# 2014

# Yakama Nation Hatchery and Reintroduction Programs

## *With Emphasis on the 2008 Columbia River Fish Accords*

Section 3 of a 4 part series

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

## Foreword:

Shiyáx̱ Mytsḵi,

The historic numbers of nusúx, asúm, wílapas (salmon, eel-like lamprey, sturgeon) and other fish throughout the Nch'i Wána (Columbia River) were so abundant that our people could live off of the fish throughout the year and trade with other tribes. This would include a process to dry the fish for cold winter months. We must carry on with this way of life, because the fish are our brothers. Within just a couple generations, fish numbers have sharply decreased and some of our young people miss the teachings that would come from creeks and rivers. It is shocking to grandparents, that some of our grandchildren do not know how to bait a hook. While a majority of our families hold on tightly to this way of life, with the decrease in fish numbers it is difficult to continue our traditional way of life. When we speak our Yakama language it contains knowledge that has been developed over thousands of years. Our survival depends on the ability to know the resources around us. We must honor our longstanding relationship with the resources by speaking for the resources that are unable to speak for themselves.

With development, the fish numbers decreased and some went locally extinct. Our biologists and fisheries staff work to increase those numbers through a number of efforts, one of those is hatcheries. Some of these projects began as a dream of our elders to return fish that were damaged or extinguished all together. Some of these projects are innovative. For example, through our steelhead kelt reconditioning and sockeye reintroduction projects we are finding solutions that nobody in this area has attempted before. Innovation requires that we break the trail. Just like stepping out into a cold winter trail to break ground, we sometimes are joined by partners that also want to help fish numbers. Alas, some stay behind to critique from afar and we have some critics about our hatchery supplementation. We address this within our regular reporting and research, much of which is publically available. In these reports, we provide summaries, record fish numbers, success and challenges. This report compiles information about our hatchery work and innovative projects. At our hatcheries, our elders, Cultural Specialists, or Tribal Council talk to staff about our teachings to have a good mind when working with our resources. This is one of the many ways we approach our projects with care, with the dreams of our elders, and for the future generations not yet born. Failure to increase fish populations is not an option. We are in a position of rapid response for our fish survival and since our wellbeing depends on having traditional foods, our survival too. Nye.

***Sam Jim, Sr.***
Chairman, Fish and Wildlife Committee
Yakama Tribal Council

## Yakama Nation Fisheries Mission:

***To honor, protect and restore Nch'i-Wána [the Columbia River], its tributaries and its resources for the benefit of current and future generations of the Yakama people as reserved for them in the Treaty of 1855.***

# 2013 Yakama Nation Fisheries Status and Trends Report

The Yakama Nation's Status and Trends Annual Reports (STAR) summarize progress toward achieving recovery goals described in the 2008 Columbia Basin Fish Accords Memorandum of Agreement (Accord). The Accord is intended, in part, to support the implementation of projects and management actions considered necessary to improve the survival of salmon and steelhead listed under the Endangered Species Act (ESA) to the levels described in the National Oceanic and Atmospheric Administration's 2008 Biological Opinion for Federal Columbia River Power System operations. It also provides funding for white sturgeon and Pacific lamprey recovery actions and benefits other species not listed under the ESA. The purpose of STAR is to: 1) track the implementation of the projects and management actions described in the Accord, 2) report on the biological effectiveness of implemented projects and actions by monitoring trends in the status of salmon and steelhead populations and other species of priority to the Yakama Nation such as white sturgeon and Pacific lamprey, and 3) provide information to tribal leadership to aid in the development of policy direction. This report will consist of four chapters, three of which will document progress in implementing restoration work and improvements to management actions, and one that tracks the status and trends of priority species. Leading up to the release of the comprehensive report, the individual chapters will be available to the public upon completion.

The sections, in order of release, are:

I — Habitat Restoration

II — Species Status and Trends

III — Hatchery and Reintroduction Programs

IV — Hydrosystem Operation

To ensure the reports reflect current and relevant information, each chapter and the supporting website will be updated regularly.

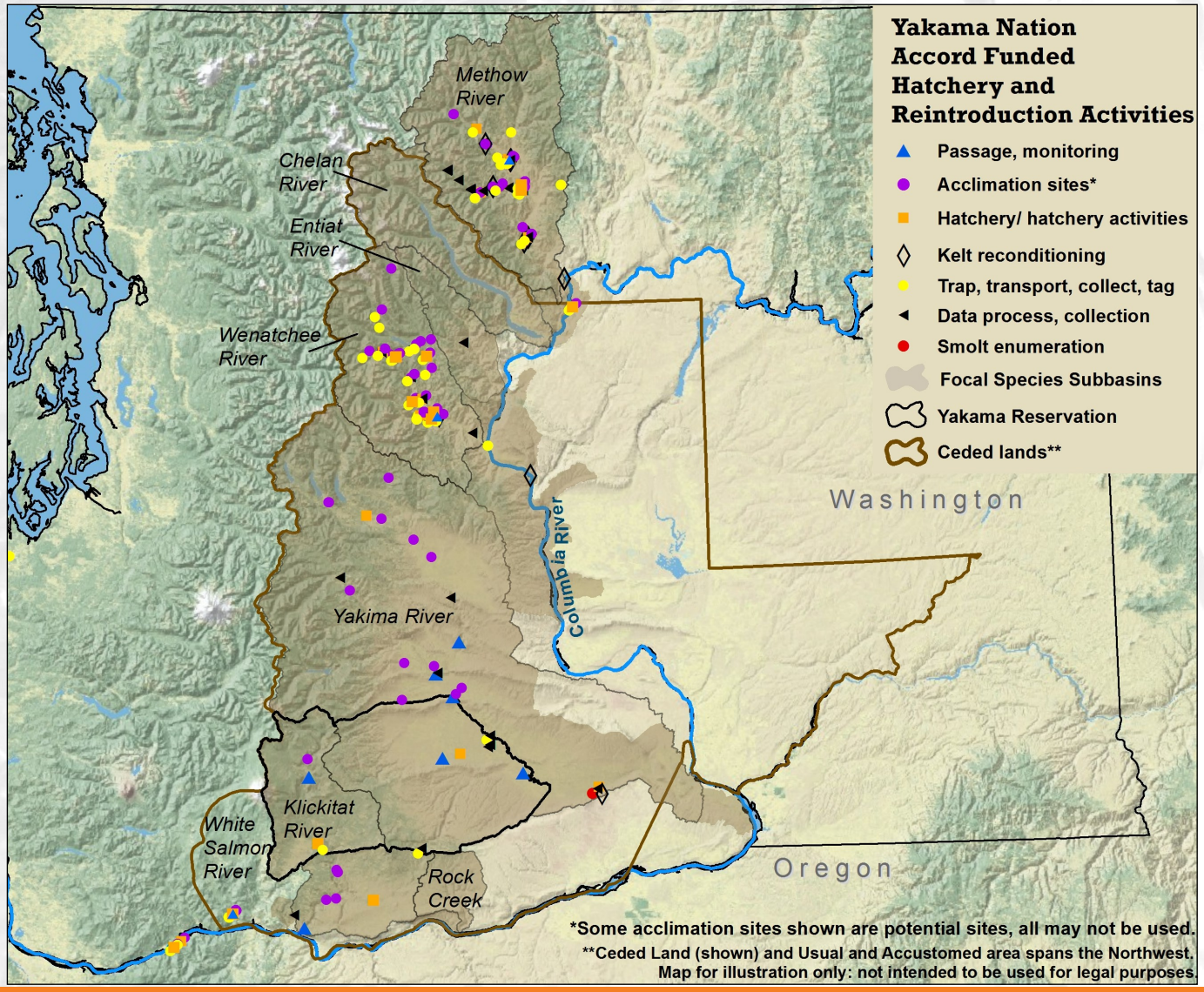
To learn more about the Yakama Nation Fisheries Status and Trends project, to download this report, please visit www.yakamafish-nsn.gov/restore/projects/star

## Accord Agreement Background

*Fish passage monitoring, Roza Dam*

On May 2, 2008, the Yakama Nation signed the Columbia Basin Fish Accords Memorandum of Agreement (Accord) which provides funds for fish and wildlife restoration work throughout the Yakama Nation's Ceded Lands, as well as other areas utilized by aquatic treaty trust species. This report is an overview of the Yakama Nation's hatchery and reintroduction programs supported by the Accord, as well as priority production work supported by other funding sources.

