



# 2022 STATUS AND TRENDS ANNUAL REPORT



March 2023



# FOREWORD



My name is Jeremy Takala, Tribal Councilmember of the Yakama Nation and Chairman of the Legislative and Fish/Wildlife Committee. I was honored recently to travel with the Columbia River Inter-tribal Fish Commission delegation to attend Congressional hearings and meet with legislators in Washington D.C. We met with at least 15 Offices, including representatives from Washington, Oregon, and Idaho, or those on important Congressional Committees.

Most of our discussions were related to Sea Lion impacts on our Salmon, Columbia River Hatchery Deferred Maintenance, and an Energy Vision for our future. Our message included the \$1.154 billion in needed work at USACE Columbia and Snake Facilities for salmon/anadromous fish passage and survival. Breaking it down, that would be about \$144.1M annually over the next 8 years. Four of those categories included Columbia River Fish Management, Hatchery Programs, Lamprey, and Operations/Maintenance.

Another point that was made during our visits was the need to continue funding for predator management, which includes invasive fish species such as northern pike, bass, walleye, etc., as well as avian predation. The proposed need is around \$3.2 million for monitoring predator management programs and about \$8 million for implementing predator management in the Columbia River. The Yakama Nation and the 3 Treaty Tribes will continue to advocate for what is needed for the survival of our Salmon, Steelhead, Lamprey, which are very important to our people. These first foods need our voice because they are being threatened by pressure from Climate Change. Overall our advocacy focused on important upgrades, like fish ladder repairs, spillway repairs and improvements, fish screen and juvenile bypass system(s), sediment management and cold water refuges, estuary restoration, and hatchery modernization upgrades and maintenance. For the Lamprey specifically, we requested a detailed breakdown of each hydro-system area. The last conversation consisted of the Operations and Maintenance needed for the Treaty Fishing Access Sites/In Lieu Sites. Yakama Nation did utilize some of these meetings to check-in on some ongoing work we are continuing with respected leaders.

Although Yakama Nation joined the CRITFC delegation, the timing was a perfect opportunity to provide testimony on behalf of Yakama Nation in the US House of Representatives Appropriations Subcommittee for the Interior, Environment, and Related Agencies. Concerns for us included the need for increased resources which have been flat-funded for decades, especially when it comes to law enforcement. We also spoke on the issues of Appraisal Backlog at Yakama, and concerns with Forest Management, degraded In Lieu and Treaty Fishing Access Sites, and Water Resources. Additionally, the Bureau of Indian Education and our need for a new Yakama Nation Tribal School was a big message to advocate for -- and many Tribes are in desperate need of school infrastructure.

*Summary of a recent trip to Washington D.C. by Yakama Nation Tribal Council Fish and Wildlife Committee Chairman, Jeremy Takala (Pax'anashat) March 14, 2023*

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To learn more, visit: [yakamafish-nsn.gov](http://yakamafish-nsn.gov) and [dashboard.yakamafish-star.net](http://dashboard.yakamafish-star.net)

Cover Photo: Female coho. This page: Pahto (Mt. Adams) Paul Ward

# METRICS HIGHLIGHTS

## Yakama Nation Restoration Accomplishments 2008-2023\*



**9,464**  
**Acre-feet/year**  
Water secured in-stream



**325 Miles**  
Stream habitats made  
accessible to fish



**2,000 Miles**  
Stream & riparian habitat  
improved, treated, or protected



**3,652**  
**Habitat Features**  
Large Woody Material & Pool  
structures created instream\*\*



**13,060 Acres**  
Wetland habitats  
improved or protected



**6 Fish Species**  
Being restored  
(8 populations/runs)



**161 Beavers**  
Released & relocated



**210,420 People**  
Educated and informed



**14,000 Pounds**  
Trash removed

\*Funded by Bonneville Power Administration. Source cbfish.org. Additional restoration work funded from other sources.

\*\*Additional 21,530 individual, unanchored logs and boulders installed instream for habitat complexity.



# YAKIMA SUBBASIN

## Levi George Supplementation and Research Facility — Spring Chinook

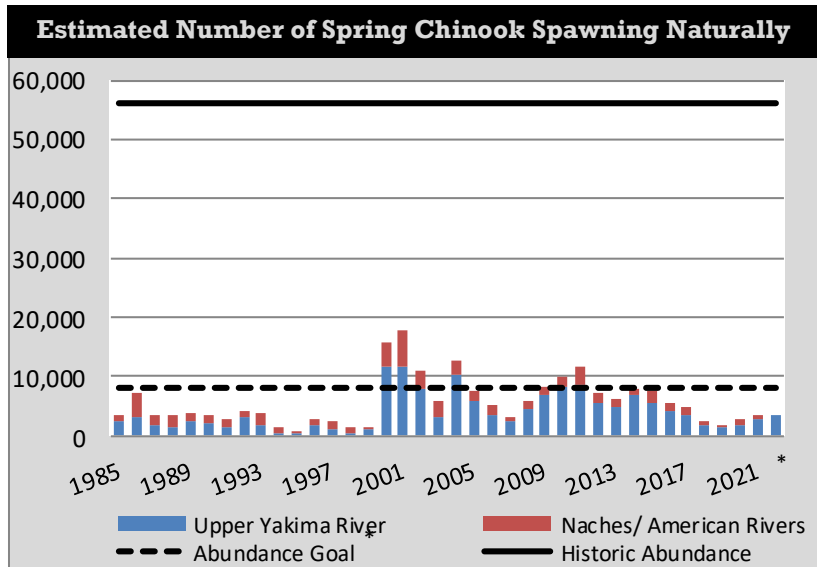
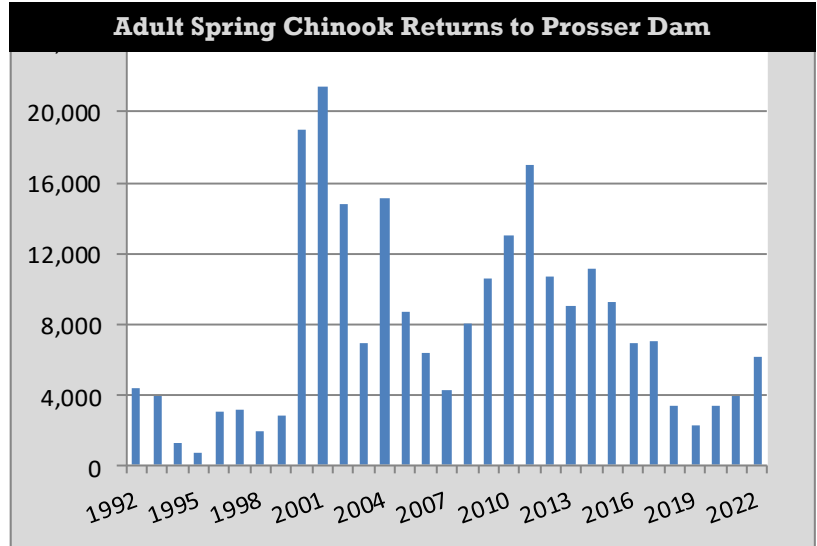
At the time of the 1855 Treaty, about 200,000 adult spring Chinook returned annually to the Yakima River. By the 1990s returns had declined to less than 3,500 fish, limiting tribal harvest.

In 1997, we opened the Levi George Cle Elum Supplementation and Research Facility (CESRF) to enhance spring Chinook returns and provide additional fishing opportunities. The facility was built to test the assumption that artificial production can be used to increase harvest and natural production while maintaining long-term genetic fitness of the fish population being supplemented and limiting adverse genetic and ecological interactions with non-target species.

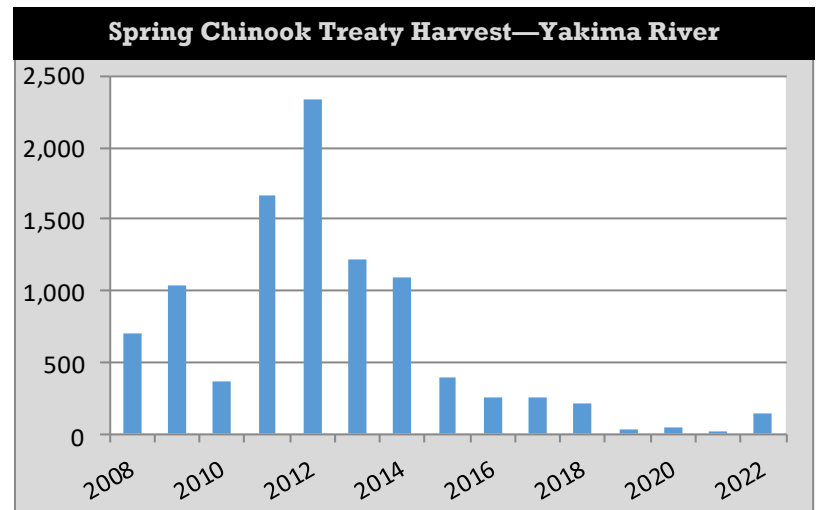
Production activities that occur at the facility include adult holding, spawning, incubation, and rearing of juvenile spring Chinook.



YN hatchery staff conducting spawning crosses to maintain genetic diversity at CESRF (YN)



\*High-range goal is for healthy and harvestable natural populations fully occupying restored habitat. See "Sources" p. 30. Naches/ American estimates not yet available for 2022.



Note: Harvest effort in recent years likely influenced by lower run sizes and COVID concerns.



## Melvin R. Sampson Coho Hatchery

During the fall of 2021, the first coho were spawned at the Melvin R. Sampson Hatchery near Ellensburg.

Mel was instrumental in starting and leading the Yakama-Klickitat Fisheries Project and an inclusive all-stocks initiative that has returned natural populations of summer Chinook, coho, sockeye, and Pacific lamprey to the Yakima Subbasin. As a highly respected tribal elder, Mel served 18 years on the Yakama Nation's Tribal Council, including the role of Council Chairman.

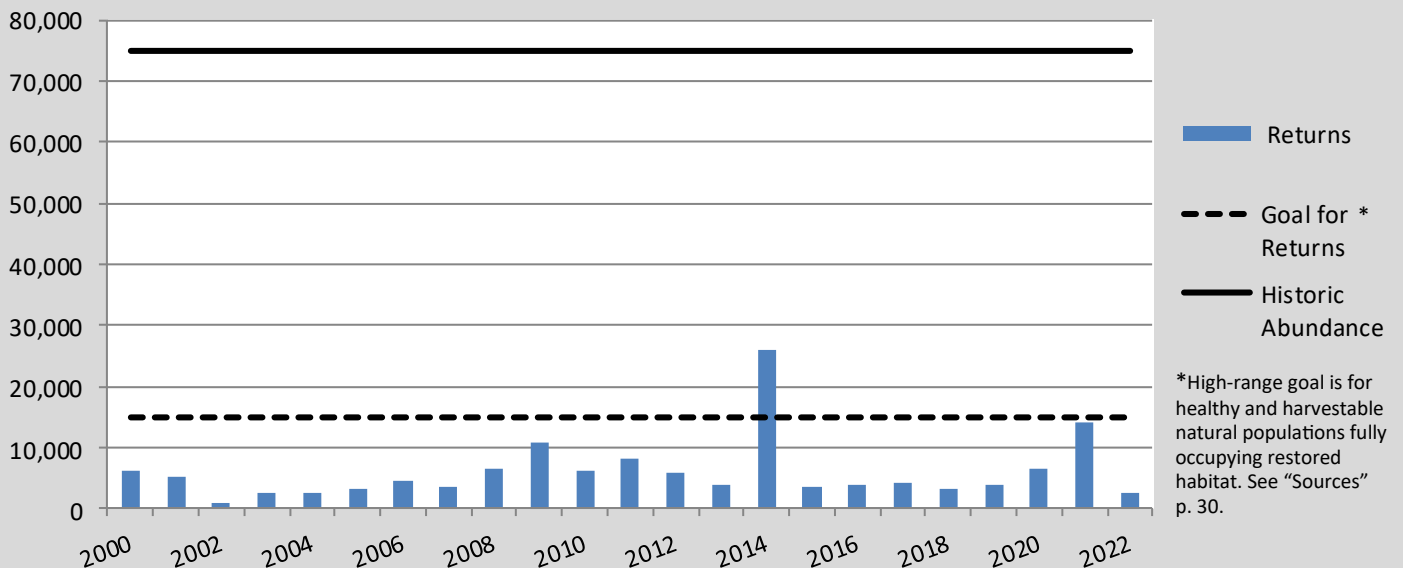
Funded by BPA through the Yakima-Klickitat Fisheries Project, the hatchery includes several environmentally sustainable features. Because limited water supply is a challenge in the subbasin during the summer and fall, there was a need to develop innovative ways to re-use water. To conserve water, the facility includes a partial recirculation system that allows for 80% of the water to be reused. This technology allows us to use 930 to 1,200 gallons of water per minute during peak demands, compared to more than 12,000 gallons per minute at a conventional facility. Also, to offset energy use via traditional sources, the hatchery is equipped with a solar grid.

With the new hatchery, we will be able to produce 700,000 juvenile coho annually for release into the subbasin in order to increase harvest levels, natural spawning abundance, and spatial/temporal distribution.



YN hatchery staff spawning coho at new facility (YN)

### Adult Coho Returns to the Yakima River Mouth



# YAKIMA SUBBASIN

## Prosser Hatchery — Fall Chinook

Prior to the Treaty era, up to 100,000 fall Chinook returned annually to the Yakima Subbasin. With the completion of hydroelectric dams, there has been a loss of natural production. One factor contributing to this loss is the inundation of spawning habitat. Consequently, reduced production led to the loss of harvest opportunities.

