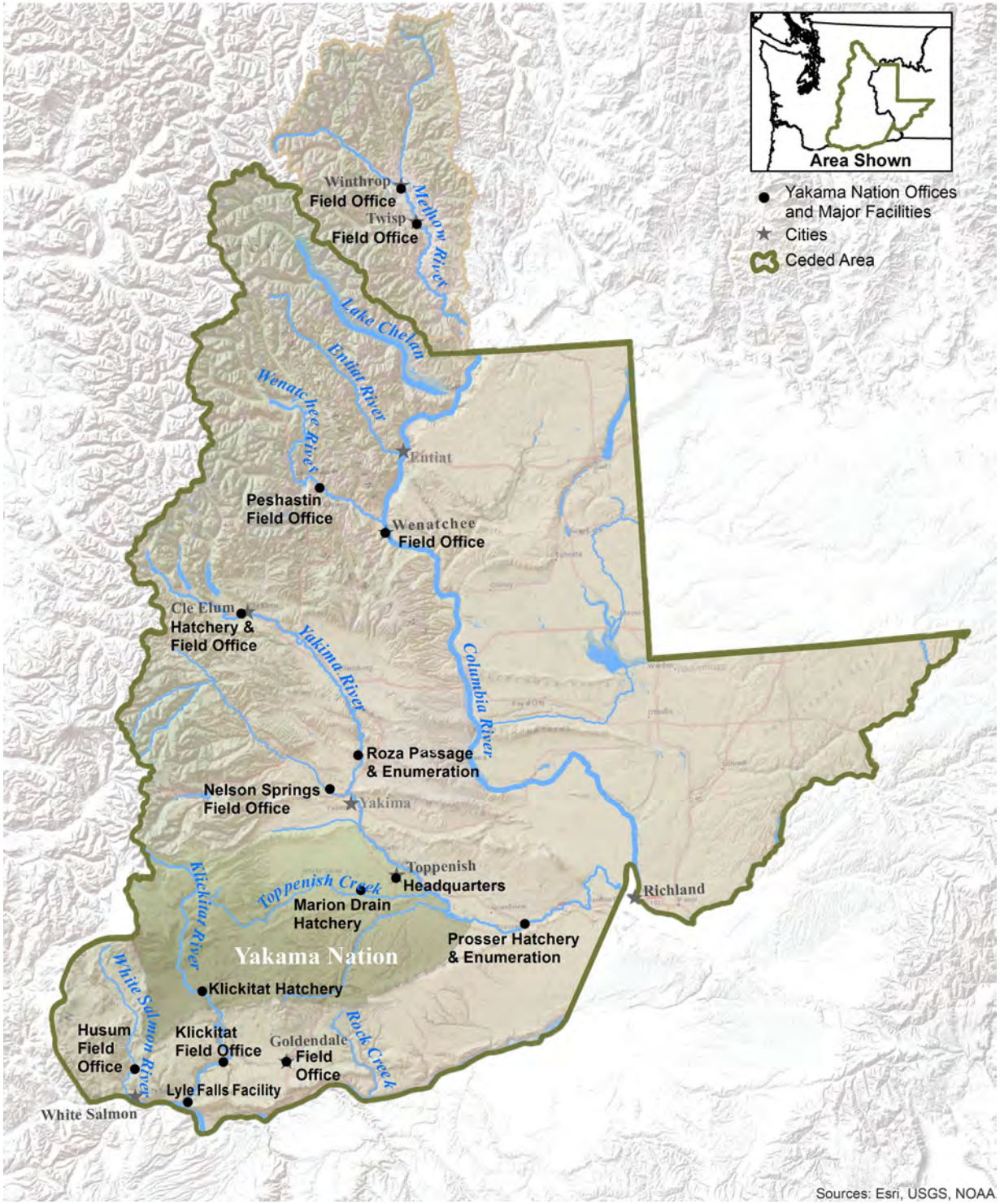
Yakama Nation Fisheries

STATUS AND TRENDS PROJECT

ANNUAL PROGRESS REPORT
Columbia River Fish Accord Focus
2008-2016



Yakama Nation Fisheries

Mission: To honor, protect, and restore the treaty trust natural resources of the Yakama Nation

From its humble beginnings in 1983, Yakama Nation Fisheries now boasts a staff of over 200. Employing scientific expertise in concert with traditional ecological knowledge, the program has developed innovative projects and partnerships credited with restoring culturally and economically important fish runs in the Columbia Basin. Headquartered on the Yakama Reservation, field offices are located throughout the ceded area to manage and restore natural resources across the region. Yakama Nation Fisheries focuses on restoring culturally important fishes such as Chinook, sockeye, steelhead, coho, Pacific lamprey, and white sturgeon, as well as their habitats.

Honor

The fish in Nch'í Wána (the Columbia River) and its tributaries are of paramount importance to our people, our diet, and our health.

Protect

Through our treaty-reserved rights, we advocate for resources that cannot speak for themselves, and provide outreach and education activities that empower others to do the same.

Restore

Our biologists and technicians are out in the field every day, actively restoring the river in accordance with our traditions and rigorous science.

Cover photo:
Les Brown, CRITFC, 2011 (Fisher: Jody Hunt, Lyle, WA)

Table of Contents

YN, Michael O'Leary, May 2014 (Boardman, OR)

This report is a summary of habitat information available as of April 2016, with some species updates added in October 2016.

Message from the Chairman

Fish and Wildlife Committee, Yakama Tribal Council

Thomas Boyd, The Oregonian, 2012 (YN Fisher Lew Allen, Lyle, WA)

BPA, 2012

The Yakama People have known since Time Immemorial that wild salmon need wild rivers to thrive, and we have lived within that balance for hundreds of generations. Now the river is no longer wild, many spawning and rearing areas are degraded, and nature is out of balance. The fish of Nch'í Wána [*the Columbia River*] and its tributaries are necessary to our people, our culture, and our health. We made a promise to the Creator that we would take care of them. That is why, while today each and every one of us benefits from the water and the energy provided to us by the river, it is also very important that we keep on working to restore the fishes and all of the habitats and clean water that they need to survive, keeping our promise.

Celilo Falls, ca 1940

By restoring the river and its habitats, we are helping to restore all of the treaty-trust natural resources of the Yakama Nation. Agreements such as the 2008 Columbia River Fish Accord are an opportunity for us to make more progress towards this goal. By understanding and supporting the restoration work that the Yakama Nation is doing as a result of the Fish Accord, and by tracking the progress we are making, we have a chance to make sure the right actions are being done and the trend is going in the right direction to make the entire ecosystem healthy once again. It is going to take quite awhile and there are many pieces that need to be put back in place, but we and our partners are working very hard to make sure we get there and that we continue to have the opportunity to persist in this important duty of restoration.

Gerald Lewis
Chairman, Fish and Wildlife Committee
Yakama Nation Tribal Council

2008 Columbia River Fish Accord

CRITFC, May 2008 (Accord signing ceremony)

PROFILE

On May 2, 2008, the Yakama Nation and other Tribes and agencies signed the Columbia Basin Fish Accords Memorandum of Agreement [*March 26, 2008 Yakama Nation Tribal Council Resolution T-118-08*]. As opposed to ongoing hydro-system litigation, and the uncertainty of funding through the Northwest Power Act mitigation program, the Accord provides stable support to implement fish and wildlife restoration projects throughout the Yakama Nation's Ceded Lands, as well as other areas utilized by all aquatic treaty-trust* species in the Columbia River Basin.

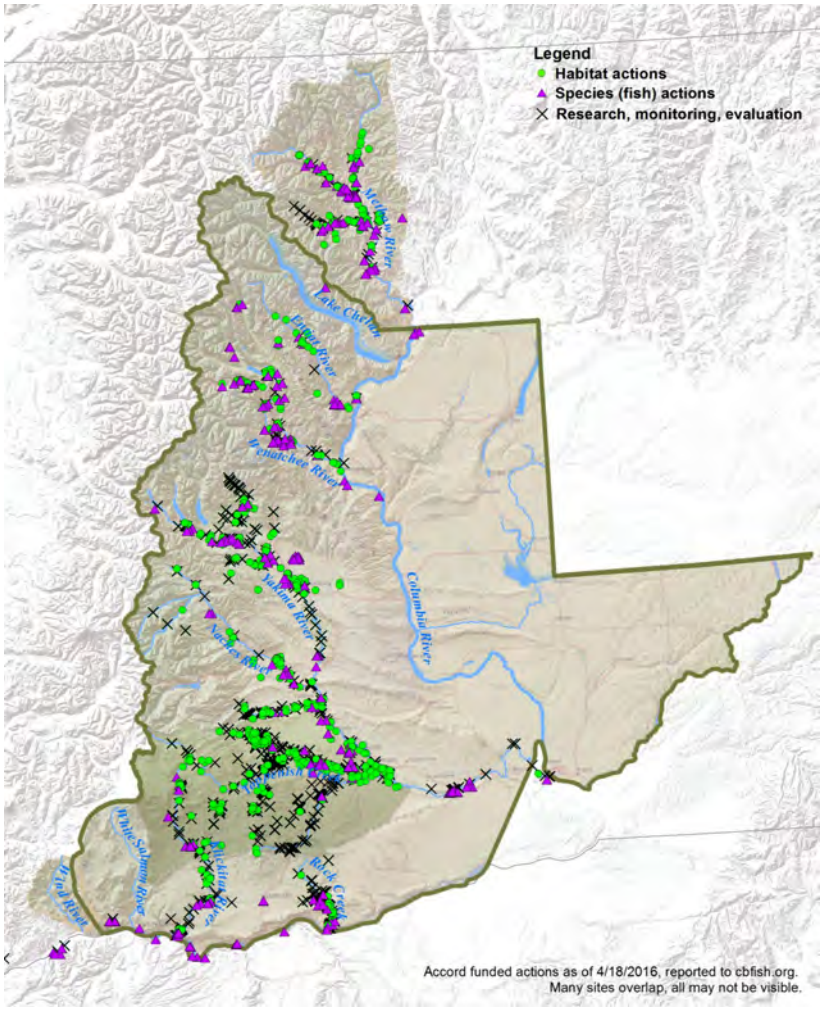
*Yakama Treaty of 1855 (12 stat. 951) with the United States of America

BENEFITS TO THE YAKAMA NATION

- Increased ability to direct funding towards all of the natural resources that the Yakama Nation values
- Stable funding allows managers to implement long-term plans
- Expansion of production and reintroduction programs
- Expansion of the Yakama Nation's influence on restoration efforts
- Improved coordination of restoration and reintroduction efforts to improve harvest opportunities
- Increased focus on habitat restoration for species-level benefits
- Maintained increased spill at Federal Columbia River mainstem dams

ACCOMPLISHMENTS

Yakama Nation Accord Actions: 2008 - 2016



HIGHLIGHTS*

Instream Habitat

- 1,400 logs, pools, habitat structures installed
- 16 beavers released
- 6 exclusion structures installed
- 17 miles of habitat treated/improved

Fish Passage Improved

- 2 barriers removed, 1 improved
- 18 miles of habitat accessed

Water Quality

- 20,000 pounds nutrients/carcasses added to 125 miles of stream
- 4,500 pounds of trash removed

Water Quantity

- 28 miles with improved water management
- 35 cfs restored/protected
- 8,000 ac/ft/yr restored/protected

Wetland Habitat

- 615 acres protected and 835 acres treated/improved

Riparian Habitat

- 9 miles protected and 156 miles treated/improved
- 30 habitat features installed

Upland Habitat

- 0.5 miles road removed
- 1,700 acres protected and 3,800 acres treated/improved

Outreach

- 27,000 people engaged

*As reported to cbfish.org 04/18/2016. Additional actions are in progress. See Subbasin Summaries for descriptions of benefits. Some work implemented in collaboration with partners.

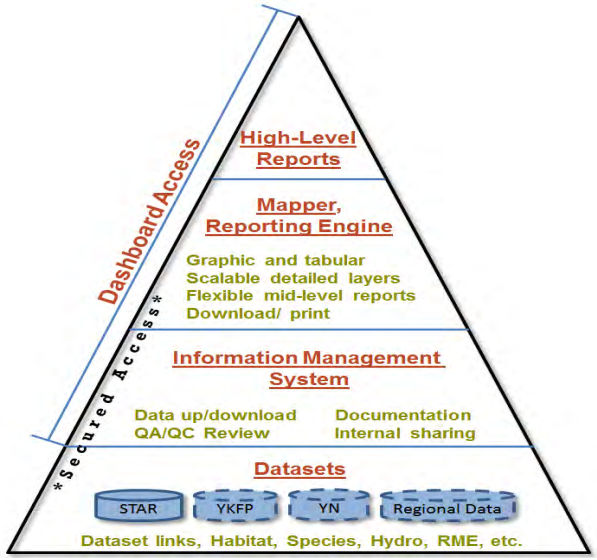
Status and Trends Project: STAR

PROFILE

Are we implementing the right restoration actions in the right places? Is recovery of fisheries and habitats going in the right direction? The Yakama Nation Tribal Council, General Council, and fisheries managers need such questions answered to ensure progress continues towards restoration goals. The ability to answer such questions is also important to maintain public- and policy-level support.

Compiling the Yakama Nation's habitat restoration and fish population information, the STAR Project provides access to summaries that chronicle the Yakama Nation's progress towards restoring treaty trust fisheries and essential habitats. The summaries, in print and available through an interactive query system, provide Tribal representatives with up-to-date information that is used for, but not limited to, outreach, programmatic decision-making, and collaborative restoration work.

This report is a product of the STAR project, and is available at: yakamafish-nsn.gov/restore/projects/star



ACCOMPLISHMENTS

- Program-wide habitat, hatchery, species, and hydrosystem status and trend summaries 2008-2016
- Accord-funded project information consolidated into databases accessible via online dashboard and a library of associated maps for staff
- Accord-funded project actions and metrics categorized for summary in interactive online mappers and reports
- Tribal harvest data, species status and trends, dam passage, and limiting factors incorporated into interactive mappers and summary reports (in progress)
- Detailed information (some limited to internal only) available at current development site: dashboard.yakamafish-star.net

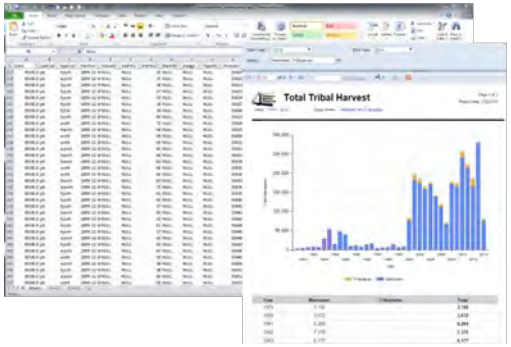
FUTURE

- Annual updates to datasets and comprehensive summaries; coordinate with development of program-wide information management system; incorporate up-to-date project-specific information for easy comprehensive report generation
- Develop overlays of actions and RME layers to identify potential response datasets
- Inclusion of restoration project information for projects supported by other funding sources
- Utilize program-wide information management system for consolidating and summarizing project and species information, and incorporate an export feature to share information internally and externally

HIGHLIGHTS

High-level comprehensive reports, Dashboard access

Interactive mappers and query reports online



Internal information management system for organizing, reviewing, and updating information

Habitat Restoration: Yakima Subbasin


YN, 2013, Panther Creek restoration

PROFILE

Salmon and steelhead populations are impaired in the Yakima Subbasin due to a number of limiting factors. Primary limiting factors include riparian vegetation, streambed and channel form, and in-channel complexity. Secondary limiting factors affecting fish include altered primary productivity and food competition, altered hydrology, side channel/wetland connection, and water quantity. Since 2008, the Yakima Nation has, through Accord-funded projects, completed a number of projects that have restored stream functions needed to sustain salmon and steelhead in the Yakima Subbasin.

