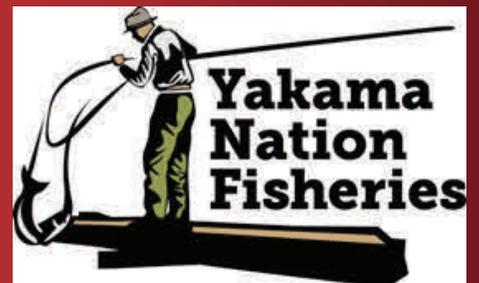


2014

**Yakama Nation Focal Species Status and Trends:
*With Emphasis on the 2008 Columbia River Fish Accords***



Section 2 of a 4 part series



HONOR. PROTECT. RESTORE.

Foreword:



Many of the salmon and steelhead populations that have sustained Yakama people since time immemorial are now listed under the Endangered Species Act. ESA listings signal a failure to adequately protect the rivers and streams that salmon need to thrive. Actions taken now under the ESA to restore these resources and their habitats also benefit other species not listed under the ESA. These actions help to bring back all Treaty trust fish resources that were once present in our region and supported the people of the Yakama Nation.

Wy-Kan-Ush-Mi Wa-Kish-Wit, the “Spirit of the Salmon” is a restoration plan developed by and for the member tribes of the Columbia River Inter-Tribal Fish Commission. The plan establishes tribal visions and goals for restoring healthy salmon populations. An initial goal was to stop salmon declines within 7 years. In many cases that appears to have been achieved. Although numbers of fish have increased since the terrible runs of the 1990s, more restoration work must be completed before we can hope to reach our goal of 4 million salmon and steelhead returning annually above Bonneville Dam by 2020. Besides salmon and steelhead, we remain especially concerned about the status of white sturgeon and eels.

As native people we are taught that we must take care of our resources if they are to take care of us. Our traditions warn us that what happens to them will eventually happen to us. The Yakama Nation has become a leader in restoring natural resources and critical habitats throughout this region. We must stay vigilant to keep our sacred promise to the resources we depend upon and to our future generations that will also depend upon them. By tracking the status and trends of indicator species, as well as understanding and supporting the restoration work that the Yakama Nation is completing through the 2008 Columbia Basin Fish Accord, we have a chance to make sure the right actions are taken. Ensuring the trends continue in the right direction will help us reach the restoration and recovery goals for our salmon and our people.

Virgil Lewis, Sr.

Chairman, Fish, Wildlife, and Law and Order Committee
Yakama Tribal Council

2014 Yakama Nation Fisheries Focal Species Status and Trends Report

The Yakama Nation's Accord Status Reports summarize progress toward achieving recovery goals described in the Columbia Basin Fish Accord Agreement of 2008. 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 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. The purpose of the Status and Trends Report (STAR) is to: 1) track the implementation of the projects and management actions described in the Accord agreement, 2) report on the biological effectiveness of implemented projects and actions by monitoring trends in the status of ESA-listed salmon and steelhead populations, and other species of priority to the Yakama Nation, and 3) provide information to tribal leadership to aid in development of policy direction. This report will consist of four chapters, three of which will document progress in implementing restoration projects and improvements to management actions, and one that tracks status and trend 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 Supplementation
- 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 and see a more detailed version, please visit www.yakamafish-nsn.gov/restore/projects/star. There, you can also leave comments and alert us to any errors or omissions.





Background

On May 2, 2008, the Yakama Nation signed the *Columbia Basin Fish Accords Memorandum of Agreement* which provides funds to implement fish and wildlife restoration projects throughout the Yakama Nation's Ceded Lands. The STAR project provides a "report card" on our progress toward improving the status and trends of focal species benefitting from actions implemented by the Yakama Nation through the Columbia Basin Fish Accords. The condition of these species serves as an indicator of the health of other species that are important to the Tribe and that also benefit from restoration actions.

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



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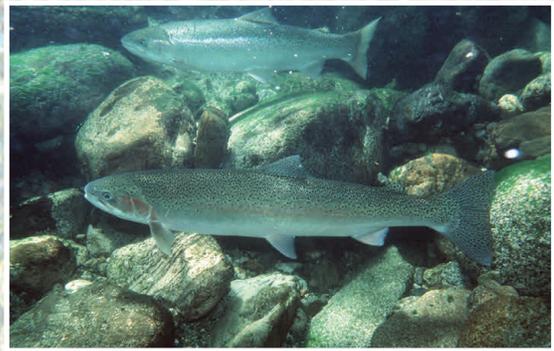
Yakama Nation Focal Species



Focal Species: Chinook (Tkwínat; Núsux)

Status: Endangered (Spring Chinook, Upper Columbia)

Trend: Slight increase



Focal Species: Steelhead (Shusháysh)

Status: Endangered (Upper Columbia) and Threatened (Middle Columbia)

Trend: Increasing



Focal Species: Coho (Sinux)

Status: Reintroduced

Trend: Increasing



Focal Species: Sockeye (Kálux)

Status: Reintroduced

Trend: Increasing



Focal Species: Pacific lamprey (Asúm; K'súyas)

Status: Depressed

Trend: Severely declining



Focal Species: White sturgeon (Wílaps)

Status: Depressed

Trend: Stable

Chinook in the Yakima Subbasin

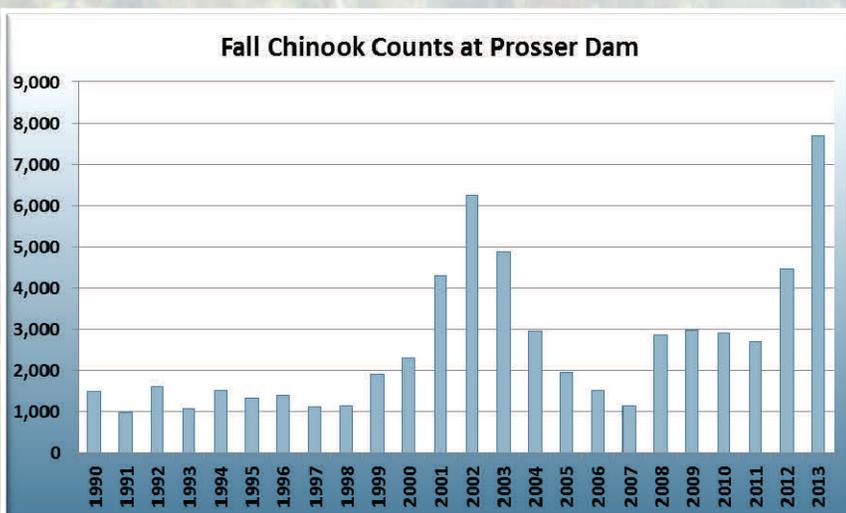
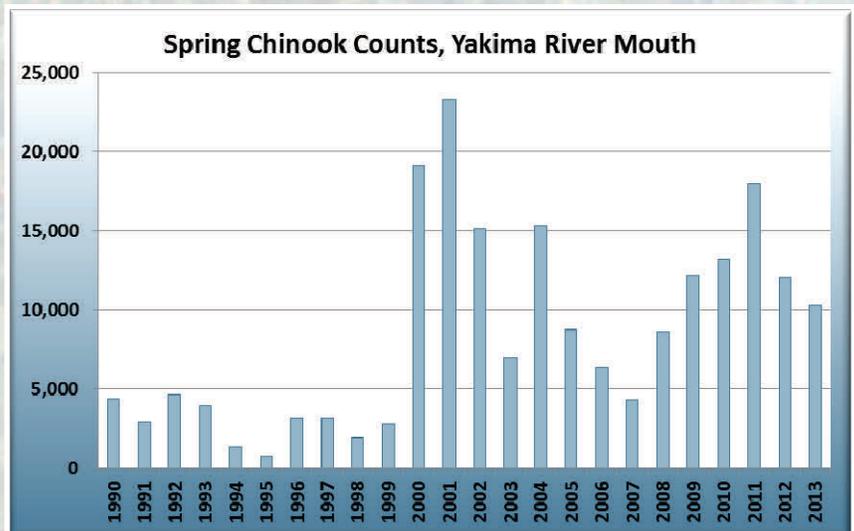


Spring Chinook

- At the time of the 1855 Treaty, 200,000 adult spring Chinook returned annually to the Yakima Subbasin. In the 1980s and 1990s, returns were less than 3,500.
- Goal:** Restoration of the fishery through supplementation and habitat protection and enhancement.
- Since 1997, the Yakama Nation has been supplementing spring Chinook in the upper Yakima using a new hatchery and acclimation complex in the Cle Elum area.
- Because Yakima spring Chinook appear to be habitat limited, the Yakama Nation is addressing habitat limiting factors to benefit all species.

