Yakama Nation

Department of Natural Resources

Philip Rigdon, DNR Superintendent

WDFW Commission Meeting

June 2020

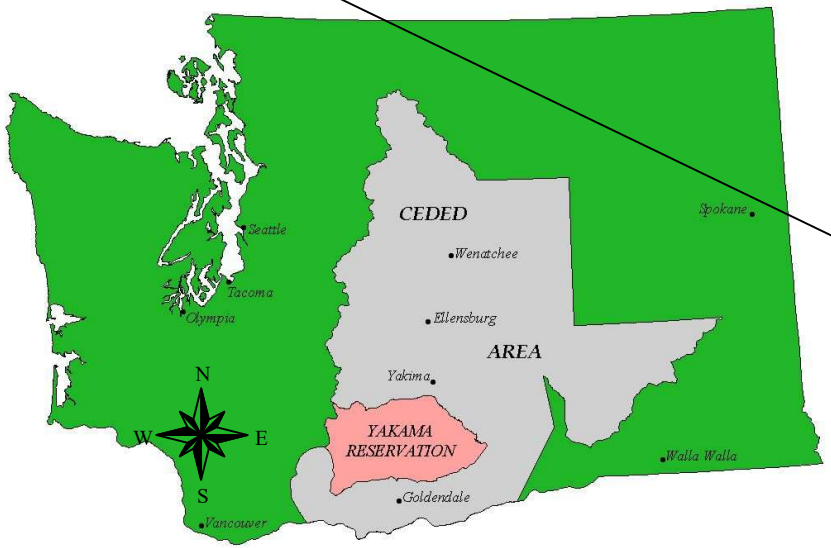
Mt. Adams, Yakama Nation

Yakama Reservation

Treaty of 1855:

"...for the exclusive use and benefit of the Confederated Tribes and Bands of the Yakama Nation."

1)Palouse 8)Sk'in-pah 9)Ka
2)Pisquouse miltpah 10)Klickit
3)Yakama 11)Wish ham 12)S
4)Wenatchapam ap Cat 13)Li ay w
5)Klinquit 6)Ochle4)Shyiks
Chotes 7)Kow was
say ee

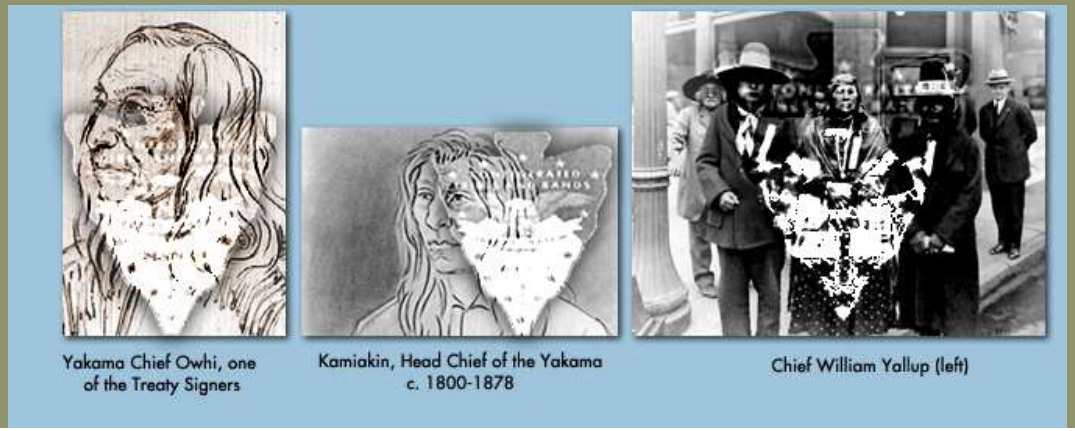


Confederated Tribes and Bands of the Yakama Nation

- Treaty of 1855 with the United States of America
- 12 million acres ceded
- 1.4 million acres reserved
- Right to hunt, fish, gather is protected throughout Ceded and Usual and Accustomed use areas

Yakama Nation Treaty of 1855

- *Isaac I. Stevens, governor and superintendent of Indian affairs for the Territory of Washington*
- *June 9, 1855*
- *Walla Walla, Washington*
- *Eleven Articles*
- *Article III - Yakama Nation retained it's right to fish, hunt, and gather foods in all usual and accustomed areas.*



Yakama Chief Owhi, one of the Treaty Signers

Kamiakin, Head Chief of the Yakama c. 1800-1878

Chief William Yallup (left)

The First Economy of the Yakama Nation and the Pacific Northwest

- Harvesting salmon and other native foods supported the Yakama People and the regional economy for thousands of years. It is still a mainstay of the Yakama culture.
- YN is a leader in salmon recovery.

HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

The First Great Economy of the Pacific Northwest

- ***"This is the Great Mart of all this Country"***
  - Journals of Lewis and Clark

The Yakama have fished this way [dip nets] since the glaciers receded.

-Tony Washines, Yakama Elder

- Lewis and Clark estimated about 10,00 Indians on the Columbia River fishing grounds in 1805

- Inter-tribal trade connected buffalo hunting tribes, shell fishing tribes and salmon fishing tribes in a great regional economy spanning uncounted thousands of years.