One of the main areas in which the Accord provides funds to the Yakama Nation is the development of new hatchery and acclimation facilities, but it also provides support for the planning and expansion of current production facilities.



# The Yakama Nation Fisheries Background

## Mandate of Fisheries Restoration

In its Treaty with the United States,* the Yakama Nation reserved a variety of rights, including the right to fish at all usual and accustomed places, which includes the right to have fish present to harvest. Since 1855, human population growth and development have substantially altered flows and habitats resulting in reduced productivity for fish populations. As a result, releases of hatchery fish are required to: 1) augment harvest, 2) re-establish fish to areas where they were extirpated, and 3) supplement naturally spawning populations. The Yakama Nation's vision for fisheries restoration combines traditional knowledge with modern science, utilizing a variety of approaches for maximum benefit.

*Monitoring natural production, Upper Yakima*

## Gravel-to-Gravel Management

The gravel-to-gravel management concept is our holistic approach to fishery restoration that recognizes the need to protect our salmon and steelhead throughout their lifecycles, from eggs maturing in the gravel to adults spawning on the gravel. The concept emphasizes reconnecting fish with their natural habitats. Unfortunately, natural habitats have become degraded and often do not support self-sustaining natural populations. The Yakama Nation is working with various partners to implement habitat restoration and water resource management projects designed to address all factors limiting abundance and productivity.

*Traditional platform fishing, Klickitat Gorge*

## Hatchery Production Approaches

One hatchery tool that the Yakama Nation is using is "supplementation." Columbia River Treaty tribes have generally referred to its purpose as increasing the abundance of naturally spawning populations (usually through integrated hatchery programs) or reintroducing historically present species to their native habitats. An integrated program is where broodstock (usually native) are managed as an artificially propagated component of a naturally spawning population, with the goal to increase the size and productivity of the population (some returning hatchery-origin fish allowed to spawn naturally).

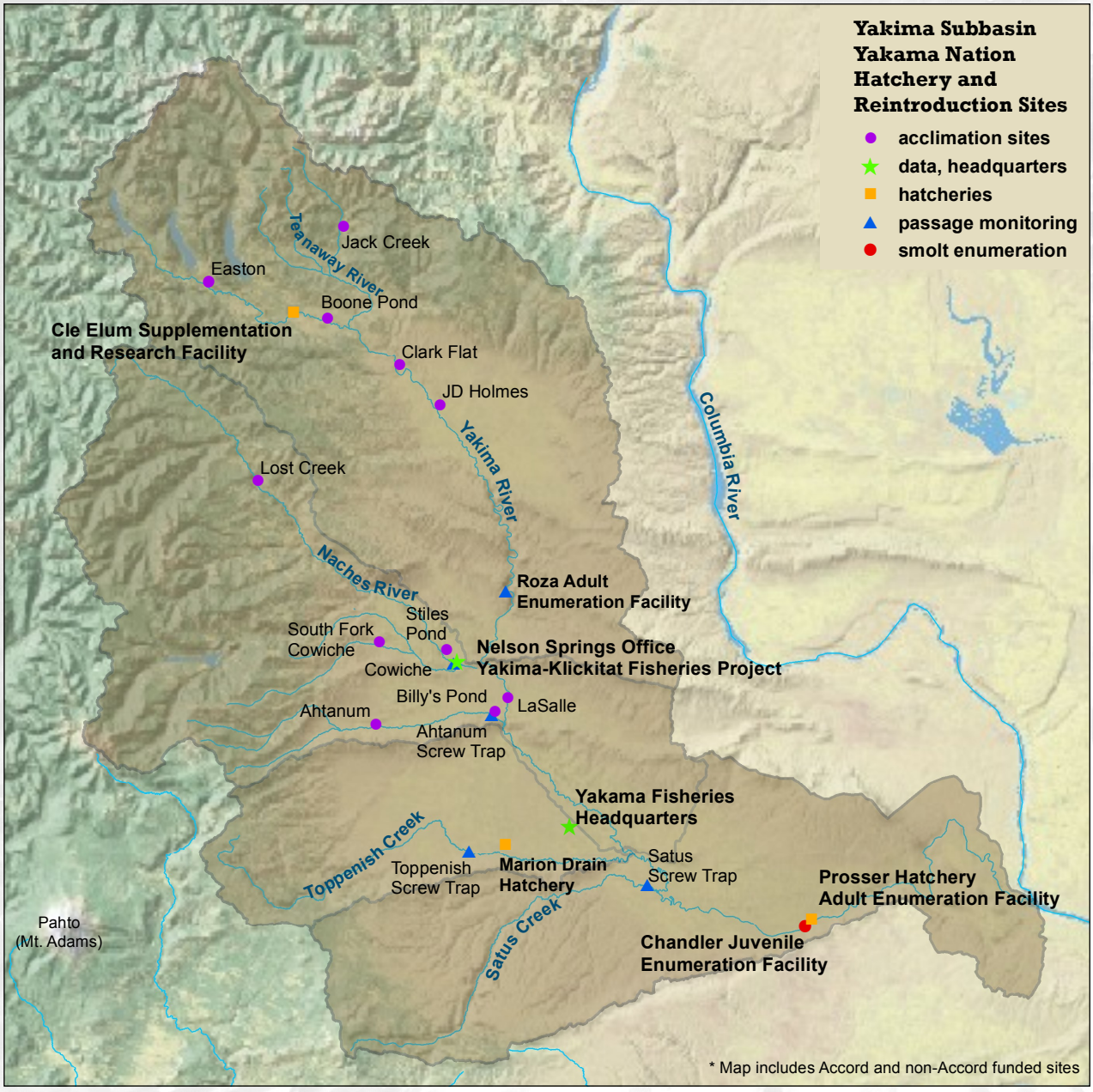
In some cases, we support a "segregated" program, where broodstock are managed as a discrete, separate population from naturally spawning, wild populations, with the goal to increase harvest opportunity to mitigate for those that have been lost.

*Family Fishing Day, Yakama Nation*

*Yakama Nation Treaty of 1855 (12 stat. 951) with the U.S.A.

Yakama Nation Fisheries

# Yakima Subbasin




## Yakima Subbasin:
## Yakama Nation's Accord Funded Hatchery and Reintroduction Activities

- Master plan development
- Yakima/Naches coho mobile acclimation units
- Steelhead kelt reconditioning and evaluation
- Facilities operations and maintenance for coho and spring Chinook restoration
- Monitoring and evaluation to track program effectiveness
- Yakima fall Chinook restoration facilities
- *Also supported from other funding sources:* Sockeye reintroduction, Pacific lamprey restoration research, and white sturgeon restoration research

# Cle Elum Supplementation and Research Facility - Upper Yakima River Spring Chinook (Tkwínat, Núsux)

At the time of the 1855 Treaty, about 200,000 spring Chinook returned annually to the Yakima River. By the 1980s and 1990s, annual returns of adults declined to less than 3,500 fish, providing minimal tribal subsistence harvest.