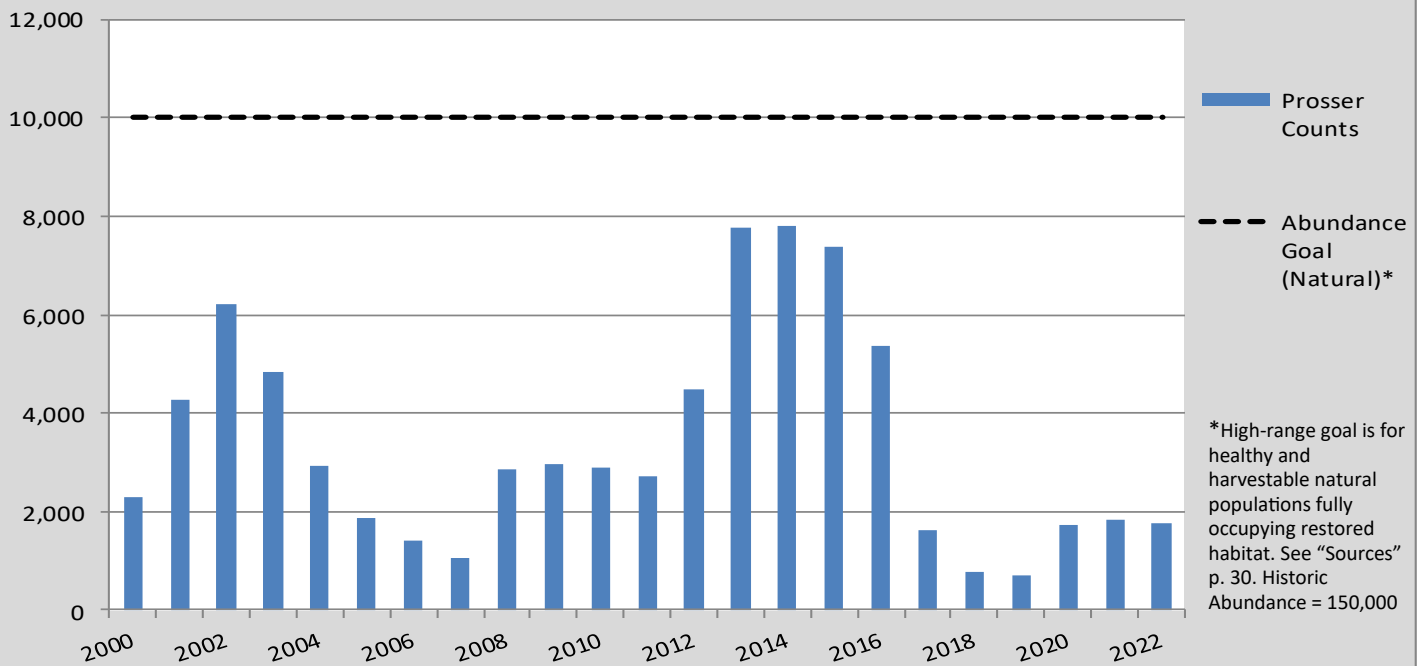
The US v. Oregon Columbia River Management Plan established annual release targets for hatchery fall Chinook in the Yakima Basin to augment harvest opportunity in Zone 6 fisheries and to increase natural spawning abundance. Annual releases have averaged approximately 1.75 million subyearlings since 1983.

Initial hatchery releases consisted of fish originating from outside the subbasin. By 1997, production of Yakima River-origin fish was occurring at Prosser Hatchery. Currently, fall Chinook returning to the Yakima River include upriver brights from Little White Salmon Hatchery and progeny of Yakima River adults.



Hatchery staff releasing fish into the Yakima River. (YN)

### Adult Fall Chinook Returns to Prosser Dam







Joe Blodgett assessing a kelt while reconditioning at Prosser (YN)

## Prosser Hatchery — Steelhead Kelts

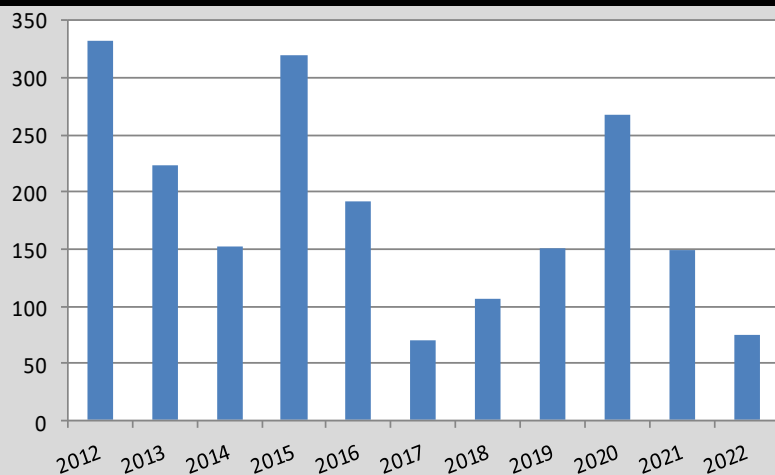
Historically, up to 40,000 steelhead returned annually to the Yakima Subbasin. By the 1990s, annual returns declined to around 1,000. Since 1999, we have been developing reconditioning strategies for kelts (post-spawn fish).

Steelhead are capable of spawning more than once; however, their physical condition after spawning combined with having to pass several dams and survive other dangers limit survival as they migrate to the ocean and back. To improve a steelhead's potential to spawn again, we have been developing a process to improve their condition.

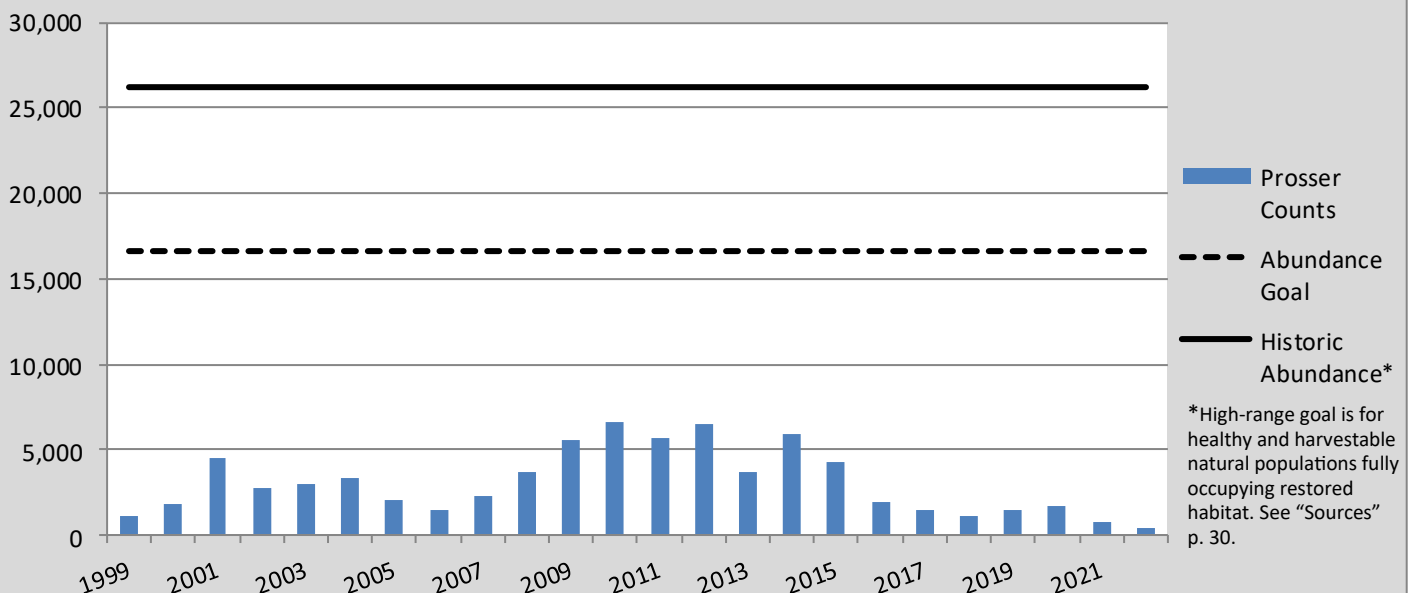
A portion of emigrating kelts are diverted into the Chandler irrigation canal and collected at the Prosser Juvenile Monitoring Facility. Upon capture, fish are held and cultured in reconditioning tanks at Prosser Hatchery.

After six months, fish are released to the river at the same time as steelhead are returning from the ocean. Reconditioned kelts naturally choose their mates, spawning location, and upstream migration and spawn timing.

Reconditioned Steelhead Kelts Released in the Yakima Basin



Adult Steelhead Returns to Prosser Dam



# YAKIMA SUBBASIN

## Summer Chinook Reintroduction Project

By 1970, summer Chinook were extirpated from the Yakima Subbasin. Summer-run Chinook are being reintroduced to the subbasin using Prosser Hatchery and temporary infrastructure at the Marion Drain Hatchery.

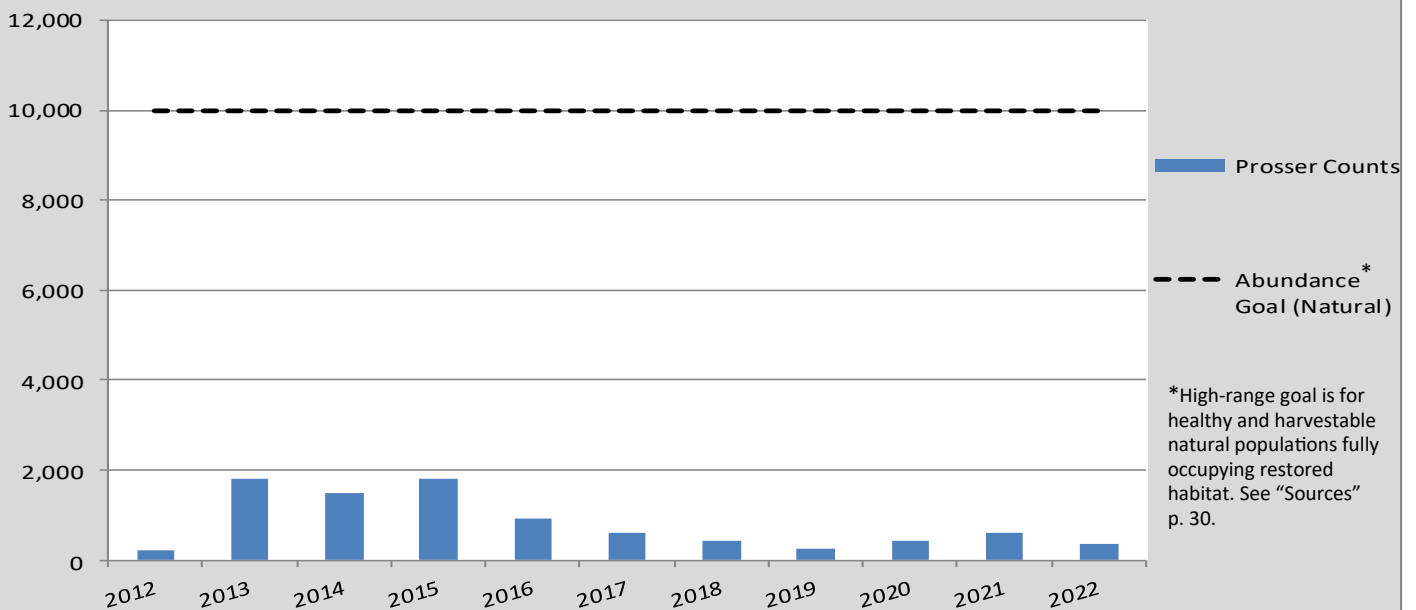
Our summer Chinook Reintroduction Project includes two phases. During the first phase, we have been releasing 500,000 fish annually above Prosser Dam to recolonize habitat and provide tribal harvest opportunities. For this phase, juvenile production at the hatchery is dependent on eggs received from the Wells Hatchery.

The second phase for the program is to transition to using a local, natural-origin broodstock for production purposes. Combined with improved habitat quality, through our on-going restoration work, this phase will allow us to reach our goal for a self-sustaining and locally-adapted population; however, hatchery supplementation may be essential to realize annual harvest goals.



Above: Prosser Hatchery staff spawning Chinook.

### Adult Summer Chinook Returns to Prosser Dam



\*High-range goal is for healthy and harvestable natural populations fully occupying restored habitat. See "Sources" p. 30.





## Yakama Nation White Sturgeon Hatchery

The construction of hydroelectric facilities in the middle and upper Columbia River have altered seasonal flows, impacted spawning and rearing habitat, and impeded sturgeon migrations. These impacts have resulted in low juvenile survival. As a result, we began to evaluate the potential for artificial production of white sturgeon in the 1990s.

By 2009, the Yakama Nation White Sturgeon Hatchery was completed, with funds from BPA and the Grant and Chelan PUDs. Since its opening, we have spawned and reared fish annually for release into Priest Rapids, Wanapum and Rocky Reach reservoirs to supplement natural production until harvestable populations exist throughout the middle Columbia and lower Snake rivers.



Yakama Nation biologists spawning white sturgeon at the Sturgeon Hatchery and releasing juveniles into the Columbia River. (YN)

## Juvenile White Sturgeon Released by the Yakama Nation

### Our Project Goals

- To supplement wild production by releasing hatchery reared juveniles until healthy self-sustaining harvestable populations can be achieved.
- Enhanced natural spawning and fisheries throughout the mid-Columbia and Lower Snake Rivers.
- From 2010-2018, about 83,000 tagged yearling sturgeon have been produced for release in mid-Columbia reservoirs.
- The future production goal is 20,000 fish, annually.