PROGRESS*

Instream Habitat

Restoring instream complexity increases spawning, rearing and holding habitat while increasing food availability.

- 6 exclusion structures installed for habitat protection
- 12 miles of stream improved
- 1,200 individual logs placed instream
- 14 log structures installed, 120 pools created

Fish Passage

Removal of barriers provides access to spawning/rearing habitat.

- 2 fish passage barriers removed and 2 improved
- 16 miles of habitat accessed due to barrier removal

PROGRESS*

Water Quantity

Improving water-use practices and restoring flows to dry sections of streams increases spawning/rearing habitats.

- 2 alternative water sources installed

Wetland Habitat

Wetland habitats help to sustain flows of clean cool water vital to salmonids. Treatments include reconnections with streams and rivers and protection/restoration of vegetation.

- 600 acres of wetland habitat protected
- 830 acres of wetland improved through treatment

Riparian Habitat

Healthy riparian areas protect/sustain stream habitats.

- 8 miles of riparian areas protected
- 120 miles of riparian areas improved by treatments

Upland Habitat

Upland habitat health affects water quality/quantity and runoff timing.

- 1,500 acres of upland habitat protected
- 0.5 miles of road removed
- 3,800 acres of upland habitat treated/improved

Outreach

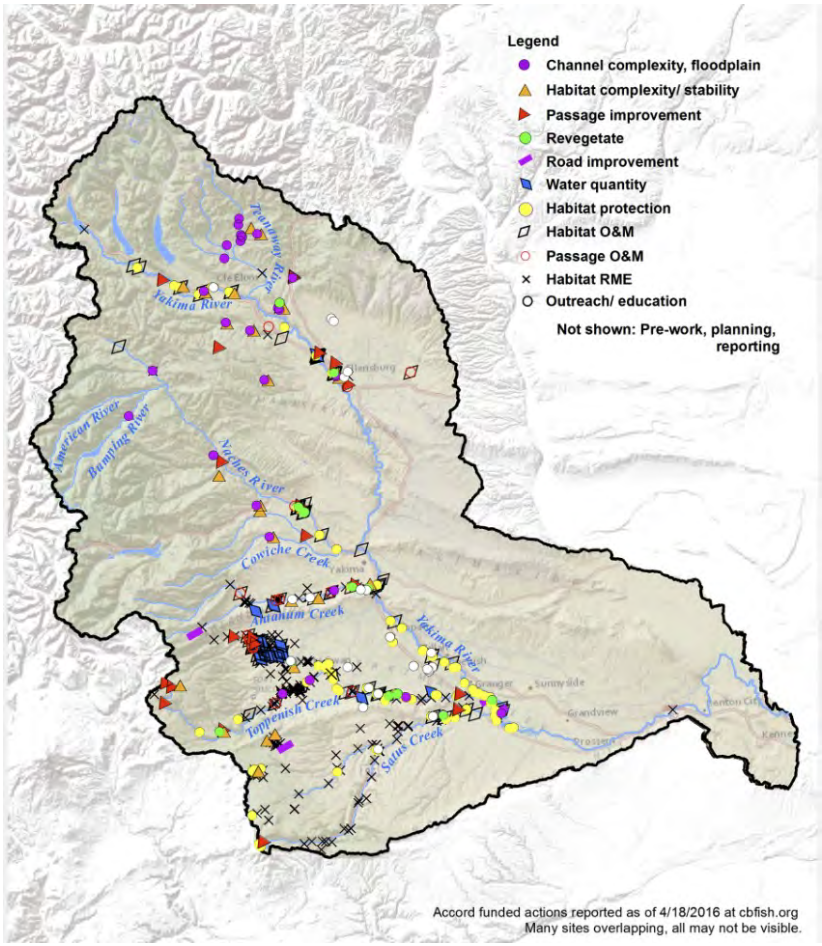
Engaging residents and partners fosters stewardship.

- 6,000 people have been engaged through outreach

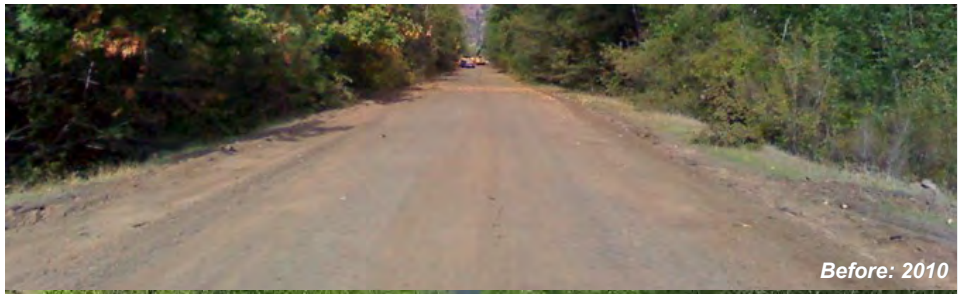
*As reported to cbfish.org 04/18/2016.

HIGHLIGHTS

Accord-funded Habitat Actions Implemented by the Yakama Nation (2008 - 2016) — Yakima Subbasin



Habitat Restoration: Klickitat and Rock Creek Subbasins


Before: 2010


After: 2014, Haul Road restoration, Klickitat (YN)

PROFILE

Past actions in the Klickitat and Rock Creek subbasins have resulted in conditions that are limiting salmonid populations. The Yakama Nation has been implementing projects to protect high-quality habitat and prevent further deterioration of degraded areas, while restoring/improving degraded riparian, wetland, and stream channel habitat in areas that support steelhead and spring Chinook. Restoration efforts are aimed at restoring stream processes by addressing watershed problems and improving habitat conditions and water quality. Protection activities complement the restoration efforts by securing refugia and preventing degradation.

PROGRESS*

Instream Habitat

Improving instream habitat and reconnecting/creating side-channels and pools increases spawning/rearing habitats and carrying capacity.

- 18 logjam structures being installed
- 64 acres of habitat improved

Fish Passage

Providing passage to spawning/rearing habitat is important to ensure the restoration of salmonid populations is realized.

- 1 fish passage structure improved (Lyle site)

PROGRESS*

Wetland Habitat

Wetlands help to stabilize dry or flashy watersheds, as well as moderate drought conditions.

- 1 acre of wetland habitat created/enhanced

Riparian Habitat

Lack of shading in riparian areas and instream wood affect water temperature and instream complexity.

- 52 acres of riparian habitat proposed for protection
- 36 miles of riparian areas improved

Upland Habitat

Upland habitat conditions can affect the speed and intensity of runoff during wet events.

- 174 acres of upland habitat proposed for protection
- 30 acres of upland habitat treated/improved

Outreach

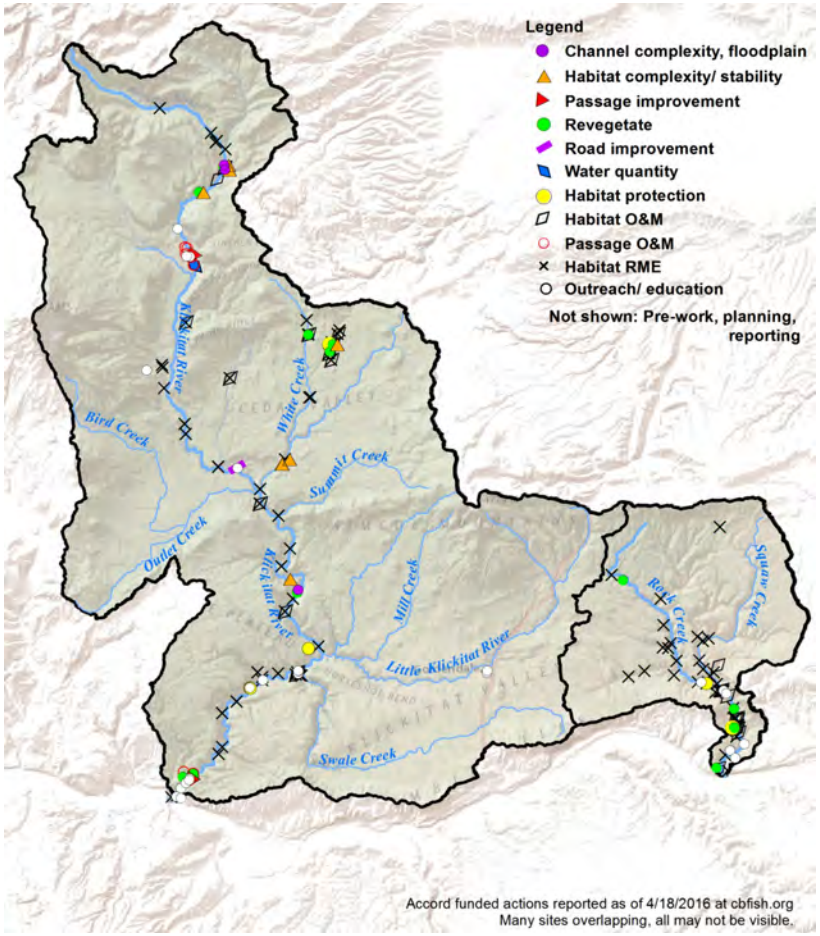
Encouraging property owners and partners to collaborate in restoration creates a sense of ownership in restoration efforts.

- 8,000 people engaged throughout the Columbia Gorge

*As reported to cbfish.org 04/18/2016. Some restoration actions funded in part from other sources.

HIGHLIGHTS

Accord-funded Habitat Actions Implemented by the Yakama Nation (2008 - 2016) — Klickitat and Rock Creek Subbasins



Habitat Restoration: Entiat and Wenatchee Subbasins

YN, 2012, Entiat "3-D" habitat enhancement

PROFILE

Past forest management practices and recreational, agricultural, municipal, and residential development have led to the decline of habitat quality/quantity. Impairments include reduced habitat complexity, connectivity, water quantity/quality, and riparian function. In the Wenatchee Subbasin, impaired stream complexity, wood and gravel recruitment, flood water retention, flows, and water quality are limiting salmonid production. Upland management activities and the construction of flood control dikes in the Entiat Subbasin have led to upland erosion and reduced channel/instream complexity, respectively. The Yakama Nation is currently implementing projects that help address many of these limiting factors.

PROGRESS*

Instream Habitat

Instream complexity and off-channel habitats are important for salmonid spawning and rearing success.

- 10 acres of freshwater habitat being protected
- 62 instream features being installed (log/boulder structures, pools)
- Over 2 miles of stream receiving habitat improvements
- 0.4 miles of new channel being created

Water Quality

When nutrients are missing in streams, the addition of fish carcasses or fertilizer helps to supplement the food base of an ecosystem.

- 3,150 pounds of nutrients added to 40 miles of stream

PROGRESS*

Water Quantity

Water conservation can be achieved through improvements of conveyances/efficiencies and instream water rights.

- 35 cfs of instream flow protected/conserved
- 28 miles of stream with improved water management
- 7,800 ac/ft/yr protected/conserved

Wetland Habitat

Wetlands are important for storing/filtering water and providing habitat for fish, wildlife, and native plants.

- 2 acres of wetlands being treated/improved

Riparian Habitat

Protecting riparian habitat by fencing, leases, and easements improves stabilization and stream complexity.

- 3 acres of riparian areas being protected
- 11 miles of riparian areas being treated/improved

Upland Habitat

Upland habitat affects water quality/quantity and need to be protected/treated to reduce erosion and restore native vegetation.

- 18 acres of upland being protected
- 4.5 acres upland being treated/improved

Outreach

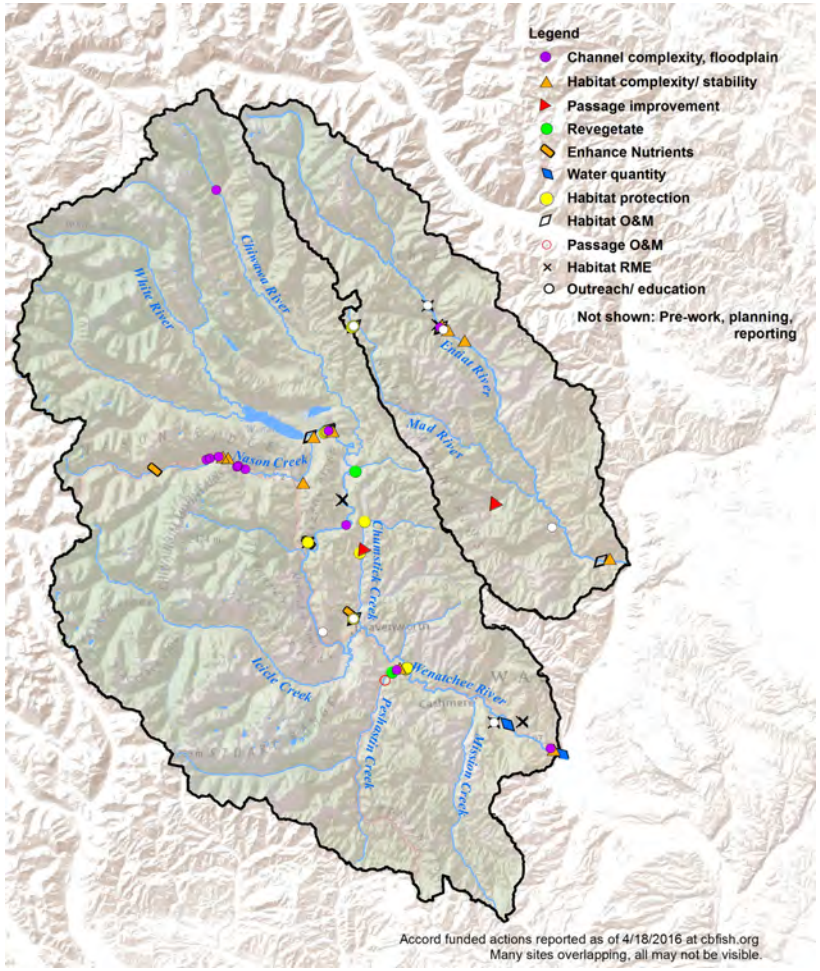
Engaging with residents and partners enables and promotes restoration.

- 19,000 people engaged throughout the Upper Columbia

*As reported to cbfish.org 04/18/2016. Some work implemented in collaboration with partners.