In 1997 the Yakama Nation, with BPA support, opened the Levi George Supplementation and Research Facility in Cle Elum to enhance spring Chinook returns and provide additional fishing opportunities. Since 2001, an average of 12,000 spring Chinook have returned annually providing for an average harvest of 2,090 fish.

*Cle Elum Facility*

*Cle Elum marking crew*

**Research**: One of the main purposes of the Cle Elum program is to provide information to regional decision-makers regarding hatchery production and management practices. The program includes extensive monitoring and evaluation in the following areas:

- Physiology and morphology
- Homing and spatial distribution
- Reproductive traits and success
- Redd and natural-origin abundance
- Gene flow and genetic divergence
- Ecological interactions and harvest

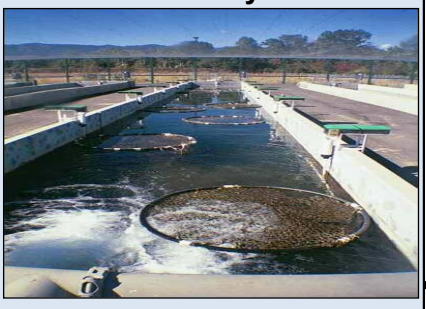
**Project success:** Results from our extended study demonstrate that a well-designed and carefully managed supplementation program can produce fish for harvest and increase the number of fish returning to spawning grounds. Through restoration work, collaboration has increased in the basin. In 2000, the recreational fishery was re-opened after a 40-year closure.

## Cle Elum Hatchery: Spring Chinook Production

### Incubation

- Local natural-origin broodstock are collected at Roza Dam
- Eggs are thermally regulated using well water and chilled water

### Raceways



- Fry moved to raceways in early March, reared at low densities
- Overhead cover and underwater feeders encourage natural behavior
- Active disease monitoring
- Juveniles remain in raceways until January

### Smolt Acclimation

- Juveniles moved to one of three acclimation sites located in natural spawning areas (Easton, Clark Flat, and Jack creeks) in January/February
- Fish allowed to imprint for at least three weeks before volitional release

Yakama Nation Fisheries

# Prosser Tribal Hatchery - Yakima River Fall Chinook (Tkwínat, Núsux)

During the pre-Treaty era, up to 100,000 adult fall Chinook returned to the Yakima Subbasin annually. With the completion of hydroelectric dams, there has been a loss of natural production, due to the inundation of spawning habitat. Reduced production led to the loss of Tribal harvest opportunities. To offset the lost productivity, and as a result of the *US v. Oregon Columbia River Management Plan,* the Yakama Nation released the first hatchery-reared fall Chinook in 1983. The plan established a short-term production goal for the Yakima Subbasin, requiring the annual release of 1.7 million sub-yearling fall Chinook for harvest augmentation.

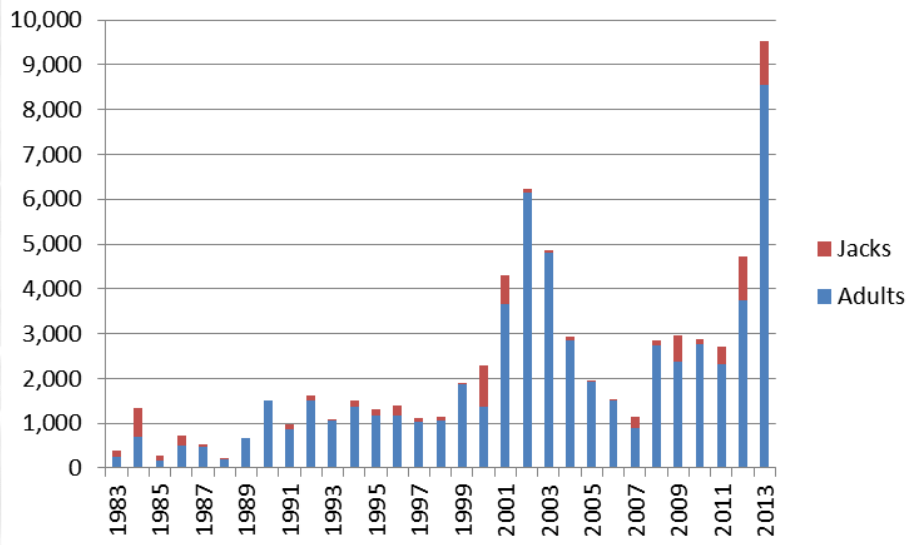
*Prosser Hatchery, staff caring for young Chinook in raceways*

*Yakima fall Chinook broodstock collection*

The Yakama Nation is in the process of implementing a summer- and fall-run Chinook program in the Yakima Basin to increase harvest levels, natural spawning abundance, and distribution. The goals of the program are to:

- Improve survival of juvenile fall Chinook by using a local brood source and constructing an acclimation facility in the lower Yakima River for the release of these fish.
- Improve the survival and productivity of fall Chinook juveniles released above Prosser Dam by upgrading facilities and increasing the use of local, natural-origin returns as the brood source.
- Reintroduce summer-run Chinook to the Yakima Subbasin ***(see page 12 for summer Chinook)***

## Counts of Summer and Fall-run Chinook at Prosser Dam, 1983-Present




Releases of hatchery-origin fish, improvements in hatchery practices, habitat protection and restoration, and increases in freshwater and marine survival have contributed to increases in the number of summer- and fall-run Chinook counted at Prosser Dam since 1983.

# Prosser Tribal Hatchery -
# Yakima River Steelhead (Shushάynsh) Kelt Reconditioning

*Prosser Hatchery, kelts feeding*

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 spawn. To improve the potential for steelhead to be repeat spawners, the Yakama Nation, and CRITFC have developed a process to recondition kelts after spawning. A "kelt" is a post-spawn steelhead, and "reconditioning" is the process of improving the health and fitness of the kelt to increase its potential to spawn a second time. We believe that through increased productivity and survival, this process will aid in improving steelhead abundance and diversity.

Prior to the 1855 Treaty, up to 40,000 steelhead returned annually to the Yakima Subbasin. That number declined to around 1,000 in the 1990s. Since 1999, the Yakama Nation has been a leader in the development of strategies to recondition kelts. We are conducting research to refine the process and discover which methods work best to reduce post-spawn mortality and increase reproductive success.

To help enable repeat spawning, we recondition kelts by capturing, holding, and feeding post-spawned steelhead in an artificial environment. We collect steelhead kelts at Prosser Dam and the Chandler Canal, after which they receive care at the Prosser Hatchery for up to 9 months before they are released. On average, the Yakama Nation annually releases about 200 reconditioned kelts.

## Prosser Hatchery: Steelhead Kelt Reconditioning

### Collection of Kelts

- Out-migrating kelts are collected during the spring at Prosser Dam and Chandler Canal

### Kelt Reconditioning


- Kelts held at Prosser Hatchery
- Feeding regimes allow kelts to rebuild their energy reserves
- Fish are treated with antibiotics to avoid infections and strengthen the immune system

### Release of Kelts

- Reconditioned kelts are released below Prosser Dam during the peak of the upstream steelhead migration

Yakama Nation Fisheries

# Prosser Tribal Hatchery - Yakima River Coho (Sinux)

In the Treaty-era, coho were found in virtually every creek and river in the Yakima Subbasin. During this time, annual returns of adult coho to the Yakima Subbasin were between 45,000 and 100,000. By the early 1980s, coho were extirpated from the area. To reestablish the coho population and the Tribal fishery, the Yakama Nation initiated a reintroduction program in 1985.