### Spawning Process

- Collect wild adult white sturgeon
- Live-spawn in the hatchery, release broodfish near their capture site
- Fertilize and hatch the eggs, rear the juveniles for about a year
- Release the juvenile sturgeon to mid-Columbia reservoirs in the spring

### Future Plans

- Working in the Mid-Columbia River to date, we will be expanding releases throughout mainstem Columbia River consistent with the Master Plan.



# YAKIMA SUBBASIN

## **Bull Trout Rescue, Rehabilitation, and Reintroduction — Upper Yakima Subbasin**

Seasonal dewatering in the upper Yakima Subbasin often results in stranding and desiccation of juvenile bull trout. The impact can be significant since these isolated populations also face challenges associated with degraded instream habitat, migration blockages, warming temperatures, and invasive species.

We are helping to address these limiting factors by rescuing stranded juvenile fish during low-water periods, rehabilitating them, and reintroducing them to good-quality historic habitats. Thus we are increasing the natural reproductive potential of and reducing risk to populations, since these fish would have died otherwise.

Since 2019, a total of 1,374 rehabilitated bull trout have been released into the Lake Kachess and Keechelus Lake systems. We are currently rehabilitating 98 fish from Gold Creek that are scheduled for release in June 2023. Survival rates in captivity have increased to over 95%, during which time bull trout grow significantly. Future project goals include reintroducing bull trout to previously occupied good-quality habitats throughout the Yakima Basin.



*Above: Adult bull trout (Zach Mays, YN), juvenile bull trout, and bull trout release after rehabilitation (YN)*





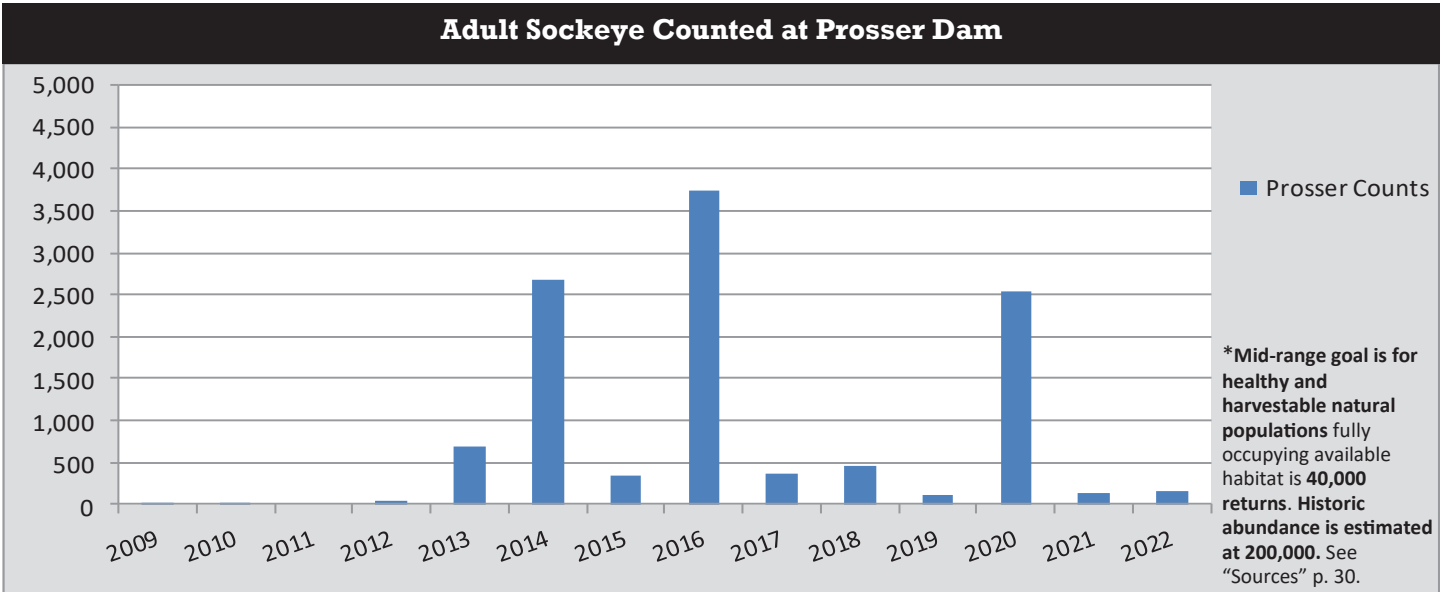
### Sockeye Reintroduction — Cle Elum Lake

Historically, annual escapement of sockeye salmon to the Yakima River Basin exceeded 200,000 spawners, but in the early 1900’s irrigation storage dams were built without fish passage, leading to the fish’s rapid extirpation. In 2009, with support from several partners and an agreement with U.S. v. Oregon parties, the Yakama Nation began a sockeye reintroduction program in Cle Elum Lake. The goal of this program is to establish and maintain a naturally spawning population that is capable of supporting harvests and restoring tribal cultural connections. The reintroduction program is based on translocation of adult sockeye salmon trapped at Priest Rapids Dam in the middle Columbia River, for release in Cle Elum Lake. The return of natural origin fish is expected to eventually replace the need for translocation once abundances reach sustainable levels in the Cle Elum population.



Since 2013, successful spawning and recruitment has led to the return of naturally produced sockeye to the basin, after an absence of over 100 years. To ensure success of the program, the Yakama Nation is working with the U.S. Bureau of Reclamation to provide permanent upstream and downstream fish passage at Cle Elum Dam. Ongoing monitoring has revealed a productive lake rearing environment for juveniles and sufficient, quality spawning habitat. Yakama Nation Fisheries is currently leading activities to remove invasive predators, and characterize reproductive success, smolt abundances, and adult return abundances through regular monitoring and evaluation.

Above: YN staff monitor sockeye reintroduction effort.





# YAKIMA SUBBASIN

## North Fork Manastash Creek Wood Replenishment

**Date Completed:** December 19, 2022

**Focal Species:** ESA-listed steelhead, bull trout

**Funding Source(s):** Bonneville Power Administration, partner Washington Department of Fish and Wildlife

**Problem:** Past land use practices have led to degraded forest and riparian health, and stream incision, leading to decreased aquifer and snowpack storage potential, poor floodplain connectivity, and poor wildlife and fish habitat conditions.

**Accomplishments:** In 2018, large wood and brush was returned to the Manastash watershed streams as nearby overstocked forests were thinned downstream of the 2022 project area. In 2022, 12 acres of overstocked upland forest was thinned, and approximately 750 pieces of wood were added to one mile of NF Manastash Creek and adjacent floodplain surfaces. Seventy-five pieces were 50 foot length and the remaining 675 pieces were 25 foot in length. Additionally, approximately 300 cubic yards of brush, which was generated from the harvest unit, was utilized instream. YN staff applied a native grass seed mix to all disturbed areas produced by heavy equipment operation, as well as weed-free straw.

**Project Benefits:** The efforts employed to return channel roughness to this degraded watershed will benefit resident trout in the short term and as physical and biological processes act upon and interact with project elements, stream temperatures will be further buffered and more water will be expressed at times of low flow –shifting the hydrograph, and reducing peak flows. This project is one step in beginning to undo over a century of aquatic habitat degradation and begin to see basin level responses in ESA listed fish and aquatic habitats.



*Above left: Example of channel incision and riparian degradation, NR Manastash Creek. Right: Ballast-based log jam after installation in stream channel.*



## Taneum Creek Rag-Heart Habitat Enhancement—2023 Update

**Date Completed:** November 30, 2022

**Focal Species:** ESA-listed steelhead, coho, Chinook, rainbow trout, and cutthroat trout

**Funding Source(s):** In 2021, stream enhancement funding was provided by BPA and the Salmon Recovery Funding Board (SRFB) from the Washington State Recreation and Conservation Office. In 2022, the planting was funded by BPA and the Salmon Recovery Funding Program (“SRF”) from the Washington State Conservation Commission. Partner: Kittitas County Conservation District, SRF grant holder.

**Problem:** This section of Taneum Creek is depleted of woody material and riparian corridor cover. The Kittitas Reclamation District (KRD) operates irrigation infrastructure within the project area.

**Accomplishments:** In 2021 we enhanced 1.5 miles of instream habitat and increased floodplain connectivity in Taneum Creek (RM 1.8- 2.4 and 2.4- 3.4) by installing 18 channel-spanning large wood structures and placing 54 root wads in the stream. Restoration design and implementation focused on wood-loading and riparian corridor planting and protection.

In 2022, 6,000 rooted native riparian trees and shrubs were deep planted to re-establish the riparian corridor. All plant stocked was sourced from eastern Washington. Temporary fencing was also installed to protect plantings as they become established, and to prevent heavy elk browsing that has been limiting vegetation growth along the creek. Disturbed areas were also re-seeded with native grasses and mulched with weed-free straw.

**Project Benefits:** Through this project, we increased: 1) quality of pool habitat, 2) complex cover within the main channel, 3) floodplain function and groundwater storage, 4) channel length, and 5) beaver recolonization potential, resulting in enhanced instream habitat quality and quantity. In addition, as a result of the stream restoration work, an advancing headcut causing a fish passage barrier was remedied, allowing restored access to improved habitats.



*Above: Five engineered log jams and 10 rootwads were placed in the Ragland Reach for habitat enhancement.*



*Above (left): Before wood placement and planting project on the Heart K reach. Above (right) After implementation.*



# KLICKITAT SUBBASIN

## Klickitat Hatchery

Completed in 1954 with funding provided by the Mitchell Act as mitigation for effects of hydropower development and operation on fisheries, the Klickitat Hatchery is jointly operated by WDFW and YN, and allows us to rear and release fish to support Tribal and non-tribal fisheries in ocean, Zone 6, and the Klickitat River.

Now supported by various funding sources, four segregated harvest fish programs are implemented in the subbasin, for which spring Chinook, fall Chinook, and coho are supported by the Klickitat Hatchery. The steelhead program relies on Washington Department of Fish and Wildlife's Skamania Hatchery for the rearing and release of juvenile fish. In a segregated program, hatchery fish populations are maintained primarily or exclusively by adults returning to the hatchery, with little to no interaction with the naturally spawning population. A process is currently underway, however, to move Klickitat spring Chinook to an "integrated" program, in support of strengthening wild populations.



Above: Scott Spino, YKFP staff, biosampling fall Chinook at Lyle Falls Adult Trap.



Above: Left: Aerial view of Klickitat Hatchery. Right: Lyle Falls Adult Trap Enumeration Facility and Fishway.

### Spring Chinook

The hatchery annually aims to rear and volitionally release 600,000 juveniles that originate from brood fish collected at Lyle Falls and the Klickitat hatchery. Future goals of an integrated program are to release up to 800k yearling smolts.

### Fall Chinook

Beginning in 1986, production at the hatchery switched from tulle stock to upriver bright fall Chinook. Today, eggs are transferred primarily from Priest Rapids Hatchery or Little White Salmon National Fish Hatchery to Klickitat Hatchery for rearing and on-site release. Some local brood is used. The program produces up to five million smolts annually.

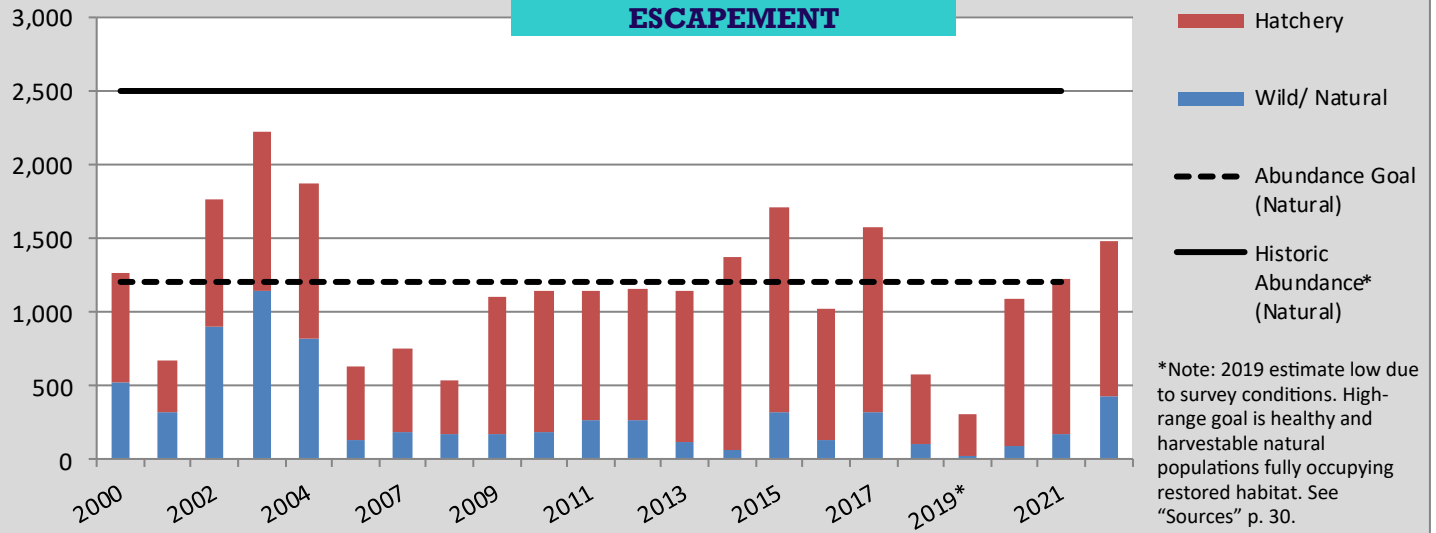
### Coho

Coho were introduced in 1952 to achieve harvest obligations. Eggs are collected from Lewis or Washougal hatcheries for a 1 million juvenile release that is reared and released at Klickitat Hatchery. An additional 2.5 to 2.7 million out-of-basin juveniles (reared at Washougal Hatchery) are also released annually directly into the lower Klickitat River.