Summer/ Fall Chinook

- By 1970, summer-run Chinook were extirpated and the fall-run was maintained with out-of-basin hatchery stock.
- The purpose of the summer/fall Chinook hatchery program is to provide for sustainable harvest, maintain population health, and contribute to regional research and education.



- Goal:** Average 7,000 natural-origin adults past Prosser Dam each year, and a total contribution of at least 18,000 summer/fall Chinook to all fisheries per year.
- The summer/fall Chinook program has both mitigation and conservation components. The goal is to meet or exceed viable salmon population guidelines and Treaty harvest obligations on a sustainable basis.

Data source:
Yakama Nation via Columbia River DART

Sockeye Restoration in the Yakima Subbasin*



Treaty era: 200,000 adult sockeye returned to these lakes annually to spawn. Sockeye were extirpated when their nursery lakes were dammed for irrigation.



July 10, 2013, First Return Celebration: Adult offspring from the 2009 transplants released into Cle Elum Lake returned back to the nursery lakes to spawn.

October 17, 2013 — 701 sockeye return to the Yakima River Basin to spawn.



2009 - 2012: 21,000 adults collected at Priest Rapids Dam and released into Cle Elum Lake.



2011: 100,000 juvenile sockeye, offspring from the adults transplanted in 2009, were trapped at Roza and Prosser dams. These fish were from the first sockeye to spawn in the Yakima Basin in over 100 years.



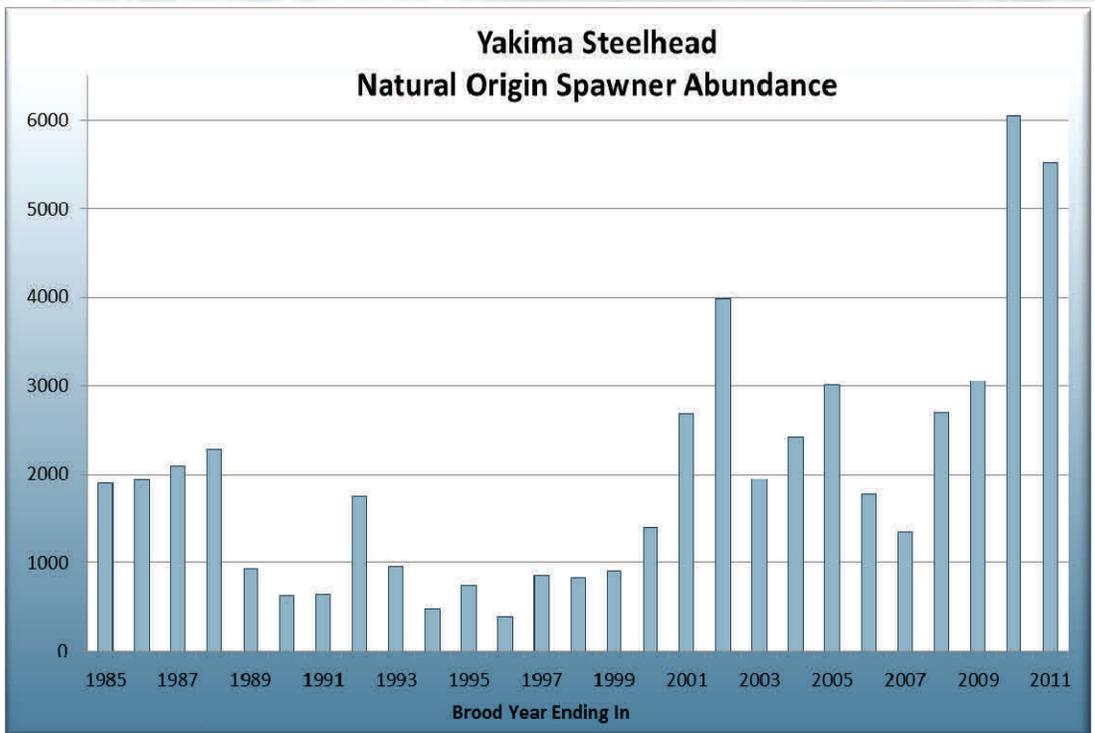
*Efforts described on this page are supported by Pacific Coastal Salmon Recovery Funds from the National Oceanographic and Atmospheric Administration.



Yakima Subbasin Steelhead

At the time of the 1855 Treaty, approximately 20,000-40,000 steelhead returned annually to the Yakima Subbasin. By the 1990s the average number of returning adults was less than 1,000. Improvements in hydrosystem operations and water management decisions, together with sustained efforts by the Yakama Nation to improve steelhead habitat on the Yakama Reservation and throughout the Yakima River Basin, are producing significant increases in steelhead survival and abundance.