*Prosser Hatchery, staff caring for young coho in raceways*

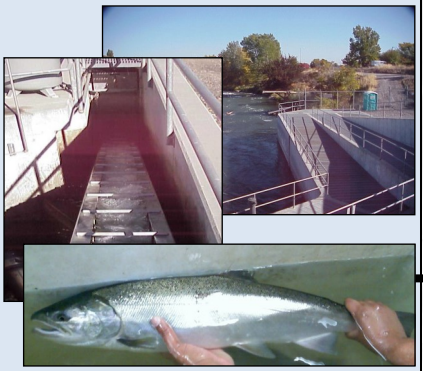
*Mid-Columbia coho*

Since the Yakama Nation's first hatchery releases of coho in 1985, the number of returning adults has steadily increased. We are developing a local, natural -origin brood source for a supplementation program that is intended to establish a wild, self-sustaining natural population.

**Project success:** Annual adult coho returns to Prosser Dam have averaged about 3,800 fish (1997-2013), including annual returns of about 900 wild/natural fish (since 2001).

## Prosser Hatchery: Coho Production

### Collection of Adults



- Local natural-origin broodstock are collected at Prosser Dam and Chandler by-pass
- Adults are maintained at the Prosser Hatchery until spawning

### Incubation and Early-rearing

- Incubation and early-rearing occurs at Prosser and Eagle Creek National Fish hatcheries
- Coho are reared at Prosser Hatchery for their first year
- Coho are transferred to Eagle Creek Hatchery, and back to Prosser in early-February

### Smolt Acclimation

- Pre-smolts from Eagle Creek Hatchery are reared at the Stiles, Holmes, Lost Creek, Boone, and Easton acclimation sites in the spring
- Mobile acclimation units are also used
- Volitional release begins in April

# Upper Yakima Sockeye (Kálux) Restoration

In the early 20th century, sockeye nursery lakes in the Upper Yakima Subbasin were impounded by the Yakima Basin Irrigation Project, which lacked fish passage facilities. Prior to the irrigation project, the lakes supported an annual run of 200,000 sockeye. In 2009, Yakama Nation Fisheries, with support from several partners, reintroduced adult sockeye into Lake Cle Elum to spawn naturally. After adults are captured at Priest Rapids Dam and/or Roza Dam, we transport them to Lake Cle Elum for release, a process that will continue until upstream passage is provided at Cle Elum Dam. A temporary out-migrant chute has been constructed so that juveniles can migrate downstream on their own.

*Sockeye reintroduced by the Yakama Nation, Lake Cle Elum*

*Cle Elum Dam juvenile passage structure*

The number of adult sockeye returning to Priest Rapids and Roza dams determines the number of fish the Yakama Nation can transplant. The number of fish transported has ranged from 1,000 to 10,000 in 2009 and 2012, respectively. In 2011, around 100,000 juvenile sockeye, offspring from the adults transplanted in 2009, were counted while migrating downstream past Roza and Prosser dams.

*Brood-year 2009 sockeye out-migrant, 2011*

*Mel Sampson, reintroducing sockeye at Cle Elum, 2009*

*Yakama Nation adult sockeye trap and haul*

**Project Success:** In 2013, 701 adults, offspring from the 2009 transplants that were released into Lake Cle Elum, returned to the Yakima Basin and were trucked to the nursery lakes to spawn. These fish were the first naturally produced Yakima River sockeye to return and spawn in the basin in over 100 years.

*Note: The Yakama Nation's sockeye reintroduction efforts are supported by Pacific Coastal Salmon Recovery Funds from the National Oceanographic and Atmospheric Administration, the U.S. Bureau of Reclamation, and Grant County PUD.*

Yakama Nation Fisheries

# Marion Drain Tribal Hatchery - Yakima River Summer Chinook (Tkwínat, Núsux)

**Yakima River Summer Chinook (Tkwínat; Núsux)**

By 1970, summer Chinook were extirpated from the Yakima Subbasin. Beginning in 2009, the Yakama Nation developed production facilities to reestablish the lost summer run. We use summer Chinook eggs from the Wells Hatchery/Wells Dam, incubate and rear their offspring at Marion Drain Hatchery, and acclimate them at sites throughout the subbasin. The Tribe's goal is to eventually use a local, natural-origin broodstock.

*Tony Washines, Yakama Nation, Chinook for sale in Portland*

The summer Chinook hatchery program has two phases. In the initial phase, we plan to re-colonize habitat with summer Chinook and provide fish for harvest. In this phase, we plan to annually release 500,000 summer Chinook (1/2 sub-yearlings and 1/2 yearlings) at locations above Prosser Dam. Improved habitat quality, through on-going restoration work, will allow us to reach our long-term goal which is a self-sustaining and locally-adapted population. To reach harvest goals, we may have to continue some hatchery supplementation.

*First summer Chinook to return past Prosser Dam, 2012*

**Project success:** Over 2,000 summer-run Chinook passed Prosser Dam in 2012-13, among the first adults to return to the Yakima Basin in over 40 years. *(See graph on page 8)*

## Marion Drain Hatchery: Summer Chinook Production

### Collection of Adults

- Wells Hatchery broodstock are spawned in October at Wells
- Goal is to move to natural and local broodstock produced by the program and collected locally

### Incubation and Early-rearing

- Eggs are transferred to the Marion Drain Hatchery where they are hatched and reared

### Smolt Acclimation

- Pre-smolts moved to Mid-Yakima locations (such as Nelson Springs), Prosser Hatchery, or potentially kept at Marion Drain Hatchery for final acclimation and volitional release in late-April and into May

# Marion Drain Tribal Hatchery - Mid-Columbia White Sturgeon (Wílaps) Restoration

Since the 1990s, Yakama Nation Fisheries has been researching how to culture white sturgeon by rearing small numbers in Tribal hatchery facilities. We obtained fish from various sources, including Pelfrey Sturgeon Hatchery, CRITFC's mid-Columbia Research Program, and the U.S. Fish and Wildlife Service. In 2012, 10 wild adult white sturgeon were collected from the Columbia River. After spawning, they were returned to the river.

*Visitors at the Marion Drain Hatchery*

*Extracting eggs from white sturgeon*

Working collaboratively with other agencies, the Yakama Nation intends to move from the research phase of the project to the implementation of restoration actions. Results from our research will be used to guide the implementation of effective and efficient restoration activities.

The long-term goal of the Yakama Sturgeon Management Project is to restore healthy white sturgeon populations that provide harvest opportunities in the mid-Columbia River and Lower Snake River reservoirs.

*Placing white sturgeon eggs in hatching containers*

**Project Success:** From 2007 to 2012, the Yakama Nation spawned and reared white sturgeon at our Marion Drain Hatchery to assist with the restoration of mid-Columbia River populations. Since 2010, more than 18,000 juvenile white sturgeon have been released into Priest Rapids, Wanapum, and Rocky Reach reservoirs.

*Juvenile white sturgeon at the Marion Drain Hatchery*

*Note: While the development of methods and staff resources described on this page are funded through the Columbia Basin Fish Accord Agreement of 2008, production efforts are supported by Grant, Douglas, and Chelan Public Utility Districts.*