Yakama Nation Fisheries

Program Overview 2008-2019

OUR MISSION

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

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

HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

YAKAMA NATION FISHERIES BY THE NUMBERS

200+ Employees

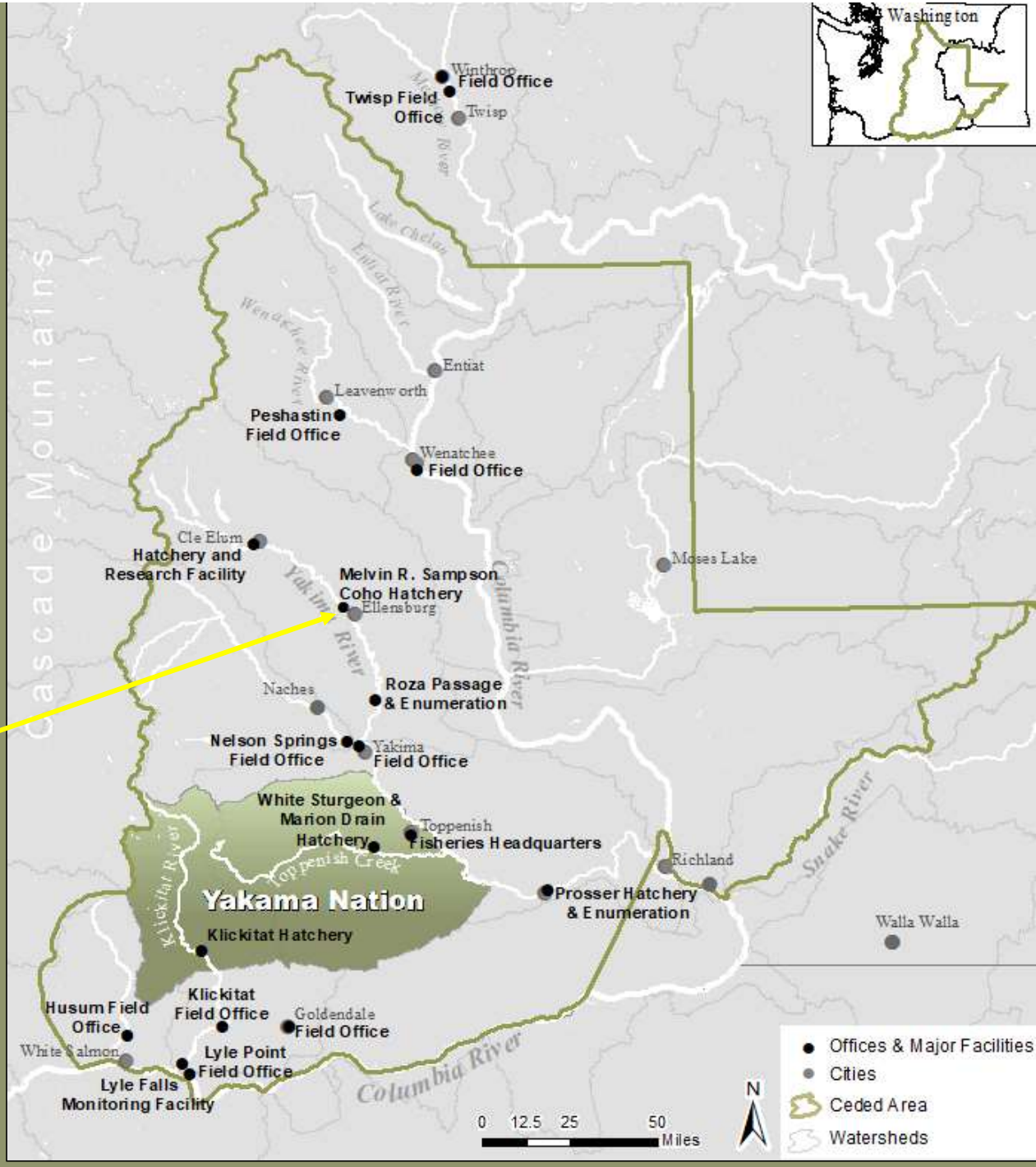
7 Facilities

hatcheries, enumeration

1 New Hatchery

13 Offices

11 Subbasins



HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

FISH BEING RESTORED AND REINTRODUCED

6 Species

5 Runs

1 Endangered species

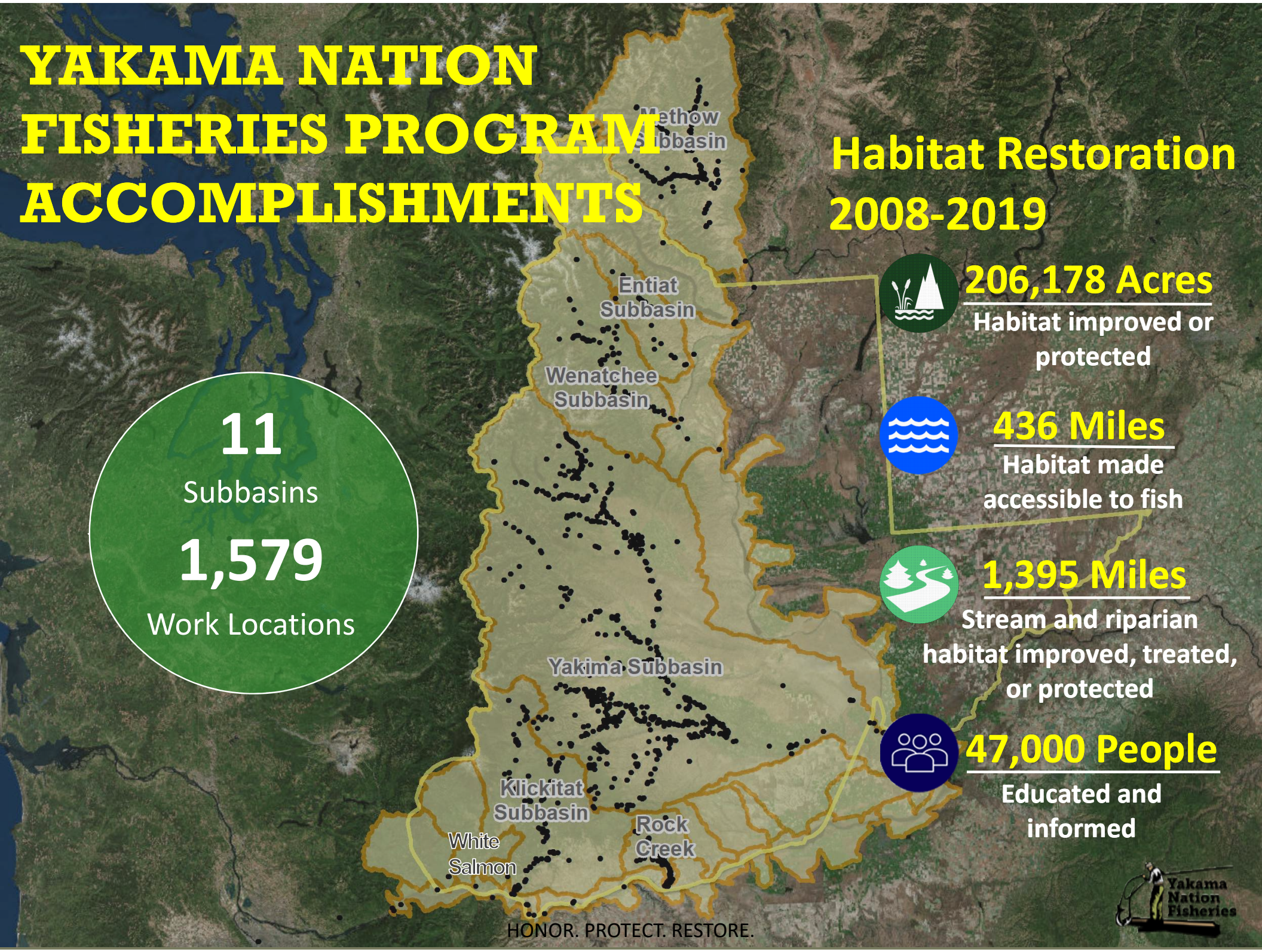
2 Threatened species

3 Reintroduced species

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

YAKAMA NATION FISHERIES PROGRAM ACCOMPLISHMENTS



Habitat Restoration 2008-2019

206,178 Acres
Habitat improved or protected

436 Miles
Habitat made accessible to fish

1,395 Miles
Stream and riparian habitat improved, treated, or protected

47,000 People
Educated and informed

11
Subbasins

1,579
Work Locations

HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

HABITAT RESTORATION DEFINITIONS

Improvement — Increase habitat quality or quantity

Examples:

- large wood structures
- off-channel habitat

Treatment — Improving habitat condition

Examples:

- non-native species removal
- prescribed burns

Protection — Prevent harm or degradation

Examples:

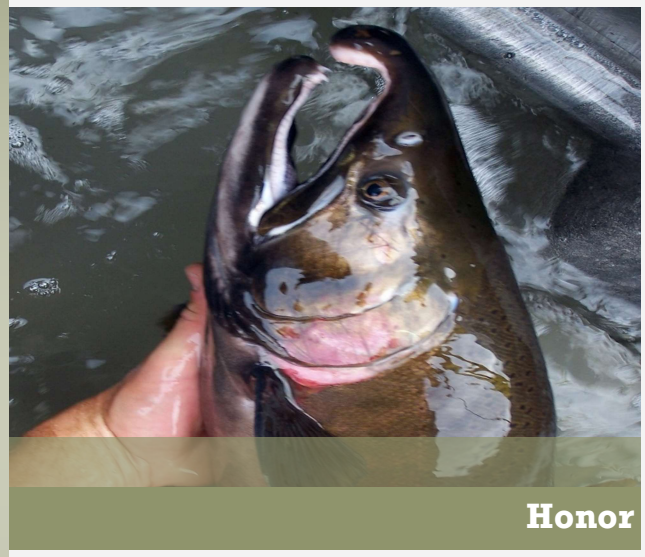
- cattle exclusion
- conservation easements

Yakama Nation Fisheries

Yakama Nation/ WDFW Co-Manager Topics

- Dam Passage, Cle Elum Passage
- Teanaway Forest
- Bateman Causeway
- Lower Yakima River Chinook Smolt Study
- Klickitat Hatchery
- Simcoe Mountain Acquisition
- Predator Management
- Broodstock Issue