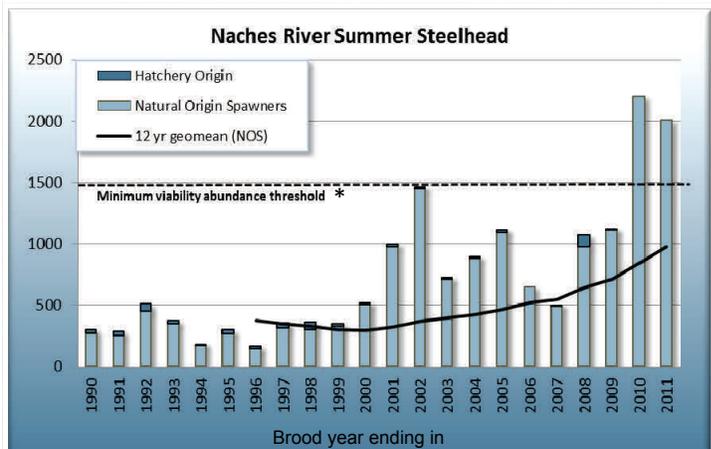
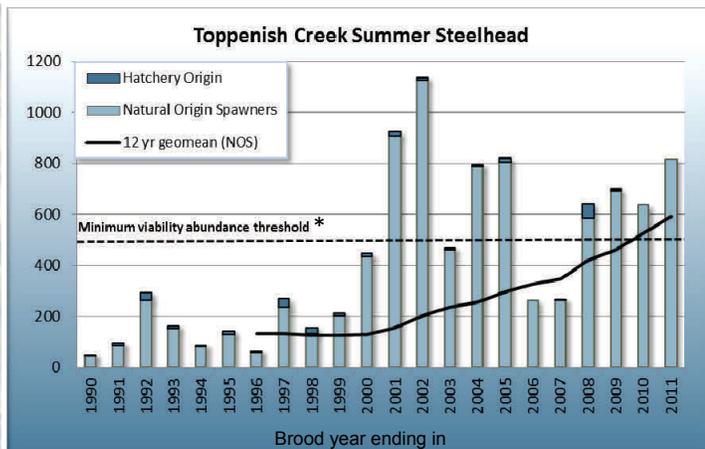
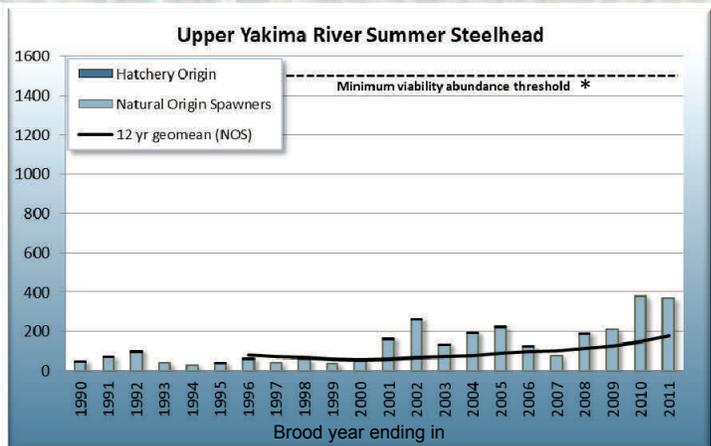
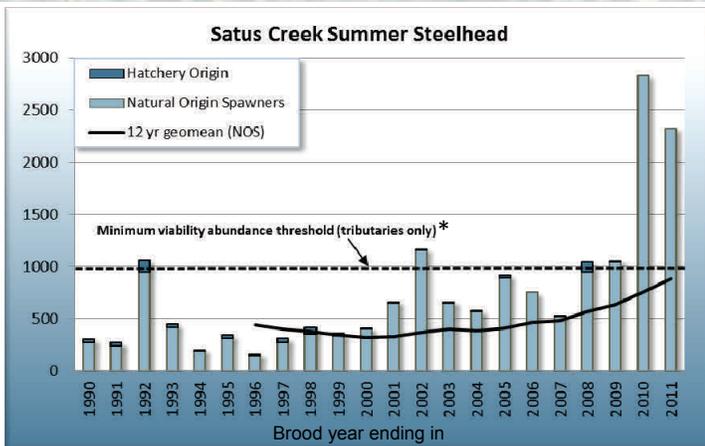
By actively reconditioning fish at Prosser Hatchery, as well as restoring habitat and stream flows, Yakama Nation Fisheries is helping to improve steelhead survival and productivity.



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Yakima Subbasin Steelhead

- Abundance estimates for steelhead are increasing for the Naches, Toppenish, Satus, and Upper Yakima populations.
- Highest population estimates in the last 20 years for the Naches, Toppenish, and Satus populations.



*See footnote on page 17.

Data source: Tim Resseguie, YN

PROJECT SPOTLIGHT: Yakima Basin Steelhead Population Monitoring



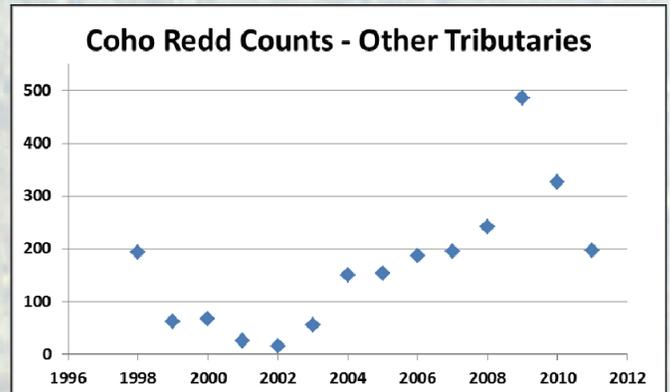
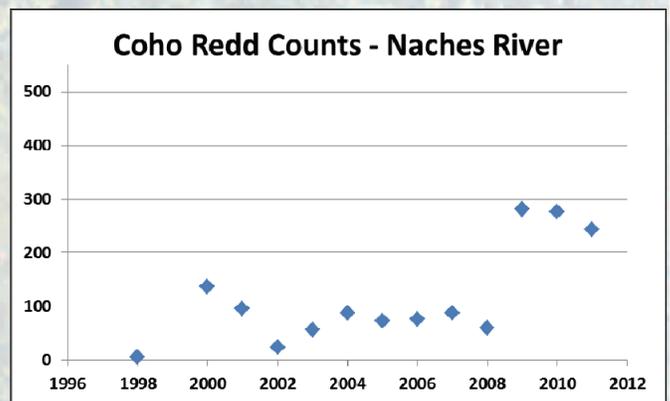
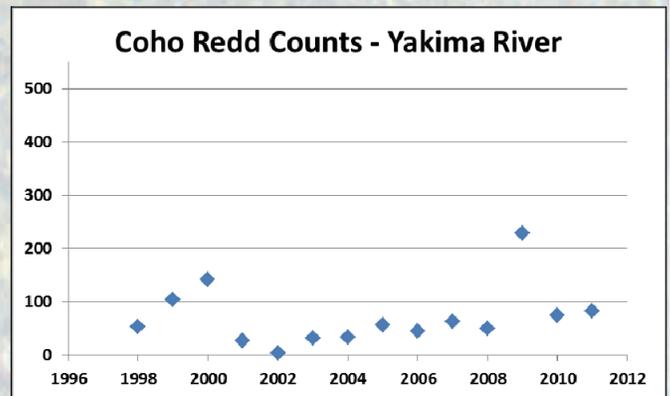
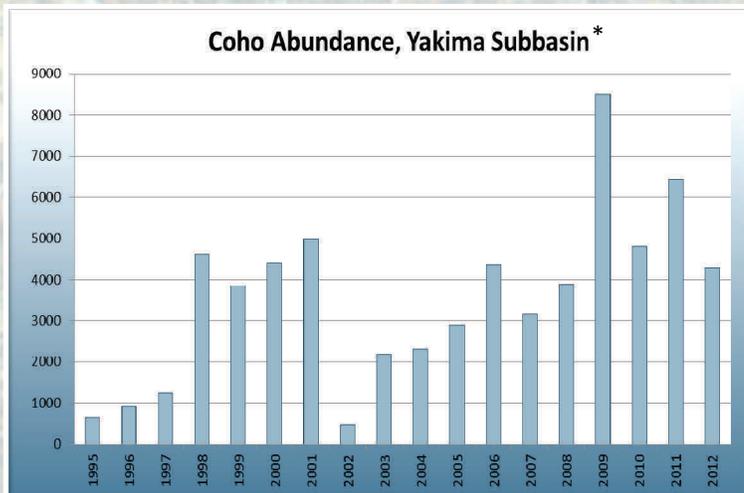
Since 2010, the Yakama Nation has been conducting intensive studies of steelhead in the Yakima Basin to better manage populations. Activities include:

- DNA sampling at Chandler, Prosser, and Roza facilities to improve abundance and productivity estimates for individual populations.
- Radio-tracking adult steelhead and expanded spawning surveys to better define spawning areas, abundance, productivity, and population structure.
- Investigating effects of Yakima Basin dams on steelhead movements.
- Evaluating interactions between rainbow trout and steelhead.
- Most of this work is Accord funded.



Coho Restoration in the Yakima Subbasin

- **Goal:** Develop a sustainable, naturally spawning coho population with a total annual harvest of at least 20,000 fish.
- **Near-Term Goal:** Restore annual returns of coho populations to biologically sustainable levels (15,000 adults, eventually including at least 3,500 of natural-origin) that provide harvest opportunities for tribal members.
- Approximate Treaty era run size: 110,000 adults
- 1980s average run size: 200 adults
- Average returns for the past decade have been 5,200 fish (over 10,000 total in 2009).