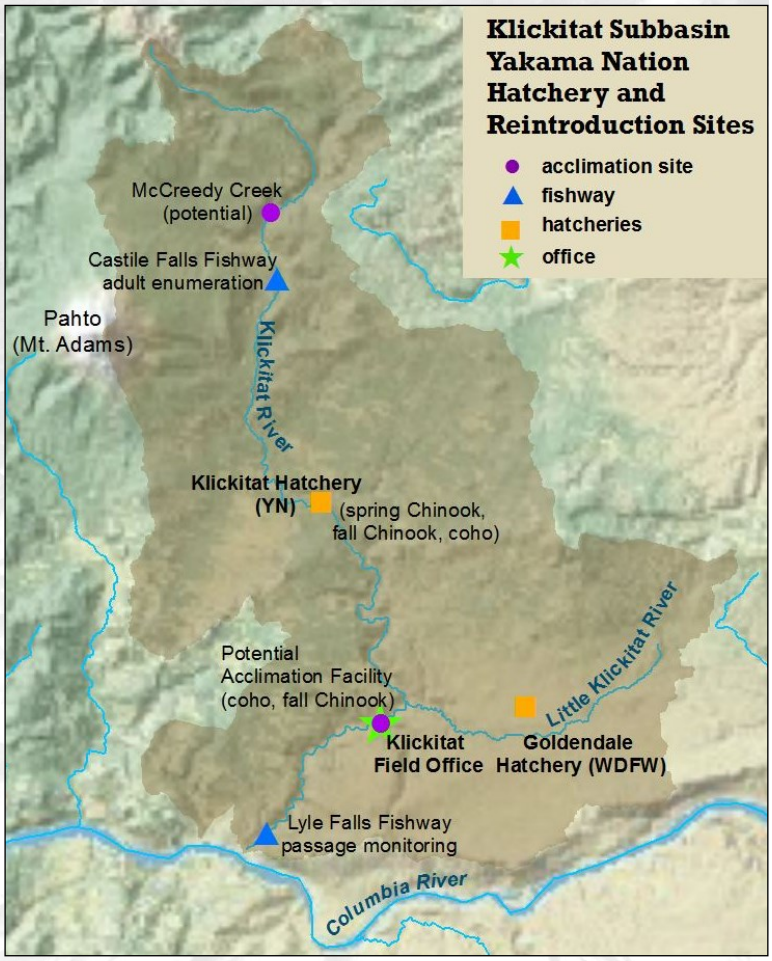
*White sturgeon broodstock collection*

Yakama Nation Fisheries

# Klickitat Subbasin

The Tribal fishery at Lyle Falls (Klickitat River) is important for ceremonial, subsistence, and commercial harvest. Klickitat Hatchery production of fall Chinook and coho helps to sustain the commercial fishery that contributes significantly to tribal members' income. Traditional dip nets, set nets, and jump nets are the preferred fishing method. Lyle Falls is one of the last places where Yakama tribal members can harvest fish using traditional methods and pass these ancient technique on to the next generation, ensuring the survival of our way of life.

*Klickitat Gorge, traditional platform fishing*




## Species of Interest: Background

*Yakama Nation staff collecting biological samples with the USFWS staff, Klickitat Hatchery*

- **Spring Chinook (Tkwínat, Núsux)** - Native to the Klickitat Subbasin, spring Chinook were once harvested in significant numbers. Since 1977, annual returns of natural spring Chinook have averaged 300 fish. Reforms to the spring Chinook hatchery have included introducing wild spring Chinook into the hatchery population to increase natural influence. Spring Chinook are the only species that swim-in to the hatchery for broodstock collection and spawning purposes.
- **Fall Chinook (Tkwínat, Núsux)** - Fall Chinook, which were introduced into the Klickitat Subbasin in 1952 to meet harvest obligations, usually are unable to pass Lyle Falls.
- **Coho (Sinux)** - Coho were introduced in 1952 to meet harvest obligations. The Yakama Nation's goal is to produce approximately 14,000 coho for harvest, mostly in the Zone 6 Columbia River Tribal fisheries and Klickitat River.

# Klickitat Hatchery

## Klickitat Hatchery

Built in 1949, the Klickitat Hatchery was operated by the state of Washington through 2006. In 2006 the Yakama Nation took over the hatchery operations; however, the WDFW still participates as a co-manager through the YKFP. The Klickitat Hatchery is one of the few Mitchell Act hatcheries above Bonneville Dam. Hatchery operations are federally-funded as mitigation for lost fisheries.

*Klickitat Hatchery*

Species we incubate, rear, acclimate and release at the hatchery include Klickitat spring Chinook (600,000 yearling smolts), Little White Salmon upriver bright fall Chinook (4 million sub-yearling smolts), and Lewis River late-coho (1 million yearling smolts). These species are managed for harvest augmentation, separate from wild stocks.

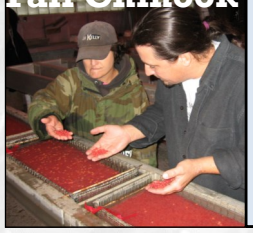
**Project Success:** Since 2009, annual spring Chinook returns to Lyle Falls have averaged 5,200 fish. Annual adult fall Chinook and coho returns to the river mouth have averaged 21,000 and over 16,000, respectively.


*Wahkiacus Field Office*

## Proposed Lower Klickitat River Acclimation Facility

The Yakama Nation is currently investigating the development of a fall Chinook and coho acclimation site on the lower Klickitat River. The proposal would free-up water and space at the Klickitat Hatchery. In addition, shifting a portion of the fall Chinook and coho releases downstream would reduce potential overlap with spring Chinook and steelhead spawning and rearing areas, reducing potential impacts on wild stocks while maintaining harvest opportunities.

### Fall Chinook



- Upriver bright fall Chinook obtained from Lower White Salmon Hatchery as green eggs
- Future: transition to pre-smolts and local broodstock obtained from the Lyle Fishway/Trap

- Fall Chinook are reared at Klickitat Hatchery by YKFP
- Approximately 4 million released annually
- Strategy to release half of the fish into the lower river, but may modify plan in the future

### Coho

- Green eggs obtained from Lewis and Washougal hatcheries
- Strategy to transition a portion of program to local broodstock collected from the Lyle Fishway/Trap

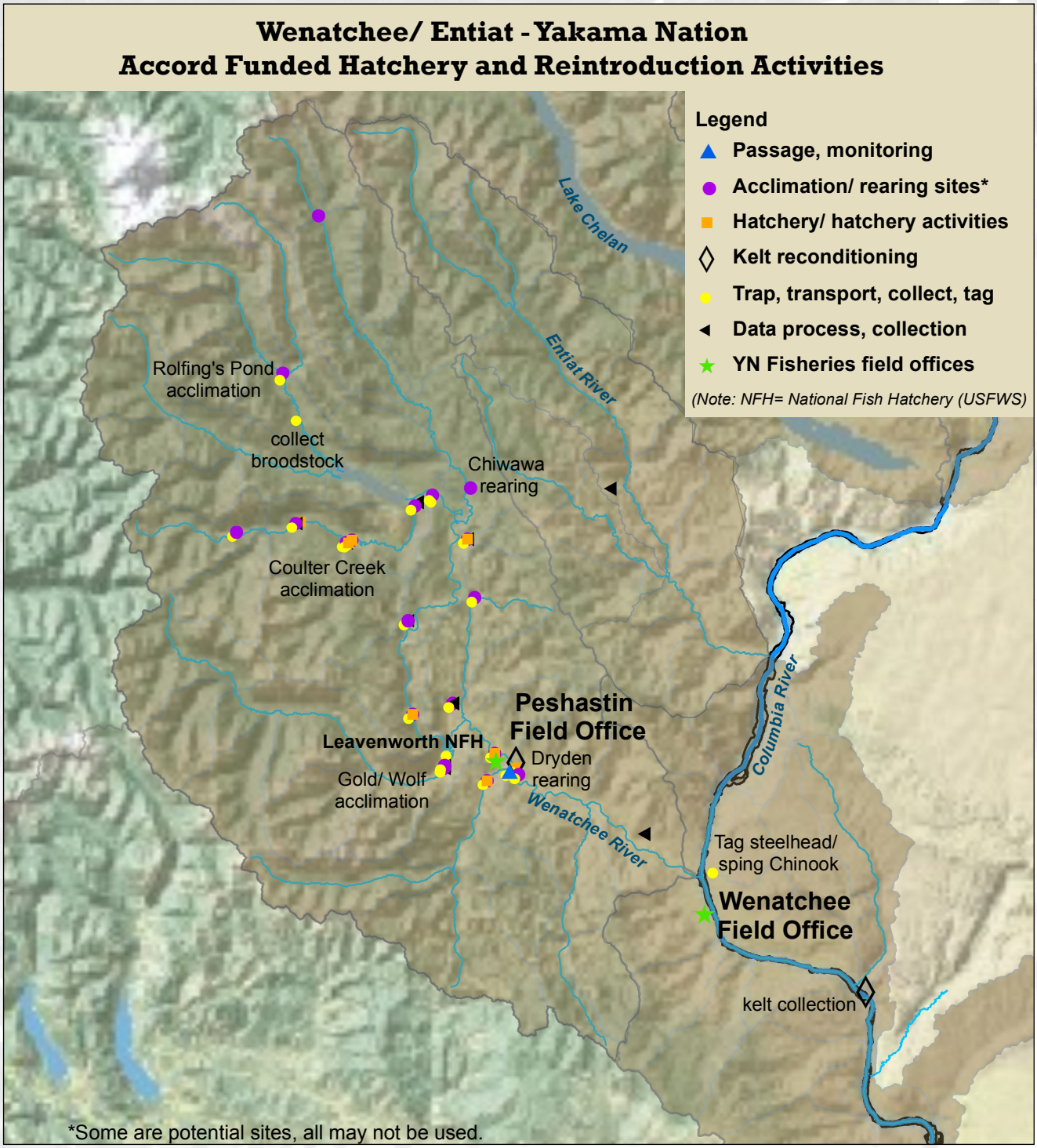
- A third of the coho are acclimated at Klickitat Hatchery by YKFP
- Approximately 1 million released annually
- Strategy to release all fish in the lower river