STATUS AND TRENDS ANNUAL REPORT

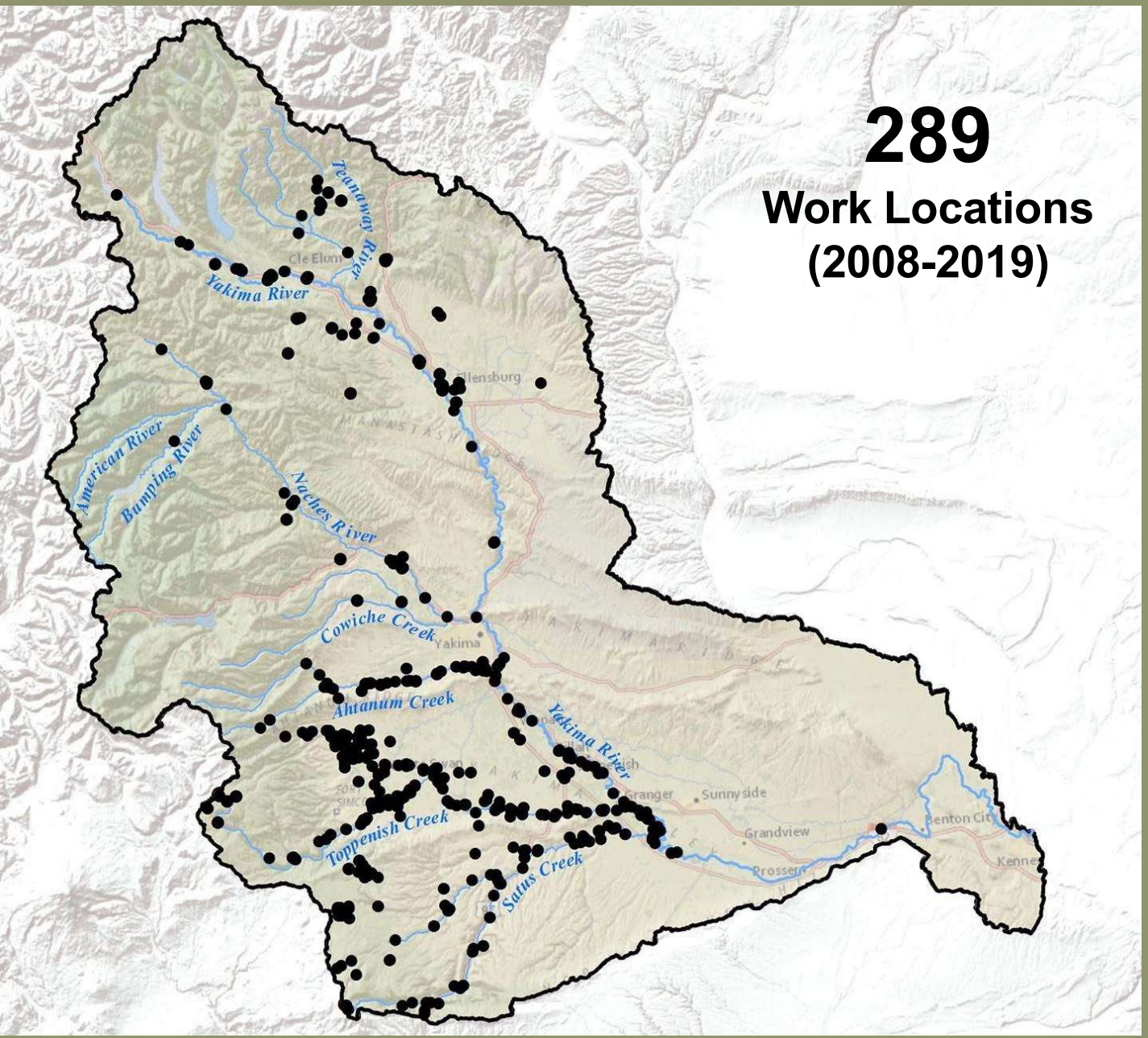


SUBBASIN SUMMARIES

HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

YAKIMA SUBBASIN – HABITAT RESTORATION



289
Work Locations
(2008-2019)

109
Miles
Stream habitat treated, improved or created

1,099
Miles
Riparian habitat improved or protected

171,771
Acres
Wetland and upland habitat treated, improved, protected

298
Miles
Stream made accessible

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

YAKIMA SUBBASIN – 2019 HABITAT SPOTLIGHTS

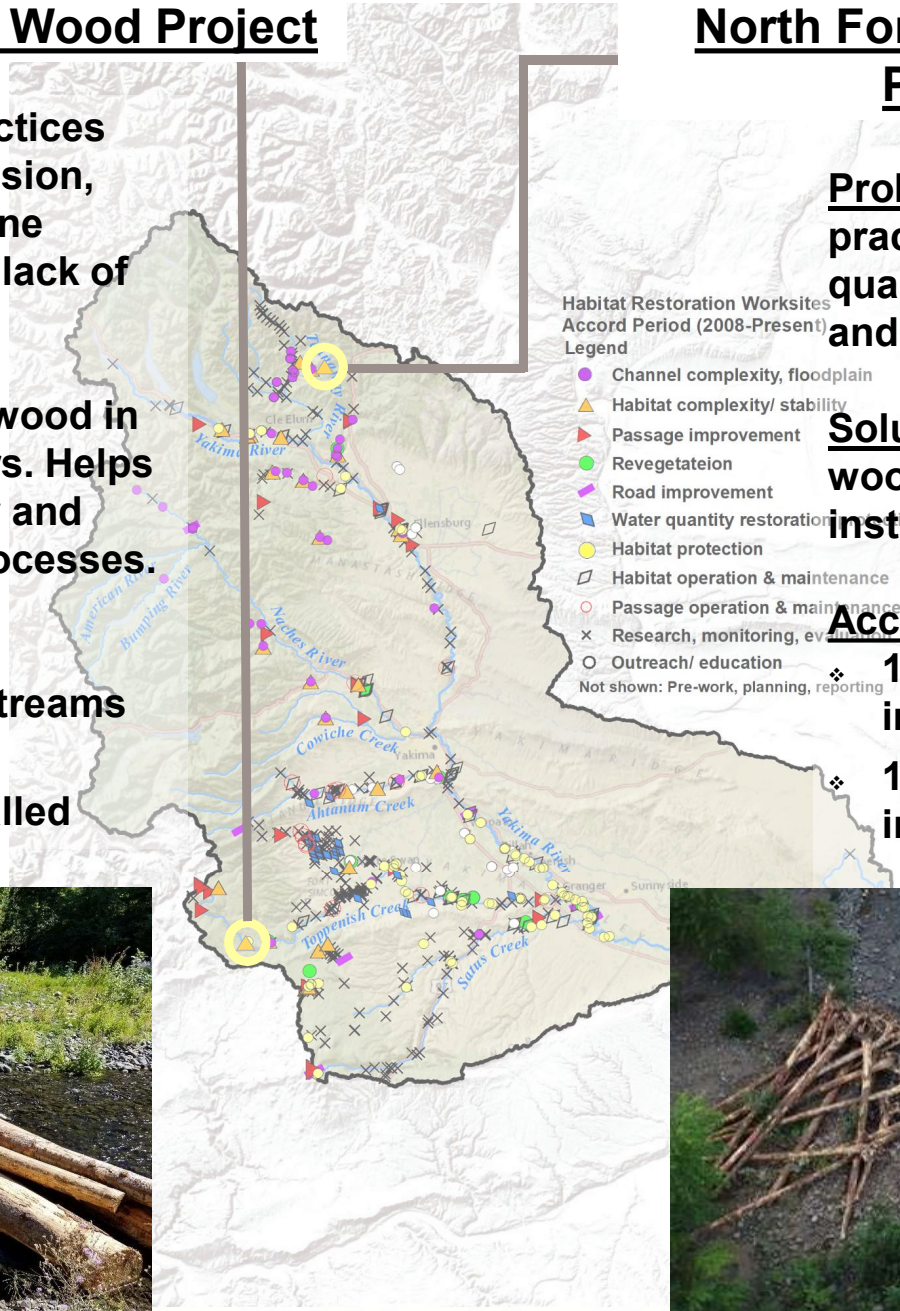
Upper Toppenish Creek Wood Project

Problem: Past land use practices contributed to: channel incision, floodplain disconnection, fine sediments, low complexity, lack of riparian cover.

Solution: Addition of large wood in 46 locations with helicopters. Helps increase habitat complexity and maintain healthy-habitat processes.

Accomplishments:

- 4.26 miles of degraded streams replenished with wood
- 805 pieces of wood installed



North Fork Teanaway Restoration Project (Phase 1)

Problem: Roads and past land use practices contributed to reduced quality and availability of habitats and impaired flows.

Solution: Using helicopters, large wood was added to enhance instream and floodplain habitat.

Accomplishments:

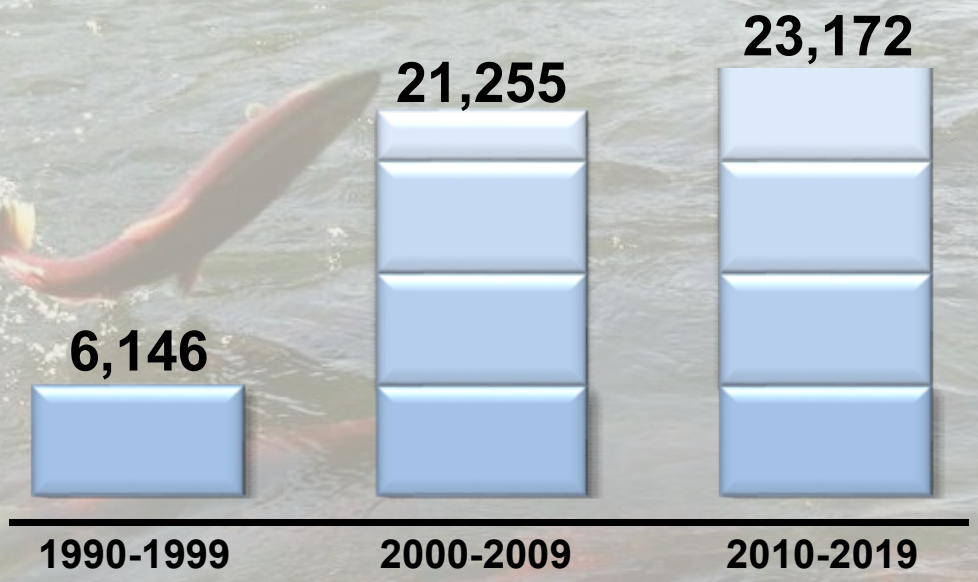
- 1.5 miles of degraded streams improved
- 1,222 pieces of wood placed instream

HONOR. PROTECT. RESTORE.

YAKIMA SUBBASIN – SPECIES RESTORATION

Average Annual Returns

Prosser Dam Counts (Chinook, steelhead, sockeye and coho)



5

Species being restored

(Chinook, Coho, Lamprey, Sturgeon, Sockeye)

5

Times more lamprey returned during 2011-2019 compared to 2000-2010

650

More spring Chinook harvested annually 2000-2019 compared to 1989-1999

8

Hatchery/reintroduction projects

(Spring, Fall, & Summer Chinook, Coho, Pacific Lamprey, White Sturgeon, Sockeye, Summer Steelhead)

HONOR. PROTECT. RESTORE.