*Abundance estimate based on adult counts at Prosser Dam, before broodstock collection (includes hatchery and wild adults).
Data source: WDFW/SASI, collected by Yakama Nation Fisheries.

Pacific Lamprey Restoration*

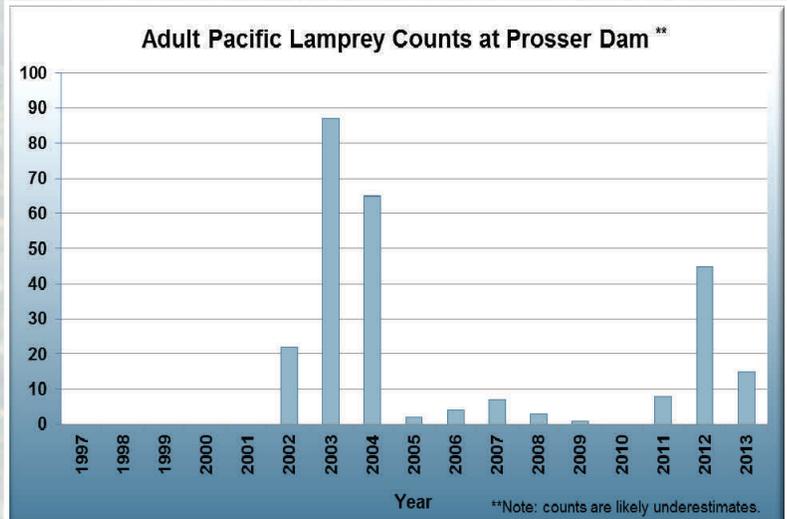


Overall Goal for the Columbia Basin:

To increase naturally sustainable lamprey populations to levels that support tribal harvest opportunities by 2025.

2009-2010: Refined survey protocols and conducted distribution surveys, developed cooperative relationships with regional entities, and developed objectives and future work elements.

2011-2012: Identified threats and limiting factors, and initiated restoration action plan.



2012-2013: Successfully completed artificial propagation of Pacific lamprey with the production of several thousand larvae.

2012-2013: Translocated 137 adult Pacific lamprey from the Lower Columbia River into Satus, Toppenish, and Ahtanum creeks.



2012-2013: Documented distribution of larvae/juveniles in Yakima, Wenatchee, Entiat, and White Salmon subbasins.

2014-2017: Focus on restoration throughout the Ceded Lands, document progress, and reassess abundance and distribution estimates.

*Translocation and survey efforts described on this page are funded through the 2008 Columbia Basin Fish Accord, other work is supported by the Bureau of Reclamation and Public Utility Districts.

The Interesting Life of a Pacific Lamprey

Eggs and larvae



- Eggs hatch and larvae drift downstream to slow velocity areas.
- Larvae live in sand/silt filter feeding for 3-7 years.

Juveniles



- Larvae transform to juveniles and migrate to the ocean.

Adults



- Adults live in the ocean for 1-3 years and feed on fish.

Spawning



- Adults return to fresh-water to live for a year before spawning.
- Die 3 to 36 days after spawn.

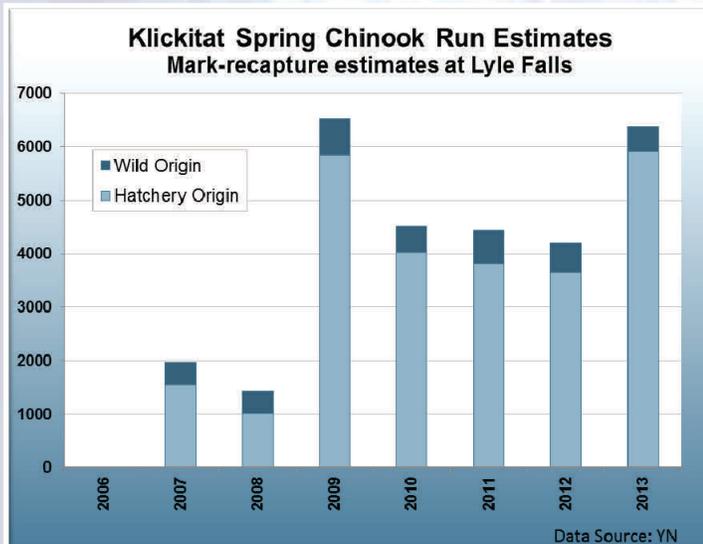


Chinook in the Klickitat Subbasin



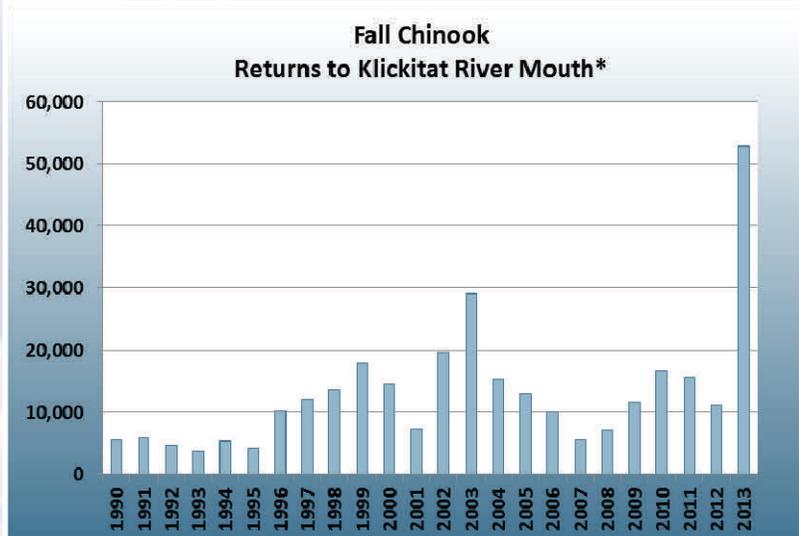
Spring Chinook

- Despite a low abundance, the population is not Federally listed. Hatchery supplementation is in place to mitigate for fish losses due to Columbia River Basin development.
- **Goal:** Increase population viability and local adaptation, while fulfilling Treaty harvest obligations sustainably.
- **Objective:** Reach harvest goals of 1,000 for all mainstem fisheries (majority in Zone 6 Tribal fisheries) and 3,000 in the Klickitat.
- **Strategies:** Transition the program to a conservation/harvest program by incorporating an increasing number of natural origin broodstock.



Fall Chinook

- Introduced into the Klickitat Subbasin in 1952 to meet harvest obligations for Tribal fisheries.
- **Goal:** Provide increased harvest opportunities to fulfill Treaty obligations by establishing a locally adapted population.
- **Objective:** Production of 18,000 fall Chinook for harvest in all fisheries, majority in Zone 6 Tribal fisheries and the Klickitat River.
- **Strategies:** Transition the out-of-basin program so pre-smolts from Little White Salmon National Fish Hatchery are reared and released from acclimation site(s) in the lower Klickitat River, as well as develop a local broodstock.

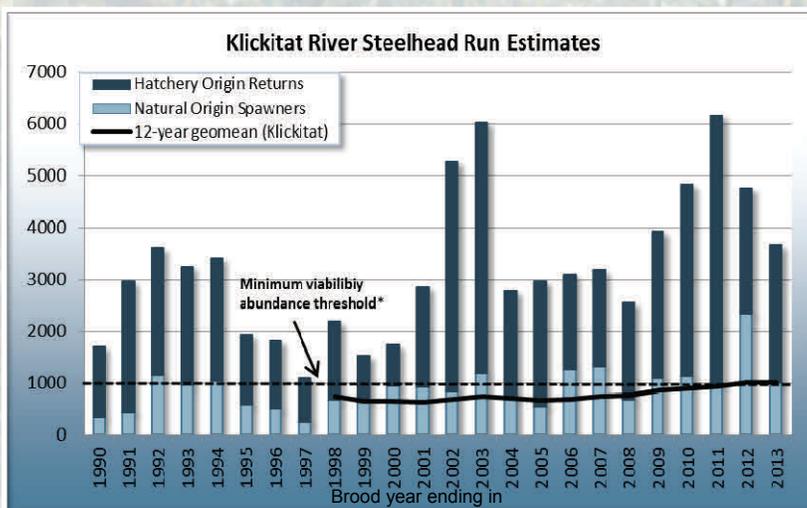


*Data source: Through 2010, run reconstruction in HGMP report, YN.; 2011-2013 population estimate based on mark-recapture to Lyle Falls.