Yakama Nation Fisheries

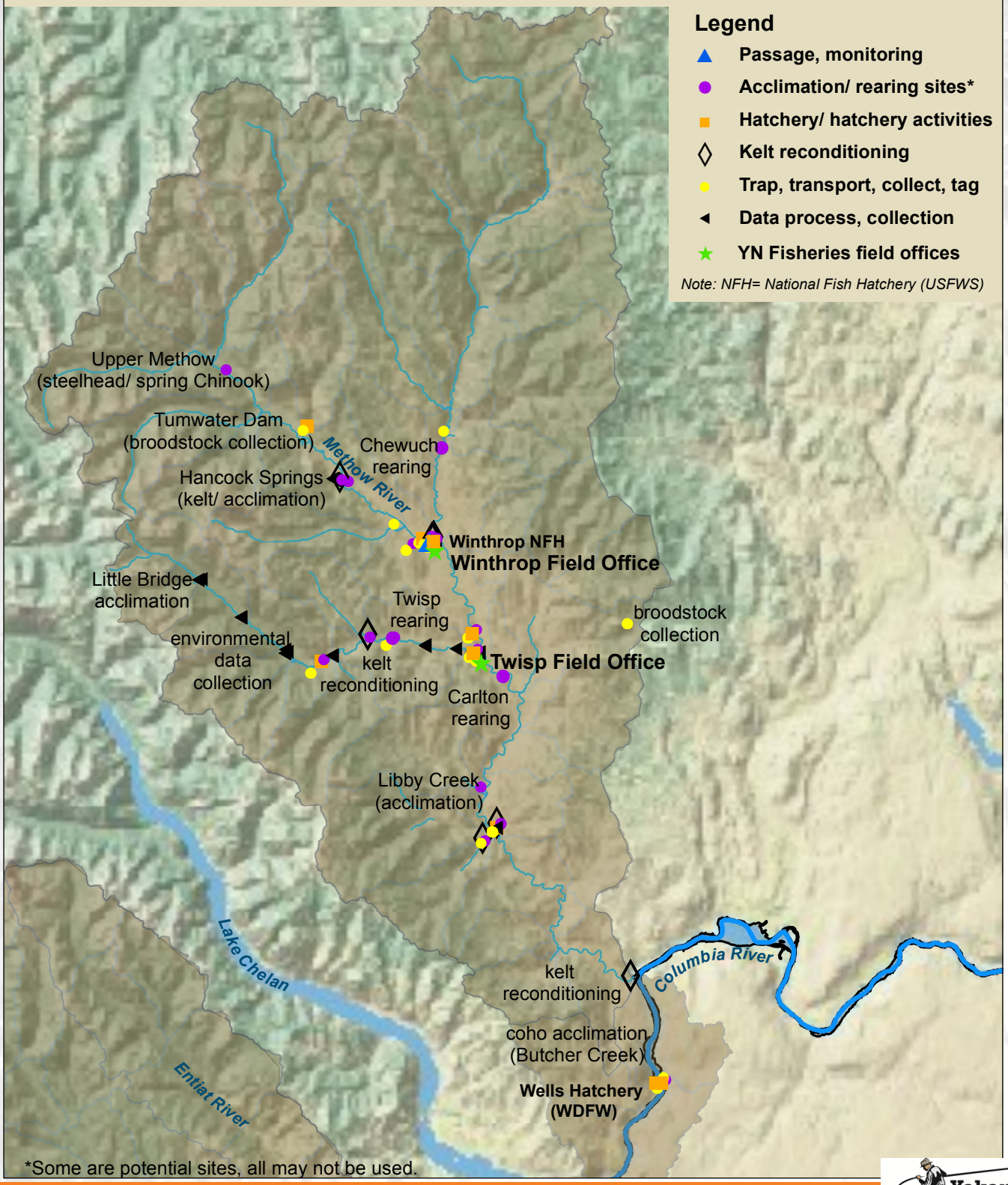
# Upper Columbia

Collaborating with state and county agencies (Chelan, Douglas and Grant County PUDs) in the Upper Columbia, the Yakama Nation's Accord-funded hatchery and reintroduction activities include:

- Steelhead kelt reconditioning
- Proposed Wenatchee/Methow coho restoration facility
- Wenatchee/Methow steelhead and spring Chinook acclimation facilities
- Wenatchee spring Chinook rearing facilities



## Methow - Yakama Nation
## Accord Funded Hatchery and Reintroduction Activities



# Wenatchee and Methow Subbasins: Coho (Sinux) Reintroduction

At the time of the 1855 Treaty, 40,000-50,000 coho returned annually to the Wenatchee, Entiat, and Methow subbasins. By the early 1990s, coho were extinct in all of these subbasins. Supported by funds from the Accord and the Grant and Chelan County PUDs, the Yakama Nation is restoring coho salmon to the Wenatchee and Methow subbasins. Besides the economic and cultural values associated with restoring these coho populations, other benefits include providing the local ecosystem with marine-derived nutrients, increasing the abundance of other species that rely on healthy salmon runs, and the opportunity to study the process of local adaptation as coho are reintroduced.

*Coho male adult*

*Coho female adult*

The Yakama Nation incubates and rears coho at the Leavenworth, Peshastin, and Winthrop hatcheries; however, these facilities have limited space, so we are exploring the possibility of a new coho hatchery in the Upper Columbia (see page 21). In preparation, we are developing broodstocks at the Leavenworth and Winthrop hatcheries using fish collected at the Dryden and Tumwater dams, swim-ins to the Winthrop National Fish Hatchery, and fish collected from the Wenatchee and Methow subbasins.

**Goal:** While the first broodstock in this reintroduction effort came from the lower Columbia, we have the goal of developing a locally-adapted, harvestable, and self-sustaining coho population in the Upper Columbia. We plan to add acclimation sites including semi-natural locations throughout the Wenatchee and Methow subbasins, use local broodstock, and focus on areas where naturally produced and locally adapted coho are the most successful. Using results from ongoing monitoring studies, we will be able to focus our efforts in areas where risks are low for negative interactions with sensitive species.