Yakama Nation Fisheries

Yakima Basin Production/ Reintroduction

Sockeye

- Extirpated by early 1900s, due to irrigation-project passage blockage.
- YN reintroduced to Lake Cle Elum in 2009.
- First adults returned in 2013.
- Cooperative efforts to restore passage (Yakima Basin Integrated Plan, USBR).
- Plan to reintroduce to other Upper Yakima lakes in future.
- Recent returns impacted by drought, heat.

Brood-year 2009 outmigrant (2011)

Release of transplanted adults (2009).

Returns are transported.
Alternatives are being tested.

Yakima Basin Production/ Reintroduction

Steelhead

- Wild/ natural population group (Satus, Toppenish, Naches, U. Yakima).
- Hydrosystem impacts, habitat degradation, and water management decisions brought the number of adults down to <1,000 in the 1990s.
- YN is researching viable population metrics collaboratively with WDFW.
- Status improving but affected by ocean conditions.
- Significant habitat restoration, protection being implemented by YN and partners.

Background: Yakima Basin Large Wood Aquatic Restoration Project

Yakima Basin Production/ Reintroduction

Steelhead (cont.)

- Kelt reconditioning (improving fitness of kelts to enable a second spawn) to increase lifetime natural reproductive success.
- Project began in 2001. CRITFC is a project partner.
- Average 200 reconditioned kelts released each year.

Collection of Kelts

Kelt Reconditioning

Release of Kelts

Background: YN Prosser Hatchery and Enumeration Facility

Yakima Basin Production/ Reintroduction

Summer Chinook

- Extirpated by 1970's, due to past land, water, and fisheries management practices.
- Spawned mouth to middle Yakima River.
- YN reintroduced in 2009.
  - Goals:
    - Locally adapted, natural-origin broodstock
    - Harvestable population
    - Temporal and spatial distribution
  - Recent 5-yr average returns: 1,181 fish.

Summer Chinook return at Prosser Facility, 2013

Yakima Basin Production/ Reintroduction

YKFP Manager (former Prosser Hatchery Manager) Joe Blodgett

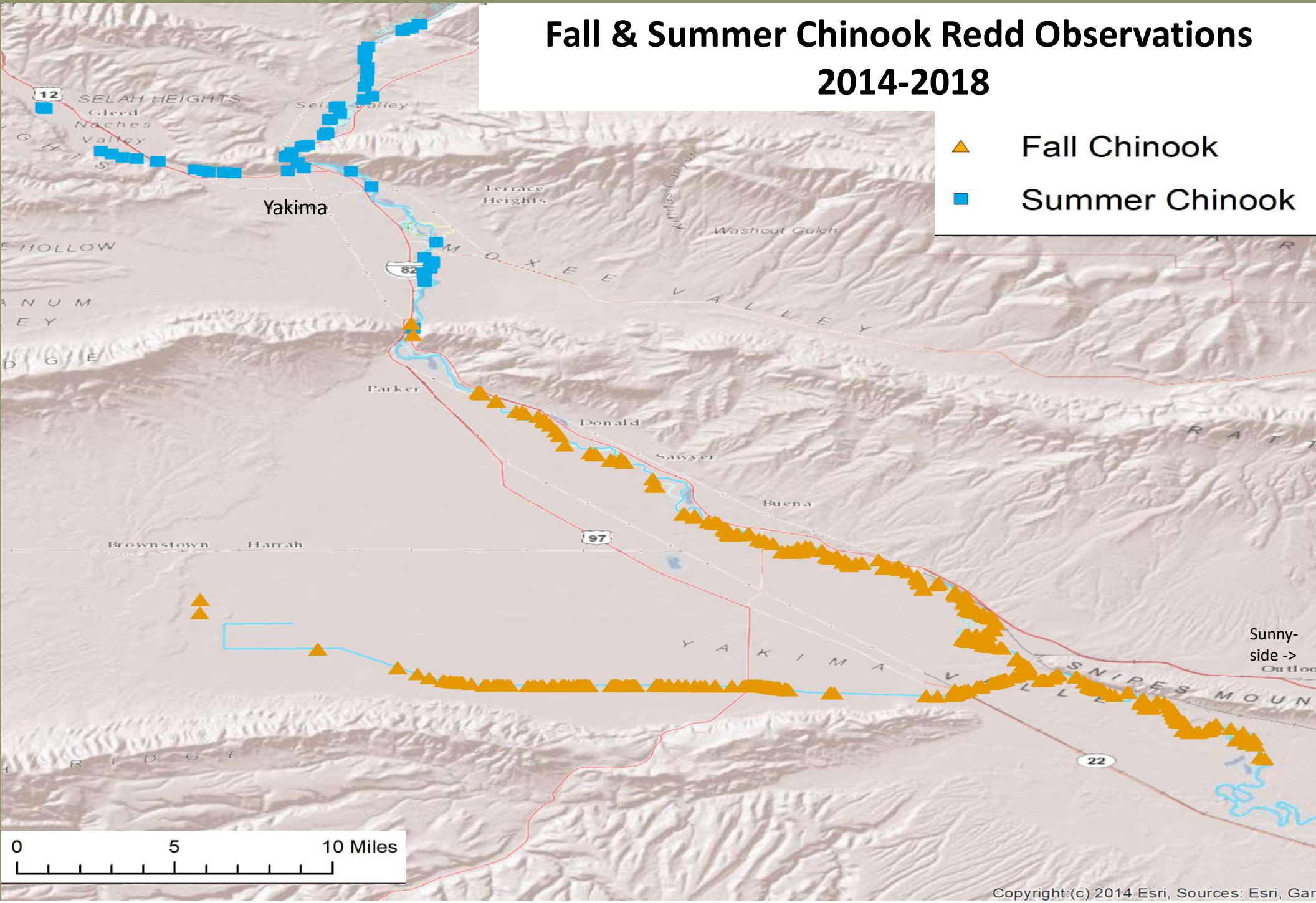
Fall Chinook

- Loss of natural production due to habitat losses from inundation of spawning habitat.
- YN supplemented from 1983, to offset lost productivity, and as result of US v. OR Columbia River Management Plan.
- Spawn in lower reaches of Yakima River.

- Goals: increase harvest levels, natural spawning abundance, distribution.
- Contributing to Treaty fishery.
- 10-year average escapement of 4,140 fish.

Yakima Basin Production/ Reintroduction

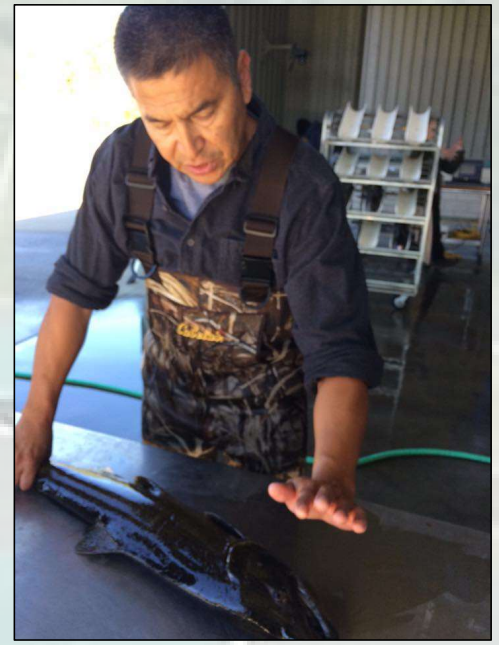
Fall & Summer Chinook Redd Observations 2014-2018



Yakima Basin Production/ Reintroduction

Spring Chinook

- Habitat loss, minimal subsistence harvest by 1990s.
- Levi George Cle Elum Supplementation & Research Facility (CESRF) opened in 1997.
- Purpose:
  - Enhance spring Chinook runs and provide fishing opportunities.
  - Research hatchery production best management practices.



Hatchery manager Charles Strom

Background: CESRF aerial view.

Yakama Nation Fisheries

Yakima Basin Production/ Reintroduction

Spring Chinook (cont.)

- **Average annual return of 10,250 fish.**
- **Recreational fishery opened in 2000, after 40 year closure.**
- **Extensive research at CESRF demonstrates success at producing fish for harvest and increased natural spawning.**

CESRF raceway

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

Background: CESRF aerial view.

Yakama Nation Fisheries

Melvin R. Sampson Coho Facility

Coho

- New, highly-efficient hatchery in Ellensburg, WA.
- Expanding reintroduction of extirpated coho (started in 1985).

Near Term Goals:

- 2020: Facility complete
- 2021: First smolts released
- 2024: First adult return

Long Term Goals:

- Produce 700,000 smolts/parr per year.
- Returns of 20,000 locally adapted adults/year.
- Re-establish naturally spawning population with sustainable harvest.