Klickitat Steelhead



- In the Treaty era, 3,000 - 6,000 steelhead spawned in the Klickitat River annually. During the mid- to late-1990s, adult steelhead populations were extremely low.
- The graph below illustrates the trend in population abundance of Klickitat steelhead since 1990. In recent years, abundance has increased to reach or exceed the 12-year geomean and Minimum Viability Abundance Threshold.*



*See footnote on page 17. Data source: J. Zendt, Yakama Nation.

PROJECT SPOTLIGHT: Klickitat Population Monitoring

Juvenile Monitoring

- Smolt traps operated in the upper and lower Klickitat River reveal outmigration timing and abundance for salmon and steelhead.
- Migration patterns and survival (steelhead) are monitored using in-stream PIT tag (passive integrated transponder) detectors in tributaries.

Adult Monitoring

- Spawner abundance, distribution, and biological data are collected using redd surveys.
- Mark-recapture population estimates are calculated for a more accurate estimate of population size.
- Adult passage monitoring occurs at Lyle and Castile fishways.

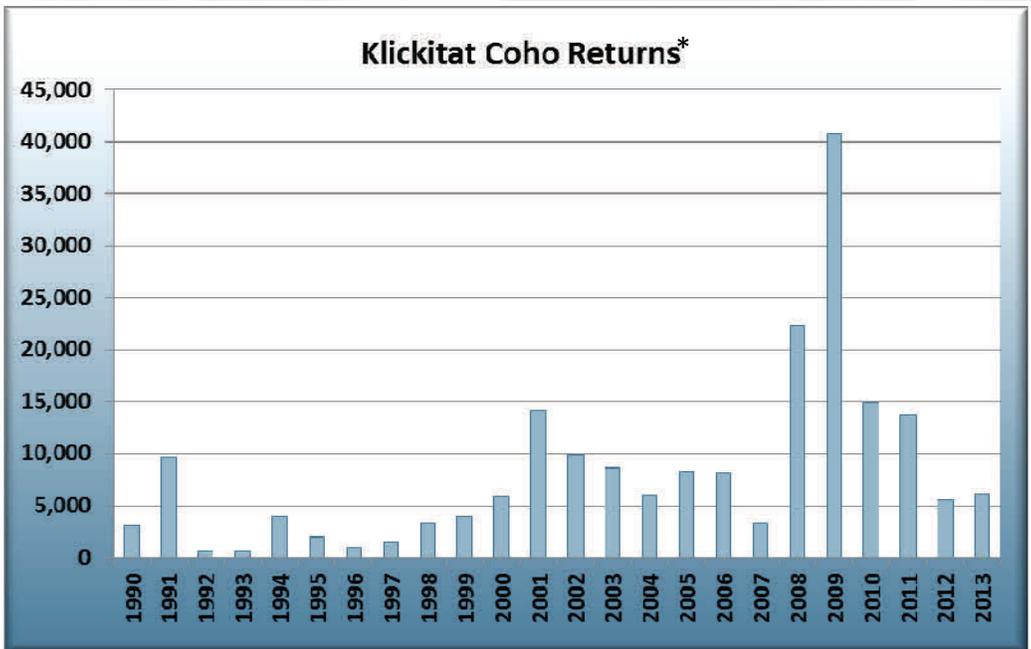
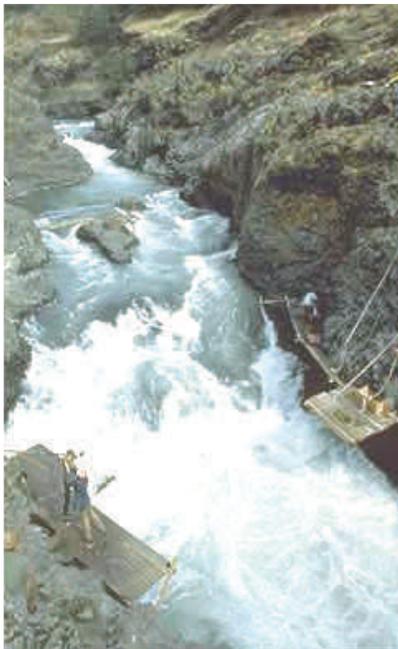
Genetic Testing

- Research is conducted to determine steelhead subpopulation composition, distribution, and interactions with each other and rainbow trout.
- Research is also conducted to determine spring Chinook hatchery/wild interactions, effects, and to inform future broodstock strategies.



Coho in the Klickitat Subbasin

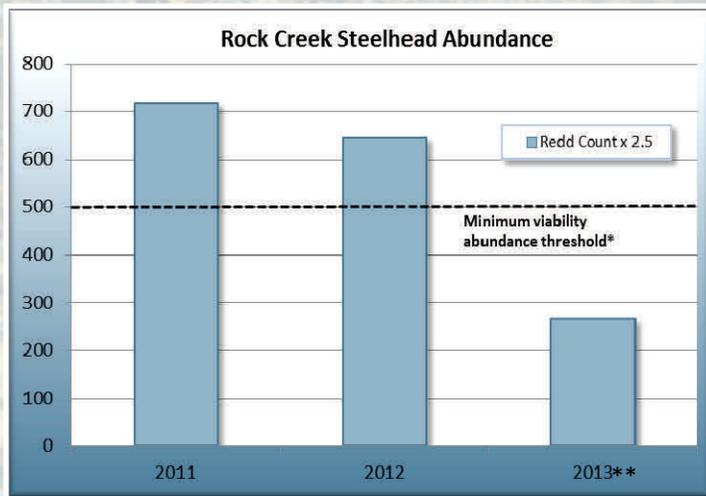
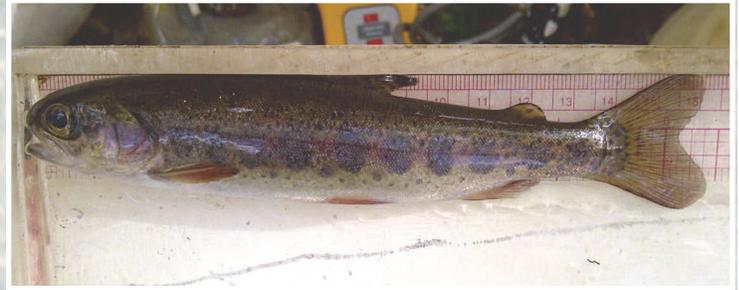
- Coho were introduced into the Klickitat Subbasin in 1952 to meet harvest obligations for Tribal fisheries.
- **Goal:** Provide increased harvest opportunities to fulfill Treaty obligations by establishing a locally adapted population.
- **Objective:** Produce 14,000 coho for harvest, mostly in Zone 6 Tribal fisheries and the Klickitat River.
- **Strategies:** Release out-of-basin pre-smolts from acclimation sites in the lower Klickitat River and develop a local broodstock program.



*2011-2013 likely underestimates, based on 10 year average percentage of run past Bonneville Dam. Source: Run reconstruction, YN

Rock Creek Steelhead

- Oral histories indicate that there used to be significant steelhead runs and year-round flows in Rock Creek. During the mid- to late-1990s, adult steelhead populations were extremely low in the nearby Klickitat River, and likely were also very low in Rock Creek.



