, the facility will reduce fish stress by keeping the surroundings quiet during their reconditioning period. Steelhead kelts are reconditioned through the summer months and returned to the Methow River near Pateros, Washington in the fall so they can spawn again in the following spring. The goal of this program is to increase the number of wild spawners in the Methow Basin by 10%.

John Day Dam on the mainstem Columbia River. Kelt steelhead have a difficult time passing back downstream through the hydrosystem, and consequently repeat spawning fish are rare.

This project demonstrates the tribes' commitment to *Wy-Kan-Ush-Mi Wa-Kish-Wit*—the Spirit of the Salmon restoration plan. The tribes' plan calls for the recovery of steelhead and other culturally important fish resources so that all residents in the Columbia River Basin might enjoy nature's bounty.

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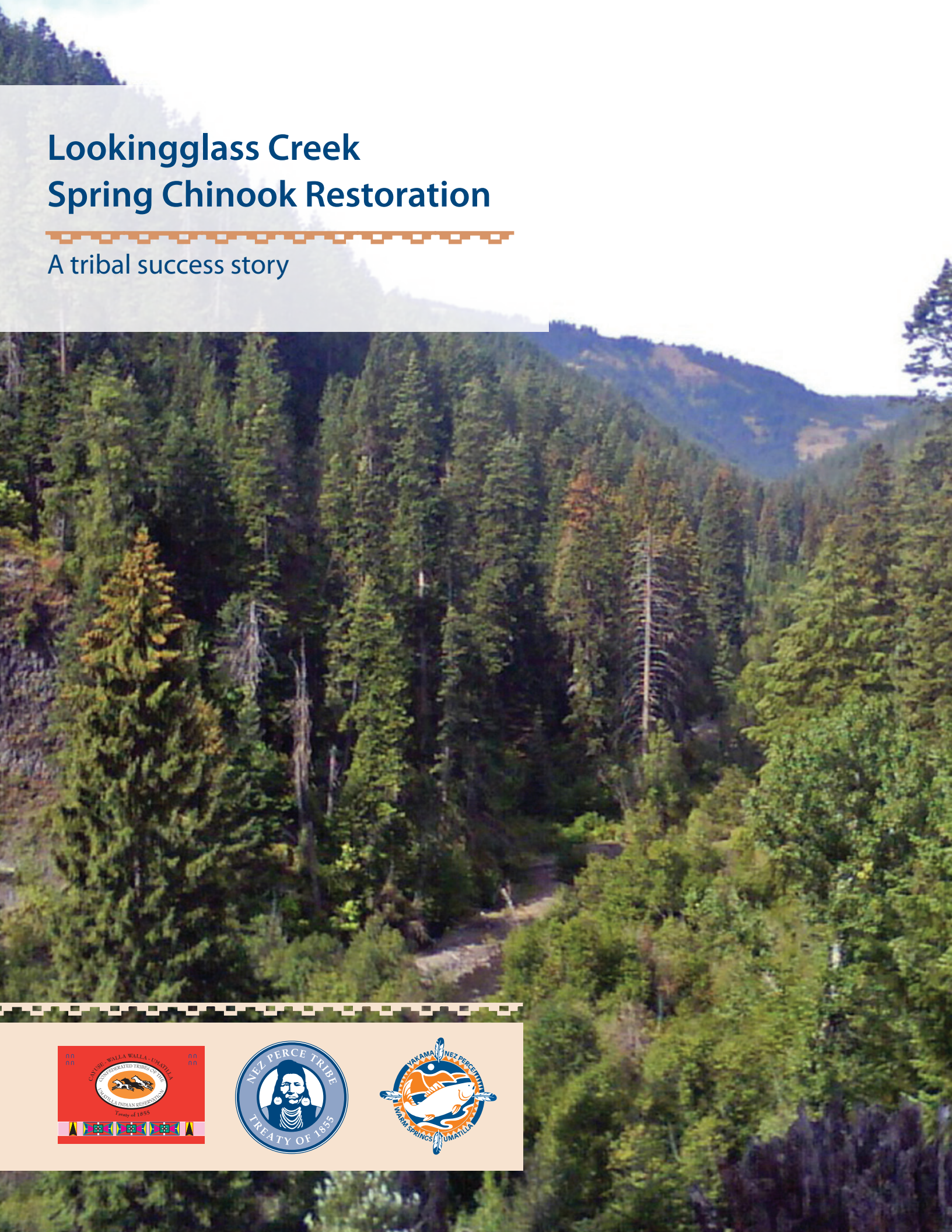
Lookingglass Creek Spring Chinook Restoration