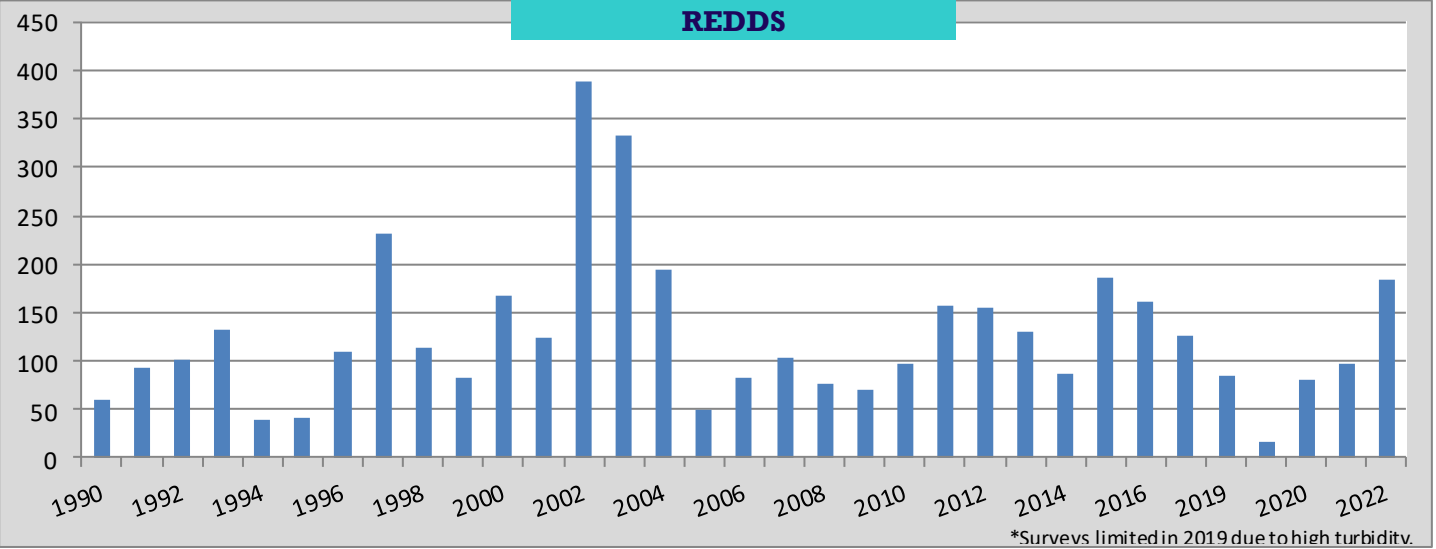


### Klickitat Spring Chinook

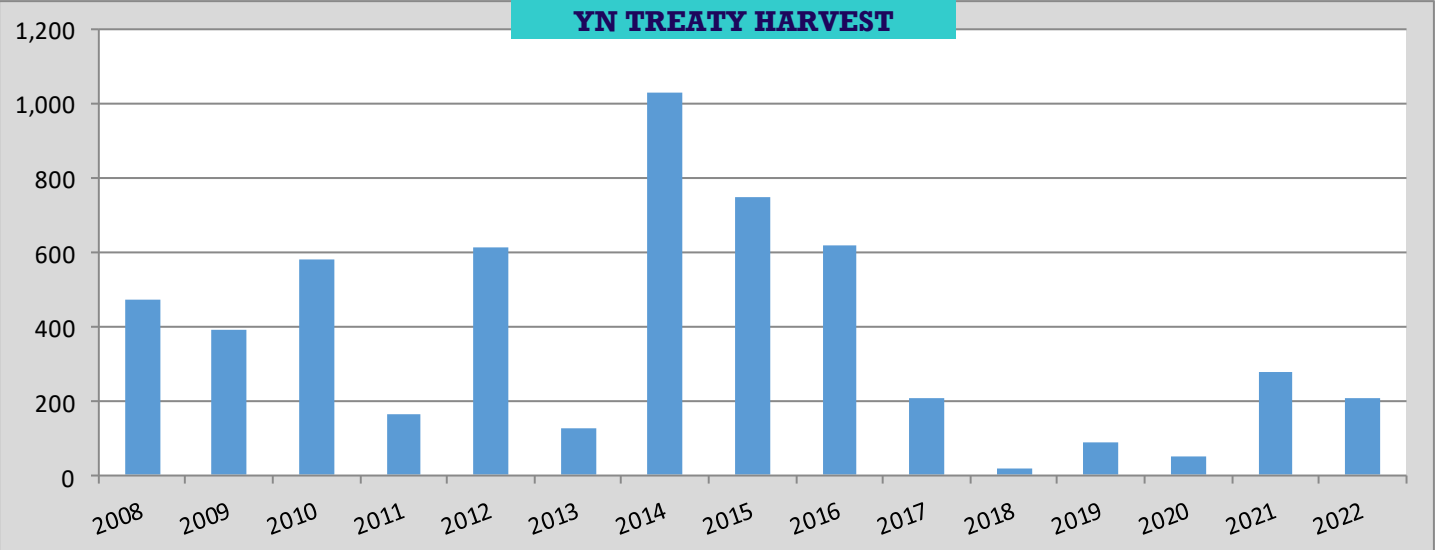
#### ESCAPEMENT



#### REDDs

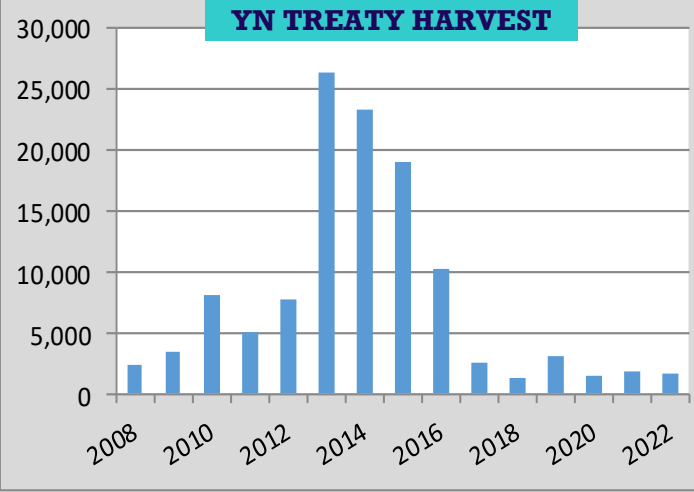
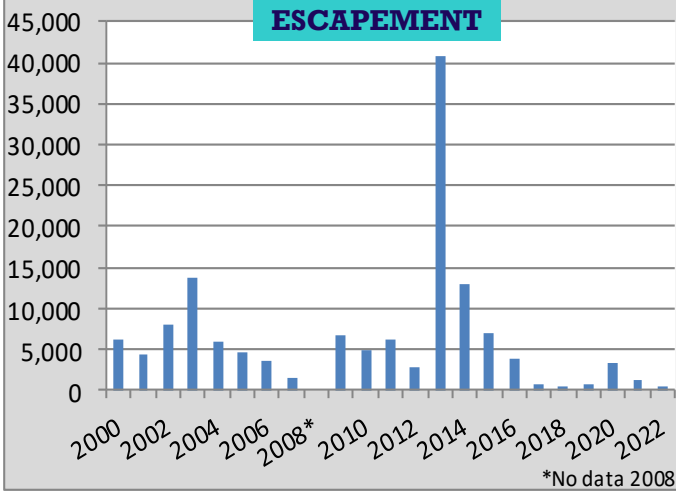


#### YN TREATY HARVEST

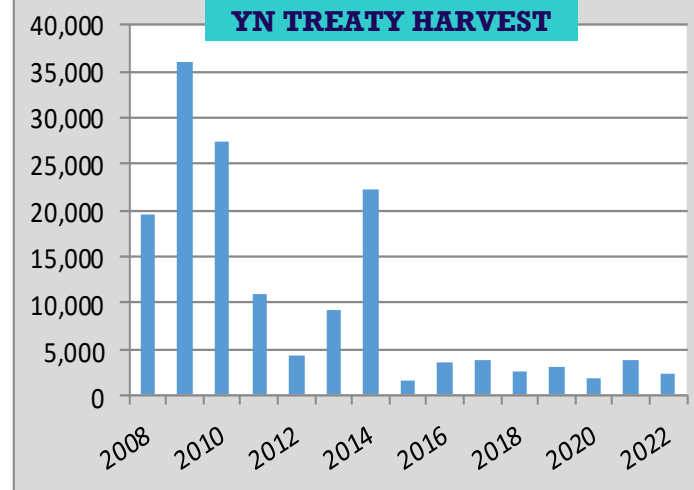
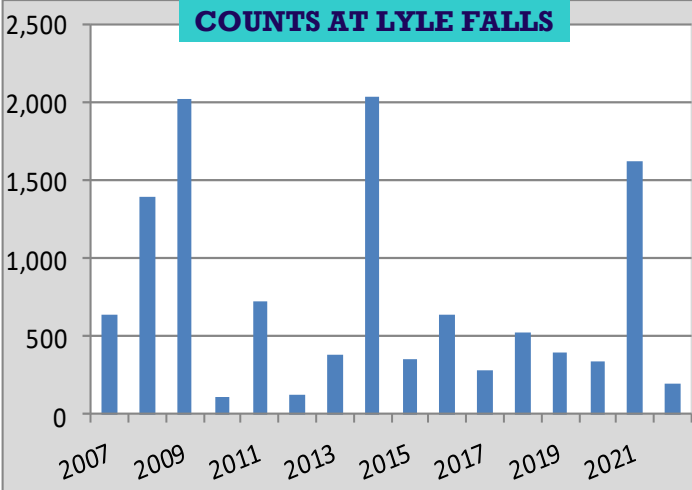


# KLICKITAT SUBBASIN AND ROCK CREEK

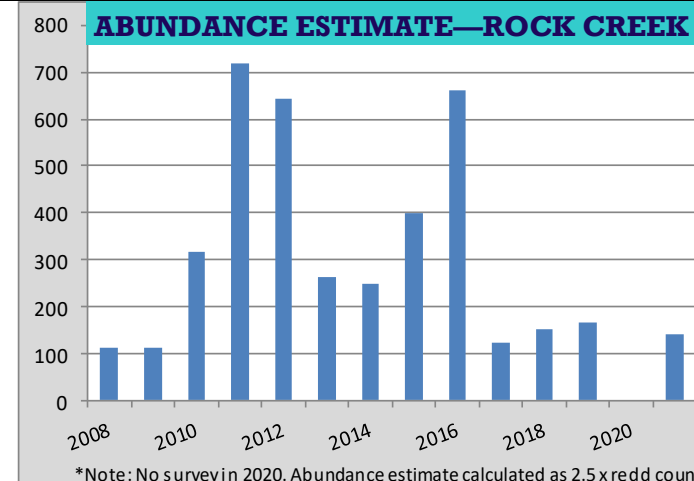
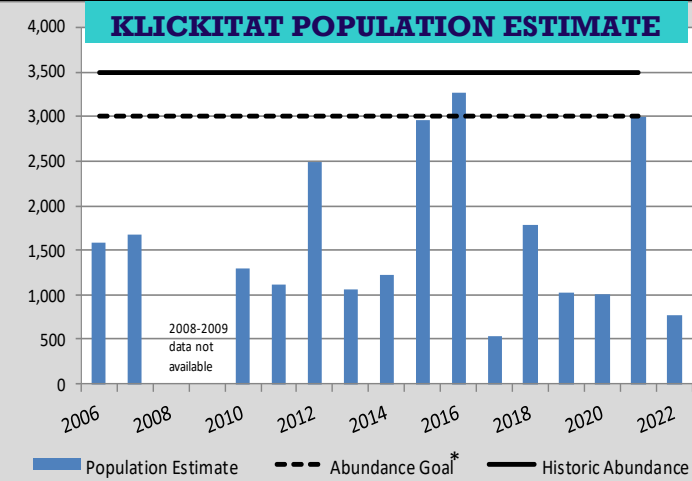
## Klickitat Fall Chinook



## Klickitat Coho



## Summer and Winter Steelhead



\*High-range goal is for healthy and harvestable natural populations fully occupying restored habitats. See "Sources" p. 30.



## Lower Tepee Creek Low-Tech Process-Based Restoration (LTPBR) Project

**Date Completed:** Year 1 complete in 2022, additional structures to be added in 2023

**Funding Sources:** Bonneville Power Administration (Funding) and Yakama Nation (with in-kind donation of small diameter logs)

**Focal Species:** ESA-listed Mid-Columbia steelhead (*Oncorhynchus mykiss*)

**Description:** Tepee Creek is part of the White Creek Major Spawning Area (MaSA) for Mid-Columbia steelhead. The White Creek



*Above: Aerial view of post-assisted log structures and beaver-dam analogs installed in Tepee Creek.*

drainage is one of the most significant spawning areas in the subbasin, of which Tepee Creek contributes a significant amount. Due to lower precipitation and snowfall than average, flows have been reduced in recent years and as a result observed spawning is reduced. The project reach is prioritized for habitat actions based on perennial water, observed spawning and rearing and is identified in the Klickitat Lead Entity Recovery Strategy to address low pool frequency, simplified channel complexity, and sediment sorting, to restore channel roughness and increase pool frequency to increase limited spawning and rearing habitat.

**Goal & Objectives:** Implementation started in late June, culminating in early October 2022. Post assisted log structures (PALS), post-less log structures, and Beaver Dams Analogues were constructed to enhance in-channel habitat conditions, increase shallow aquifer storage/recharge, reduce active channel hydraulic severity, increase wetted perimeter of active channel and potentially increase low-flow conditions.