- The Yakama Nation has been monitoring Rock Creek steelhead abundance and distribution since 2008. Although the timeline is not long, recent population estimates for Rock Creek steelhead (assuming about 2.5 spawners per redd observed) have been greater than or equal to the 12-year geomean and Minimum Viability Abundance Threshold.*

- Surveys of the Rock Creek population distribution, abundance, movement, relatedness with other populations, and habitat conditions will help biologists to target the most effective restoration strategies. A geomorphic assessment will be complete in spring 2014, and will assist in locating key sites for restoration.



- Research in Rock Creek is in part cooperative between the United States Geological Survey and the Yakama Nation, and receives Accord funding.

*See footnote on page 17.

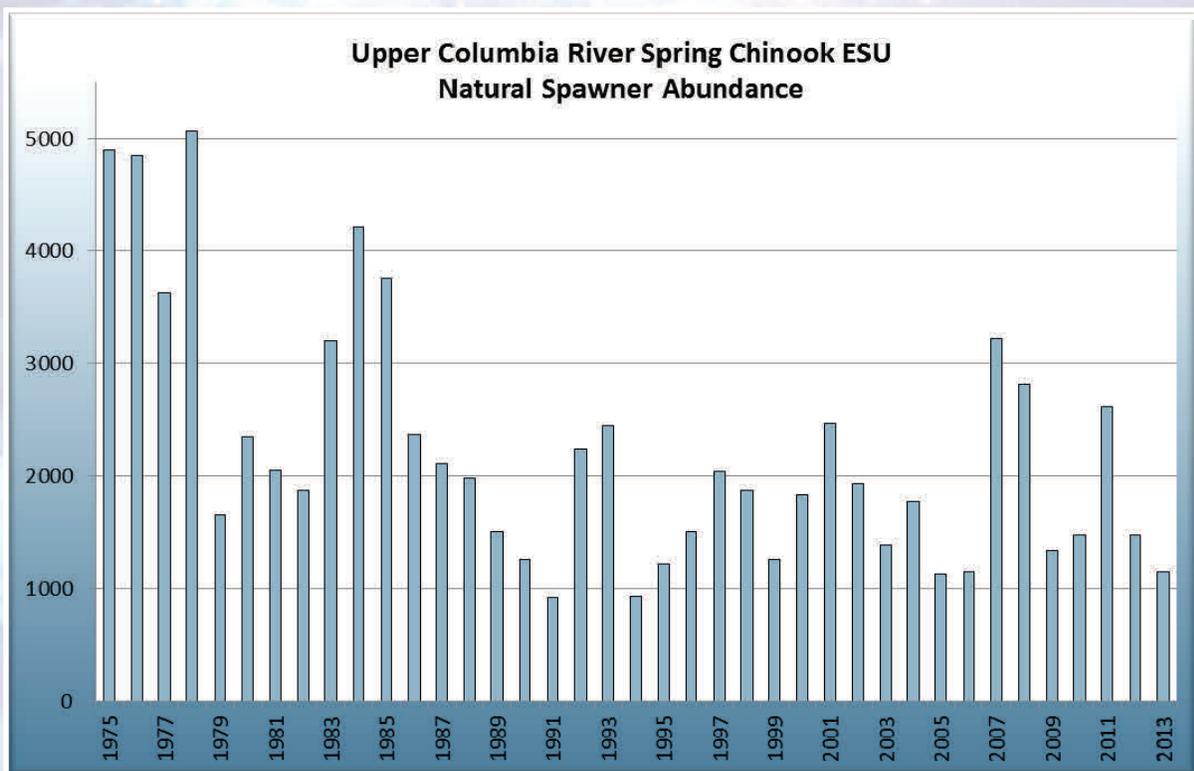
**Due to high flows and poor visibility, 2013 values are significantly underestimated. Abundance estimate assumes approximately 2.5 spawners per redd, which has been used for other steelhead populations in the region (E. Harvey, J. Zendt, YN).



Upper Columbia River Spring Chinook

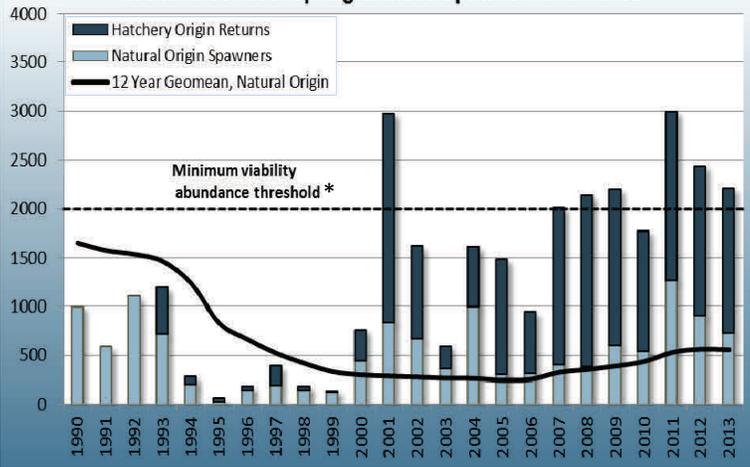
At the time of the 1855 Treaty, it is estimated that about 68,000 wild spring Chinook returned to the Wenatchee, Entiat, and Methow River basins. In the mid-to-late-1990s, adult spring Chinook populations in the region were at record lows, leading to their listing as Endangered under the ESA. Since then, the status of adult spring Chinook populations has improved slightly; however, all of the populations continue to remain significantly below Treaty era levels.

By restoring and protecting key habitats, appropriately regulating harvest, and advocating for the appropriate use of hatchery supplementation to increase natural spawner abundance, the Yakama Nation is helping to restore this species.



Upper Columbia River Spring Chinook

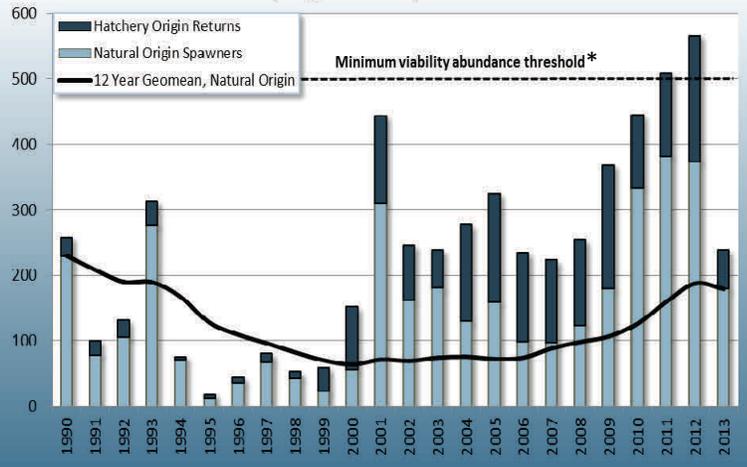
Wenatchee River Spring Chinook Spawner Abundance



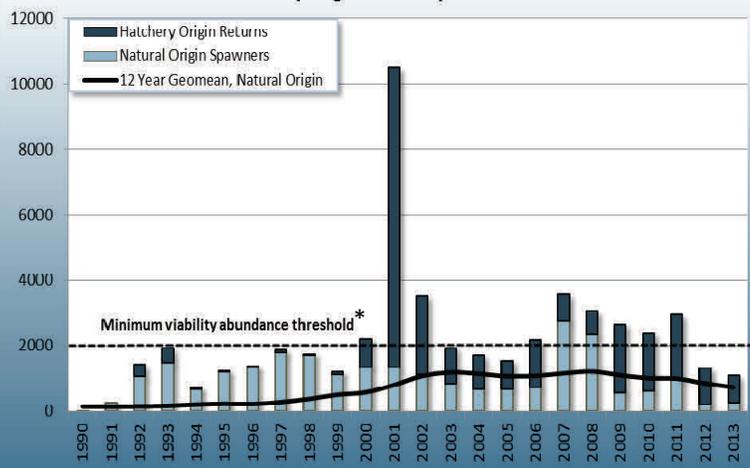
- Adult abundances are increasing for natural origin spring Chinook in the Wenatchee and Entiat rivers, but have recently decreased in the Methow River.