A tribal success story



Emerging from the Blue Mountains in Eastern Oregon, Lookingglass Creek travels through the Umatilla National Forest then through private land before entering the Grande Ronde River, a tributary of the Snake River. With five major tributaries—Lost Creek, Summer Creek, Eagle Creek, Little Lookingglass Creek, and Jarboe Creek—the Lookingglass Creek watershed provides essential spawning habitat for spring chinook salmon.

Nearly all spring chinook spawning occurs in Lookingglass Creek and its largest tributary, Little Lookingglass Creek. The native spring chinook population in the Lookingglass Creek basin once supported significant tribal and sport fisheries. Historical redd count data from the 1950s-1970s indicate that spring chinook abundance typically exceeded 1,000 adults.

The completion of lower Snake River dams in

Lookingglass Creek watershed is the red area.

the 1970s as well as the construction of the Lookingglass Hatchery and weir in 1982, however, led to the extirpation of the native population of spring chinook in the watershed. Still Lookingglass Creek had relatively unaltered habitat that could support spawning salmon.

Bringing Fish Back to the Habitat

The loss of this population and the associated fishery prompted the Confederated Tribes of the Umatilla

Lookingglass Creek Hatchery

Indian Reservation to begin an effort to reestablish a spring chinook population in the watershed.

In 1992 the tribe began a reintroduction program. From 1992 to 1999, a non-endemic (non-local) Rapid River, Idaho stock with a history of hatchery domestication was introduced to reestablish a spring chinook population. The weir and trap at the hatchery and outmigrant trap allowed for precise monitoring of fish in and fish out. Intensive monitoring of natural production occurred throughout the 1960s, which provided benchmark productivity data for biological comparisons.

Broodstock Differences?

Performance measures for returning adults of the Rapid River stock were similar to the endemic stock across all metrics evaluated (redd distribution, spawn timing, adults per redd, outmigrants per redd, outmigration timing and survival, and parent/progeny ratios).

A weir on Lookingglass Creek where adults are collected

Genetic Resources

To maintain the genetic resources of the Lookingglass spring chinook stock, biologists collect adults throughout the entire run.

Lookingglass Creek is co-managed by the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and Oregon Department of Fish and Wildlife.

After objections from the National Oceanic and Atmospheric Administration (NOAA) Fisheries and rules prohibiting use of the non-local Rapid River stock, the Umatilla tribe was obliged to restart the reintroduction program with an inbasin stock. In 1999 the stocking of Rapid River juveniles ceased, and for the next several years the tribe had to block passage of all returning adults, causing the upstream population to again go extinct.

In 2001 the tribe reintroduced juveniles produced from a recently established Catherine Creek stock, a nearby Grande Ronde River tributary. In 2004 the first year that adults from the new Catherine Creek stock returned to the basin and passage of fish upstream was again permitted.

Beginning in 2007, the first adult progeny from natural spawning of the 2004 broodyear fish returned. Supplementation of the new population continues—using a mix of natural- and hatchery-origin broodfish—with the intent of promoting the creation of a naturalized Lookingglass stock.

Information acquired through the monitoring program permits performance measure comparisons of the new Catherine Creek stock, as well as the prior Rapid River stock, to the endemic fish (shown in the table below). These results and others indicate striking potential for success of hatchery reintroduction and supplementation programs for spring chinook.