HIGHLIGHTS

Accord-funded Habitat Actions Implemented by the Yakama Nation (2008 - 2016) — Entiat and Wenatchee Subbasins



Habitat Restoration: Methow Subbasin


YN, 2011, Chewuch backwater channel construction

PROFILE

Municipal and agricultural development have impaired stream and floodplain functions in the middle and lower portions of the Methow Subbasin. Such development has reduced stream channel and floodplain functions, leading to impaired stream complexity, wood and gravel recruitment, floodwater retention, and water quality problems. The restoration of Chinook and steelhead populations in the Methow Subbasin will be partially dependent on improved habitat conditions. The Yakama Nation has begun to address many of these limiting factors through the implementation of habitat improvement projects and protections.

PROGRESS*

Instream Habitat

Stream complexity is beneficial to fish and can be improved by returning beavers to a stream.

- 16 beavers released
- 34 instream features installed for complexity (logs, pools, jams)
- 5 miles of stream receiving instream habitat improvements

Water Quality

Water quality has been affected by fewer salmon returning (loss of nutrients) and toxics (dumping of trash).

- 17,000 pounds of nutrients/carcasses added to 85 miles of stream
- 1,500 pounds of trash collected

PROGRESS*

Fish Passage

Fish production can be improved by removing barriers that block access to quality habitat.

- 2 miles of stream accessed by barrier removal

Water Quantity

Restoring flows to streams and rivers during late-summer and drought conditions is vital for salmonids.

- 267 ac/ft/yr of instream flow protected/conserved

Wetland Habitat

Wetlands perform ecosystem services by absorbing, filtering, and releasing water slowly while providing habitat.

- 13 acres of wetland protected

Riparian/ Floodplain Habitat

Riparian and floodplain areas provide shade, stream complexity, stabilization, and slow flows during floods.

- 22 acres of riparian habitat protected
- 3.6 miles of riparian areas being treated/improved
- 30 terrestrial habitat features installed

Upland Habitat

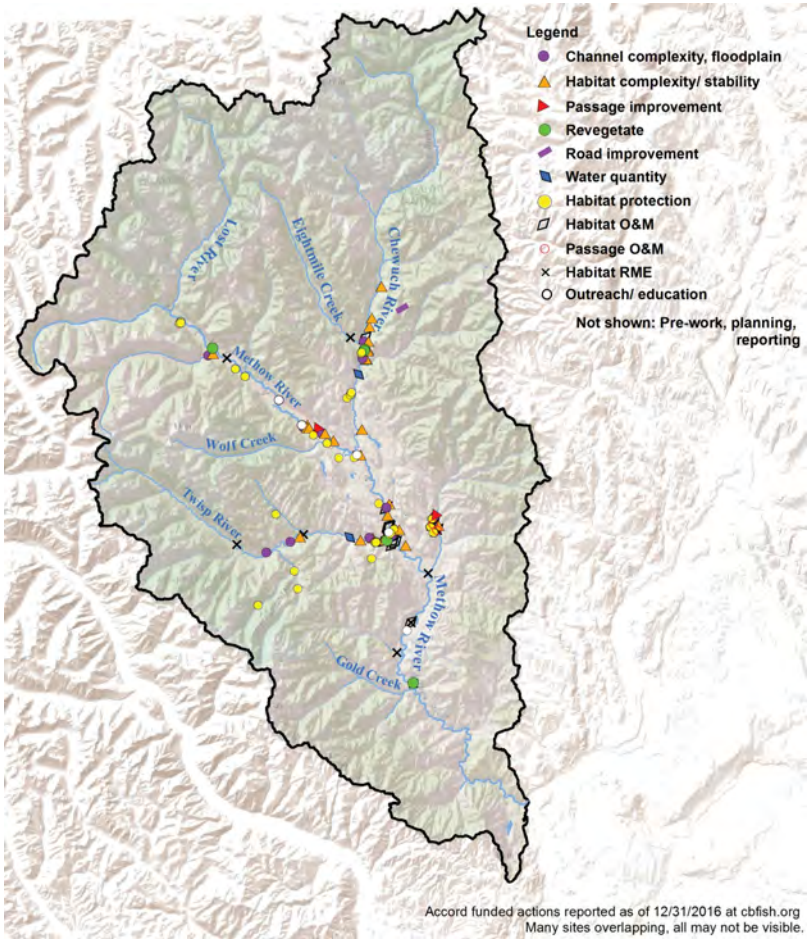
Degraded upland conditions lead to flashy flows, erosion, elevated temperatures, and sediment loading.

- 166 acres of upland protected
- 12 acres of upland being improved through treatment

*As reported to cbfish.org 04/18/2016. Some work implemented in collaboration with partners.

HIGHLIGHTS

Accord-funded Habitat Actions Implemented by the Yakama Nation (2008 - 2016) — Methow Subbasin



Accord Focal Species Status and Trends: Yakima Subbasin


YN, T. Newsome, 2009 (steelhead)

PROFILE

By the 1970s and 1980s, all of the Yakima River salmonid stocks were either extirpated or severely depressed. Summer-run Chinook were extirpated from the Yakima Basin by 1970, while coho were declining until they were gone by the early 1980s. By the 1980s and 1990s, adult spring Chinook and steelhead returns were less than 3,500 and 1,000, respectively. To restore these culturally and economically important species, the Yakama Nation is applying a combination of habitat restoration and hatchery supplementation/reintroduction efforts to restore the ecosystem with sustainable and harvestable populations of salmonids and other at-risk species.

SUMMARY

Steelhead

- Steelhead returns increased substantially during the Accord period
- Redd counts increasing through the Accord period; Wild Smolt-to-Adult Index 2002-2013 is 4.67% (geometric mean, McNary-McNary)

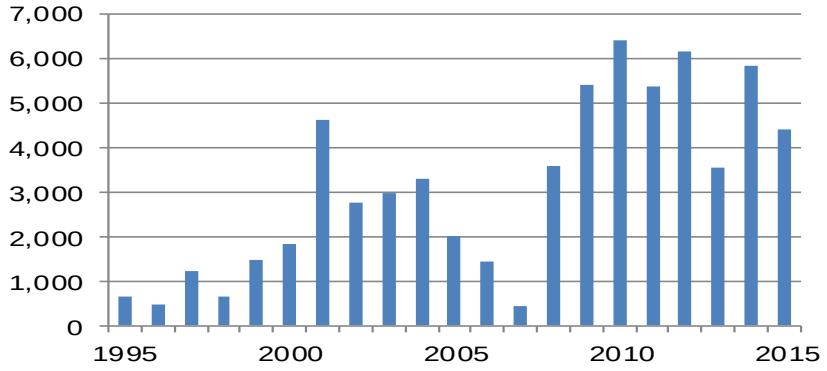
Spring Chinook

- Although returns were not as high during the Accord period as in the early 2000s, annual increases have been observed
- Redd counts were lower during the Accord period than in the early 2000s; however, spatial distribution has increased in underutilized habitat; Wild SAR Index 2002-2013 is 2.37% (geometric mean, McNary-McNary)

Source: Fish Passage Center, 2015 Comparative Survival Study Annual Report (Available at www.FPC.org)

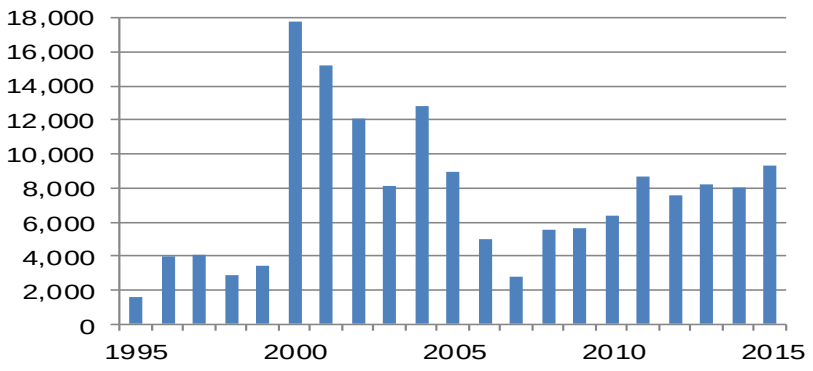
HIGHLIGHTS

Adult Natural Steelhead Counts at Prosser Dam in the Yakima Subbasin (1995 - 2015)



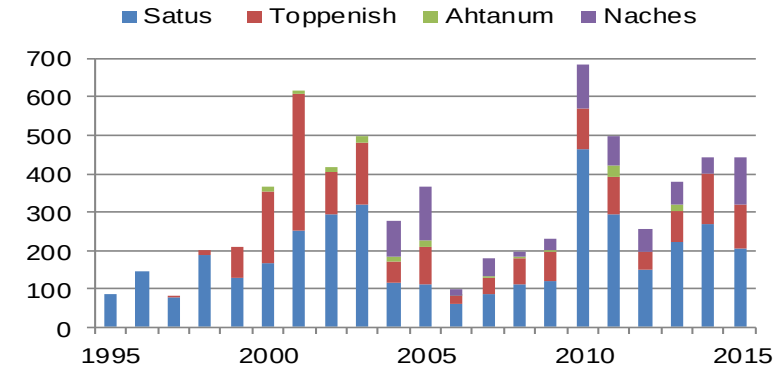
Source: YKFP website - http://ykfp.org/docsindex.htm

Adult Natural Spring Chinook Counts at Prosser Dam in the Yakima Subbasin (1995 - 2015)



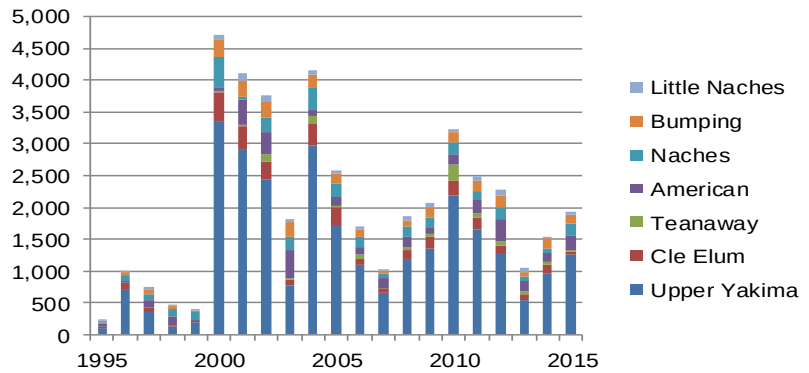
Source: YKFP website - http://ykfp.org/docsindex.htm

Steelhead Redd Counts at Index Areas in the Yakima Subbasin (1995 - 2015)



Source: Fredericksen et al. 2015. https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P143527

Spring Chinook Redd Counts at Index Areas in the Yakima Subbasin (1995 - 2015)



Source: Sampson et al. 2016. YKFP Monitoring and Evaluation Yakima Subbasin Annual Report; https://www.cbfish.org/Document.mvc/Viewer/P150170

Accord Focal Species Status and Trends: Yakima Subbasin


YN, T. Newsome, 2013 (coho)

SUMMARY

Fall Chinook

- Escapement above Prosser Dam in 2014 and 2015 was greater than for any previously recoded year
- Spawners are increasing their spatial distribution throughout the Yakima Subbasin
- Fish are contributing substantially to harvest in Zone 6 Treaty fisheries as well as the ocean and lower Columbia River fisheries

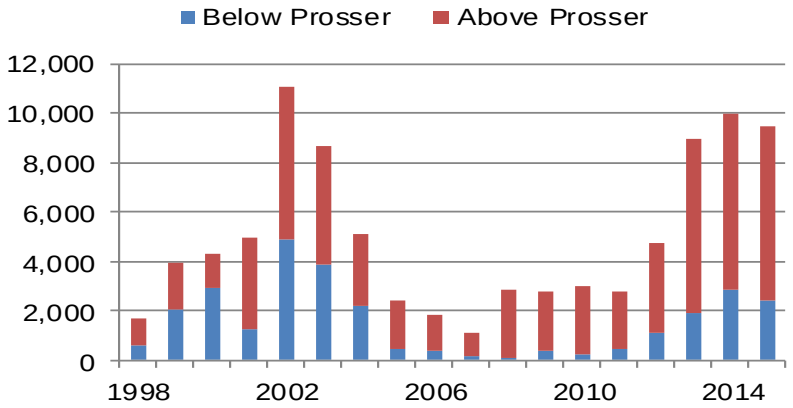
Coho

- Coho returns and redd counts increased substantially during the Accord period
- 2014 return represents a modern-day record
- Redd counts have increased substantially from 2008 to 2015 with a transition of redds from the mainstem river to tributaries
- Natural-origin Smolt-to-Adult Index (average 2000-2013 smolt migration year) = 3.7% to Prosser (preliminary estimate)

Source: YKFP, 2015 Annual Report, BPA Project # 1995-063-25, available at cbfish.org

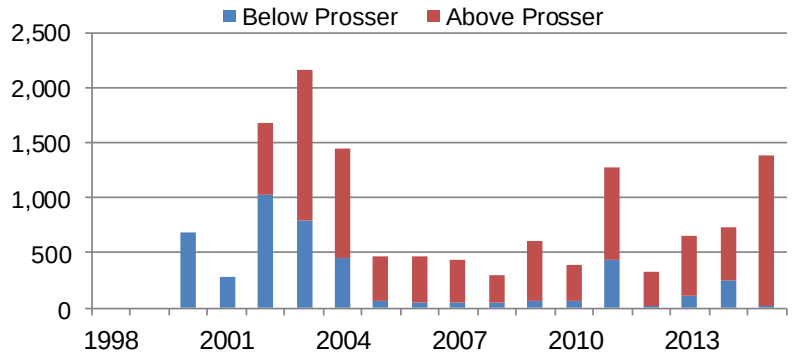
HIGHLIGHTS

Adult Fall Chinook Escapement in the Yakima Subbasin (1998 - 2015)



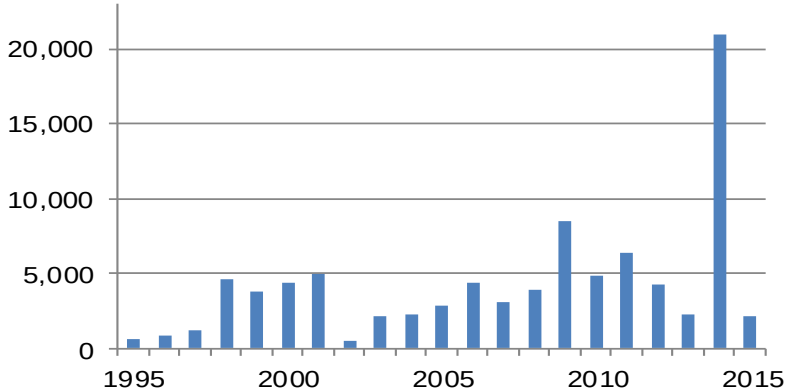
Source: Sampson et al. 2016. YKFP Monitoring and Evaluation Yakima Subbasin Annual Report, https://www.cbfish.org/Document.mvc/Viewer/P150170

Fall Chinook Redd Counts Above and Below Prosser Dam in the Yakima Subbasin (1998 - 2015)



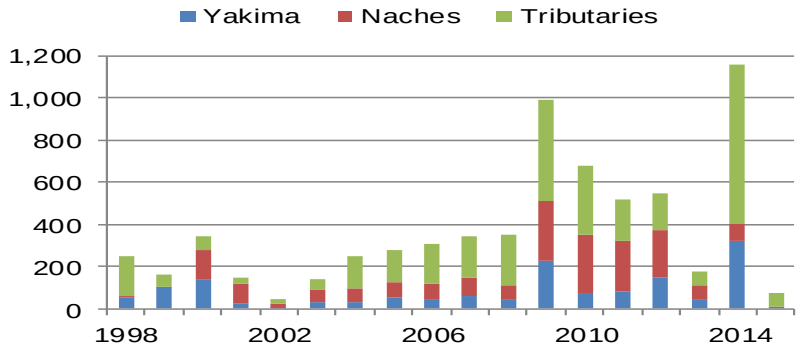
Source: Sampson et al. 2016. YKFP Monitoring and Evaluation Yakima Subbasin Annual Report, https://www.cbfish.org/Document.mvc/Viewer/P150170

Adult Coho Counts at Prosser Dam in the Yakima Subbasin (1995 - 2015)



Source: Sampson et al. 2016. YKFP Monitoring and Evaluation Yakima Subbasin Annual Report, https://www.cbfish.org/Document.mvc/Viewer/P150170

Coho Redd Counts at Index Areas in the Yakima Subbasin (1998 - 2015)



Source: Sampson et al. 2016. YKFP Monitoring and Evaluation Yakima Subbasin Annual Report, https://www.cbfish.org/Document.mvc/Viewer/P150170

Accord Focal Species Status and Trends: Klickitat and Rock Creek Subbasins

Les Brown, CRITFC 2011 (Chinook, Lyle Falls, Klickitat)

PROFILE

In the 1950s, an average of 2,523 spring Chinook (adults and jacks) returned annually to the Klickitat Subbasin; however, from 1977 to 2003 returns decreased to an average of 1,900 fish annually (includes hatchery-origin fish). The Klickitat Subbasin supports native winter and summer steelhead and historically provided a significant steelhead fishery. From 1987 to 2003, the average escapement of steelhead (winter and summer) was fewer than 300 fish (wild and hatchery). To restore these species, the Yakama Nation is restoring habitat and conducting research and monitoring of steelhead populations to evaluate need for hatchery supplementation/reintroduction.