- Although the number of returning adult spring Chinook has increased since the record low returns of the mid-1990s, the populations must continue to grow before they are no longer considered at significant risk for extinction.*

Entiat River Spring Chinook Spawner Abundance



Methow River Spring Chinook Spawner Abundance



* For ESA delisting, the standard set by the National Oceanic and Atmospheric Administration is a 12-year geomean which must exceed the "minimum viability abundance threshold" for numbers of natural origin adults. Before the extinction risk can be lowered there are additional population structure and distribution requirements that also must be met. The goal of the Yakama Nation is more robust however: naturally reproducing populations that can provide sustainable harvest benefits.

Data sources: NOAA (SPS) through 2008, WDFW (SASI) estimates through 2012. 2013 data is preliminary and may change.



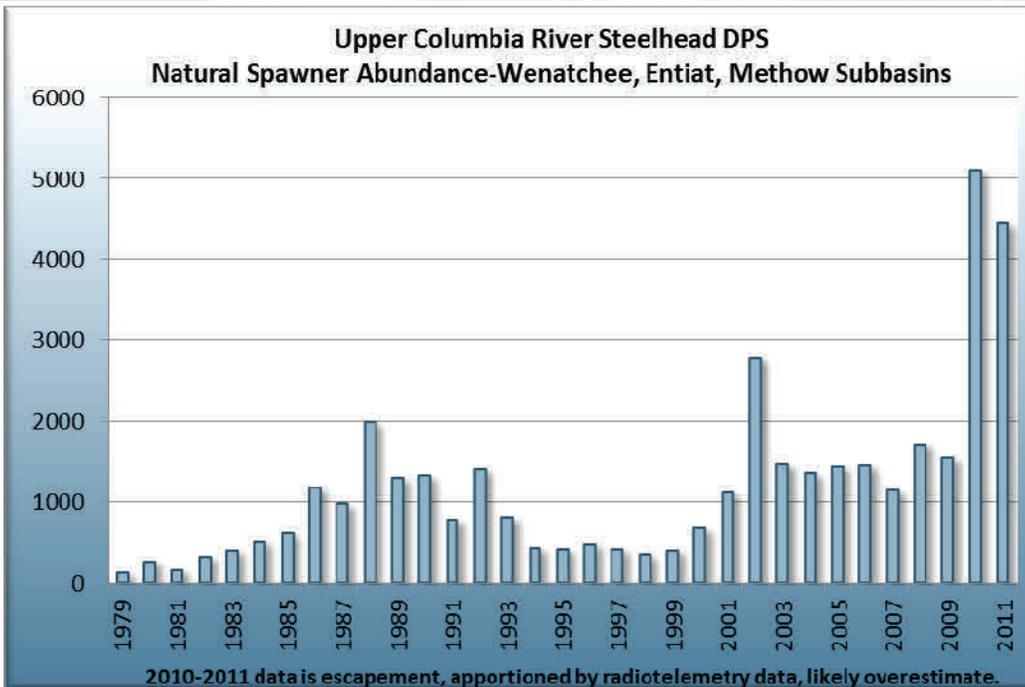
Upper Columbia River Steelhead

In the Treaty era, about 12,000 wild steelhead spawned in the Wenatchee, Entiat and Methow rivers annually. During the late-1970s to early-1980s, as well as the 1990s, populations were extremely low throughout the Yakama Nation's Ceded Lands. Major causes for these declines include manmade barriers and deterioration of watershed and in-stream habitat conditions due to land use practices. In recent years, in part through concerted efforts to address these issues, steelhead populations have increased throughout the region.



Major causes for these declines include manmade barriers and deterioration of watershed and in-stream habitat conditions due to land use practices. In recent years, in part through concerted efforts to address these issues, steelhead populations have increased throughout the region.

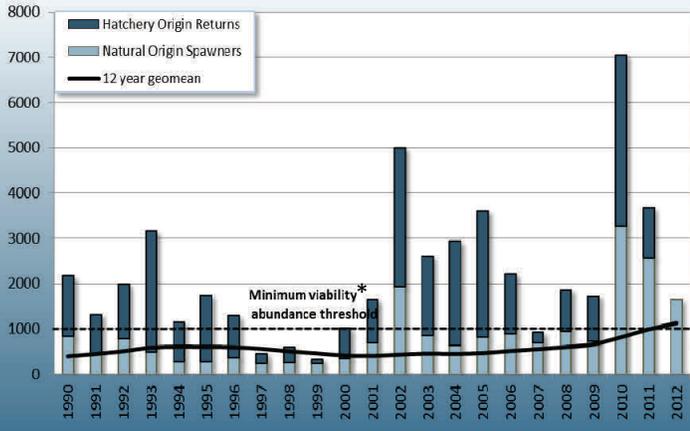
Unlike salmon, steelhead may spawn multiple times. By actively reconditioning spent spawners (kelts) and restoring their habitats throughout the region, Yakama Nation Fisheries is helping to improve wild steelhead survival and productivity.



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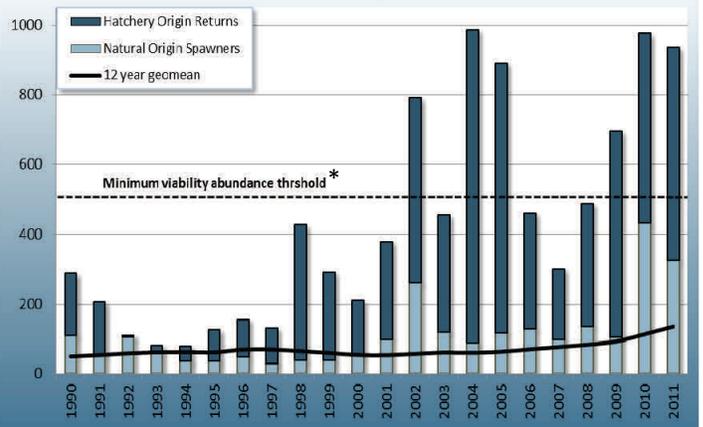
Upper Columbia River Steelhead

Wenatchee River Steelhead Spawner Abundance



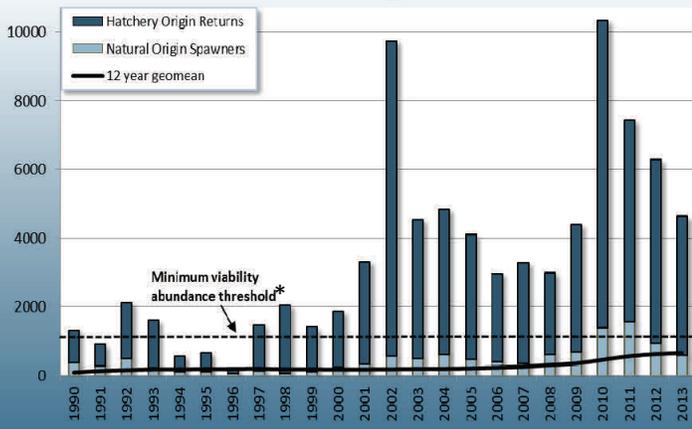
- After record lows in the 1970s and 1990s, adult abundance estimates for steelhead have increased for the Wenatchee, Entiat, and Methow populations.