Productivity measures for the endemic and the two introduced stocks of spring chinook in Lookinglass Creek

(Outmigrants are juvenile fish counted as they leave their natal stream on their way to the ocean.)

Stock	Broodyear	Redds	Outmigrants Produced	Outmigrants per Redd
Endemic	1965	99	33,437	338
	1966	279	55,315	198
	1967	120	31,036	259
	1968	133	29,076	219
	1969	276	33,148	120
Rapid River Stock	1992	49	8,715	178
	1993	132	46,536	353
	1994	40	6,388	160
	1996	24	14,625	609
	1997	24	13,330	555
Catherine Creek Stock	2004	49	16,344	334
	2005	29	11,500	397
	2006	28	12,502	447
	2007	32	7,796	244
	2008	104	59,942	576

A contentious past

Rapid River spring chinook have a storied history. In 1980 Nez Perce tribal members fished for chinook in protest of a state fishing ban. Tribal members were ticketed (in the photo above, an 8-year-old Nez Perce boy is being ticketed), and the state posted armed guards at the treaty fishing site. After a prolonged trial, an Idaho judge dismissed all charges.

Continued work will include a genetic evaluation of the productivity of progeny from captive Catherine Creek broodstock that spawn naturally versus those subjected to another "hatchery cycle" and used for broodstock in Lookingglass Hatchery.

Supplementation of the reintroduced population is successfully contributing to the maintenance and growth of the spring chinook in the Lookingglass Creek watershed. In fact, for the first time in decades, returns to Lookingglass Creek were strong enough in spring 2011 and 2012 to allow tribal and sport fisheries. The run size in 2012 was estimated at 1,700 fish, roughly the same as seen historically.

Chinook in Lookingglass Creek, swimming upstream to spawn

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Columbia River Inter-Tribal Fish Commission
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Portland, Oregon 97232
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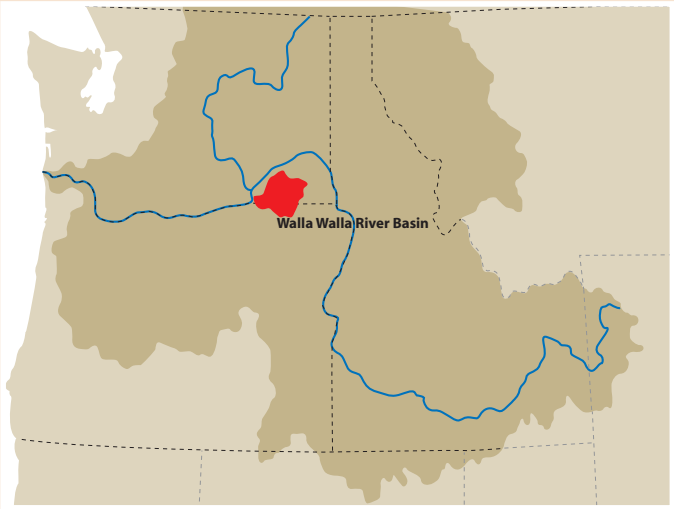
Walla Walla River Spring Chinook Reintroduction

A tribal success story

Photo: Marshal Hedin

The Walla Walla River subbasin is located within the northeast portion of the aboriginal title lands of the Confederated Tribes of the Umatilla Indian Reservation. The headwaters of the Walla Walla River are in the Blue Mountains and contain important salmonid production areas for summer steelhead, rainbow trout, bull trout, mountain whitefish, and reintroduced spring chinook. The Walla Walla River enters the Columbia River at roughly river mile 315.

Spring chinook were extinct from the Walla Walla River for more than 80 years. The last run of more than a few fish was reported in 1925. Nine Mile (Reese) Dam, constructed in 1905, preceded the disappearance of spring chinook and caused the Walla Walla River to run dry each summer for nearly 100 years.



The Water Flows Again

Then in 2001, thanks to an agreement among three irrigation districts, the Umatilla tribe, and federal agencies, the Walla Walla River started flowing all year long once again. This agreement supplemented earlier tribal, state, and landowner partnerships to improve fish passage and habitat. These actions to restore instream flows improved the likelihood that the tribe's reintroduction program, started in 2000, would succeed.