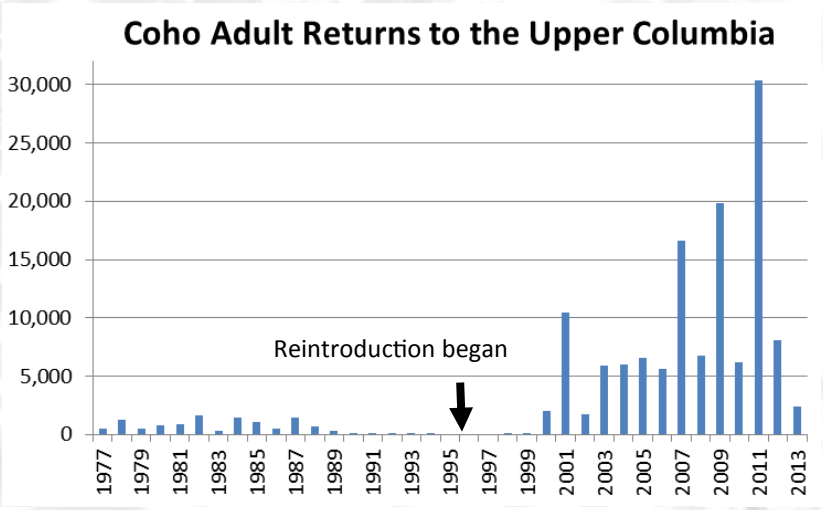
*Leavenworth National Fish Hatchery and various potential semi-natural acclimation sites*

# Wenatchee and Methow Subbasins: Coho (Sinux) Reintroduction

*Juvenile coho*

**Project success:** Since 1996, we have conducted research to evaluate the feasibility of reintroducing coho into the Wenatchee and Methow subbasins. Currently, 1.5 million smolts are acclimated and released annually into the subbasins by Yakama Nation. Over the last ten years, the average annual return of adult coho has been 8,600 fish. Record returns in 2009 allowed for the opening of a limited fishery in Icicle Creek, and the return of over 30,000 fish in 2011 allowed for harvest in the lower Wenatchee and Methow subbasins.

*Adult coho*




*(source: Fish Passage Center)*

## Proposed Upper Columbia Coho Hatchery

With the opening of the coho fishery, the Yakama Nation's Upper Columbia Coho Reintroduction Program is now considered a success. In transitioning to full implementation, a new coho hatchery has been proposed for the Upper Columbia. By 2028, it is the Yakama Nation's goal to have developed self-sustaining, naturally reproducing populations of coho in the Wenatchee and Methow subbasin. With the addition of a new hatchery, which is currently in the planning phase, we anticipate annual releases of 2 million smolts that are acclimated throughout the Wenatchee and Methow subbasins.

Yakama Nation Fisheries

# Wenatchee and Methow Subbasins: Steelhead (Shusháynsh) and Spring Chinook (Tkwínat, Núsux) Acclimation

*Icicle Creek Chinook fishery, Max Corpuz, mid-1990's*

Using what has been learned from the successful Mid-Columbia Coho Restoration Project, the Yakama Nation is implementing a similar approach in the Upper Columbia to restore steelhead and spring Chinook. Yakama Nation Fisheries is developing localized acclimation and rearing facilities at semi-natural sites throughout the region to increase the effectiveness of conservation production programs.

Utilizing existing Grant, Chelan, and Douglas County PUD mitigation production, this project is converting from direct-stream and/or single-point smolt releases to an approach of more naturalized and widely distributed acclimation and rearing. With these short-term sites, the Yakama Nation hopes to improve spawning distribution of adult returns and homing ability, while improving productivity and survival. At some locations, we plan to co-rear multiple species, a method that we have tested and demonstrated to be viable.

**Vision:** With the potential of supplementation numbers being reduced in the future, it is essential that conservation hatchery programs are operated in an efficient and effective manner. With improved productivity and survival, as well as better spawner distribution and homing, increased efficiency and effectiveness are goals that we believe the Methow/ Wenatchee steelhead and spring Chinook project can achieve.

*Yakama Nation fisheries working with Chinook, early days of the program*

*Semi-natural acclimation sites in the Wenatchee and Methow subbasins*

*Winthrop National Fish Hatchery back channel acclimation site*

# Upper Columbia Steelhead (Shushάynsh) Kelt Reconditioning

Yakama Nation Fisheries, along with partner CRITFC, is expanding their successful Yakima Subbasin Kelt Reconditioning Program into the Upper Columbia. Kelt reconditioning is a process whereby post-spawn steelhead are taken into captivity and cared for so that they will be more likely to spawn again (see p.10). With funding from BPA and in cooperation with the U.S. Fish and Wildlife Service, we have developed facilities at the Winthrop National Fish Hatchery to recondition post-spawn kelts prior to their release.

*Kelts in conditioning tank*

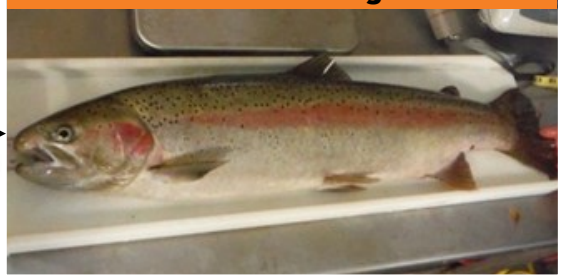

*Kelt weir on Little Bridge Creek, Twisp Subbasin*

**Research:** With a steelhead reproductive success study being conducted by WDFW in the Twisp Subbasin, it is the idea; location to monitor the effectiveness of kelt reconditioning. Coordinating with WDFW's monitoring project will better enable the Yakama Nation Upper Columbia Kelt Reconditioning Program to: 1) recondition kelts using long-term methods at existing facilities, 2) evaluate kelt survival and the effectiveness of reconditioning methods, and 3) collaborate with ongoing monitoring studies to document the reproductive success of kelts released from the program.

**Strategy:** The overall goal for the Upper Columbia Steelhead Kelt Reconditioning Program is to help restore steelhead through increased productivity and reduced mortality. Reconditioning improves the health of kelts and removes dangers encountered during post-spawn migrations to the ocean and back. The Yakama Nation will be collecting kelts for reconditioning at several sources, including live-spawned broodstock from the Twisp River program at Methow Fish Hatchery and Winthrop National Fish Hatchery, Chelan PUD's Rock Island bypass facility, and tributary weirs in the Methow Subbasin. By 2015, we expect to have an average of 100 kelts available annually for reconditioning.

**Kelt Reconditioning—Before**


**Kelt Reconditioning—After**



***"For the Yakama people, fishing for salmon is not much less necessary to the Indians than the atmosphere they breathed."***