Entiat River Steelhead Spawner Abundance



- Methow and Wenatchee natural origin populations have exceeded the Minimum Viability Abundance Threshold* in recent years.

Methow River Steelhead Spawner Abundance



*See footnote on page 17.

Data sources: NOAA (SPS) through 2009, WDFW (SASI) estimates through 2011. 2011-2013 data is escapement, apportioned by radiotelemetry data, likely overestimate. 2012-2013 data is preliminary, incomplete and may change.

PROJECT SPOTLIGHT: Steelhead Kelt Reconditioning in the Upper Columbia River



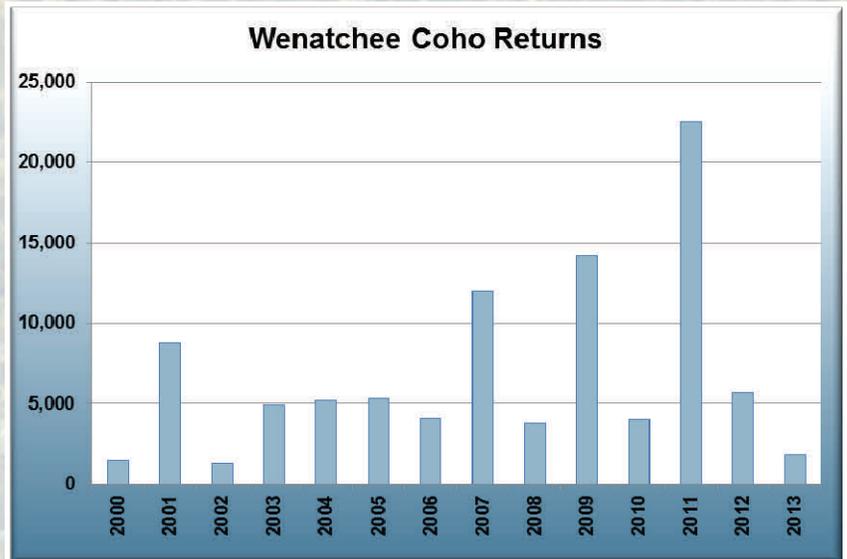
The Yakama Nation's Accord-funded steelhead kelt reconditioning project, which uses methods developed by Yakama Nation Fisheries and the Columbia River Inter-Tribal Fish Commission in the Yakima Subbasin, is expanding into the Upper Columbia River. Kelts are steelhead that have already spawned and appear to have the potential to spawn again during the upcoming year. After spawning in the spring, kelts are held in captivity for 6-9 months to recover from the weight loss and stress that occur during their return from the ocean. In the fall these kelts are returned to the same area where they were captured to reproduce once again. The Yakama Nation is developing reconditioning facilities at the Winthrop National Fish Hatchery in the Methow Subbasin.



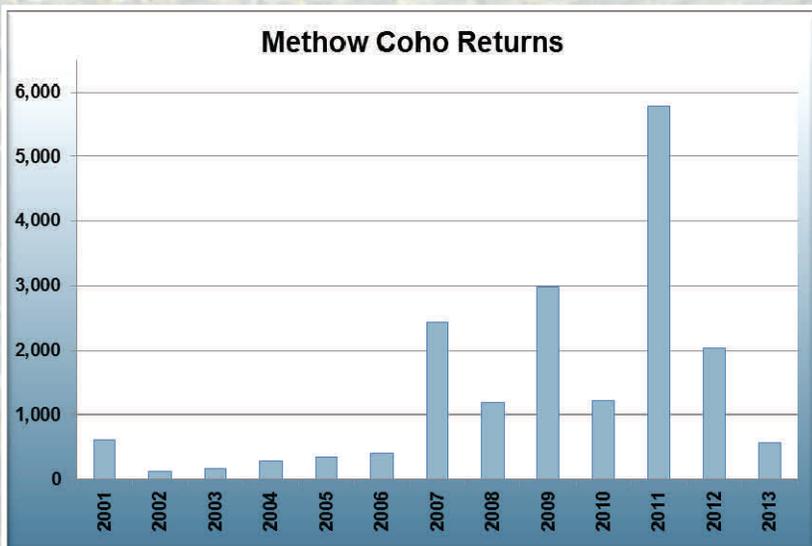
Coho Restoration in the Upper Columbia



- **Estimated Treaty era returns:** Wenatchee River 7,000-8,000; Methow River 23,000-31,000 annually.
- By the mid-1980s, coho were extinct in the Wenatchee, Entiat, and Methow rivers.



- **Goal:** By 2028, develop a locally adapted, naturally spawning coho stock in the Wenatchee River and Methow River subbasins with an escapement of at least 1,500 adults in each subbasin (current numbers are supported by hatchery production) that provide harvest opportunities.
- The Yakama Nation began to reintroduce coho to the Methow River in 1997 and the Wenatchee River in 1999.



Data source: Fish Passage Center

White Sturgeon Restoration in the Mid-Columbia*

Overall Goal for the Columbia Basin: To increase white sturgeon populations to naturally sustainable levels that support tribal harvest opportunities by 2025.



2007-2008 and 2010-2012: Successfully spawned white sturgeon at the Yakama Nation's Marion Drain Hatchery.

Rocky Reach
2011 Releases—6,500



2010-2011: Yakama Nation's Marion Drain Hatchery produced 13,000 juvenile white sturgeon for the Chelan and Grant PUDs.

2011: 13,000 hatchery-raised juvenile white sturgeon released.



2012: Improvements to the hatchery facility included a new production well, completion of an additional aeration tower, new incubation room, and a broodstock holding/rearing area.

Wanapum
2011 Releases—5,000



2012: Spawned 10 wild white sturgeon collected from the Columbia River.



2012-2013: Reared 6,500 juvenile sturgeon for release in Priest Rapids, Wanapum, and Rocky Reach reservoirs.

Priest Rapids
2011 Releases—1,500

2014-2017: Expansion of Marion Drain program. Working collaboratively with other agencies, plan to move from research to implementing restoration actions using research results to guide restoration priorities and methods.



*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.



Glossary

12 year geomean	Average over 12 years. Used to smooth out variation from one year to the next. (= geometric mean)
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.
broodstock	Parent fish used as source of offspring for hatchery production.
delisting	To remove from the endangered species list.
ESA	Endangered Species Act, a Federal law used to protect species at risk of going extinct.
escapement	Numbers of fish that make it back to a stream/river to spawn.
ESU, DPS	“ecologically significant unit” “distinct population segment”: Ways to group closely related populations of a species from a certain region, used in defining and tracking management and recovery goals.
fishway	Passage created to help fish get past a barrier.
geomorphic	Landforms and the processes that shape them.
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.
minimum viability abundance threshold	The minimum number of fish (along with other population requirements) needed to reduce the risk of extinction, as is defined by the National Oceanic and Atmospheric Administration.
natural origin spawner (NOS)	A fish that was spawned in the wild that returns as an adult to spawn in the wild.
PIT tag	Passive integrated transponder, a tiny tag that is inserted in a fish that enables that fish’s presence and direction of movement to be recorded as it passes by a receiver antenna.
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 out to the ocean.
subbasin	The land area that drains to a common point, usually into a medium-large size river. A “basin” consists of several smaller “subbasins”.
translocation	To move an animal from one area to another, for example for reintroduction of an extinct population.
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 (<i>12 stat. 951</i>) with the United States of America.
watershed	The land area that drains to a common point, usually into a stream or other small water body.

“If the fish go, so do we. We break the circle and the circle ends and we end with the circle”

-James Kiona, Yakama fisherman

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HONOR

PROTECT

RESTORE



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