Protecting and Restoring the First Foods

The Umatilla tribe's mission for its fishery and natural resource programs is "to protect, restore, and enhance the First Foods, water, salmon, deer, cous, and huckleberry, for the perpetual cultural, economic, and sovereign benefit of the Confederated Tribes of the Umatilla Indian Reservation…" The tribe began its spring chinook reintroduction program because the tribe relies on spring chinook culturally and spiritually and recognizes the species' importance in the Walla Walla River's ecological functioning.

To jump-start the program, the tribe released surplus Umatilla and Ringold adult spring chinook

A salmon feast at a tribal longhouse. Salmon and water are the first of the First Foods. In the spring, when the tribes celebrate the salmon's return, tribal longhouses and churches must have spring chinook—no other fish will do—for their First Salmon ceremonies.

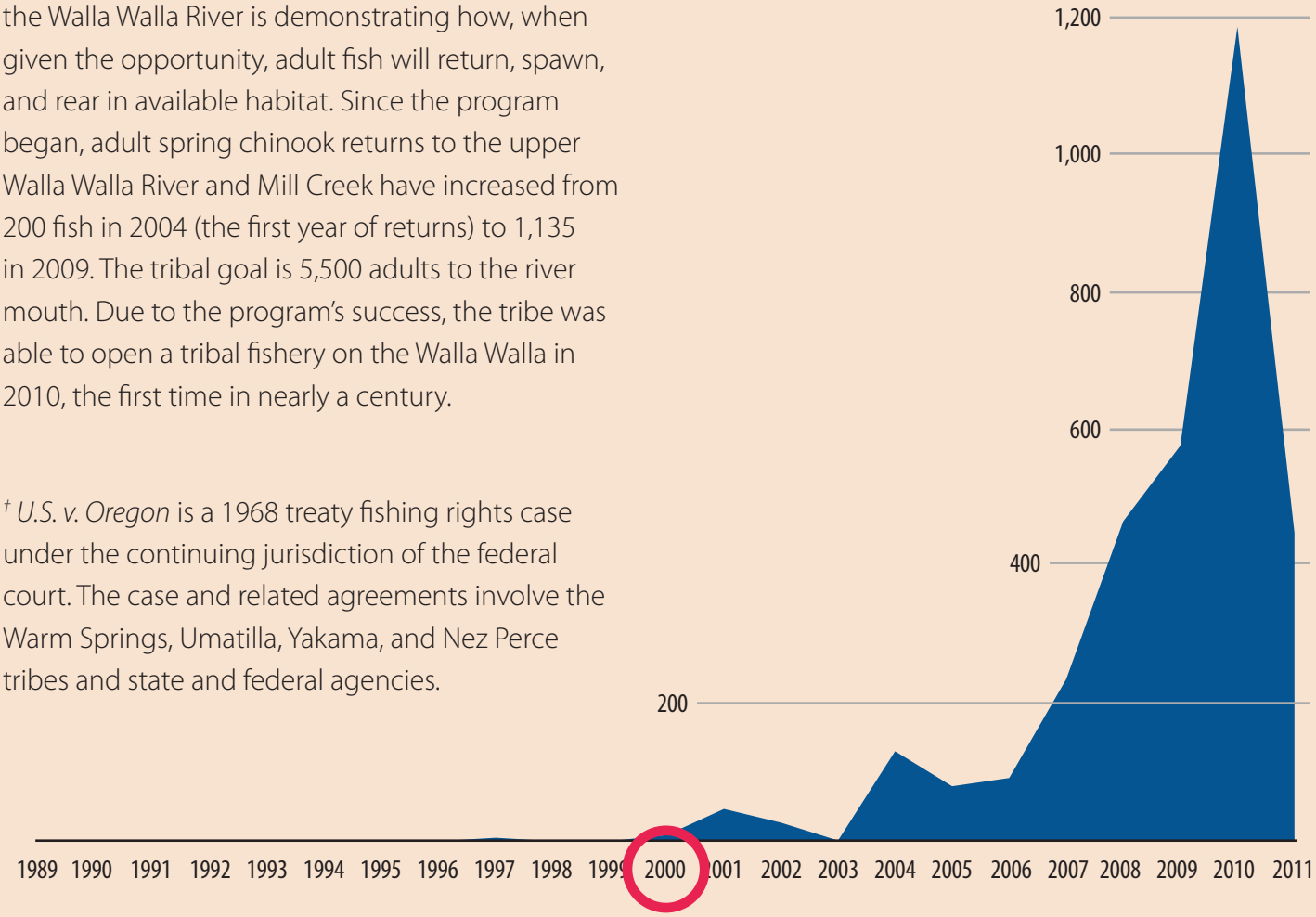
Spring chinook alevin or sac-fry hatched from eggs. Photo: USWFS Pacific