***- U.S. Supreme Court Justice Joseph McKenna***
***Landmark 1905 US v Winans Supreme Court decision***

## Glossary

| | |
|---|---|
| **2008 Columbia River Fish Accords** | Legal agreement signed between Yakama Nation and several other tribes and agencies to mitigate for the impacts of federal dams on fishes. |
| **BPA** | Bonneville Power Administration, federal entity that markets and distributes energy produced by federal hydroelectric dams. It is part of the U.S. Department of Energy. |
| **broodstock/ broodfish** | Parent fish used as source of offspring for hatchery production. |
| **CRITFC** | Columbia River Intertribal Fish Commission, coordination and technical entity of which Yakama Nation is one of four member Tribes. |
| **ESA** | Endangered Species Act, a federal law used to protect species at risk of going extinct. |
| **fishway** | Passage created to help fish get past a barrier. |
| **hatchery origin spawner (HOS)** | A fish that was produced in a hatchery but returns to spawn in the wild. |
| **kelt** | A steelhead that has already spawned once, but may be able to return to spawn again. |
| **memorandum of agreement** | A document written between parties to cooperate on an agreed upon project or meet an agreed objective. |
| **Mitchell Act** | Act signed by Congress in 1938 to use seining fees to restore fish habitats. Amended in 1946 to screen irrigation ditches, build fish ladders, and establish hatchery supported fisheries, primarily downstream of Bonneville Dam. |
| **natural-origin spawner (NOS)** | A fish that was spawned in the wild that returns as an adult to spawn in the wild. |
| **NFH** | National Fish Hatchery (operated by the U.S. Federal Government) |
| **NOAA** | National Oceanic and Atmospheric Administration. A federal agency that is part of the U.S. Department of Interior, and is involved with fisheries management on a federal level, as well as marine commerce, weather and coastal monitoring and warnings, for example. |
| **PUD** | Public utility district – local (county) governmental body that provides public utilities to the people of that district. They own and operate some hydroelectric dams in the Upper Columbia. |
| **reconditioning** | To improve the health/fitness of spawned out steelhead so that they are more likely to spawn again. |
| **smolt** | Juvenile salmon that are migrating to the ocean. |
| **subbasin** | The land area that drains to a common point, usually into a medium-large size river. Smaller ones may be interchangeable with "watershed". A "basin" consists of several smaller "subbasins". |
| **Treaty trust resources** | Natural resources that occur in the usual and accustomed places for harvest, the rights to which are protected by the Yakama Nation's Treaty of 1855 (*12 stat. 951)* with the United States of America. |
| **U.S. v. Oregon Columbia River Management Plan** | Management agreement based on the federal U.S. v. Oregon court case, that establishes shared harvest rates between Tribal and non-Tribal fishers, upriver and downriver fishers, a means to protect and rebuild weak Columbia River fish populations, and resolve disputes. |
| **U.S. v Winans** | 1905 landmark U.S. Supreme Court case brought by the Yakama Nation, that held that Treaty tribal members had the right to cross non-tribal lands to access usual and accustomed places. |
| **watershed** | The land area that drains to a common point, usually into a stream or other small water body. |
| **WDFW** | Washington Department of Fish and Wildlife– An agency providing fish and wildlife management for the state of Washington. |
| **YKFP** | Yakima-Klickitat Fisheries Project– a part of Yakama Nation Fisheries, YKFP collaborates and cooperates on fisheries issues with WDFW in the Yakima and Klickitat River subbasins. |

| Photo | Credit | Year | Page |
|---|---|---|---|
| Wild sockeye out-migrant, caught at Roza Dam | From Gordon King, Yakima Herald Republic | 2011 | cover |
| Sockeye trap and haul, Chuck Carl at Cle Elum | YN | 2011 | cover |
| Cle Elum Hatchery eggs | YN | 2001 | cover |
| Sam Jim, Sr., Chairman Yakama Tribal Council Fish and Wildlife Committee | Courtesy office of Gov. Jay Inslee | 2014 | 2 |
| Historic photo– Columbia River Indians fishing Celilo | Photo by A. M. Prentiss, Courtesy via CTUIR | - | 2 |
| Historic photo– Klickitat dip netting | Courtesy via Alicia Patterson Foundation | - | 2 |
| Roza Passage Facility, Joseph Yellup | Emily Washines, YN | 2013 | 4 |
| Traditional platform fishing, Klickitat gorge | YKFP-YN | - | 5 |
| Monitoring Chinook natural production, Upper Yakima- Andy Dittman (NOAA) and Gerry Lewis (YN) | YKFP | 2000 | 5 |
| Yakama Nation Family Trout Fishing Day, Marion facility | Emily Washines, YN | 2013 | 5 |
| Cle Elum Hatchery, marking crew, eggs, Jack Creek Acclimation | Jason Rau, YKFP-YN | 2012 | 7 |
| Prosser Hatchery, raceways | Michelle Steg-Geltner, YN | 2014 | 8 |
| Yakima fall Chinook broodstock collection | Melinda Davis, YN | 2004 | 8 |
| Prosser, kelts feeding, Yakima River release | YN | 2013 | 9 |
| Prosser dam and fish monitoring facility, Joe Blodgett | YN | - | 9 |
| Prosser Hatchery, circular tanks | Michelle Steg-Geltner, YN | 2014 | 9 |
| Kelt release, Yakima River | YN | - | 9 |
| Prosser Hatchery, juvenile coho raceways | Michelle Steg-Geltner, YN | 2014 | 10 |
| Mid-Columbia Coho | Todd Newsome, YN | 2012 | 10 |
| Prosser denil fish ladder | YKFP-YN | - | 10 |
| Mid-Columbia coho (silver) | Todd Newsome, YN | 2008 | 10 |
| Mobile acclimation unit | YN | - | 10 |
| Sockeye reintroduced to Lake Cle Elum by YN | Courtesy of YBEEP | 2010 | 11 |
| Cle Elum out-migrant chute | YN | - | 11 |
| Wild sockeye out-migrant, caught at Roza Dam | From Gordon King, Yakima Herald Republic | 2011 | 11 |
| Sockeye trap and haul, Chuck Carl and Brian Saluskin | YN | - | 11 |
| Mel Sampson, sockeye reintroduction at Cle Elum, 2009 | YN | 2009 | 11 |
| Tony Washines, YN, and Columbia River Chinook for sale | Sam Beebe, Ecotrust | - | 12 |
| 3-ocean summer Chinook past Prosser Dam, July, 2012 | YN | 2012 | 12 |
| Wells Hatchery | WDFW | - | 12 |
| Marion Drain facility | YN | - | 12 |
| Prosser Hatchery, Chinook acclimation raceways | Michelle Steg-Geltner, YN | 2014 | 12 |
| Marion Drain Hatchery tour, sturgeon rearing tanks | YN | 2013 | 13 |
| Sturgeon female, egg extraction, Marion Drain Hatchery | Donella Miller, YN | 2013 | 13 |
| Juvenile white sturgeon, Marion Drain Hatchery | AP Photo/ Yakima Herald-Republic Ross Courtney | 2011 | 13 |
| YN sturgeon broodstock collection | CRITFC | 2011 | 13 |
| Traditional platform fishing, Klickitat gorge | Les Brown, CRITFC | - | 14 |
| Klickitat Field office, Klickitat Hatchery | Jason Rau, YKFP-YN | - | 14, 15 |
| Wahkiacus Field Office | Google Maps | 2014 | 15 |
| YKFP/ USFWS spring Chinook spawning, Klickitat Hatchery | YKFP-YN | - | 15 |
| Fall Chinook eggs, Egg transfer, Klickitat Hatchery | Jason Rau, YKFP-YN | - | 15 |
| Chinook (spring) spawn, Klickitat Hatchery | Jason Rau, YKFP-YN | - | 15 |
| Visitors at Klickitat Hatchery raceway | Jason Rau, YKFP-YN | - | 15 |
| Coho adults | Todd Newsome, YN | 2013 | 18 |
| Possible acclimation sites (Leavenworth NFH, side channel, Butcher Creek Methow) | Cory Kamphaus, YN | 2013 | 18 |
| Upper Columbia coho, juveniles and adults | Cory Kamphaus, YN; E.R. Keeley, WDFW | 2013 | 19 |
| Icicle Creek Chinook fishery, mid-1990's | Courtesy of Paul Ward, YN | 1990s | 20 |
| Spring Chinook | YN | 1990s | 20 |
| Possible acclimation sites | YN | 2013 | 20 |
| UC kelt reconditioning, in tank | Matt Abrahamse, YN | 2013 | 21 |
| Kelt collection weir, Little Bridge Creek, Twisp Subbasin | Matt Abrahamse, YN | 2013 | 21 |
| Background– Dipnetting at Celilo Falls | George Chute, Washington State Historical Society | ~1950 | 23 |

HONOR

PROTECT

RESTORE

Prepared with assistance from:

QW Consulting, LLC

With Funding Provided By:

Bonneville Power Administration

This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, under Project No. 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.

Yakama Nation Fisheries