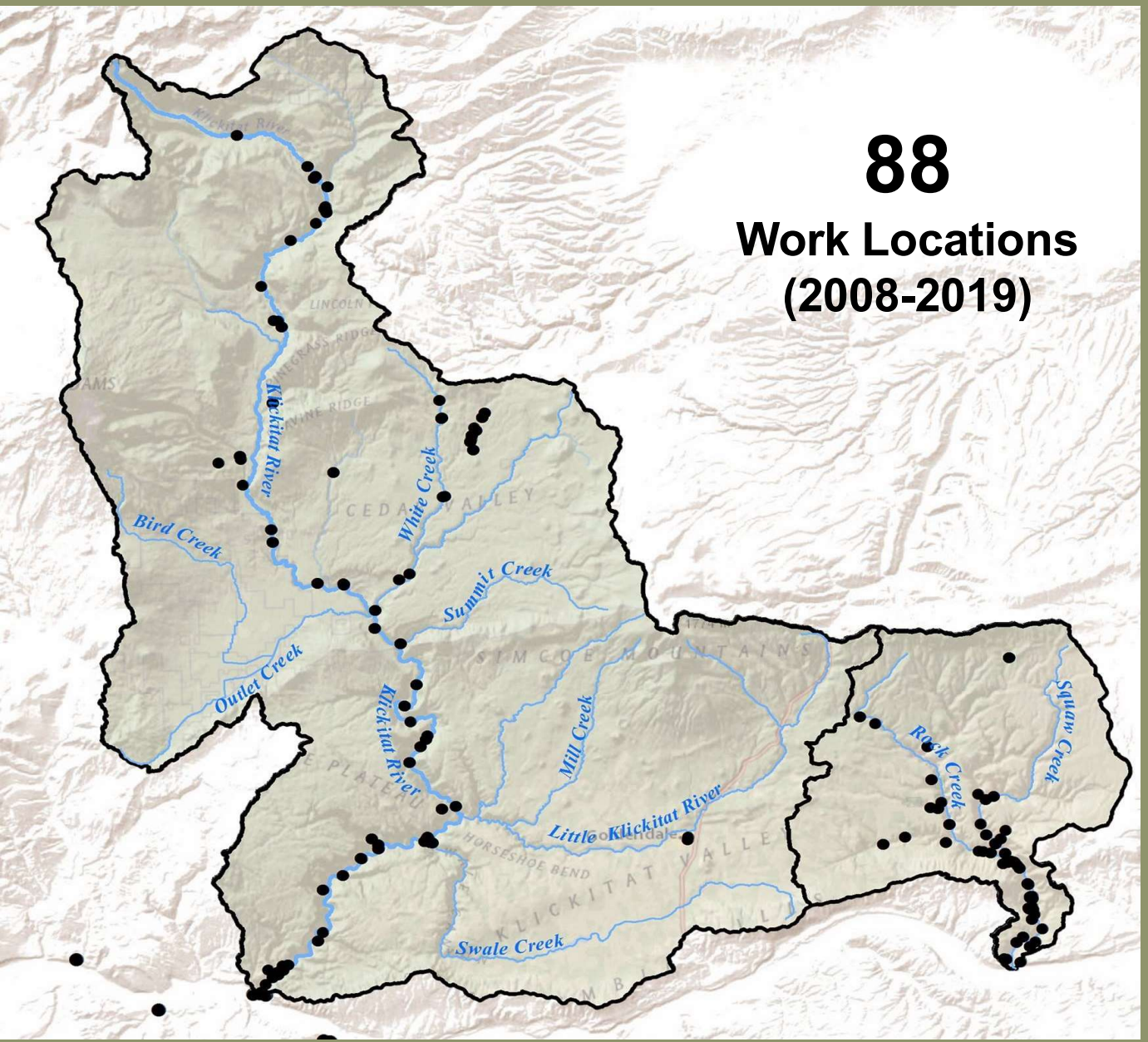
Groundbreaking

Rendering of new hatchery

Facility under construction (aerial view)

Yakama Nation Fisheries

KLICKITAT/ROCK CREEK SUBBASINS HABITAT RESTORATION



88
Work Locations
(2008-2019)

32.2
Miles
Stream habitat improved or created

109
Miles
Riparian habitat treated or improved

595
Acres
Wetland and upland habitat treated or protected

134
Miles
Stream now accessible

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

BPA funded metrics reported to cbfish.org
(1/2008-12/2019) plus cost-share SRFB work

Southern Territories Habitat Restoration

Habitat Strategy:

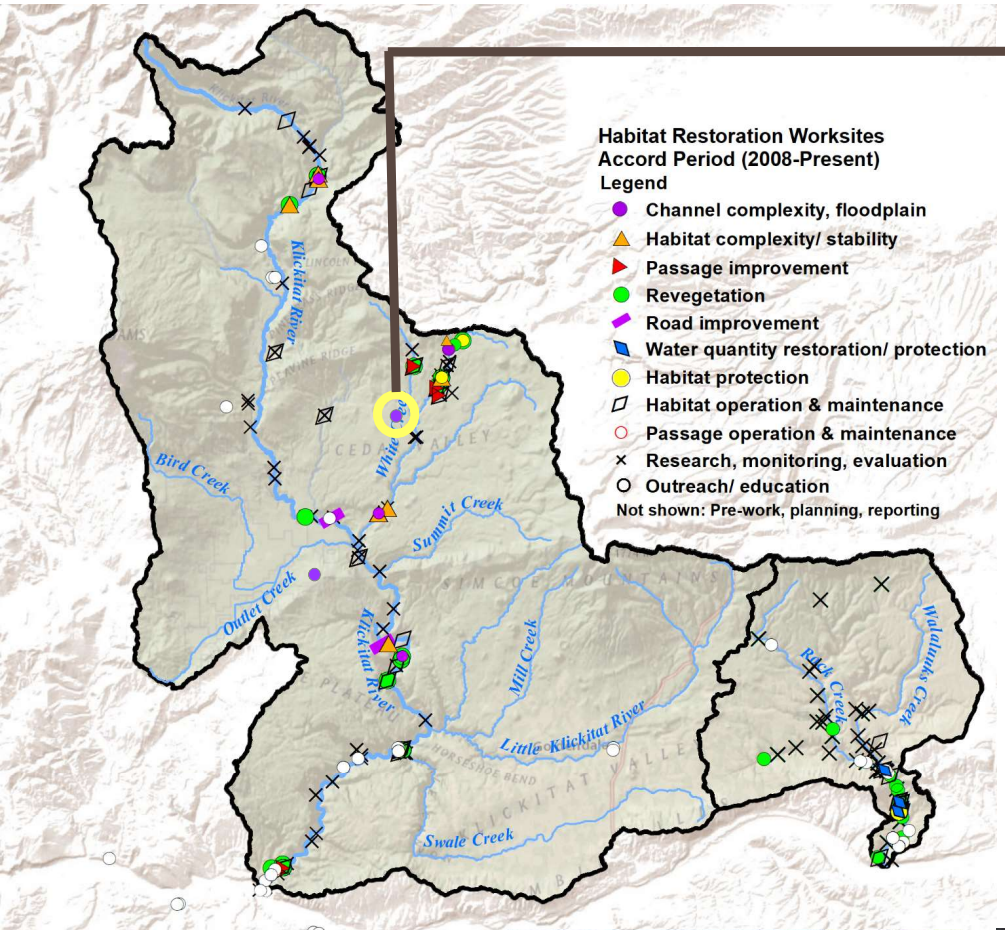
- Watershed protection and reach scale projects to improve flows and habitat conditions.
- Prioritized restoration work based on M&E and habitat assessments.
- Effectiveness monitoring where appropriate.
- Land acquisitions and easements to protect key habitats.
  - Simcoe Mtns. Partner with WDFW and Conservation Dist. to develop Coordinated Resource Management Plan.

Lower Klickitat River, floodplain reconnection.

Background: Klickitat Canyon spawning survey.

Yakama Nation Fisheries

KLICKITAT SUBBASIN – 2019 HABITAT SPOTLIGHT



White Creek 191 Meadows Enhancement Project

Problem: Critical spawning, rearing habitat for ESA Threatened steelhead degraded from past land use practices.

Solution: Increase wetland and instream habitat complexity, resiliency, and roughness to improve flows, reduce sediment, increase shade, cover.

Accomplishments:

- 0.77 acres of floodplain reconnected
- 5 pools deepened
- 5 log jams installed at meander bends
- 1 mile of fence built to exclude cattle

Stream disconnected from floodplain and downcut.