SUMMARY

Spring Chinook (Klickitat)

- Most spawning occurs in the upper middle Klickitat River
- Recolonization above Castile Falls has been slow

Fall Chinook (Klickitat)

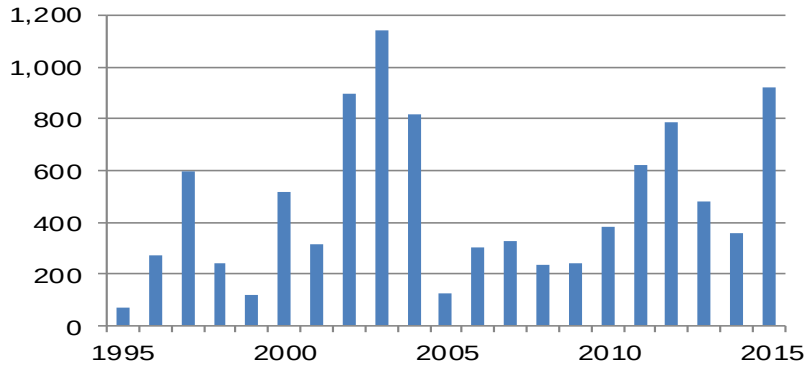
- Population sustained by hatchery production with most spawning occurring from the Klickitat Hatchery downstream to Twin Bridges
- Returns in recent years have been strong

Steelhead

- Spatially diverse population spawning throughout the lower and middle sections of the Klickitat Subbasin
- Majority of adult Skamania Hatchery fish returning from Klickitat River smolt releases do not appear to spawn in the wild
- Research into species status and needs, as well as priority habitat restoration for Rock Creek steelhead is currently underway

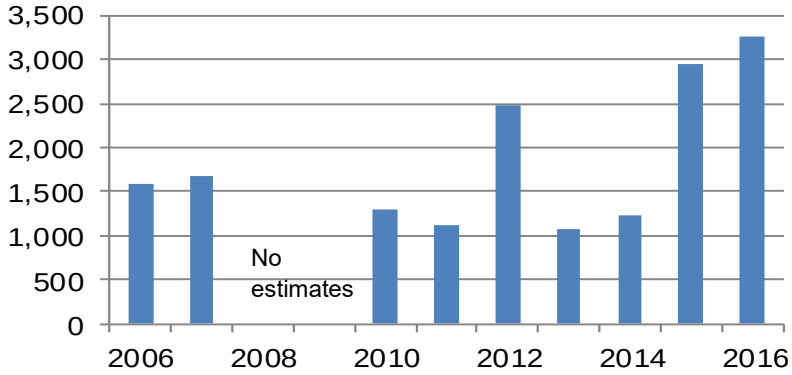
HIGHLIGHTS

Adult Wild Spring Chinook Escapement Estimates for the Klickitat Subbasin (1995 - 2015)



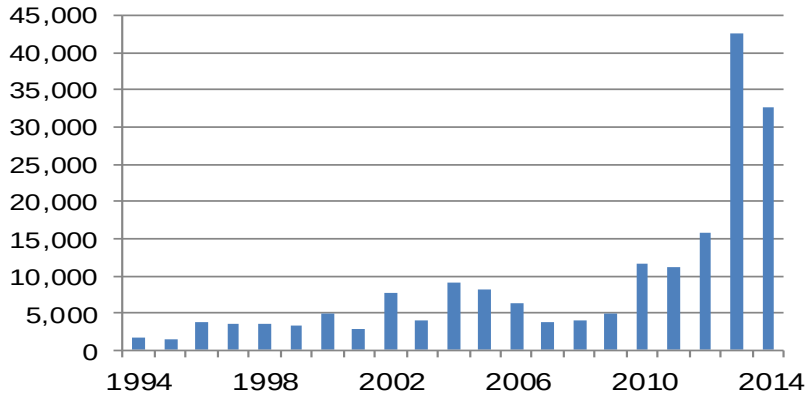
Source: Zendt et al. 2016. https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P148516

Adult Wild Summer/Winter Steelhead Population Estimates for the Klickitat Subbasin (2006 - 2016, Spawning Year Ending In)



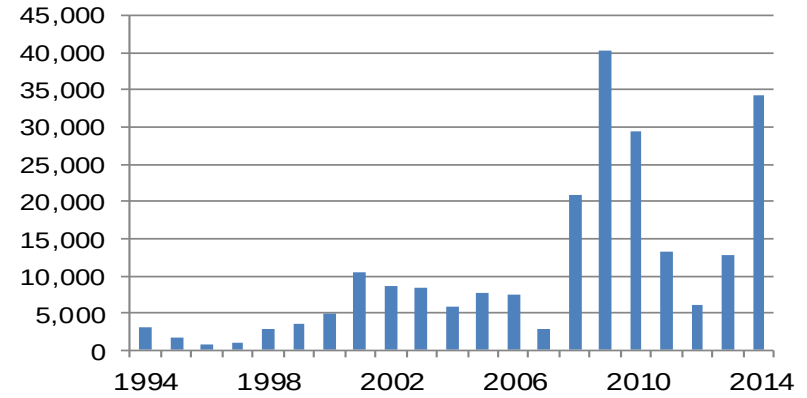
Source: Zendt et al. 2016. https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P148516

Total Klickitat Fall Chinook Harvest (1994 - 2014) (Sport and Tribal)



Source: Roger Dick Jr. (YN) - Personal Communication

Total Klickitat Coho Harvest (1994 - 2014) (Sport and Tribal)



Source: Roger Dick Jr. (YN) - Personal Communication

Accord Focal Species Status and Trends: Entiat Subbasin


Michael Jeffries, Flickr (Chinook)

PROFILE

Salmon and steelhead were abundant in the Entiat Subbasin during the pre-development period; however, resource exploitation depleted runs and in some cases led to their extirpation. Between 1992 and 2002, the long-term averages for redd counts and escapement were 110 and 215, respectively, for spring Chinook in the Entiat Subbasin. For summer/fall Chinook, an average of 75 redds were observed annually between 1994 and 2002.

SUMMARY

Spring Chinook

- Average spawning escapement during the Accord period was 100 more fish annually than for the years between 2001 and 2007

Summer Chinook

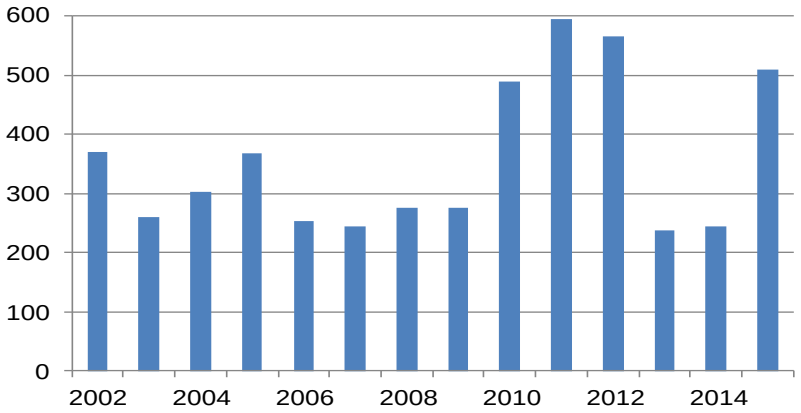
- Redd counts/spawning escapement estimates have been declining since 2012
- Spawning escapement of 512 fish annually since 2008

Summer Steelhead

- Redd counts (average = 263) have remained relatively stable during the Accord period

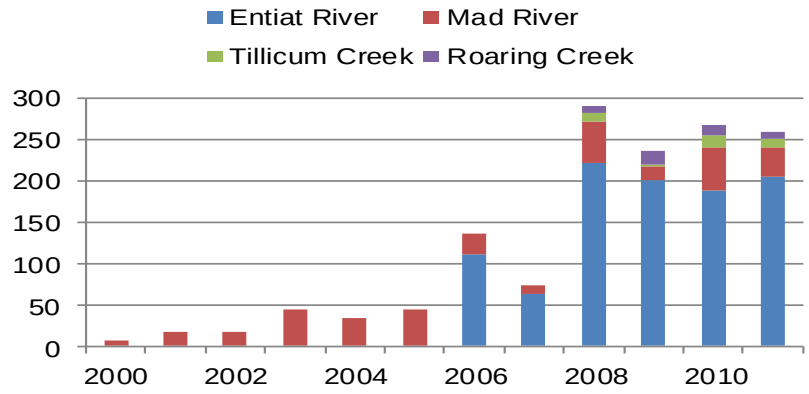
HIGHLIGHTS*

Adult Spring Chinook Spawning Escapement Estimate for the Entiat Subbasin (2002 - 2015)



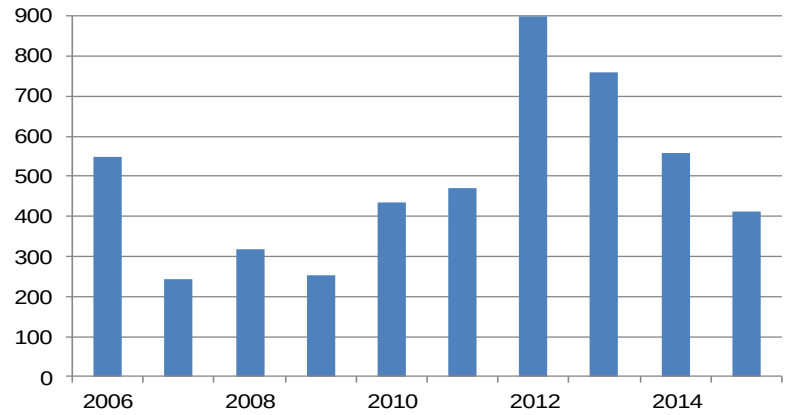
Source: Fraser and Hamstreet. 2016. https://www.fws.gov/LeavenworthFisheriesComplex/MidColumbiaRiverFRO/reports.html

Summer Steelhead Redd Counts in the Entiat Subbasin (2000 - 2011)



Source: Willard. 2012. http://q.streamnet.org/Request.cfm?Cmd=BuildQuery&ID=155902&DataCategory=9&NewQuery=BuildCriteria

Adult Summer Chinook Spawning Escapement Estimates for the Entiat Subbasin (2006 - 2015)



Source: Fraser and Hamstreet. 2016. https://www.fws.gov/LeavenworthFisheriesComplex/MidColumbiaRiverFRO/reports.html

**If figure titles do not specify origin, the counts include natural- and hatchery-origin fish.*

Accord Focal Species Status and Trends: Wenatchee Subbasin

PROFILE

During the pre-treaty era, salmonids were abundant in the Wenatchee Subbasin; however, exploitation and habitat degradation depleted the runs. Spring Chinook redd counts have fluctuated since the 1950s. From 1958 to 2002, the spring Chinook redd count average and escapement estimate were 560 and 1,200, respectively. Decadal counts for summer steelhead have fluctuated since the 1930s, with a significant increase observed in the early-2000s. Note that Icicle Creek steelhead are originally of hatchery origin, and are not ESA listed. Decadal averages of summer Chinook returns from the 1930s through 2002 indicate an increasing trend. Coho, extirpated in the early-1900s, have recently been reintroduced by the Yakama Nation. Natural reproduction is now occurring in the subbasin.