The overall goal of restoration on Tepee Creek is to improve the quality and quantity of habitat for threatened steelhead by promoting sustainable fluvial processes that result in a healthy and resilient riverscape.

- Increase the abundance of beaver dams and large wood accumulations.
- Increase in-channel geomorphic diversity.
- Increase the proportion of the valley bottom composed of active channel and active floodplain.
- Increase wetland and riparian vegetation extent, diversity, and abundance.
- increase perennial surface flow extent during low flow periods.

**Outcomes:** In year 1 of the project, 19 anchored individual log structures and 48 logjam structures were installed for complexity, totaling over 500 individual logs, creating 28 pools. The installation was done by hand with the assistance of a hydraulic post pounder and an ATV to drag logs to the floodplain. Over 50 individual people were involved in the efforts, including a hosted LTPBR workshop (YN staff from various programs), Tribal youth via a summer forestry program and a local stewardship crew. The structures were installed on the receding limb of the hydrograph with low flows, no flow and dry channel conditions. In 2023, year 2 of the project, additional structures will be constructed, informed by information gathered from observing year 1 structures post run-off.

# METHOW AND WENATCHEE SUBBASINS

## Coho Reintroduction — Upper Columbia

Coho were once abundant in the mid-Columbia region with estimates of adult populations of about 30,000 in the Methow, where they may have once been the most common salmon species. By the end of the 20th century, coho in the mid- and upper- Columbia River basins were extirpated due to hydropower development, unscreened irrigation diversions, overharvest in the lower-Columbia River, and habitat degradation. Because coho spawn in small, low

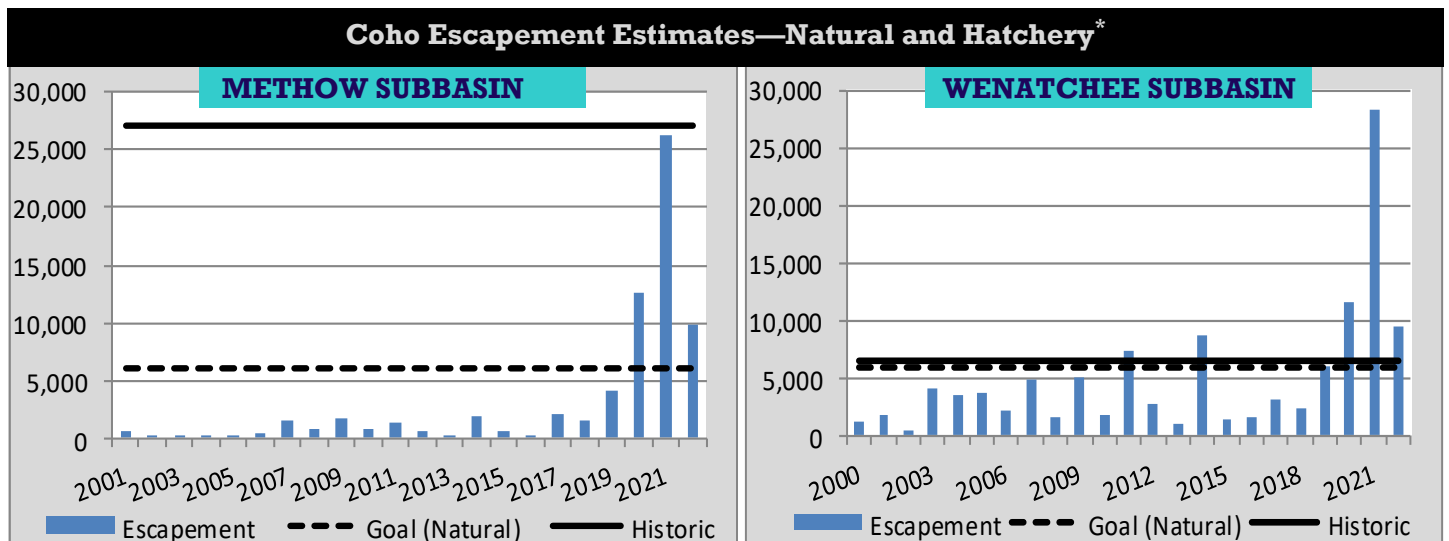
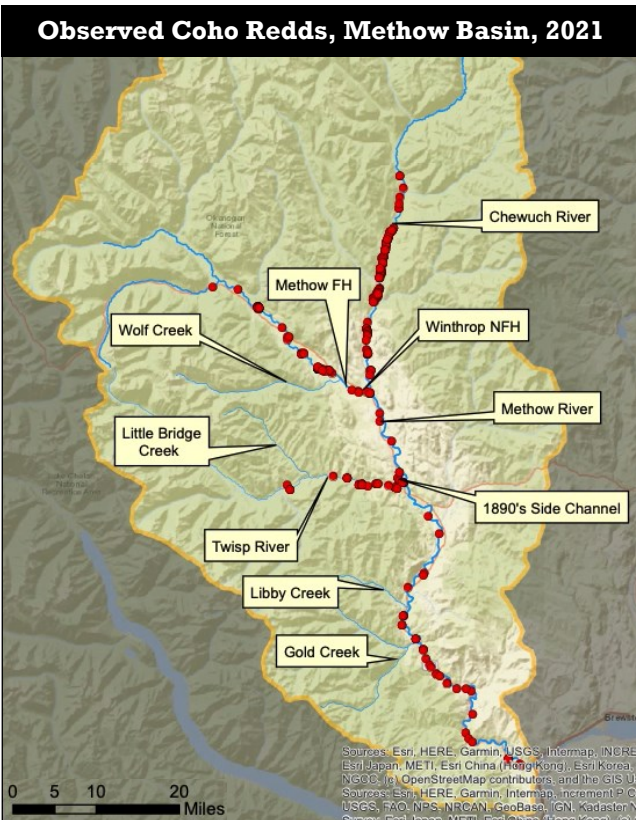


gradient streams

and because these streams are often in locations that humans populate, coho are particularly vulnerable.

The Yakama Nation recognized the potential to return coho to the Methow and Wenatchee River subbasins, and since 2000, we have been collaborating with the US Fish & Wildlife Service (Willard NFH, Leavenworth NFH, and Winthrop NFH), Oregon Department of Fish & Wildlife (Cascade FH), and various local landowners to re-establish spawning coho populations to levels that can support harvest. Although broodfish were initially sourced from lower Columbia River stocks, a transition to local broodstock occurred as early as 2005. Through guidance of our long term Master Plan, we continue to expand project releases while initiating natural-origin production within historic spawning areas; ultimately creating sustainable spawning aggregates within target watersheds.

After decades of effort, the Yakama Nation Mid-Columbia Coho Restoration Program is now demonstrating the benefits predicted. Ancestral fishing rights are being supported, the ecological health of the watersheds is being improved, coho species fitness is being strengthened, and both tribal and non-tribal harvests are increasing.



\*Note: New model used to calculate estimates from 2019 onwards.

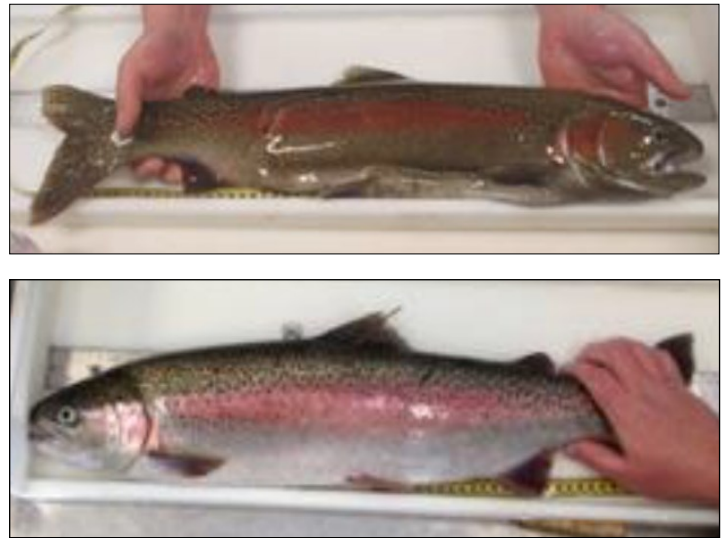
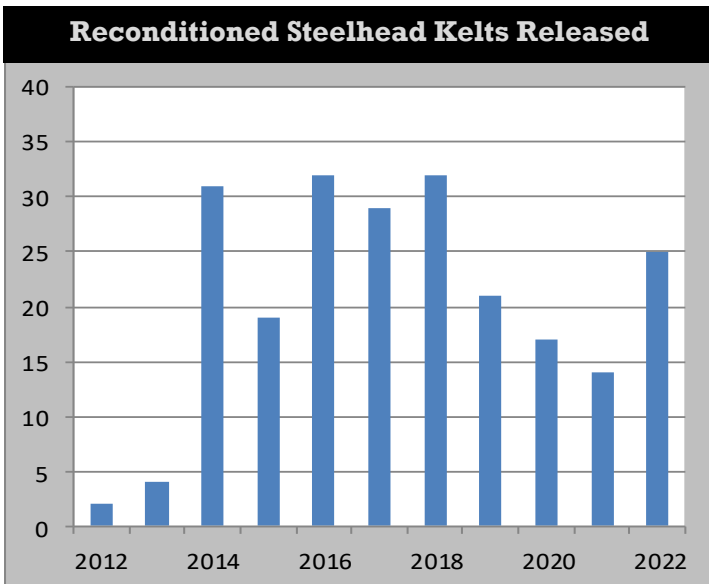


## YN Steelhead Kelt Reconditioning at the Winthrop National Fish Hatchery

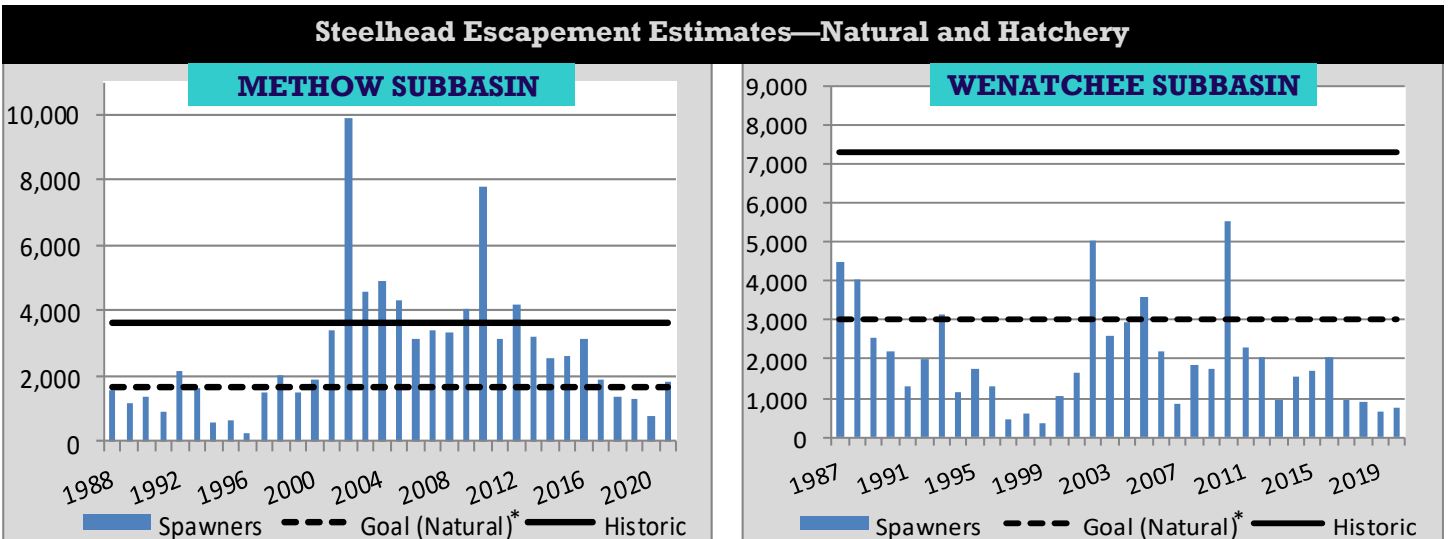
Upper Columbia River (UCR) steelhead are listed as “Threatened” under the ESA, and naturally-spawning populations currently exist at threshold levels. Steelhead display a variety of life history strategies including the ability to spawn more than once. Low rates of repeat spawning in the upper Columbia River exist likely due to mortality associated with energetic demand, degraded habitat, and post-spawning migration through the Columbia River hydropower system.

Reconditioning post-spawn steelhead (kelts), may help upper Columbia populations that experience high mortality rates maintain genetic diversity. Kelt reconditioning includes a 6 to 10 month period in a captive environment where fish reinitiate feeding, grow, and redevelop mature gonads.

In 2011, we opened the Methow Steelhead Kelt Facility at the Winthrop National Fish Hatchery, allowing us to recondition up to 136 kelts at any given time. The goal of our Upper Columbia River Steelhead Kelt Reconditioning Project is to determine whether the abundance of naturally-produced steelhead on natural spawning grounds can be increased through the proven increase in lifetime reproductive success. Work is currently focused on the Methow River Basin, with expansion to the Wenatchee Basin by 2025.



Condition of a steelhead kelt as it enters the reconditioning program (top) and a reconditioned fish prior to release. (YN)



\*High-range goal is for healthy and harvestable natural populations fully occupying restored habitats. See “Sources” p. 30.