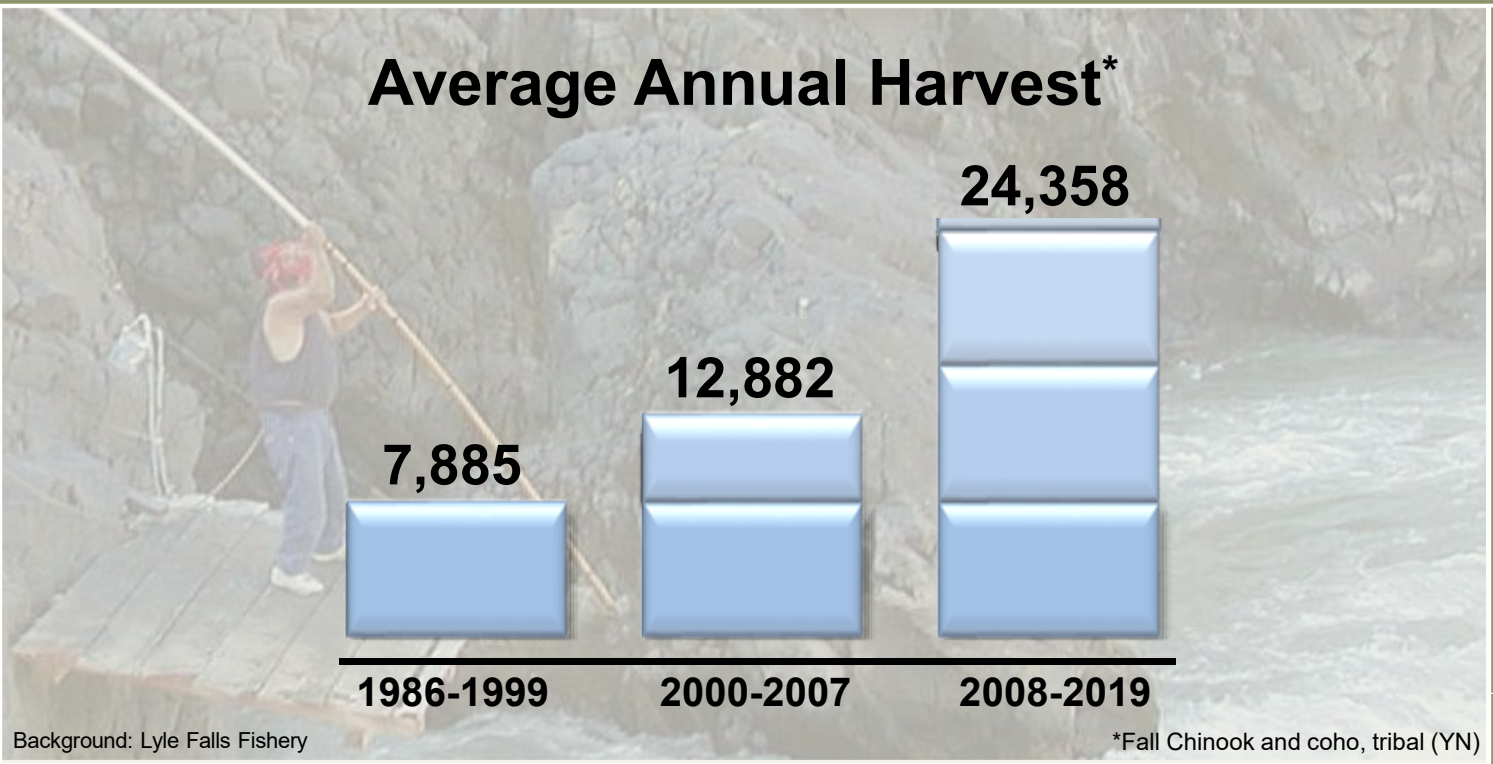
Floodplain reconnected and large wood installed ("after" photo taken before re-watering post-construction).

Aerial view.

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

KLICKITAT SUBBASIN SPECIES RESTORATION



Background: Lyle Falls Fishery

*Fall Chinook and coho, tribal (YN)

3

Species being supported through restoration work or supplementation

(Chinook, Coho, Steelhead)

6,230

More coho harvested annually 2008-2019* compared to 1997-2007

*Tribal

5,953

More fall Chinook harvested annually 2008-2019* compared to 1997-2007

*Tribal

3

Hatchery/reintroduction projects restoring or supplementing species

(Spring & Fall Chinook, Coho)

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

Klickitat Subbasin Production

Klickitat Hatchery (Mitchell Act)

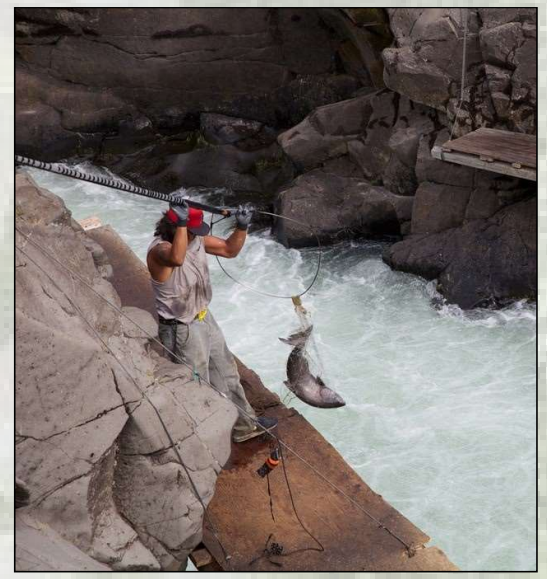
Spring Chinook

- Native population supplemented to mitigate for fish losses.
- Hatchery reform underway to transition to a conservation/harvest program.

Chinook jumping at Lyle Falls

Fall Chinook and Coho

- Introduced in 1952 to meet harvest obligations for Tribal and Sport fisheries.
- Goal: Fulfill harvest obligations while establishing locally produced brood source.



Lyle Falls Fishery (CRITFC)

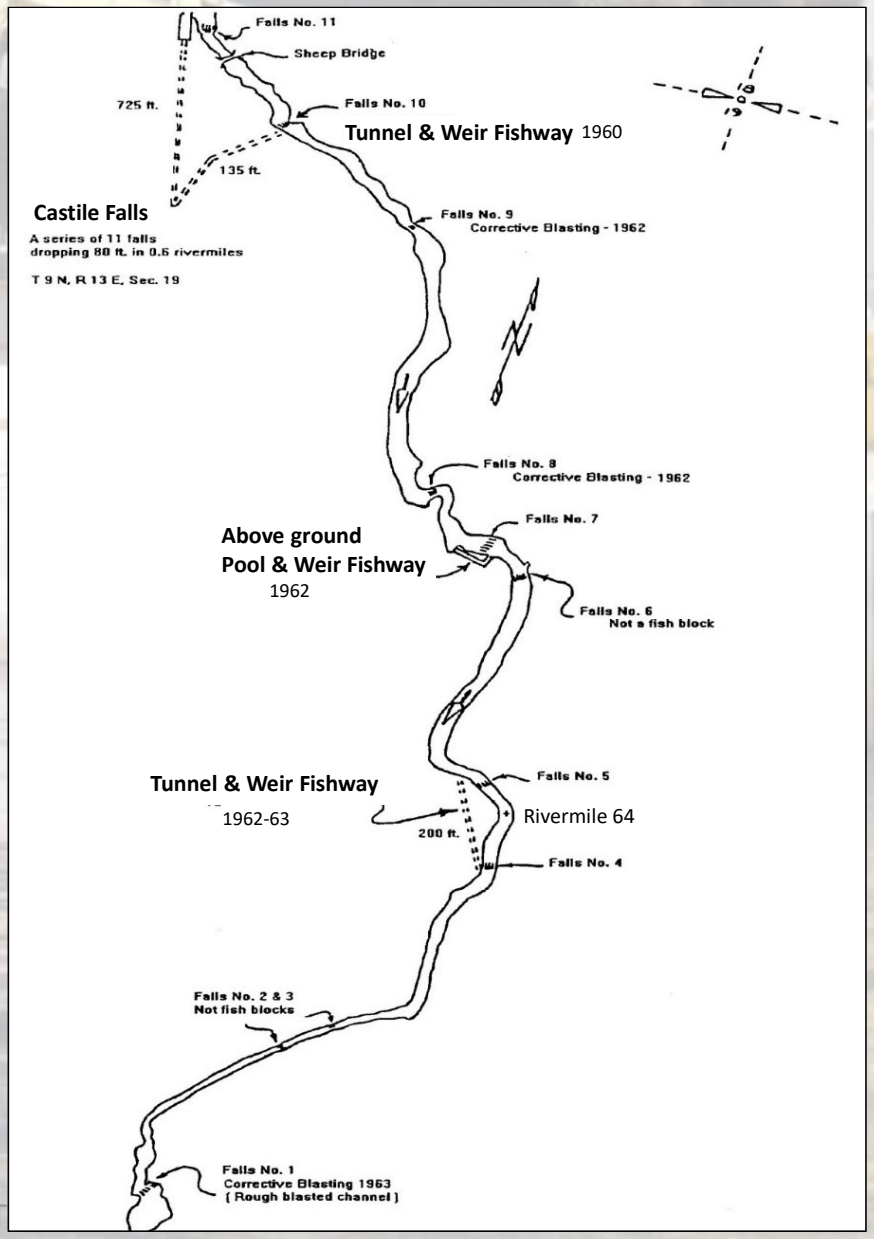
Background: Klickitat Hatchery aerial view.