SUMMARY

Spring Chinook

- Spawning escapement estimates trending upwards in recent years

Summer Chinook

- Spawning escapement estimates trending upward but still lower than the early- and mid-2000s

Summer Steelhead

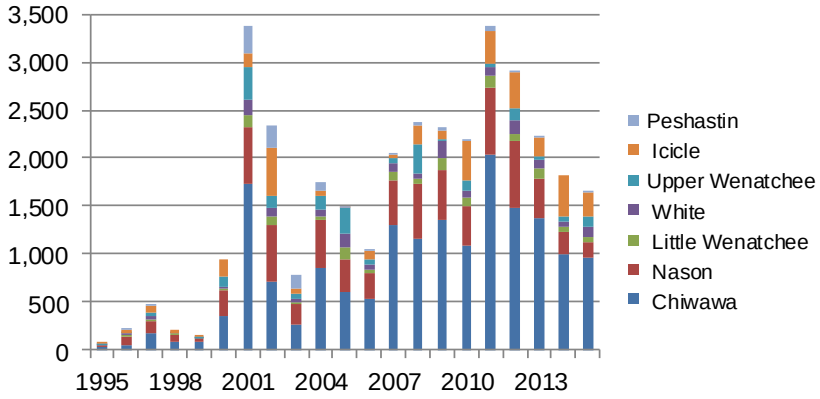
- Second greatest annual return (1,494 adults) during Accord period

Coho

- 2011 redd count total represents a modern-day record

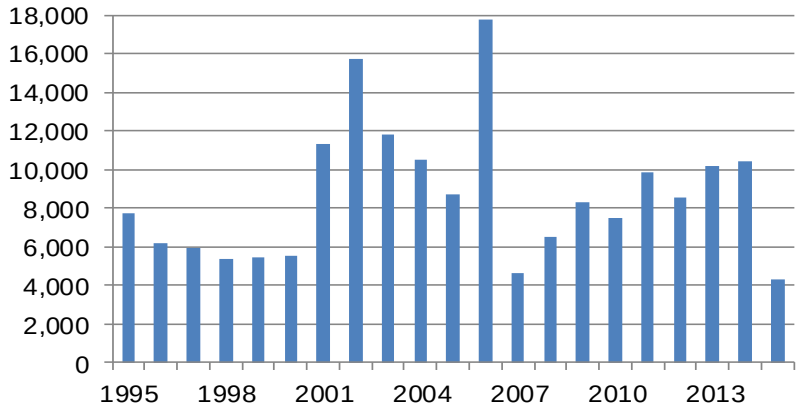
HIGHLIGHTS*

Spring Chinook Spawning Escapement Estimate for the Wenatchee Subbasin (1995 - 2015)



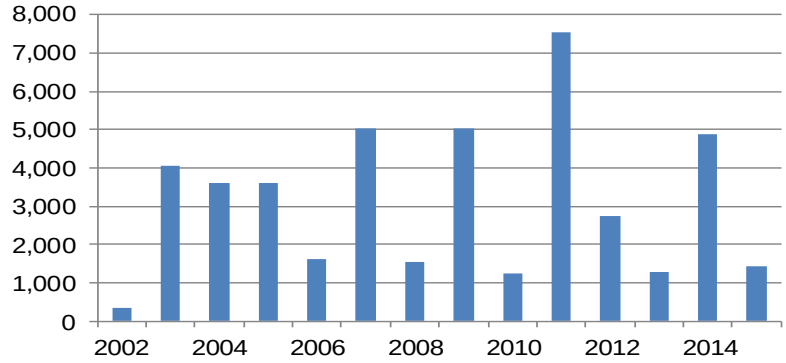
Source: Hillman et al. 2016. http://www.gcpud.org/environment/resource-committees/other-documentation

Summer Chinook Spawning Escapement Estimates for the Wenatchee Subbasin (1995 - 2015)



Source: Hillman et al. 2016. http://www.gcpud.org/environment/resource-committees/other-documentation

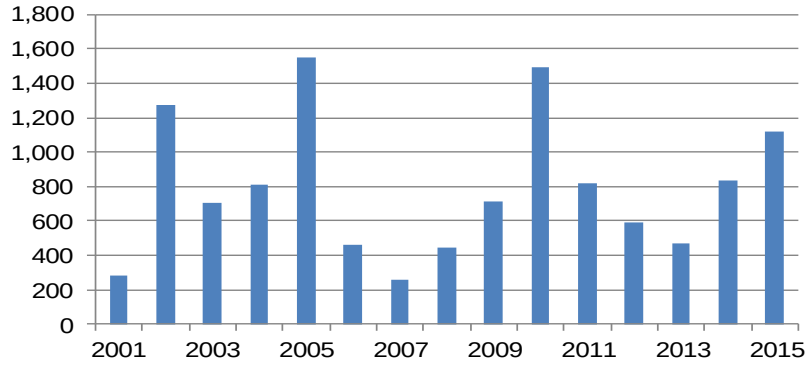
Coho Escapement Estimate in the Wenatchee Subbasin (2002 - 2015)*



Source: Ishida et al. 2016. https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P148025

**2002-2003: Dryden Dam counts, expanded for non-trapping days (2003 with downstream redd counts added). Adults and jacks.*

Summer Steelhead Spawning Escapement Estimates for the Wenatchee Subbasin (2001- 2015)



Source: Hillman et al. 2016. http://www.gcpud.org/environment/resource-committees/other-documentation

**If figure titles do not specify origin, the counts include natural- and hatchery-origin fish.*

Accord Focal Species Status and Trends: Methow Subbasin


BPA (Methow coho)

PROFILE

Industrial development of the Columbia River, agricultural, forestry, and private development of the Methow Subbasin, combined with historically intensive fishing, have led to declines of wild salmonid populations. By the 1930s, only 200 to 400 adult spring Chinook returned to the subbasin. There have been large fluctuations in redd counts from the 1950s through the 1990s. For summer Chinook, the run size averaged approximately 1,000 adults from 1980 to the 1990s. Although the Methow was once a productive steelhead system, the population sustains itself only at a threshold population level. Coho, were extirpated in the early-1900s and have recently been reintroduced by the Yakama Nation, with natural reproduction now occurring.

SUMMARY

Spring Chinook

- Average wild adult escapement improved by 10 fish/year during the Accord period as compared to 2000-2007

Summer Chinook

- Natural escapement trending upwards (average of 2,278 fish/year)

Summer Steelhead

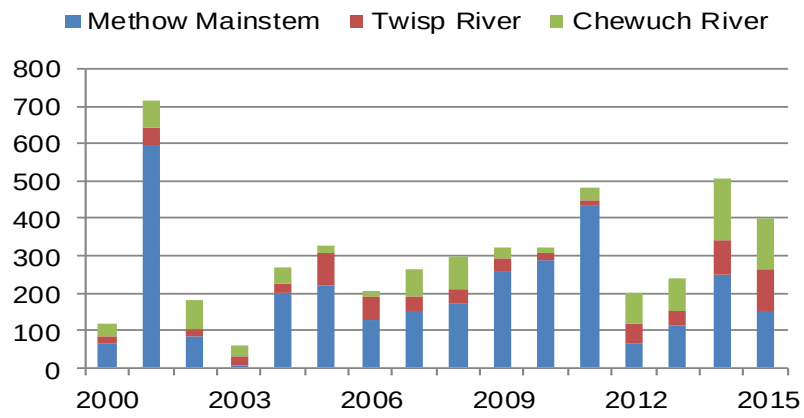
- Redd counts trending downward, but improved over the 1990s with an average redd count of 978 during the Accord period

Coho

- Coho redd counts have generally increased since 2007

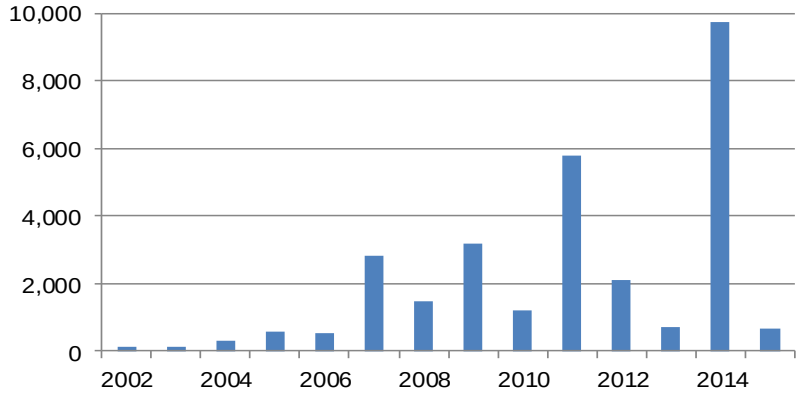
HIGHLIGHTS*

Natural Adult Spring Chinook Spawning Escapement for the Methow Subbasin (2000 - 2015)



Source: Snow et al. 2016. Draft. 2015 numbers preliminary. http://www.douglaspud.org/HCP%20HC%20Documents/2014_11_14%20Douglas%20-%20FINAL%202013%20DCPUD%

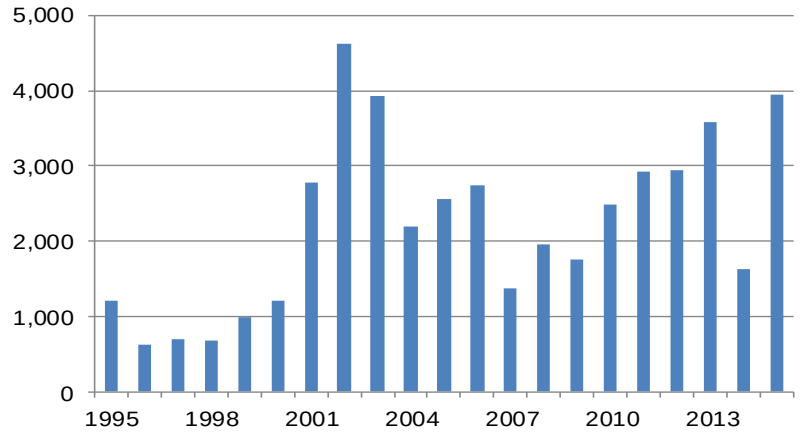
Coho Escapement Estimate in the Methow Subbasin (2004 - 2015)



Source: Ishida et al. 2016. https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P148025 *Note 2002-2003 Just Wells Dam counts. Adults and jacks.

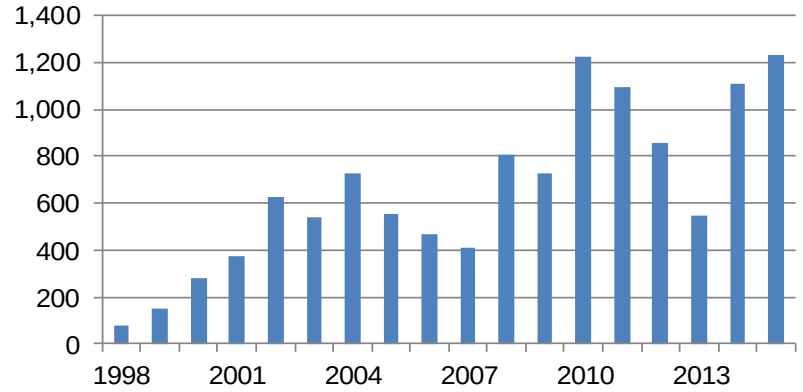
**If figure titles do not specify origin, the counts include natural- and hatchery-origin fish.*

Summer Chinook Escapement Estimates for the Methow River Mainstem (1995 - 2015)



Source: Hillman et al. 2016. http://www.gcpud.org/environment/resource-committees/other-documentation

Natural Summer Steelhead Spawning Escapement Estimate for the Methow Subbasin (1998- 2015)



Source: Snow et al. 2016. Draft. 2015 numbers preliminary. http://www.douglaspud.org/HCP%20HC%20Documents/2014_11_14%20Douglas%20-%20FINAL%202013%20DCPUD%

Accord Hatchery and Reintroduction: Yakima Subbasin


YN, CESRF, Cle Elum

PROFILE

To enhance adult returns and provide harvest opportunities, fish are reared at the Levi George Supplementation and Research Facility (i.e., Cle Elum), Prosser, and Marion Drain Tribal hatcheries and their associated acclimation sites. Spring Chinook are produced at Cle Elum, while summer and fall Chinook are reared at Prosser and Marion Drain. Coho, a component of the Yakama Nation's reintroduction efforts, are reared at Prosser and its acclimation sites. Additional species cultured at Prosser and Marion Drain include Pacific lamprey, white sturgeon, and steelhead (kelts). *Sturgeon, lamprey, and sockeye production/reintroduction projects receive some funding from non-Accord sources.*

SUMMARY

Chinook (Spring)

- 4.7 million smolts (782,613/year) released since 2008

Coho

- 2.3 million smolts (Yakima River-origin) released in the Upper Yakima River from 2008 to 2015 (376,171/year)

Steelhead Kelts

- 1,961 kelts reconditioned and released since 2008 (280/year)

White Sturgeon

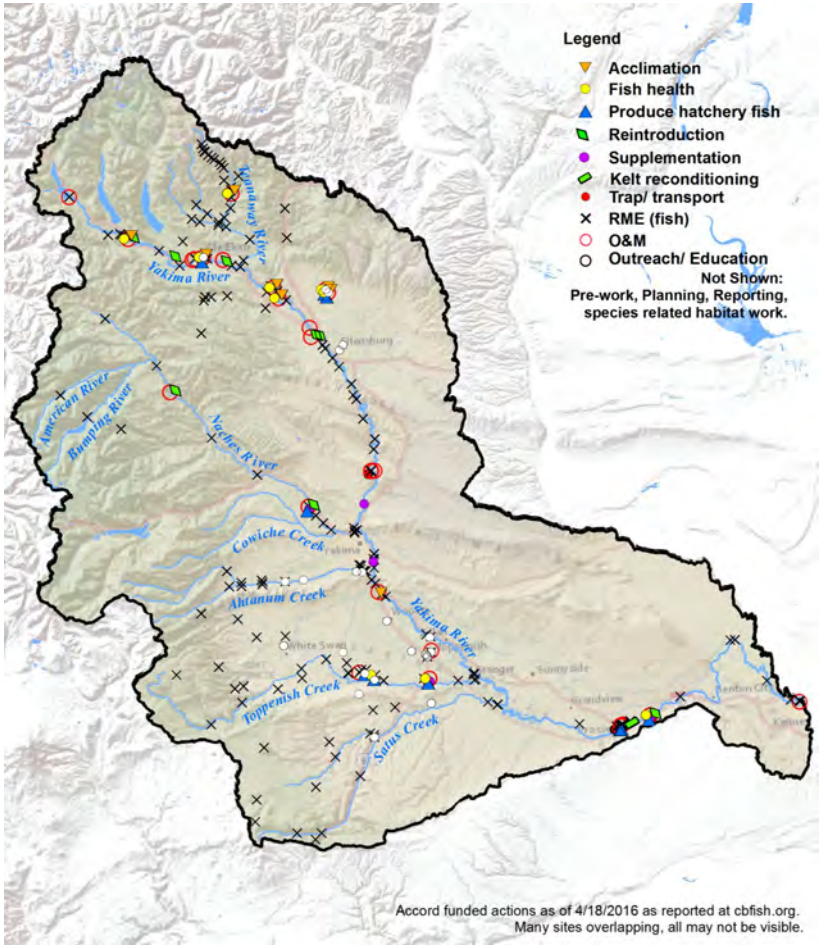
- 62,000 juveniles produced since 2011

Pacific Lamprey

- 7,000 - 30,000 larvae produced per year (2012 - 2015)

HIGHLIGHTS

Accord-funded Hatchery Actions Implemented by the Yakama Nation (2008 - 2016) - Yakima Subbasin



Levi George Spring Chinook: Summary of Key Findings After Three Generations of Hatchery Supplementation

- Spawner abundance, spatial distribution, and harvest increased
- Natural-origin returns maintained
- Managed gene flow and reduced genetic divergence in hatchery population
- Ecological interaction parameters were maintained within established guidelines
- Habitat and water management factors continue to limit natural productivity; supplementation is likely necessary until these factors are fully addressed

Yakima Basin Coho Reintroduction

- Spawner abundance, spatial distribution, and harvest increased
- Ability for domesticated hatchery-origin fish to re-naturalize has been demonstrated
- Re-established coho populations are contributing to improved stability and function of the Yakima River ecosystem
- Out-of-basin stray rates are minimal

Hatchery and Reintroductions: Klickitat Subbasin


YN, Klickitat Hatchery

PROFILE

In 2006, the Yakama Nation assumed responsibility for the operation of Klickitat Hatchery and the Lyle and Castile falls fishways through funding under the Mitchell Act. The Yakama Nation has continued the efforts to culture hatchery spring and fall Chinook and coho to mitigate for lost harvest opportunities due to the hydrosysytem. The Yakama Nation uses fish produced in the Klickitat facilities to re-establish, supplement, and/or increase natural production and harvest opportunities while maintaining long -term fitness of the target populations and limiting/avoiding impacts on non-target species. Most production efforts are supported by Mitchell Act funding. Fishway operation and maintenance are funded in part with Accord funding.