into the South Fork of the Walla Walla River. Needing additional broodstock, the Umatilla tribe was able to acquire an additional 250,000 spring chinook smolts from Carson National Fish Hatchery in Carson, Washington as a result of a *U.S. v. Oregon*[†] Interim Management Agreement. In 2005 the Umatilla tribe successfully reprogrammed these fish for release into the South Fork Walla Walla.

The Umatilla tribe's spring chinook reintroduction in the Walla Walla River is demonstrating how, when given the opportunity, adult fish will return, spawn, and rear in available habitat. Since the program began, adult spring chinook returns to the upper Walla Walla River and Mill Creek have increased from 200 fish in 2004 (the first year of returns) to 1,135 in 2009. The tribal goal is 5,500 adults to the river mouth. Due to the program's success, the tribe was able to open a tribal fishery on the Walla Walla in 2010, the first time in nearly a century.

[†] *U.S. v. Oregon* is a 1968 treaty fishing rights case under the continuing jurisdiction of the federal court. The case and related agreements involve the Warm Springs, Umatilla, Yakama, and Nez Perce tribes and state and federal agencies.

Total returns of Walla Walla River spring chinook *(Adult counts at Nursery Bridge). Year reintroduction began is circled in red.*



Cooperation and Creative Problem Solving

The Walla Walla Watershed Management Partnership, a broad collaboration with local governments and stakeholders, is part of a unique pilot program passed by the Washington State Legislature in 2009.

This voluntary program believes the key to augmenting stream flows for fish is for water users to employ greater local control and flexibility beyond what conventional water management options and regulation can deliver. The partnership works with water users to develop and implement reach-scale "Flow from Flexibility" water plans and operates the Walla Walla Water Bank, which accepts water rights conserved in local water plans, agreements not to divert, voluntary contributions, and mitigation transactions.

The Walla Walla project is coordinated with the Snake River Salmon Recovery Board, which is comprised of officials representing Walla Walla, Garfield, Asotin, Columbia, and Whitman counties, the Umatilla Tribe, and various state and federal agencies.

The Next Step: A Spring Chinook Hatchery

The Umatilla has a hatchery master plan for developing spring chinook production facilities for the Walla Walla Basin. The plan's goals are to restore harvest and natural production while naturalizing a local stock to the system. The tribe believes these goals can be achieved in a reasonable amount of time by using hatchery technology rather than waiting for natural recovery through straying and recolonization, which may not occur within any relevant timeframe.

The endemic chinook population in the Walla Walla had been extirpated (extinct) for some 80 years when adults from Carson hatchery were first outplanted in 2000. The current level of natural production was reestablished from these Carson stock outplants. To improve natural production in the system, the proposed program would naturalize a run and work to build genetic and life-history diversity through best management practices and progressive hatchery actions. The master plan's guidelines aim to create a "localized" stock and minimize hatchery effects on the reestablished natural populations. The recent returns of naturally reared fish derived from Carson stock adults outplanted in the Walla Walla seem to be performing well.