Klickitat Subbasin Facility Transfers

Klickitat Fishways and Hatchery (Mitchell Act)

Castile Falls Fishways

- Upper-basin fishways built in early 1960s.
- Modifications in 2005.
- Transfer of O&M from WDFW to YN 2006.
- Fish Accord funded M&E upgrades, digital imagery, PIT array, and trap.



Background: Klickitat River fishway, screwtrap.

Klickitat Subbasin Facility Transfers

In 2003: Washington State-Yakama Nation MOU establishing the transition of Klickitat Basin Mitchell Act Facilities operations to the YKFP.

Lyle Falls Fishway (Mitchell Act)

- **Built in early 1950s**
- **2006: Joint Operational Agreement established for Lyle Falls Fishway.**
- **2010-13: Fish Accord funded upgrades, PIT array, fishway extension, and trap.**
- ***New facility significantly increases managers' ability to conduct monitoring and research.***

Background: Klickitat Hatchery aerial view.

Klickitat Hatchery Transition

Klickitat Hatchery (Mitchell Act)

- Continuous operation since 1949.
- 2008: Joint Operational Agreement established for Klickitat Hatchery.
- 2008-Present: Multiple facility improvements, various funding sources (BPA, NOAA, WA. State).
- Fish Accord-funded upgrades currently in the early design stage, NEPA underway.
- Fish Accord-funded upgrades focus on:
  - replacing aging water supplies, brood and rearing facilities.
  - change spring Chinook production from existing “segregated” to an “integrated” program.
  - increase production from 600k to 800k yearling smolts.

Background: Klickitat Hatchery bridge placement.

Klickitat Hatchery Transition

Klickitat Hatchery (property transfer)

- Upcoming WDFW Commission briefings from the YKFP over the course of the design, NEPA, and construction phases.

- As described in 2003 Transition MOU both parties "*Intent to establish a real estate and personnel property transfer*" and use the NEPA process (currently underway) to facilitate the State's SEPA process for fee title transfer.

- Continue well-established relationship with WDFW Region 5 biologists and fish managers on a variety of production and harvest matters

- Continue partnership with WDFW's Lewis River, Washougal, and Skamania Hatcheries to support harvest in the Klickitat River.

Background: Klickitat Hatchery aerial view.

Southern Territories Research & Monitoring

Research and Monitoring:

- Adult and juvenile populations.
- Distribution, migration, habitat use.
- Genetic composition, interaction.
- With WDFW monitoring White Salmon River recolonization post-Condit Dam.
- Assessing predation impacts within Zone 6.

Miller Rocks Island gull colony – The Dalles Pool

Rock Creek steelhead

Background: Lyle Falls Fishery (wildcolumbiasalmon).

Yakama Nation Fisheries

Upriver Bright Fall Chinook Broodstock Issue

- In 2018, URB fall Chinook was critically depressed.
- Attempting only to protect future production shortfalls, facilities with brood-capture capabilities were prioritized by US v. OR parties.
- Prosser Hatchery Program was non-existent, Klickitat was significantly short.
- This was inequitable: Important Yakama Nation fisheries bear the conservation burden, while other program needs were met at or near 100%.
- Result: Yakama Nation and non-tribal terminal fisheries will be severely impacted in the near future.
- We urge the US v. OR parties (especially WDFW) avoid repeating this conflict in future with early dialogue, searching for ways to avoid repeating this mistake.

Mid & Upper Columbia Restoration/ Reintroduction

Pacific Lamprey

- **Project began in 2009.**
- **Goal: Increase populations to sustainable harvest levels by 2025.**

Adult lamprey translocation (Ahtanum)

Activities:

- **Translocate adults** throughout historic range
- **Artificial propagation/ larval outplanting**
- **Passage structure** improvements
- **M&E:** natural history, limiting factors
- **Salvage:** from dewatering/ dredging

Juvenile lamprey salvage

Project Success:

Distribution and abundance is improving, including wild spawning.

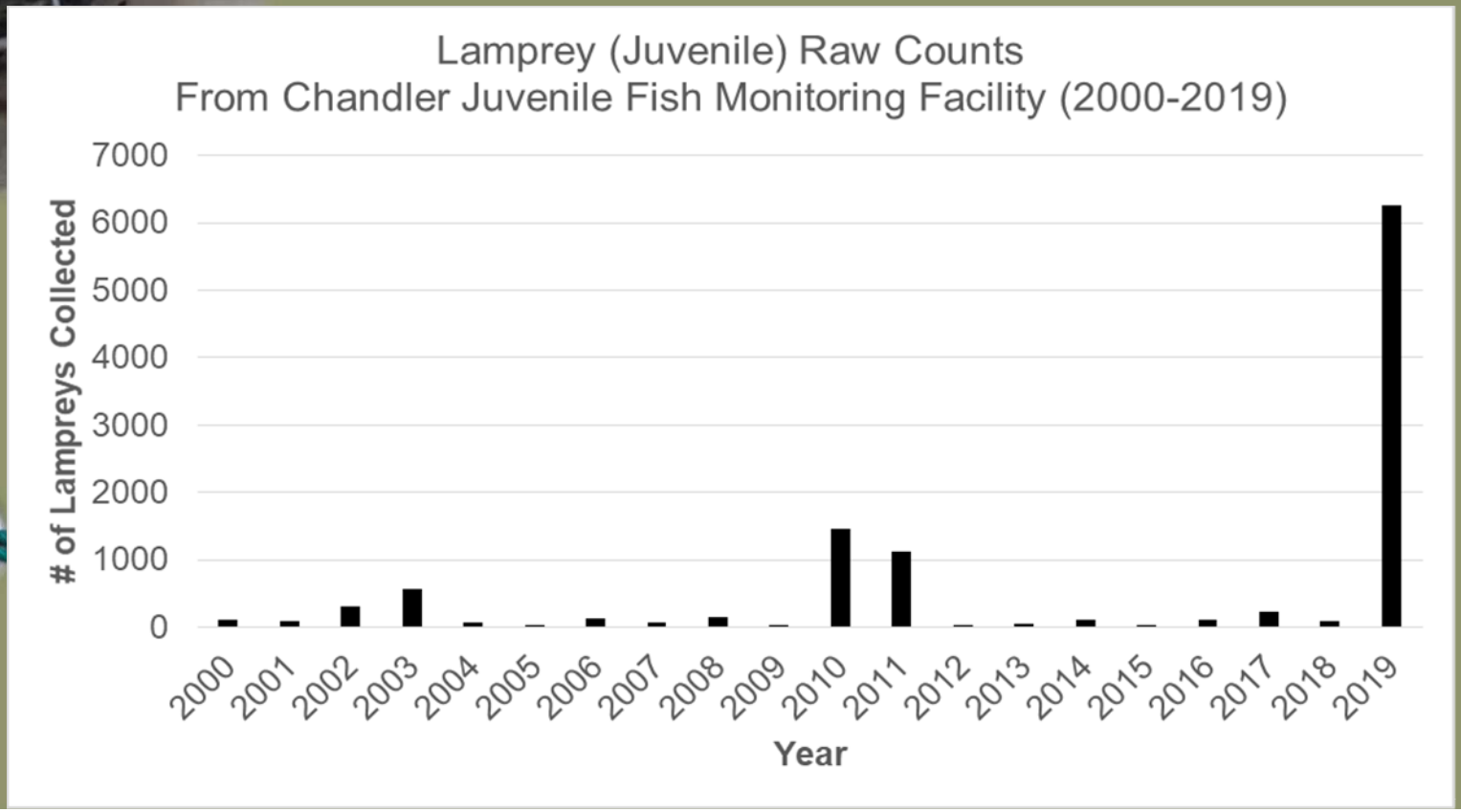
Background: Willamette Falls (historic).

Large Increase in Juvenile Lamprey Outmigrants
(Yakima Basin, over 6 Years)

2019 Toppenish Estimate from Screw Trap Data
~18,000 (from avg. ~0)

- **10% of all outmigrating juvenile lamprey (detected at John Day) are attributed to the Tribes' reintroduction efforts.**

2019 Lower Yakima Estimate
~111,000 Juvenile
(x22 Increase from avg. 5,027)



Mid-Columbia Restoration/ Reintroduction

White Sturgeon

- Low recruitment since 1980s.
- YN research rearing techniques since 1990s.
- Expanded production in 2009.
- Working in Mid-Columbia to date, expanding to Master Program (throughout mainstem Columbia River) in future.