SUMMARY*

Chinook (Spring)

- 4.6 million smolts (578,966/year average) released since 2008

Chinook (Fall)

- 28.9 million smolts (3.6 million/year average) released since 2008

Coho

- Yakama Nation releases 1 million coho/year. Combined with the WDFW releases, 8.4 million smolts released since 2008

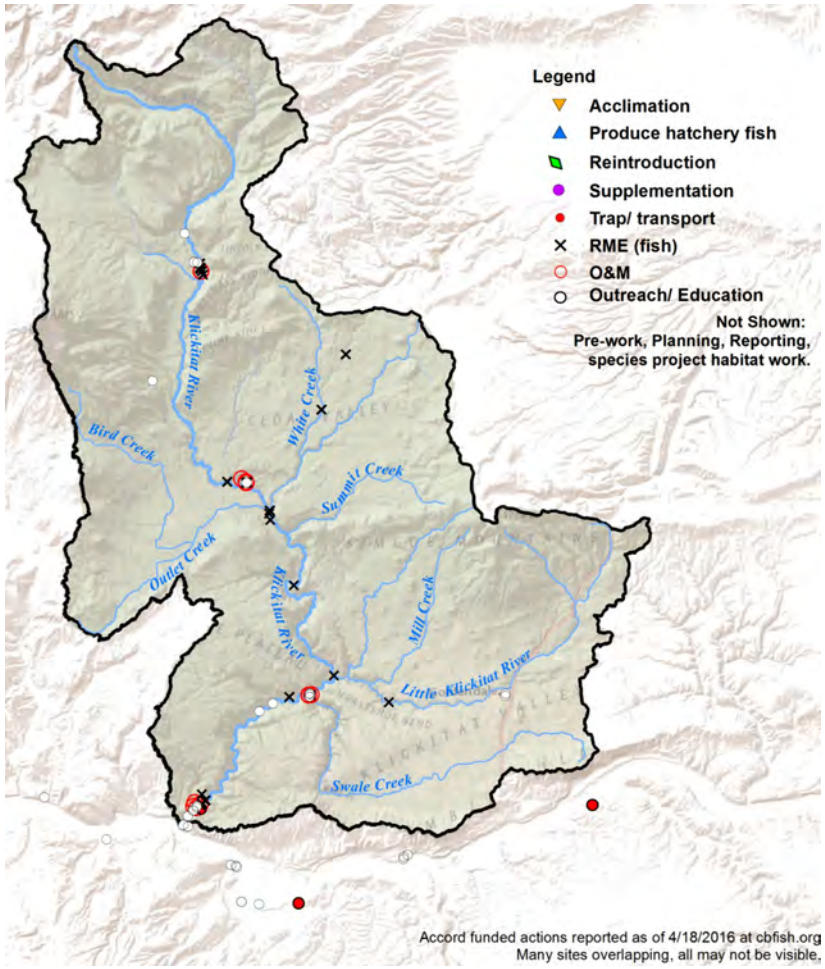
Steelhead

- 94,500 smolts released in 2015 by WDFW (Non-Accord funded)

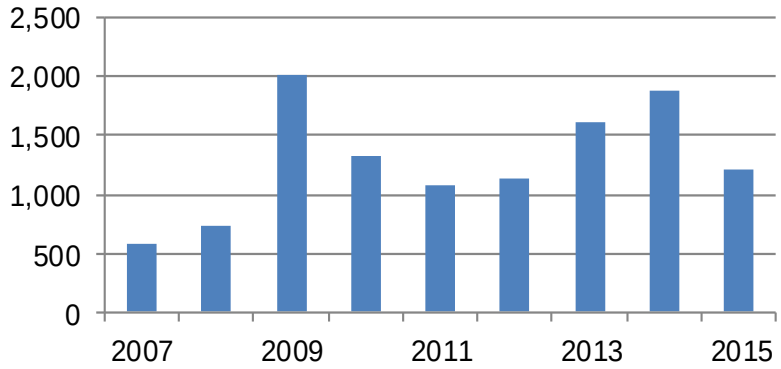
**Production actions Mitchell Act funded*

HIGHLIGHTS

Accord-funded Hatchery Actions Implemented by the Yakama Nation (2008 - 2016) - Klickitat Subbasin

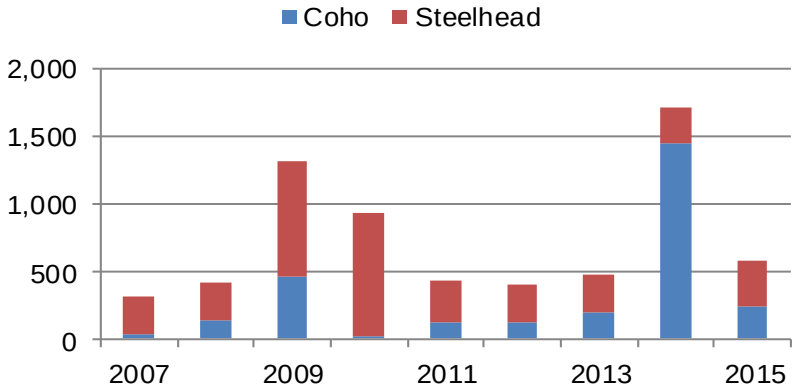


Hatchery-origin Chinook Returns to the Klickitat Subbasin (Klickitat Hatchery) (2007 - 2015)



Source: YKFP website - http://www.ykfp.org/klickitat/Data.htm (adults and juveniles)

Hatchery-origin Steelhead and Coho Returns to the Klickitat Subbasin (Lyle Falls) (2007 - 2015)



Source: YKFP website - http://www.ykfp.org/klickitat/Data_lyleadulttrap.htm

Accord Hatchery and Reintroduction: Entiat and Wenatchee Subbasins

Leavenworth National Fish Hatchery

PROFILE

Coho were extirpated from the middle reach of the Columbia River in the early-1990s. The reintroduction of coho in the middle and upper Columbia River Basin has been dependent on releases of hatchery-origin coho. The Yakama Nation's reintroduction program initially depended on broodfish from the Lower Columbia River; however, the program now only uses in-basin, locally adapted broodstock. To help restore steelhead production, the Yakama Nation has participated in research on the homing fidelity of smolts into areas where they can return as adults and rebuild naturally spawning populations.

SUMMARY

Coho

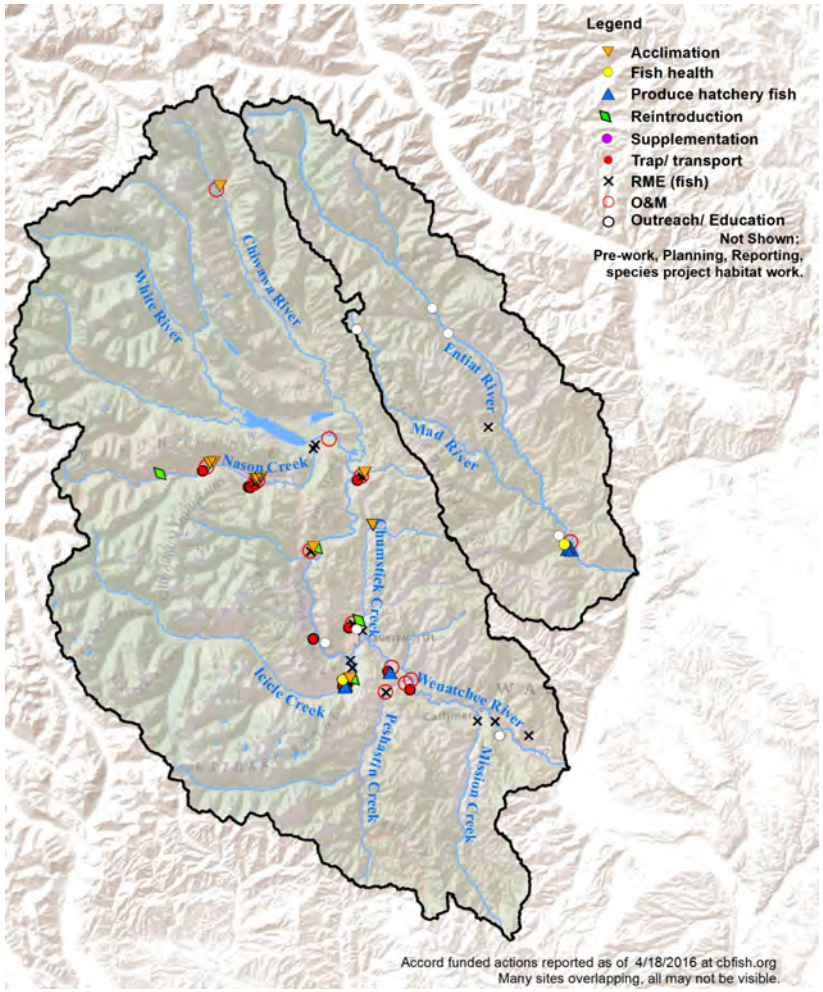
- 6.7 million smolts released since 2008 (average of 954,033/year)
- During Accord, average annual adult return of 827 (Tumwater Dam)

Steelhead

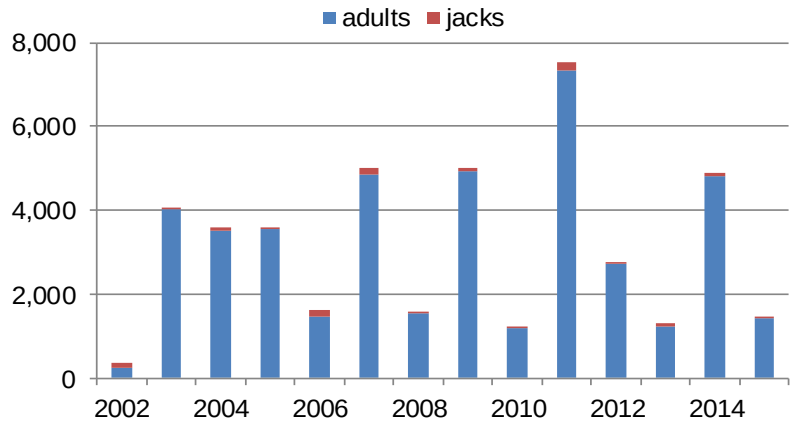
- Majority Public Utility District funded, not Accord funded, although the Yakama Nation has participated in some Accord funded homing research in partnership with CPUD and WDFW
- 49,324 smolts released from 2010 to 2012 (average of 16,441/year)

HIGHLIGHTS

Accord-funded Hatchery Actions Implemented by the Yakama Nation (2008 - 2016) - Entiat and Wenatchee Subbasins

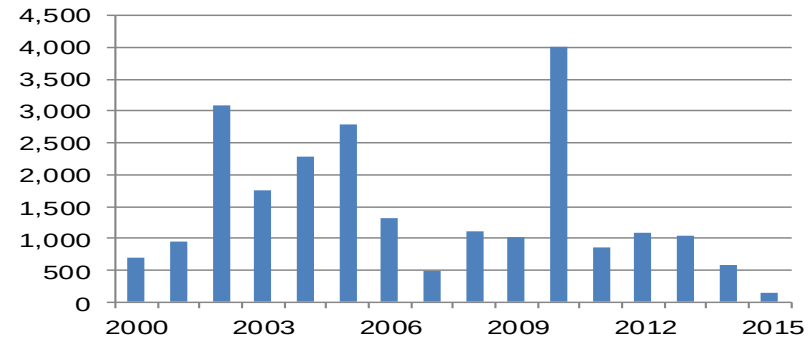


Adult Coho Escapement Estimate, Wenatchee Subbasin (2002 - 2015)*



**Adult passage at Tumwater Dam, plus redd counts below Tumwater and broodstock collected (except 2002-2003 are Dryden Dam counts, expanded for non-trapping days, with redd counts downstream of Dryden added in 2003.* Source: BPA Annual reports for Project #1996-040-00, Mid-Columbia Coho Reintroduction Feasibility Study

Hatchery-origin Summer Steelhead Spawner Escapement to the Wenatchee Subbasin (2000 - 2015)*



**Majority CPUD hatchery source, majority not Accord funded. Priest Rapids minus Wells Dam counts apportioned to population by radio telemetry estimates. Harvest and brood-stock removed, 10% prespawn mortality applied, and age composition from fish trapped and sampled at Priest Rapids Dam. Source: WDFW https://fortress.wa.gov/dfw/score*

Accord Hatchery and Reintroduction: Methow Subbasin


YN, 2012, Upper Columbia kelt reconditioning

PROFILE

Extirpated in the early-1900s, hatchery-reared coho are being reintroduced into the subbasin by the Yakama Nation with a goal of establishing naturally spawning populations. Of the salmonids in the subbasin, steelhead are unique in that they possess the ability to repeat spawn. The artificial reconditioning of post-spawn steelhead (kelts) is important for Upper Columbia River steelhead that experience high mortality rates. The Yakama Nation initiated a kelt reconditioning project in 2012 to test whether the abundance of naturally-produced Upper Columbia River steelhead on natural spawning grounds can be increased through the use of long-term kelt reconditioning methods.