Walla Walla River near Stone Creek
Photo: Glenn Scofield-Williams

For More Information

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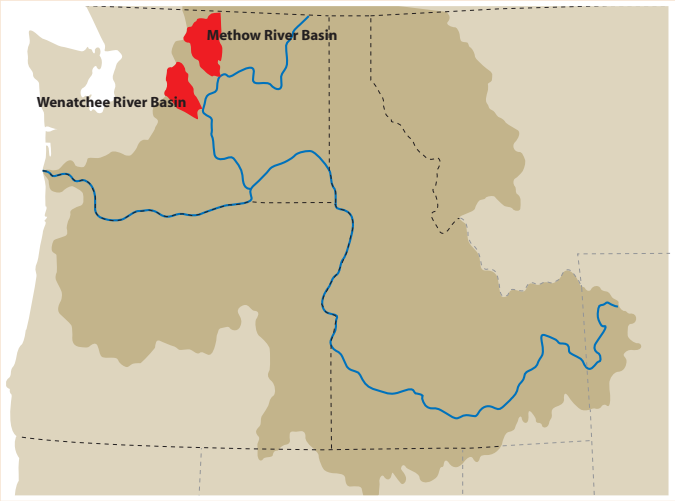
Coho Restoration in the Methow and Wenatchee Rivers

A tribal success story

Coho salmon are once again navigating the waters of the Wenatchee and Methow rivers. Coho were essentially eliminated from these river systems during the 20th century. Impassable dams, overfishing, unscreened irrigation diversions, habitat degradation, and hatchery policies all contributed to the virtual disappearance of coho in these two mid-Columbia river systems.

Prior to the 20th century, an estimated 120,000 to 165,000 coho returned annually to mid-Columbia rivers—the Yakima, Wenatchee, Entiat, Methow, and Spokane.

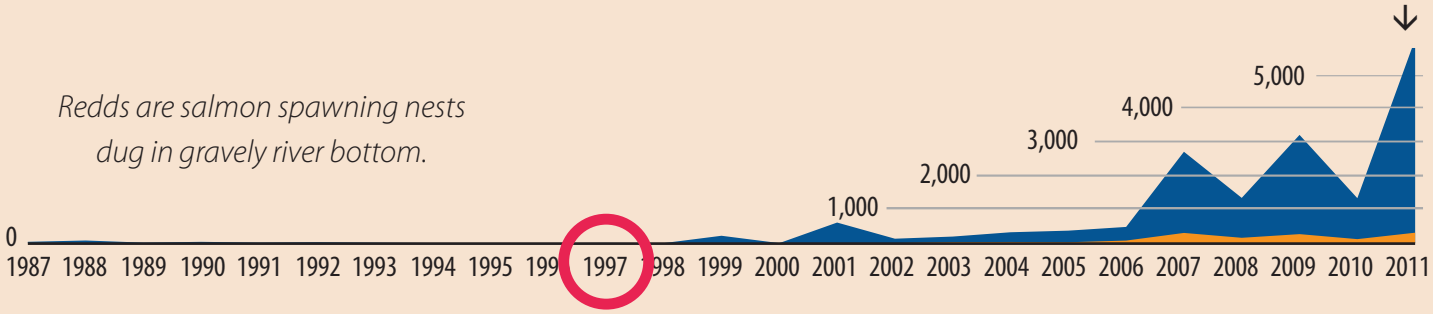
Recognizing the losses that occurred after dams were built in the mid and upper Columbia, the Yakama Nation began an aggressive program to restore coho. The Yakama Nation began reintroducing coho to the Methow River in 1997 and the Wenatchee River in 1999. The tribe used the only coho stock available, an early-run, lower river coho. With an innovative supplementation approach that acclimated the juvenile coho to spawning areas, the Yakama Nation has rebuilt Wenatchee and Methow coho runs and put more adults back into the spawning grounds.