# METHOW AND WENATCHEE SUBBASINS

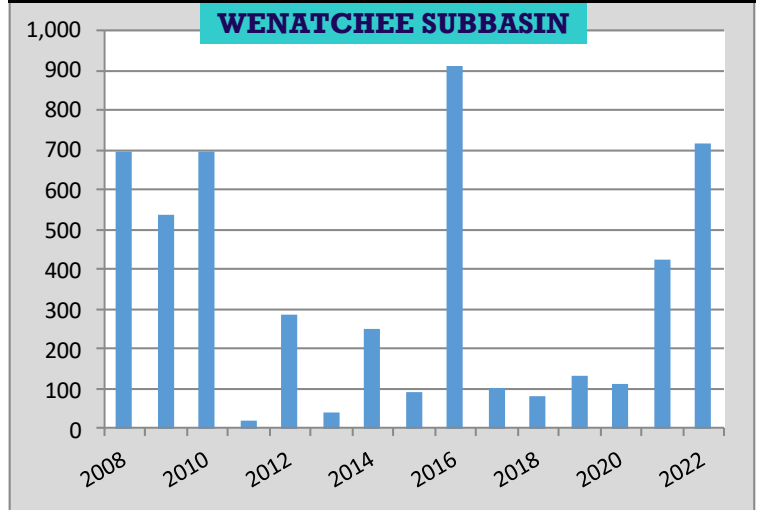
## Upper Columbia Salmon and Steelhead Acclimation Project (UCSCA) — Spring Chinook and Summer Steelhead

Our Upper Columbia Salmon and Steelhead Acclimation Project, which began in 2009, is designed to provide additional acclimation opportunities for existing spring Chinook and steelhead hatchery mitigation programs in the Wenatchee and Methow subbasins. Juvenile salmon and steelhead are initially reared at local hatchery facilities and transported as pre-smolts to acclimation ponds in target areas within the respective basins in mid-March. They are reared in the ponds before being volitionally released in mid-to late April. Since 2017, juvenile spring Chinook releases have occurred at Goat Wall Pond in the Methow Basin. Currently work is underway for planned steelhead releases from the Early Winters Ponds in the Methow Basin and Powerline Pond in the Wenatchee Basin in the near future.

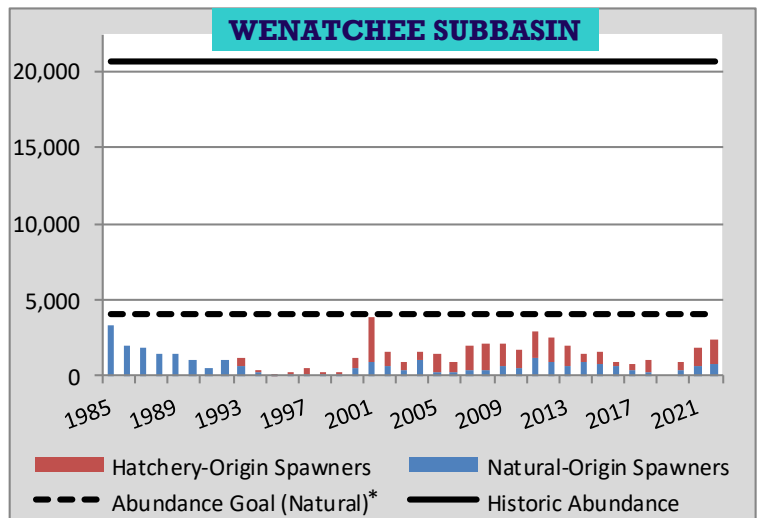
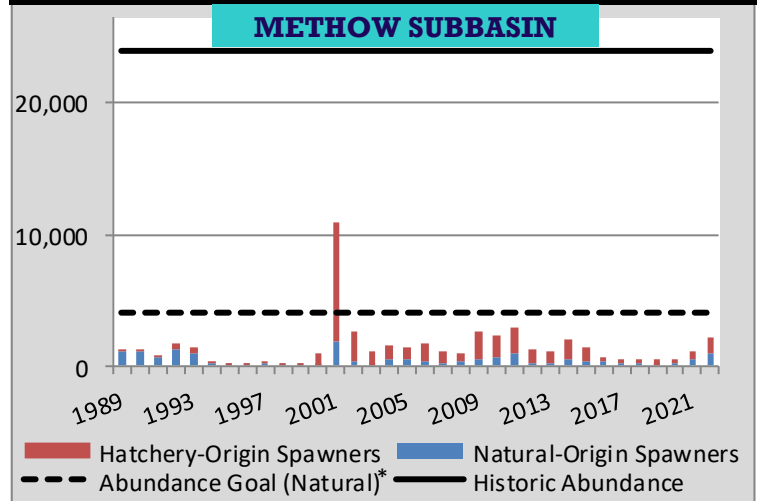


Above: Early Winters (aerial) and Powerline acclimation ponds (YN)

### Spring Chinook YN Treaty Harvest—Icicle River



### Spring Chinook Spawner Escapement Estimate



\*High-range goal is for healthy and harvestable natural populations fully occupying restored habitats. See "Sources" p. 30.



## Twisp River - Horseshoe Reach Habitat Enhancement Project

**Date Completed:** October 2022

**Funding Sources:** Bonneville Power Administration, HCP Tributary Committees (Regional PUDs), Washington State Recreation and Conservation Office

**Focal Species:** Upper Columbia spring Chinook salmon and steelhead

### **Problem:**

Historic logging, levee development, and the recent removal of large wood habitats from the Twisp River have resulted in channel straightening and incision, and the loss of floodplain and side channel connectivity in the Horseshoe project area. Habitat assessments conducted by Yakama Nation Fisheries show that this area recently provided much higher quality spawning and rearing habitat of ESA listed salmonids. The 2022 project seeks to restore river channel and floodplain large wood roughness to recreate lost fish habitat and recover natural processes that sustain a productive aquatic environment.

### **Accomplishments:**

In total 11 large wood structures were installed over a 1 mile long project reach

3 large wood structures were installed to re-establish split flow conditions

8 large wood structures were installed to promote pool development and channel complexity

### **Project Benefits:**

The newly installed wood structures promote better stream sediment sorting and depositional patterns that will improve stream bed habitat and floodplain re-connection. Over time there will be increased wood cover complexity in the main channel, and more split flow channel conditions with higher amounts of cover and channel complexity. These conditions improve the spawning and rearing habitats necessary for ESA listed Upper Columbia spring Chinook salmon and steelhead.



*Above left: Project site pre-construction. Above right: Post-construction.*



# METHOW AND WENATCHEE SUBBASINS

## Twisp River Watershed - Mystery and War Creek Reaches, and Lower Little Bridge Creek Large Wood Enhancement Projects

**Date Completed:** July 2022

**Funding Source:** Bonneville Power Administration, HCP Wells Tributary Committee, Washington State Recreation and Conservation Office

**Focal Species:** ESA-listed Endangered Upper Columbia spring Chinook salmon, ESA-listed Threatened Columbia River Steelhead and ESA-listed Threatened Bull Trout.

**Problem:** The upper Twisp River watershed has been affected by past industrial logging practices, road and bridge development, mining, and campgrounds. The Project reach has very low quantities of large wood, the primary driver of fish habitat development. This has resulted in impaired habitat conditions such as floodplain connectivity, lateral channel migration processes and in-stream habitat complexity; directly affecting juvenile rearing habitat and spawning habitat for ESA-listed species.

**Project Goals and Objectives:** • Restore natural habitat forming processes by improving large wood loading throughout 3.0 miles of the Twisp River and 1.5 miles of Little Bridge Creek. • Create stable large wood structures to retain mobile wood on Forest Service land.

### Accomplishments:

- Constructed 76 large wood structures via helicopter (39 structures in the Twisp River, and 37 structures in Little Bridge Creek).
- Constructed 9 engineered large wood structures using an excavator on the Twisp River.
- Installed 1,400 pieces of large wood with rootwads and 42 slash bundles.

**Benefits:** The upper Twisp River is a critical area supporting one quarter of the spring Chinook salmon and steelhead spawning and rearing in the Methow Subbasin. This project exemplifies what large scale process-based habitat restoration can look like in at-risk streams, where natural wood concentrations have been diminished by historic landuse practices. A heavy-lift helicopter was used to transport large wood into the most wood deficient sections of the upper Twisp River and Little Bridge Creek; providing an immediate lift in habitat complexity and habitat forming processes with minimal disturbance to the surrounding riparian forest. This intensive restoration treatment improved lateral channel migration, floodplain connectivity, side channel access, large wood recruitment and large wood retention. By restoring these habitat forming processes, critical habitat for ESA-listed salmon, steelhead and bull trout will be sustained in these priority reaches.



*Above left: Twisp R. post-construction, with spring Chinook immediately present. Above Right: Aerial photo of large wood structures constructed in the Mystery Reach Project Area.*



## Methow River - Alder Creek Floodplain Enhancement Project

**Date Completed:** October 2022

**Funding Sources:** Bonneville Power Administration, Wells HCP Tributary Committee, Washington State Recreation and Conservation Office

**Focal Species:** Upper Columbia spring Chinook salmon and steelhead

**Problem:** Located in a broad, low gradient floodplain of the Methow Subbasin, the project area historically provided highly complex and productive off-channel rearing habitat for juvenile steelhead and spring Chinook salmon. In the last 50 years anthropogenic influences including levee construction and floodplain grading disconnected the site's off-channel habitats which impaired foraging and cover opportunities for rearing juvenile salmonids. The project seeks to restore connectivity and inundation to these off-channel habitats, helping to reestablish conditions necessary to sustain spring Chinook and steelhead.

### Accomplishments:

- 0.5 miles perennial side channel habitat restored
- 1 mainstem log jam installed
- 7 side channel log jams and pools constructed
- 5 floodplain cover habitat structures installed

**Benefits:** The Alder Creek Floodplain Enhancement Project is located in an area of the Methow River with substantial groundwater upwelling. The project re-established perennial connectivity to this groundwater fed habitat providing rearing juvenile salmonids better thermal refuge habitat during high and low temperature extremes. Furthermore, the reconnected side channel now has substantially more large wood and riparian cover which has helped restore more productive rearing habitat conditions for ESA listed salmonids.



*Above: Side-channel after restoration.*



*Above left: Project site pre-construction. Above right: Post-construction.*



# METHOW AND WENATCHEE SUBBASINS

## Methow River - Suspension Reach Habitat Restoration Project

**Date Completed:** October 2022

**Funding Source:** Bonneville Power Administration and Washington State Department of Natural Resources.

**Landownership:** This project was made possible by the participation of five private landowners, one Home Owners Association, Methow Trails, Methow Conservancy, WDFW, WA DNR, Okanogan County, and the U.S. Forest Service.

**Focal Species:** ESA-Endangered spring Chinook and ESA-Threatened Steelhead.

**Problem:** The Suspension Reach Project area is one of the most ecologically important reaches within the Methow subbasin due to prolific upwelling of groundwater that is expressed in spring creeks. These creeks provide critical spawning habitat and refuge to juvenile fish during seasonal temperature extremes. Fish habitat in the upper Methow River is significantly impaired by current and historical land use practices such as levees, log removal, rip-rap, floodplain forest clearing, trails, roads, bridges and residential development. These activities have resulted in channel straightening, incision, loss of floodplain connectivity, disrupted lateral channel migration processes and tree recruitment. The diminished function of these natural processes has reduced large wood retention, in-stream habitat complexity, and access to off-channel habitat.



*Above: Large wood structures upstream of the Suspension Bridge*

These creeks provide critical spawning habitat and refuge to juvenile fish during seasonal temperature extremes. Fish habitat in the upper Methow River is significantly impaired by current and historical land use practices such as levees, log removal, rip-rap, floodplain forest clearing, trails, roads, bridges and residential development. These activities have resulted in channel straightening, incision, loss of floodplain connectivity, disrupted lateral channel migration processes and tree recruitment. The diminished function of these natural processes has reduced large wood retention, in-stream habitat complexity, and access to off-channel habitat.

### **Project Goals and Objectives:**

- Increase instream habitat complexity for rearing juvenile spring Chinook salmon and steelhead.
- Create bar apex log jams to recruit and retain mobile large wood and increase channel sinuosity.
- Improve juvenile rearing and adult holding habitats at groundwater fed side channel confluences

### **Project Metrics:**

- Constructed 11 engineered large wood structures throughout the  $\frac{3}{4}$  mile long project reach.
- Installed 228 habitat logs with roots and 94 pilings.

**Project Narrative:** The YN identified the Suspension Reach Project area along the Methow River as a high priority reach to focus habitat restoration activities. This is due to the high use by spawning spring Chinook salmon, steelhead and coho, and extensive documented degradation of aquatic habitat. The Project is named after the Tawlks-Foster Suspension Bridge, located within the project reach, which is critical infrastructure along the Methow Community Trail. The Project strategically installed stable habitat log structures to create new scour pools, complex rearing habitat, and retention of large wood associated with bar-apex jams. This was done while maintaining the resilience of the Suspension Bridge and the Methow Community Trail. To minimize impacts to the riparian corridor, private property and recreation along the Methow Community Trail, a heavy-lift helicopter transported the large wood from a nearby WDFW property to the installation sites. An excavator with a sonic vibratory pile driver then accessed each site and completed construction of the engineered log structures.



# HYDROSYSTEM IMPROVEMENT UPDATES

## Lewis River Dams Passage

- In 2004 there was a Federal Energy and Regulatory Commission (FERC) relicensing settlement agreement (with the Yakama Nation, our co-managers Washington Dept. of Fish & Wildlife (WDFW), the Cowlitz Tribe, and several Non-Governmental Organizations) to restore anadromous fish back into the Lewis River.
- First, adult salmonid trap and haul was established at the lowermost dam (Merwin), as well as a collector at the uppermost dam (Swift) for outmigrating juveniles.
- In-lieu habitat restoration was initially in place instead of completing the process of establishing passage at all dams.
- Recently, USFWS and NMFS verified the necessity for fish passage. Upstream passage is scheduled to be implemented at the upper (Swift) dam by 2028 and middle (Yale ) dam by 2026, and downstream passage at Yale Dam by 2026. Downstream passage at Merwin Dam may be delayed until 2032.