SUMMARY

Coho

- 3.5 million smolts released since 2008 (average of 506,132/year)
- Since 2008, 3,507 adults have returned to Winthrop NFH

Steelhead (kelts)

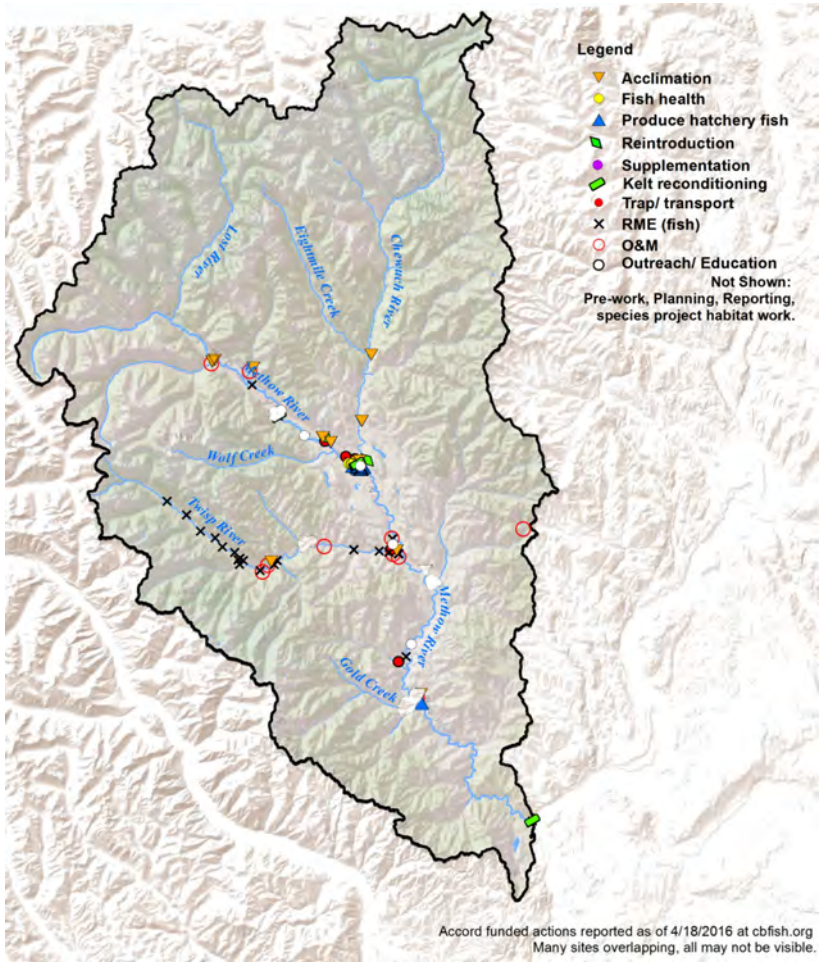
- 64 kelts reconditioned and released from 2013 through 2014

Spring Chinook

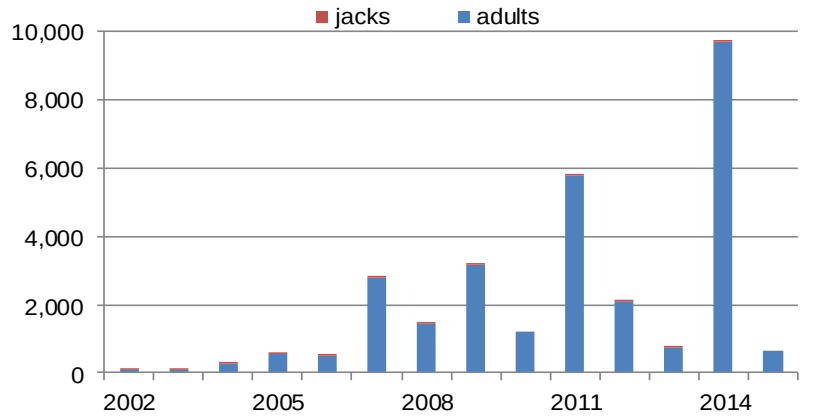
- While hatchery releases are CPUD and USFWS mitigation programs, the Yakama Nation plans to assist with experimental acclimation of spring Chinook in the future, to improve homing ability to better quality habitat areas

HIGHLIGHTS

Accord-funded Hatchery Actions Implemented by the Yakama Nation (2008 - 2016) - Methow Subbasin

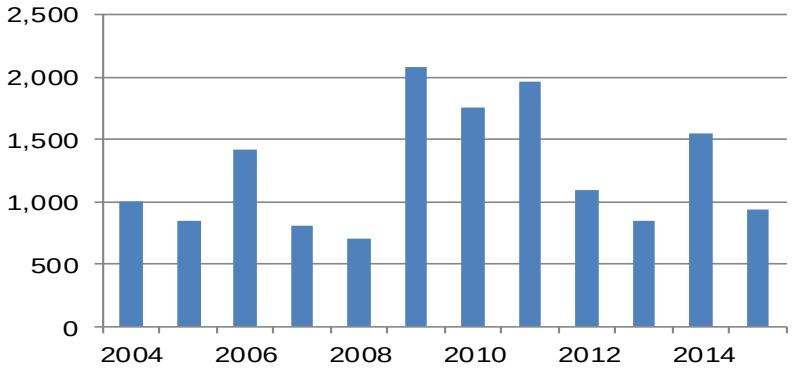


Adult Coho Escapement Estimate - Methow Subbasin (2002 - 2015)*



*2004-2015 Wells Dam counts plus broodstock. 2002-2003: only Wells Dam counts. Source: BPA Annual reports for Project #1996-040-00, Mid-Columbia Coho Reintroduction Feasibility Study

Hatchery-origin Spring Chinook Spawner Escapement to the Methow Subbasin (2004 - 2015)*



**Total census redd counts.*. Majority CPUD / USFWS mitigation project, although the Yakama Nation expects to participate in acclimation research in the future. *Source: WDFW https://fortress.wa.gov/dfw/score*

Tribal Harvest

Benjamin Brink/ The Oregonian 2009 (Fisher: Mackie Jackson, YN)

PROFILE

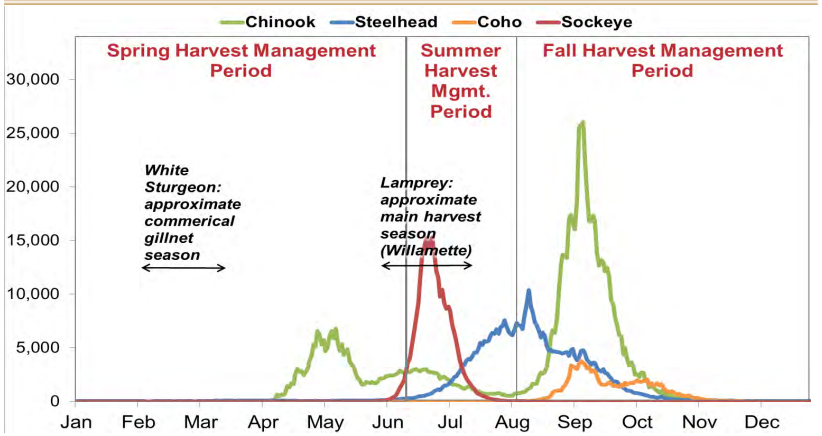
In the Treaty of June 9, 1855, the Yakama Nation reserved the right to maintain its culture and the natural resources on which its culture depends, including rights to water, land, and natural foods and medicines. The people of the Yakama Nation recognize the spiritual, cultural, and economic value of fish resources, as fish are an irreplaceable part of the Yakama Nation's heritage and sustenance. By the Treaty, the Yakama Nation reserved the right to exclusive control of their own fish management and take, and the preservation/restoration of fish habitat at all usual and accustomed fishing areas. Subsequent federal court cases reaffirmed these rights, with managed catches determined as a proportion of the total returns.

SUMMARY

- Tribal harvest of more than 2 million salmon and steelhead between 2008 and 2015 (Zone 6)
- Modern-day tribal harvest record for coho occurred in 2014
- Tribal salmon and steelhead harvest averaged 110,781 fish more per year 2008-2015 than in 2000-2007 (Zone 6 only)
- On average, 18,540 more sockeye were harvested annually during 2008 to 2015 period than during the 2000 to 2007 period (Zone 6)

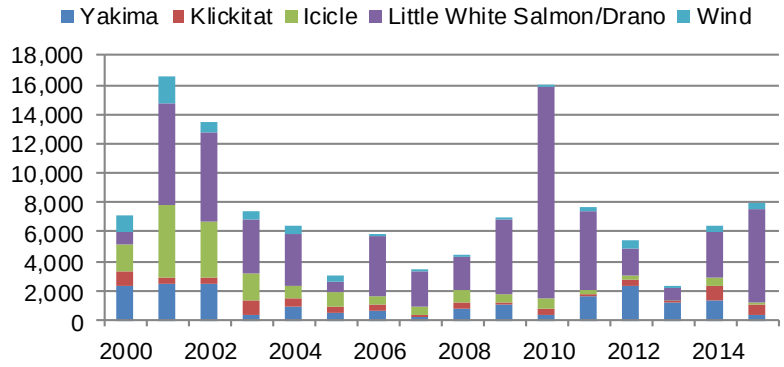
HIGHLIGHTS

Harvest Management Periods and Average Fish Passage Counts at Bonneville Dam (2008 - 2015)*



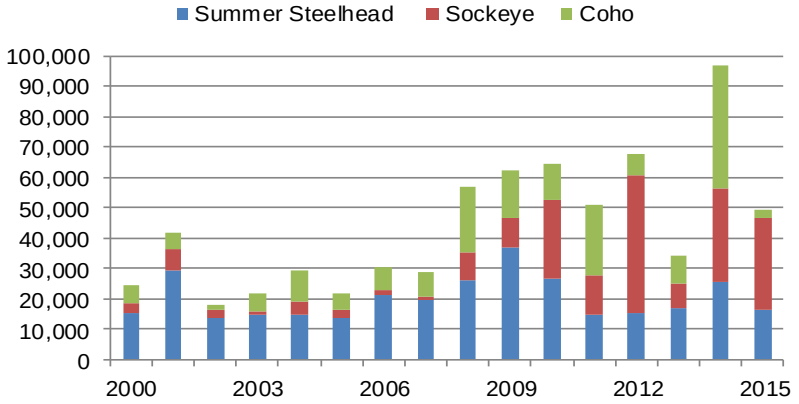
*Ten-year average 2005-2015. There may be a smaller sturgeon setline fishery in spring, summer, fall, depending on the catch. There may be a smaller Klickitat lamprey harvest. Lamprey harvest depends on appropriate flows. Passage data source: DART

Yakama Nation Harvest of Spring Chinook in Columbia River Tributaries (2000 - 2015)



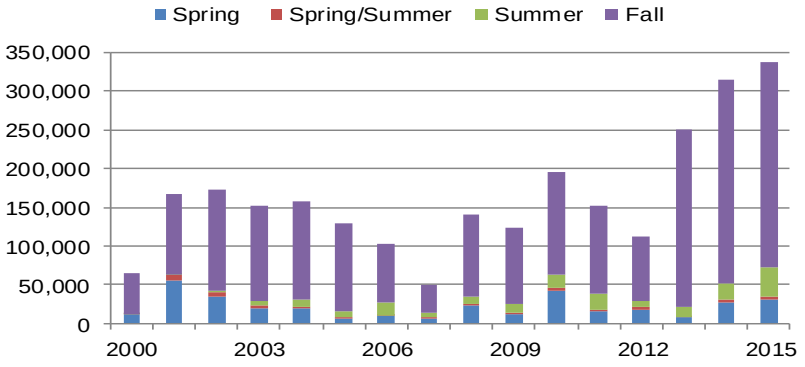
Source: Roger Dick Jr. (YN) - Personal Communication

Tribal Harvest of Summer Steelhead, Coho, and Sockeye in Zone 6 (2000 - 2015)



Source: WDFW/ODFW Joint Staff Reports, WDFW website - http://wdfw.wa.gov/publications/01830/wdfw01830.pdf

Tribal Harvest of Chinook in Zone 6 (2000 - 2015)



Source: WDFW/ODFW Joint Staff Reports, WDFW website - http://wdfw.wa.gov/publications/01830/wdfw01830.pdf

Hydropower System: Water Supply and Spill Management*

McNary Dam, USACE

PROFILE

Spill and flow are important for the survival of juvenile salmonids passing through the Columbia River hydropower system. Increased spill levels reduce passage delay and the time required for juvenile salmonids to pass through the Columbia River, improving downstream survival. In addition, surface spill provides a safer route with lower mortality than through bypasses and turbines, increasing survival through the entire system.

Spotlighted here is McNary Dam as an example of year-to-year changes in conditions and operations in the upper- to mid-Columbia River, illustrating the importance of flow timing and smolt out-migration.

For information about other facilities please visit www.fpc.org.

SUMMARY

General Spill Targets

- Based on required spill at dams and maximum dissolved gas levels
- Not always met, influenced by annual flows
- Court spill requirements were continued through the Accord (for the Snake River dams, summer spill was not required prior to 2005)
- The BiOp, Accord, and other court orders specify percentages of flow required as spill to facilitate juvenile salmonid transit downstream (spill limits exist due to dissolved gas levels)
- Recent studies suggest higher levels of spill may be necessary at some dams to achieve BiOp survival objectives

**For more information about structural and operational improvements, please see the 2015 STAR Hydro System report, available at yakamafish-nsn.gov/restore/projects/star*

HIGHLIGHTS

Compliance with Fish Operation Plan and Court Ordered Spill (2010 - 2014)*

- System-wide compliance generally good over past years. Environmental conditions often a complicating factor
- Elevated dissolved gas measurements often limit spill, especially in high flow years
- Low flows constrained spill in some years
- Surface passage structures have increased spill efficiency and reduced travel times
- Recent NOAA study indicates reduced juvenile travel times due to higher flows, along with apparent "smolt readiness" for transition to salt water
- In 2015 high spill percentages and water temperatures during low flow conditions caused high mortality

Source: Fish Passage Center Annual Reports, http://www.fpc.org/documents/FPC_Annual_Reports.html

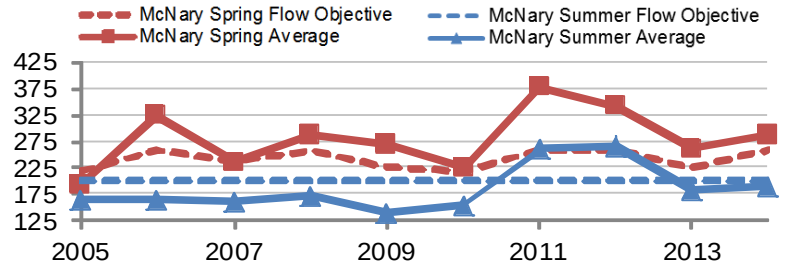
Spill/Survival Target Testing Results (2010 - 2014)*

Dam	Spill Compliance	Survival Tested at Dam*		
		Chinook (yearling)	*Chinook (sub-yearling)*	*Steelhead*
Bonneville	*2011, 2012*	*2011*	*2012*	*2010, 2011*
The Dalles		*2010, 2011*	*2010, 2012*	*2010, 2011*
John Day		*2011, 2012*	*2012, 2014*	*2011, 2012*
McNary	*2012, 2014*	*2012, 2014*	*2012, 2014*	*2012, 2014*
Lower Monumental	*2012*	*2012*	*2012, 2013*	*2012*
Little Goose	*2012*	*2012*	*2012, 2013*	*2012*

Black years= passage target met; red years= passage target not met
*Not all compliance tests conducted every year. Environmental conditions can make testing difficult.

Sources: Fish Passage Center Annual Reports, http://www.fpc.org/documents/FPC_Annual_Reports.html; DART, http://www.cbr.washington.edu/dart/; CRITFC (personal communication), Skalski et al., 2016, NAJFM 36:4 (p.726)

Spring and Summer Flow Objectives and Averages at McNary Dam (2005 - 2014)



- Spring flow objectives have been met or exceeded from 2005 to 2014
- Due to environmental constraints, summer flow objectives have only been met in 2011 and 2012

Sources: Fish Passage Center Annual Reports, http://www.fpc.org/documents; DART http://www.cbr.washington.edu/dart/query/river_graph_text

Relationship Between Peak Flows and Juvenile Run Timing

- High flows in the Columbia River typically occur throughout June and decrease from early-July through August
- Juvenile sockeye and yearling Chinook typically migrate through the system by mid-June, and sub-yearling Chinook migrate out in July when flows are lower and water temperatures are warmer
- Meeting spill targets and operation of surface spill is especially important to late summer migrants

Hydropower System: Juvenile Fish Passage

Juvenile steelhead (NOAA)

PROFILE

Flow, spill, water temperature, and dam operations affect passage and survival for juvenile salmonids in the Columbia River. These factors are related to run timing, travel time, susceptibility to dissolved gas trauma, disease, and predation.

These limiting factors are monitored annually to ensure Accord and BiOp compliance. With increased spill during the past eight years, travel times have been reduced and juvenile survival has improved.

McNary Dam is spotlighted here because it is where travel times for Upper Columbia and Snake River stocks are measured and data are available to determine impacts on fish traveling through this region.