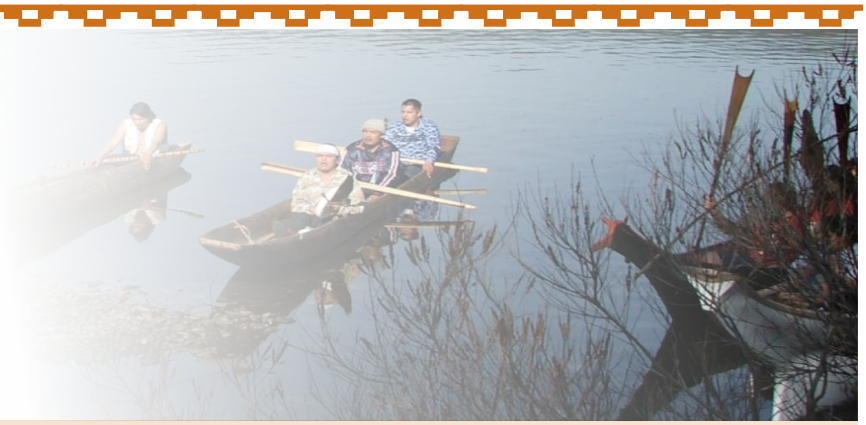


Butcher Creek acclimation site

***Total return of Methow River coho**, adult counts shown in blue (Wells Dam counts). Redd counts shown in gold. The year Methow coho reintroduction began is circled in red.*

Redds are salmon spawning nests dug in gravely river bottom.