Above: PacifiCorp's Merwin Dam on the Lewis River (Keely Murdoch, YN)

## Upper Columbia: Rock Island Dam Relicensing

- Rock Island Dam was built in the early 1930s on the Upper Columbia River.
- Since early 2022, YN ( along with WDFW, USFWS, NMFS, CRITFC, and others) has been participating in a voluntary early engagement period to help inform Chelan PUD's Pre-Application Document which is anticipated to be submitted to FERC in the 4th quarter of 2023.



Above: Chelan County Public Utility's Rock Island Dam.

- The process has been used to identify issues, information gaps, and conduct studies to evaluate potential impacts of the dam.
- Purpose: to use relicensing process to require reduction of impact of dam operation on fish, wildlife, habitat, and cultural resources , especially impacts to juvenile outmigrants in the case of Rock Island.

# CEDED LANDS LAMPREY



Above: Lamprey navigating a lamprey ladder.

## Yakama Nation Pacific Lamprey Ceded Lands Evaluation and Restoration Project

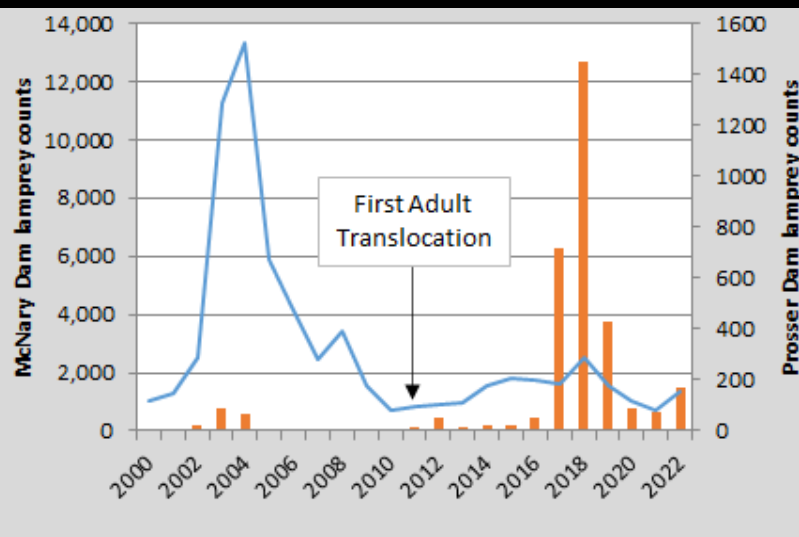
For over 10,000 years we have depended on Pacific Lamprey for food and medicine. We harvested lamprey in a sustainable manner, taking only what our families needed for subsistence. During this time, lamprey were plentiful and many harvest locations were available across the Treaty Territories. Due to various factors, this is no longer the case.

Our goal is to restore natural production of lamprey to a level that will provide robust species abundance, significant ecological

contributions, and meaningful harvest. With only 50% passage at Bonneville Dam and < 10% cumulative passage at McNary Dam, the lamprey subpopulations in the Upper Columbia and Snake rivers are severely limited. To mitigate this impact, we annually collect adults at Bonneville, The Dalles, and John Day dams (in locations where lamprey struggle to pass the dam) for the purpose of translocating the fish to currently blocked productive tributaries and mainstem habitat in the Upper Columbia, including Yakima, Wenatchee, and Methow subbasins.

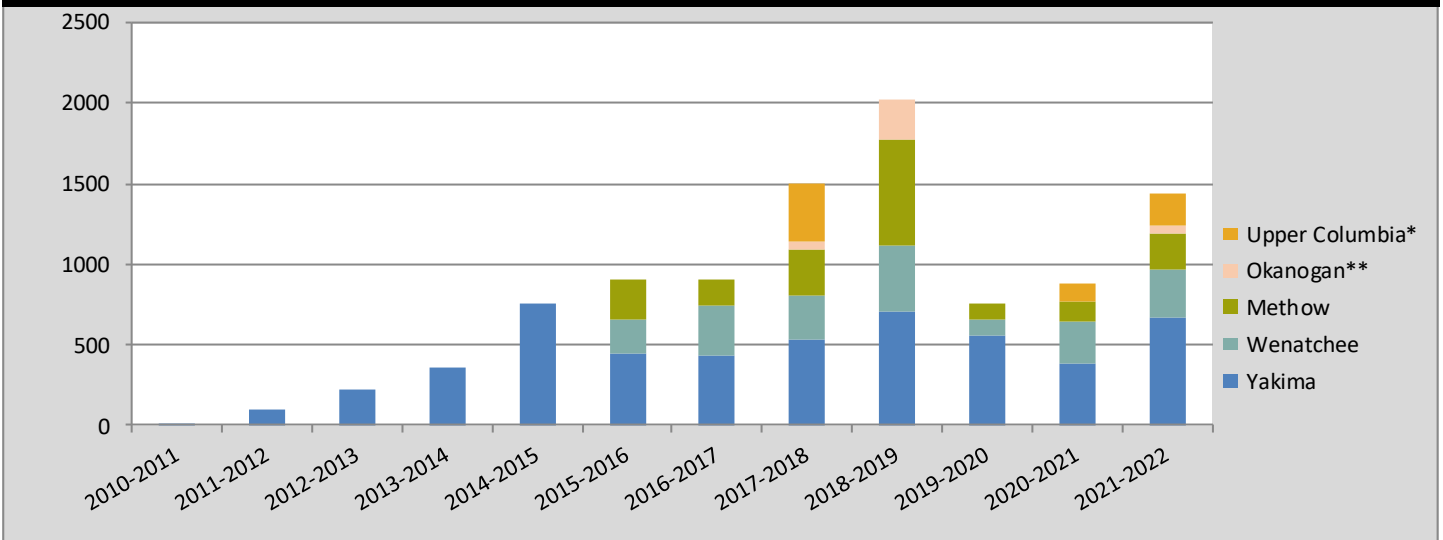
As a result of adult translocation, larval Pacific Lamprey distribution has increased by 2-3 folds in the Yakima Subbasin (and similar increases are observed in other subbasins).

### Adult Pacific Lamprey Returns to Prosser\* & McNary Dams



\*Note: Prosser Dam Counts in orange above. Starting in 2018, return estimates to Prosser based on PIT tag studies rather than window counts.

### Adult Pacific Lamprey Translocations (All Subbasins)



\*2017-2018 brood year release in Upper Columbia/ Okanogan was a collaboration of the YN, Colville Tribes, and Grant and Douglas County PUDs.  
 \*\*Okanogan translocation listed here is a collaboration with the Colville Tribes.



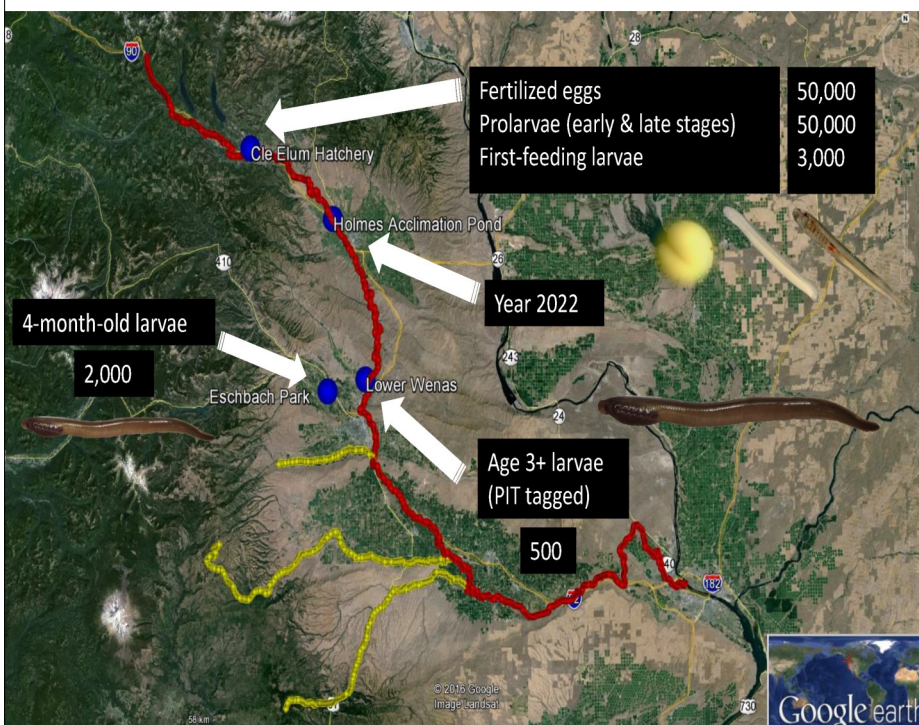
Outmigrating larval/juvenile lamprey collected in rotary screw traps in the Yakima Subbasin were virtually absent prior to adult translocation but now Lower Toppenish screw trap collects as many as ~4,500 eyed juvenile lamprey in one single day. We estimate that conservatively > 30,000 eyed juveniles are outmigrating each year from most of the translocated small tributaries annually. Based on PIT tagging studies, we estimated that > 500,000 juveniles were outmigrating from the Lower Yakima River in 2021. At Prosser Dam, the number of adult returns increased considerably six years after the first adult translocation release and the baseline level increased substantially in comparison with McNary Dam counts.

In 2020, we detected the very first group of translocation offspring that returned to Bonneville Dam as adults after surviving their ocean migration (n = 23) and this return increased by a 25-fold (n = 578) in 2021, demonstrating the superior productivity of the YN translocation streams. Most of the 2021 translocation offspring returned as 8-year-old adults from the early years of adult translocation releases (primarily from the 2012-2013 release), and we expect even higher returns in the future years (given that lamprey typically have a > 10-year lifespan).



Above: Release of translocated lamprey is often a community event (Yakima River, YN).

## 2021 Early Life Stage Outplanting



We are also developing hatchery techniques to reintroduce early life stage lamprey. The first outplanting with approximately 105,500 lamprey (ranging from fertilized eggs to eyed juveniles) occurred in 2021 and this effort continues annually. The primary goals are to understand the best life stage for outplanting survival and furthering our knowledge of their early life history as well as the unique threats they face. In addition to adult translocation, we are improving adult passage by installing lamprey passage structures at problematic dams, rescuing stranded/entrained larval/juvenile lampreys in dewatered canals, monitoring impacts from juvenile migration and predation as well as legacy and currently used contaminants, and reaching out to schools and the general public to educate lamprey's importance in the Columbia River Basin.

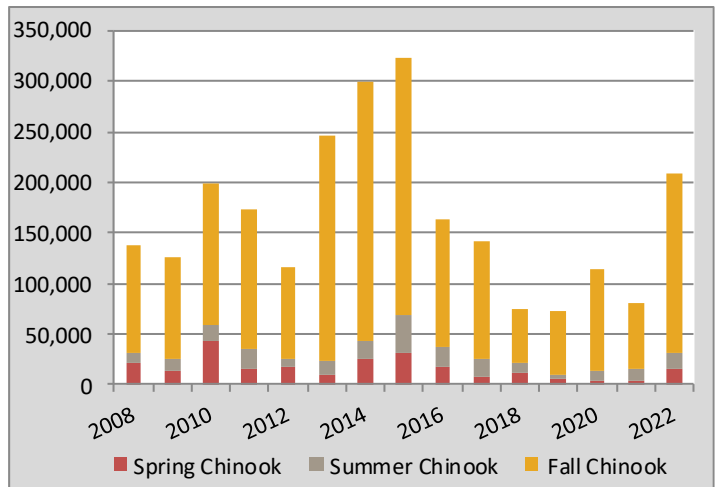
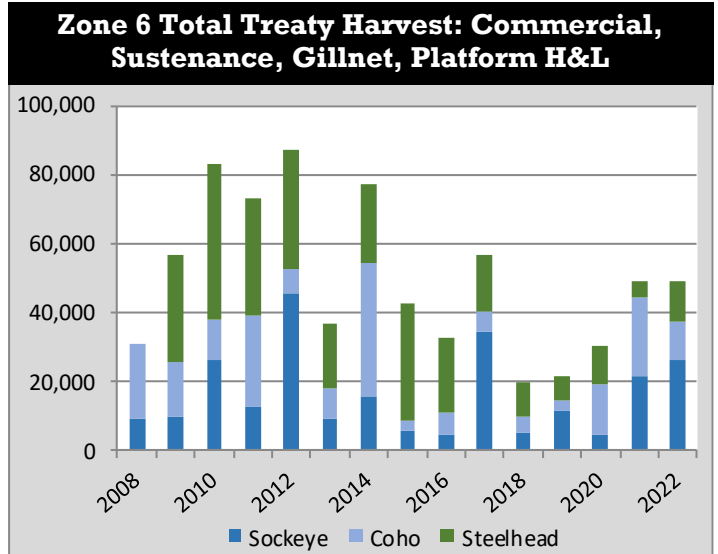
# COLUMBIA RIVER ZONE 6 HARVEST

Through the Treaty of 1855\*, the Yakama Nation reserved the right to maintain natural resources on which our culture and livelihoods depend, including rights to water, land, and natural foods and medicines at all usual and accustomed places.

Additional court rulings assured us the right to self-regulation of our own fish management and take, a fair share of all allowable harvest, and the restoration of fish historically present and/or mitigation for losses.

The Yakama Nation manages fisheries resources to ensure continued access by our members to fulfill ceremonial, subsistence, and commercial needs.