For information about other facilities please visit www.fpc.gov.

SUMMARY

Average Annual Estimated Whole System Survival for Snake River Stocks*

Species (Snake River)	Pre-Accord (1999-2008)	Current (2009-2015)
Chinook	43%	47%
Steelhead	35%	49%
Sockeye	37%	54%

*Average annual survival rates, through dams and reservoirs, as reported by NOAA (Fulkner et.al, 2016)

- Improved turbine design, operations, bypass structures, turbine diversion screens, and surface spillway weirs have contributed to increased survival
- Efforts are in place to limit and remove predators such as Caspian terns, double-crested cormorants, northern pikeminnow, and sea lions that eat juvenile and adult salmonids below Bonneville Dam, as well as the reservoirs upstream from Bonneville Dam

HIGHLIGHTS

Average Change in Travel Times (Days)

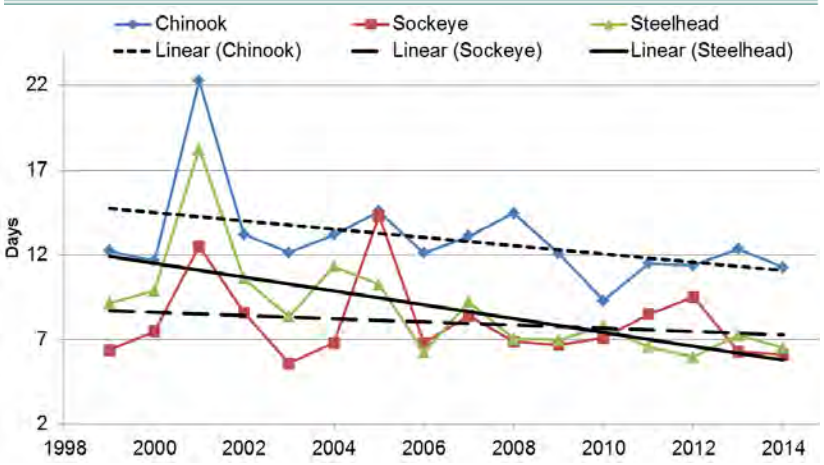
- Average spring travel from McNary Dam to Bonneville Dam decreased by about 1.5 days (Chinook) and 1.7 days (steelhead) over the past 10-15 years
- Spring travel from Lower Granite Dam to McNary Dam decreased by about 2.1 days (Chinook), 1.2 days (sockeye), and 3.5 days (steelhead) during the past 15 years, and summer travel for Chinook decreased by 10.3 days
- Spring travel from Rock Island Dam to McNary Dam have decreased by about 1.1 days (Chinook), 0.6 days (sockeye), and 1.9 days (steelhead) during approximately the same time period, and summer Chinook travel times increased by 4.6 days (2000 - 2007 vs. 2008 - 2014)

Source: www.fpc.org/survival/surv_queries/smp_multiyearsurvival_results.asp

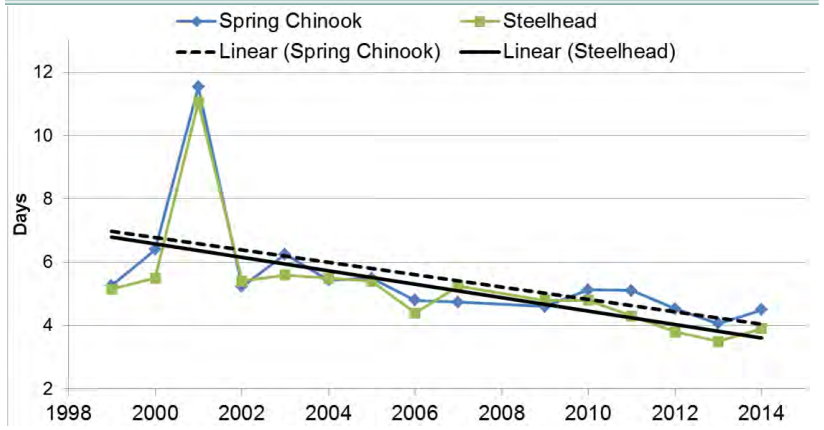
Improved Project Operations

- With increased flows and use of “surface spill structures”, juvenile travel times have declined
- Travel time is dependent on the amount of annual runoff, runoff timing, and dam operations throughout the Columbia River system during the passage season
- Structural and operational improvements, since the 2004/2008 BiOps, have increased juvenile survival; however, the benefit of more spill is weighed against survival issues associated with excessive dissolved gas
- Although improvements in FCRPS dam operations have led to improved river conditions and survival for juvenile salmonids, additional work is needed

Average Juvenile Travel Time from Lower Granite Dam to McNary Dam (April - June)

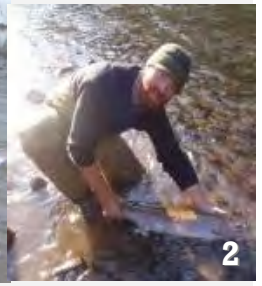


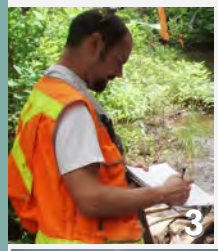
Average Juvenile Travel Time from McNary Dam to Bonneville Dam (April - June)

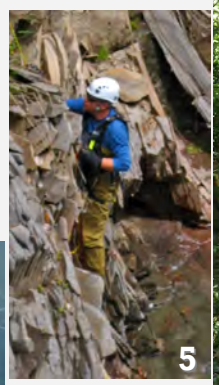


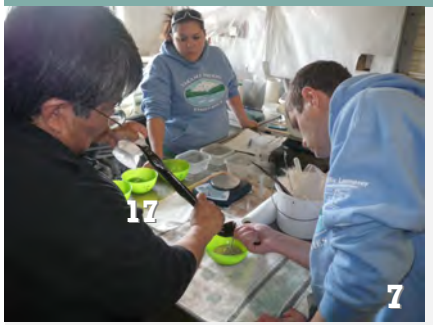
Source for both travel time graphs: Fish Passage Center. http://www.fpc.org/survival/surv_queries/smp_multiyearsurvival_results.asp

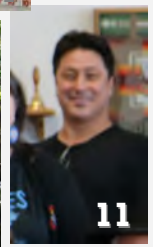
YN Fisheries: Production/ Reintroduction, Research, Habitat Restoration Project Staff*

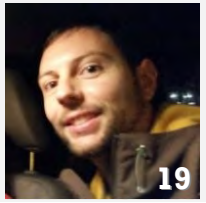






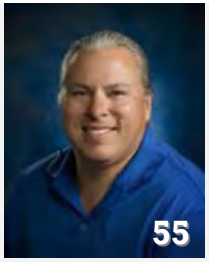


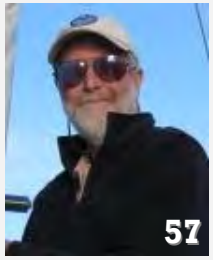


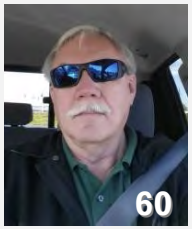


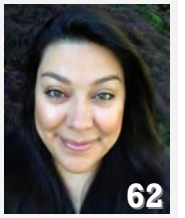
*Unfortunately, unable to include many of the invaluable technicians and fish culturists. Not pictured: Michael Porter, Biologist, Predation Studies.

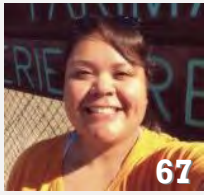
YN Fisheries
Managerial, Technical, Research and Support Staff*

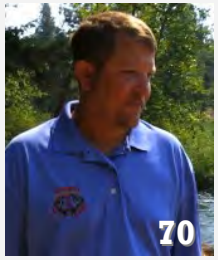


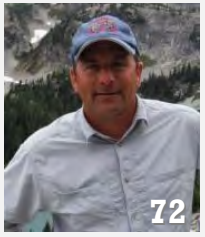


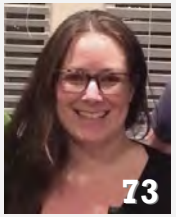


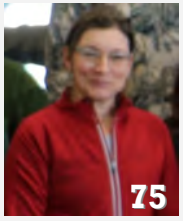


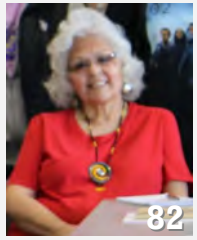


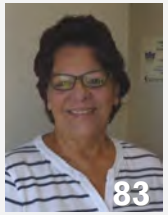


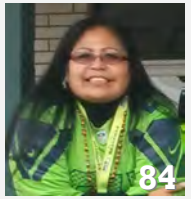


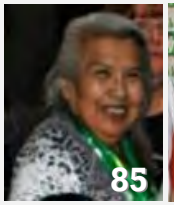












**Administrative staff not pictured*: Monica Clark, Jeanna Hernandez, Shirley Alvarado, Suzie Tynan

Staff Photo Lookup Table

1 Donella Miller: Sturgeon Biologist (Proj. Mgr., and Sturgeon Technicians)
2 Shane Keep: Fisheries Biologist
3 David Lindley: Habitat Biologist
4 Ralph Kiona: KWEP Watershed Technician
5 Will Conley: S. Ceded Watershed Specialist
6 Elaine Harvey: Rock Creek Biologist, and technicians
7 Lamprey Proj.: Tyler Beals (Fish Biologist I), Davey Lumley (Lamprey Tech III), (Patrick Luke)
8 Ralph Lampman: Pacific Lamprey Project
9 Melinda Goudy: Fall Chinook Biologist
10 Nicolas Romero: Fisheries Biologist
11 Jason Rau, Klickitat Hatchery Manager
12 Klickitat Hatchery (technicians)
13 Flo Howtopat: Video Monitoring Tech II
14 Winna Switzler: Video Monitoring Tech II
15 Shannon Adams: Watershed Restoration Specialist (Satus)
16 Bill Fiander: Yakima Production Mgr.
17 Tim Ressigue: Watershed Biologist
18 Joshua Hall: Fisheries Habitat Biologist
19 Jeff Trammell: YKFP Video Biologist II
20 Joe Blodgett(Kelt/Spec. Proj. Mgr) and Prosser/ Marion Staff (Tracy Selam, Emmerson Scabbyrobe, Robert Gleason, Oliver Davis Jr., Terrance Compo, Justin Olney, Tyler Ward, Nathan Lewis, Steve Aragon, Kathleen Starr, Carrie Skahan, Jerimiah Walterman)
21 Charlie Strom (Cle Elum hatchery mgr.), Vern Bogar, David Washington, Ted Martin, DJ Brownlee (Hatchery Foreman), Markesta Pinkham, Simon Goudy
22 Roza bypass: Wayne Smartlowit, Toby Ambrose
23 Matt Wilberding: Habitat Biologist (UC)
24 Brandon Rogers: Watershed Restoration Specialist(UC)
25 Hans Smith: Methow Project Biologist
26 Chris Clemmons: Wenatchee Project Biologist
27 Michael Fiander: Hatchery Foreman, Prosser
28 Talbert Looking Elk: Fish Culturist
29 Chris Butler: Methow Project Biologist
30 Jason Breidert: Wenatchee Project Biologist
31 Jarred Johnson: Methow Project Biologist
32 Megan Begay: Assistant Harvest Manager
33 Brian Saluskin: Fish Passage Biologist III
34 Todd Newsome: Yakima River Coho Project Lead
35 Scott Nicolai: Habitat Biologist (Upper Yakima)
36 Dallas Reed: YN Forest Development Fish Biologist
37 Tim Jeffris: Fisheries Biologist
38 Barry Hodges: Scientific Technician III
39 Casey Heemsah: Fisheries Technician III
40 Bryan Ishida: Fisheries Biologist
41 Clendon Allen: Fish Technician II
42 Laura Klasner Shira: Environmental Engineer
43 Kelly Clayton : Fisheries Habitat Biologist
44 Ryan DeKnikker: Fisheries Habitat Biologist
45 Greg Morris: TFW Fisheries Habitat Biologist
46 Kraig Mott: Fisheries Biologist
47 Jeff Kosma: TFW Biologist
48 David Powell: TFW/ Archaeologist
49 Gregory Wolfe: Mid-Columbia Coho Restoration Project Hatchery Complex Manager
50 Corey Kamphaus: Production Biologist
51 Shawn Bechtol: Fish Technician II
52 Rick Alford: Methow Biologist (coho)
53 Matt Abrahamse: Fisheries Biologist - Kelt
54 Phil Rigdon: DNR Deputy Director
55 Paul Ward: Fisheries Resource Management Program Manager
56 Mel Sampson: Yakima-Klickitat Fisheries Project Manager
57 Steve Parker: FRMP Technical Coordinator
58 Dave Fast: YKFP Senior Research Scientist
59 Bob Rose: Hydrosystem Coordinator
60 Lee Carlson: Habitat Section Coordinator
61 Tom Scribner: Production Coordinator
62 Rose Longoria: Regional Superfund Cleanup Projects Coordinator
63 Bill Sharp: Klickitat Coordinator
64 Jim Matthews, TFW Coordinator
65 Roger Dick Jr.: Harvest Coordinator
66 Emily Washines: Public Relations Specialist
67 Jonalee Squeochs: Environmental Coordinator
68 Chris Fredericksen: EDT/AHA Modeler
69 Bill Bosch: YKFP Data Manager
70 Mark Johnston: Research Scientist
71 David Lind: FloodplainAG/ToppCorr LRP
72 Joe Zendt: YKFP Research Scientist
73 Keeley Murdoch: M&E Biologist/Tech. Adv.
74 John Marvin: Habitat Biologist
75 Jeanette Burkhardt: YKFP Watershed Planner
76 Paul Huffman: YKFP Data Manager
77 Mike Babcock: Klickitat Data Manager
78 McClure Tosch: Remediation & Restoration Specialist
79 Michelle Steg-Geltner: STAR Coordinator
80 Willow Jim: Policy & Planning Specialist I
81 Debbie Azure: FRM Administrative Coordinator
82 Adrienne Wilson: YKFP Program Coordinator
83 Linda Lamebull: Inventory/GSA Manager
84 Carol Sue Martin: YKFP Administration Asst.
85 Louiza Umtuch: Office Assistant V
86 Beverly Allen: Administrative Assistant
87 Dianna Grunlose: Bookkeeper V
88 Deanna Lamebull: YKFP Bookkeeper V
89 Ida Sohappy Ike: YKFP Bookkeeper V
90 Rachel Castilleja: Bookkeeper V
91 Jackie Olney: Bookkeeper V
92 Loverne George: Bookkeeper IV
93 Joanne Fernandez: YKFP Bookkeeper IV
94 Tana Hoptowit: Bookkeeper IV
95 Rubi Rodriguez: YKFP A/P Bookkeeper III
96 Patti Bogar: Office Assistant V
97 Annet Dillman: Bookkeeper
98 Jackie Andrews: FRM Bookkeeper II
99 Andraya Trujillo: Bookkeeper II
100 Angelina Rivas: Bookkeeper II
101 Leonora Ives: YKFP A/P Bookkeeper II

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Bonneville Power Administration

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