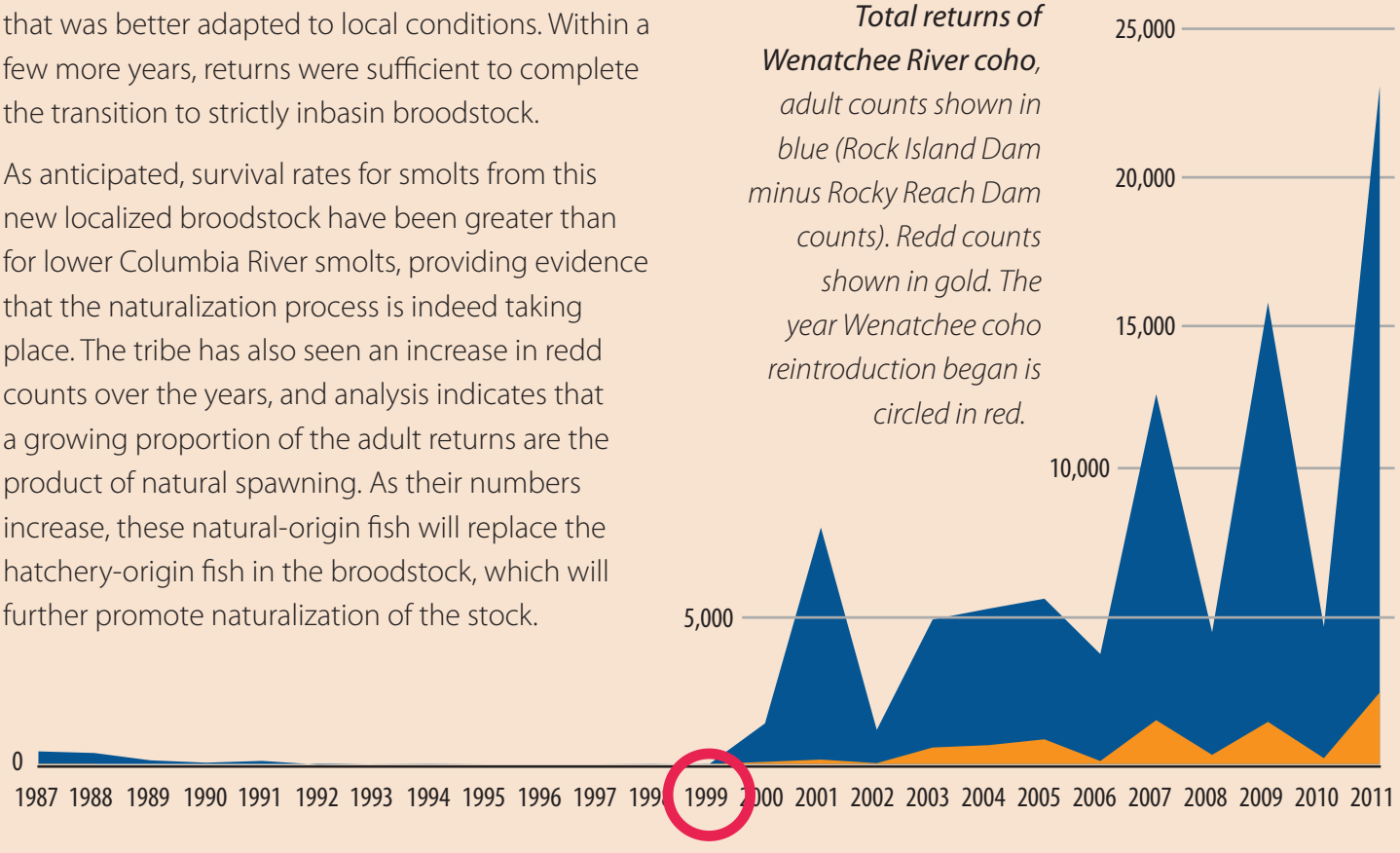
The Coho Come Back

Coho adults at spawning time

Within a few years of reintroducing coho to the Wenatchee and Methow, the Yakama Nation began replacing the lower Columbia fish with juveniles produced from a portion of the inbasin returning adults; the other fish were allowed to pass upstream for natural spawning. By choosing these fish with the demonstrated ability to migrate the many hundreds of miles out and back from the ocean, past seven or more dams, and home back to their mid-Columbia tributaries, the tribe hoped to create a broodstock that was better adapted to local conditions. Within a few more years, returns were sufficient to complete the transition to strictly inbasin broodstock.

As anticipated, survival rates for smolts from this new localized broodstock have been greater than for lower Columbia River smolts, providing evidence that the naturalization process is indeed taking place. The tribe has also seen an increase in redd counts over the years, and analysis indicates that a growing proportion of the adult returns are the product of natural spawning. As their numbers increase, these natural-origin fish will replace the hatchery-origin fish in the broodstock, which will further promote naturalization of the stock.

Total returns of Wenatchee River coho, *adult counts shown in blue (Rock Island Dam minus Rocky Reach Dam counts). Redd counts shown in gold. The year Wenatchee coho reintroduction began is circled in red.*



Stripping coho eggs for culturing

Coho Restoration in the Yakima and Clearwater Rivers

Similar coho reintroduction and restoration have occurred in the Yakima and Clearwater river basins. Both the Yakama Nation's Yakima River Coho Re-Introduction Study and the Nez Perce Tribe's Clearwater Coho Restoration Project are successful with results comparable to the Wenatchee/Methow program. Despite starting with out-of-basin hatchery stock, the Clearwater, Yakima, Wenatchee, and Methow rivers are seeing increasing returns of natural origin coho—fish that are adapting to their new environment and establishing spawning populations in new habitat areas.

Since the program's inception, total adult coho returns to the two basins have ranged from 1,751 to 30,341 with a 10-year average of 8,576 fish. Significantly, adult returns in 2009 were at a record high (since the mid-1900s) and deemed sufficient to open a limited tribal and non-tribal fishery in Icicle Creek, a Wenatchee tributary. It was the first fishery in over half a century. Another record return— almost twice that of the 2009 record—occurred in 2011. A fishery was opened not just in Icicle Creek, but in the lower Wenatchee and Methow rivers as well.

Tending to coho eggs in the hatchery

Dramatic increases in annual returns, including natural-origin coho, have been accompanied by increasing numbers and distribution of redds.

Success Is Shared

Partnerships with Grant County and Chelan Public Utility Districts and the Methow Salmon Recovery Foundation have helped make this restoration project possible. Sportsfishers, tribal members, and non-tribal commercial fisheries are now sharing in the benefits.

For More Information

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