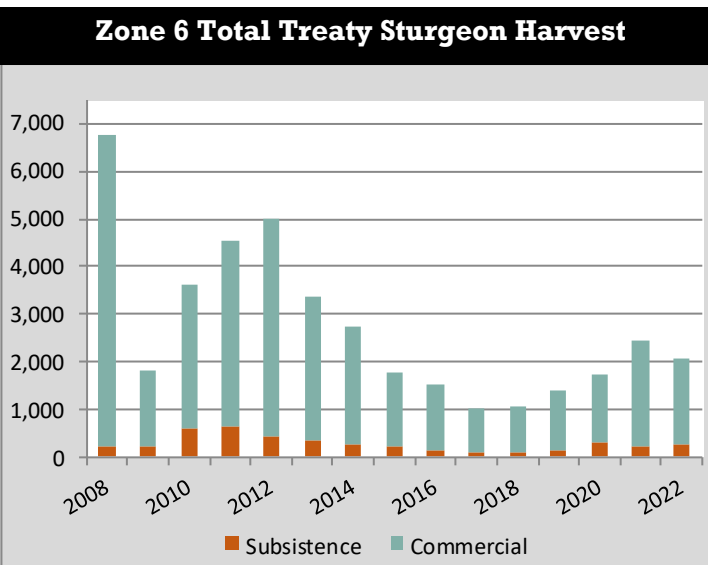
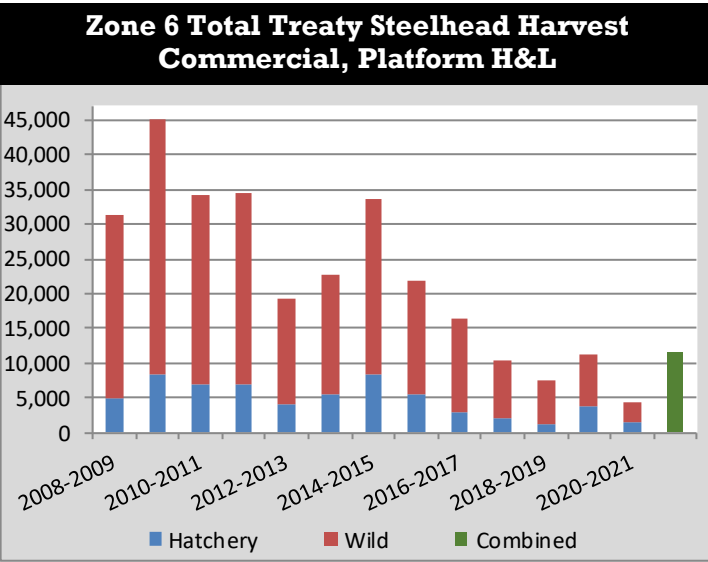
\*Yakama Nation Treaty of 1855 (12 stat. 951) with the United States of America



Note: 2022 data preliminary. Fall Chinook is combined bright and tule.

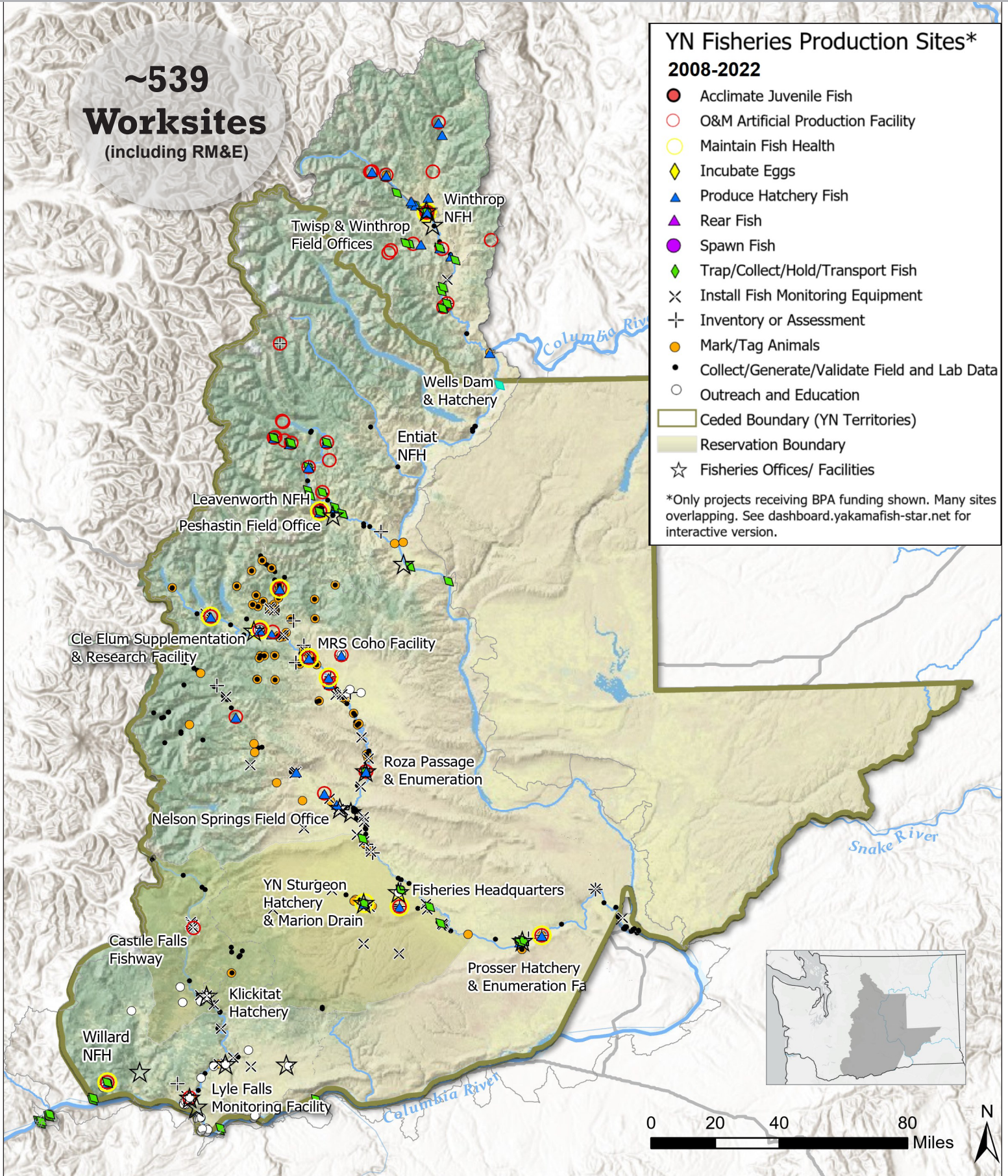


Above: Scaffolds at Drano Lake (The Columbian).



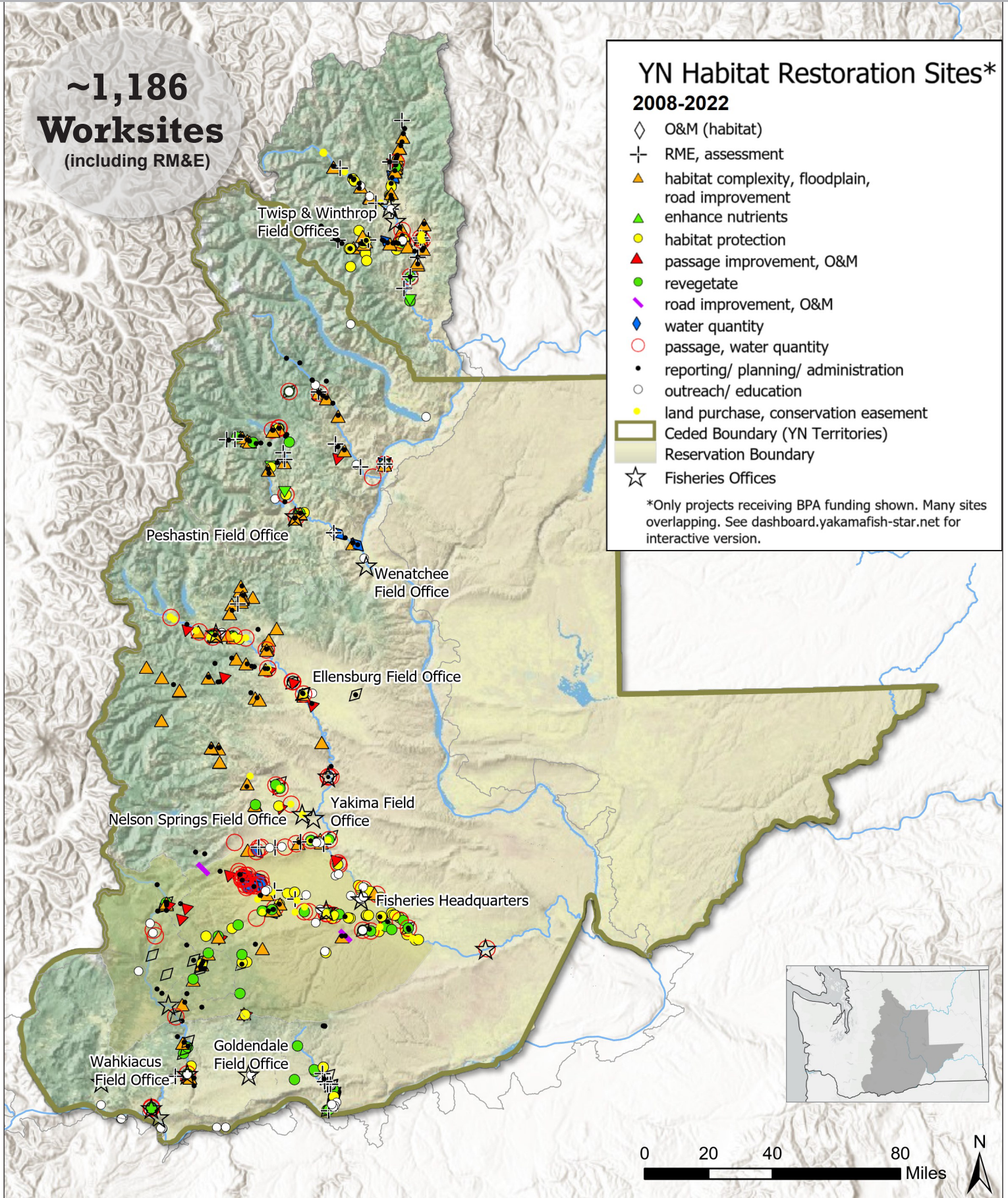


# PRODUCTION & SPECIES RESTORATION SITES





# HABITAT RESTORATION SITES





## Species Status and Trends

Fish population descriptions: Hatchery reform summaries and BPA annual reports, master plans, subbasin plans and recovery plans, presentations given at the Yakima and Klickitat annual science conferences, and from WDFW's species website (<https://fortress.wa.gov/dfw/score/score/species>)

**Abundance Goals and Historic Abundances** as shown in graphs are from Marine Fisheries Advisory Committee [MFAC] Columbia Basin Partnership [CBP] "Vision for Salmon And Steelhead: Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin" Report, 2019. Goals are shown as "high-range" provisional quantitative goals for natural production, unless otherwise indicated, at which point the natural population is considered "healthy and harvestable" where habitats are restored and populated to maximum capacity. Mid-range goals are generally defined as the number of natural-origin spawners that could effectively use available habitat and sustain high levels of harvest, which is judged as about halfway between low-range goals (of viable population status) and high-range goals.

### Yakima

Prosser Dam counts: [http://dashboard.yakamafish-star.net/DataQuery/adult\\_passage\\_counts](http://dashboard.yakamafish-star.net/DataQuery/adult_passage_counts)

Estimated Spawners: Bosch, Bill. (2022). Run Size Forecast for Yakima River: Adult Spring Chinook, 2023. [white paper]. YKFP. October 14, 2022

Kelts Released: Bill Bosch, YN, Personal Communication, 2023

Sturgeon Project: Donella Miller, YN, personal communication, 2022.

Pacific Lamprey Project: Ralph Lampman, YN, personal communication, 2023.

### Klickitat

Summer/winter steelhead and spring Chinook population estimates: Joe Zendt, YN, personal communication, 2023.

Lyle Falls fish trap counts: [http://dashboard.yakamafish-star.net/DataQuery/adult\\_passage\\_counts](http://dashboard.yakamafish-star.net/DataQuery/adult_passage_counts)

Fall Chinook and coho harvest: Megan Begay, YN, personal communication, 2023, TAC BA tables.

Rock Creek steelhead: Elaine Harvey, YN, personal communication, 2022.

### Wenatchee/ Methow

Coho escapement estimates: Cory Kamphaus, YN, BPA Annual Project Reports and personal communication, 2023.

Steelhead Kelts Released: Matt Abrahamse, YN, personal communication, 2023.

Spring Chinook and Wenatchee steelhead escapement: WDFW's species data website (<https://fortress.wa.gov/dfw/score/score/species/species.jsp>) "The Score"

Methow steelhead escapement: [grantpud.org](http://grantpud.org)

## Tribal Harvest

Harvest Data: Megan Begay, YN, personal communication, and 2023. Joint Staff Report: Stock Status and Fisheries for Fall Chinook Salmon, Coho Salmon, Chum Salmon, Summer Steelhead and White Sturgeon. Joint Columbia River Management Staff ([www.dfw.state.or.us](http://www.dfw.state.or.us)), TAC BA tables.

## Habitat Spotlights

Habitat Restoration Project staff, YN, personal communication, and BPA Funded Project Completion Forms, 2023.

## Maps

Created by the STAR project on ESRI software. Backgrounds are from ESRI, USGS, National Geographic and NOAA. Worksite locations are downloaded from BPA reporting site ([cbfish.org](http://cbfish.org)) with STAR Project categories applied (2023).



**HONOR. PROTECT. RESTORE.**



This report was funded by the Bonneville Power Administration, U.S. Department of Energy, under Project Number 200900200, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views expressed in this report, however, are those of the authors and do not necessarily reflect the official policy or position of the BPA.