Goals:

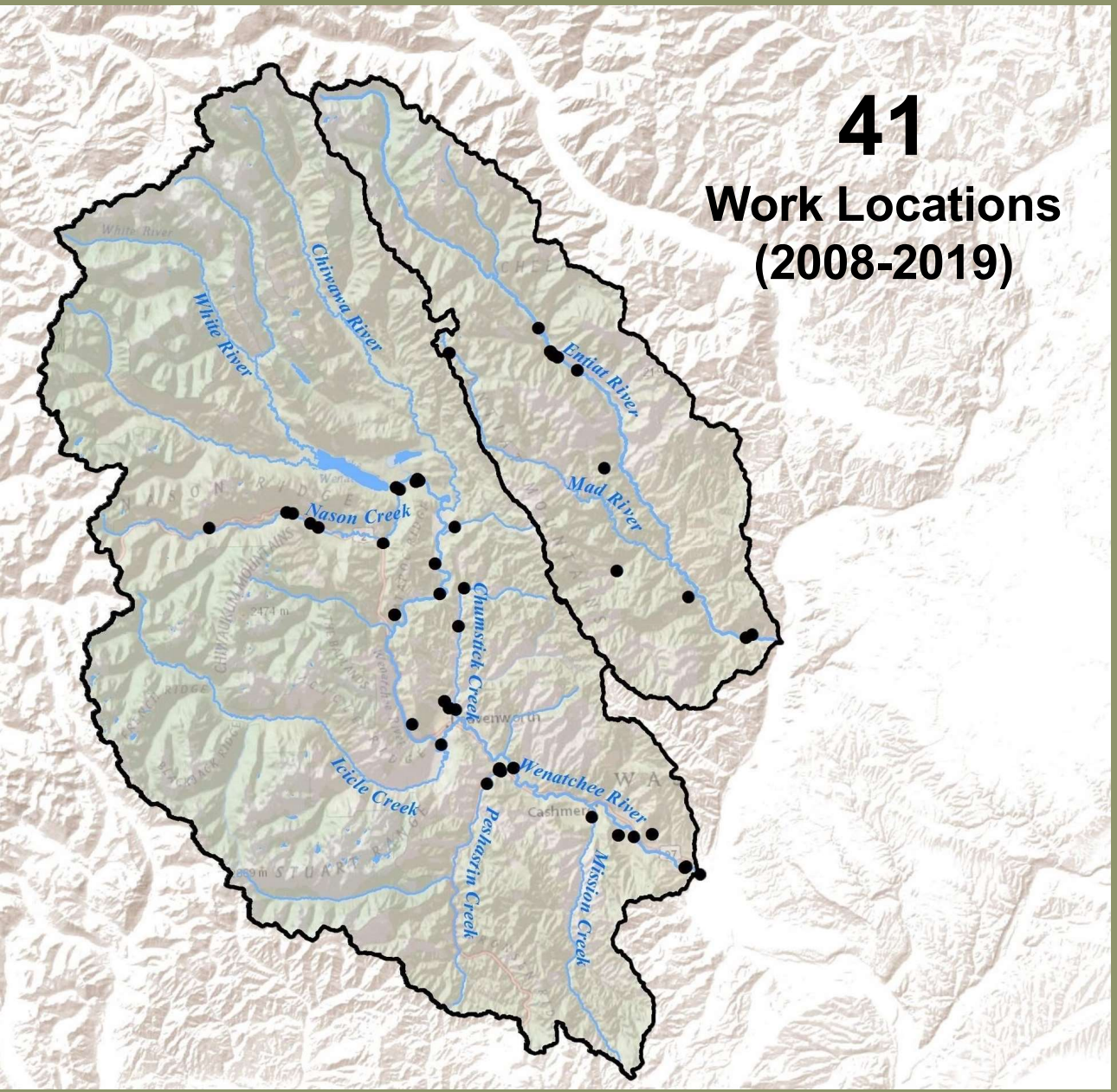
- Supplement wild production with hatchery reared juveniles.
- Healthy, self-sustaining, harvestable wild populations.

Broodfish are returned to the river after live-spawning

Eggs are fertilized and hatched, juveniles reared for about a year.

Juveniles tagged and released

WENATCHEE/ENTIAT SUBBASINS HABITAT RESTORATION



41
Work Locations
(2008-2019)

36
Miles
Stream and riparian habitat treated, improved or created

131
Structures
Installed for instream habitat complexity

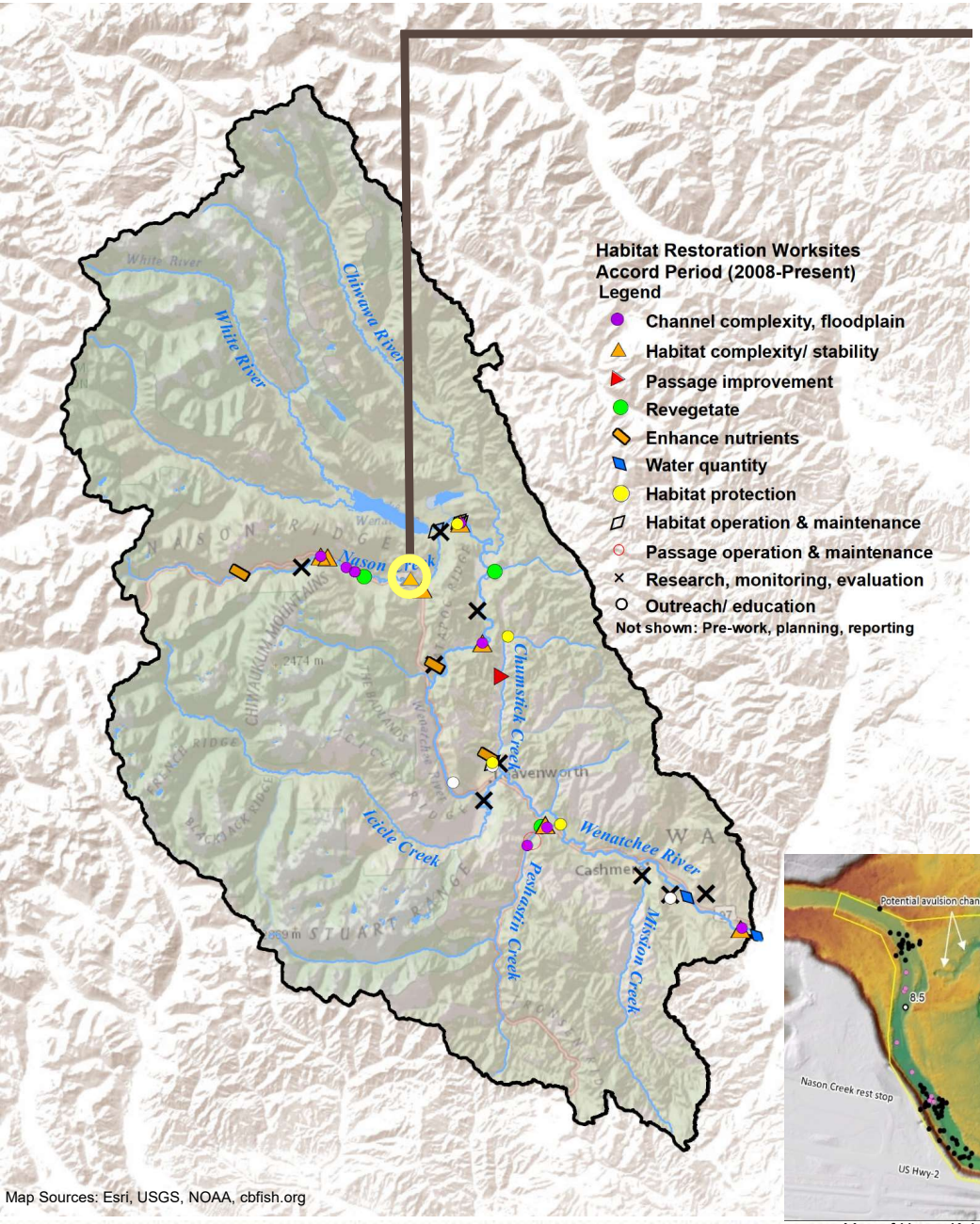
472
Logs, Boulders, Pools
Installed for instream habitat complexity

2
Miles
Stream now accessible

Yakama Nation Fisheries

HONOR. PROTECT. RESTORE.

WENATCHEE SUBBASIN– 2019 HABITAT SPOTLIGHT



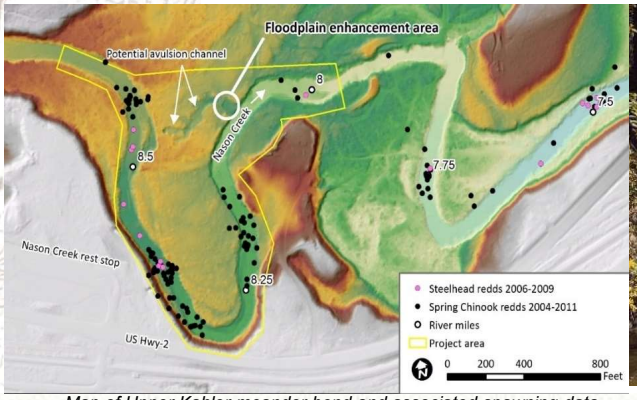
Nason Creek Upper Kahler Project

Problem: Transportation, powerlines, and development have cutoff an historic meander, losing spawning an refuge habitats, and threatening channel avulsion (jumping to steeper course).

Solution: Wood structures were installed to enhance existing juvenile rearing habitat while protecting against channel avulsion.

Accomplishments:

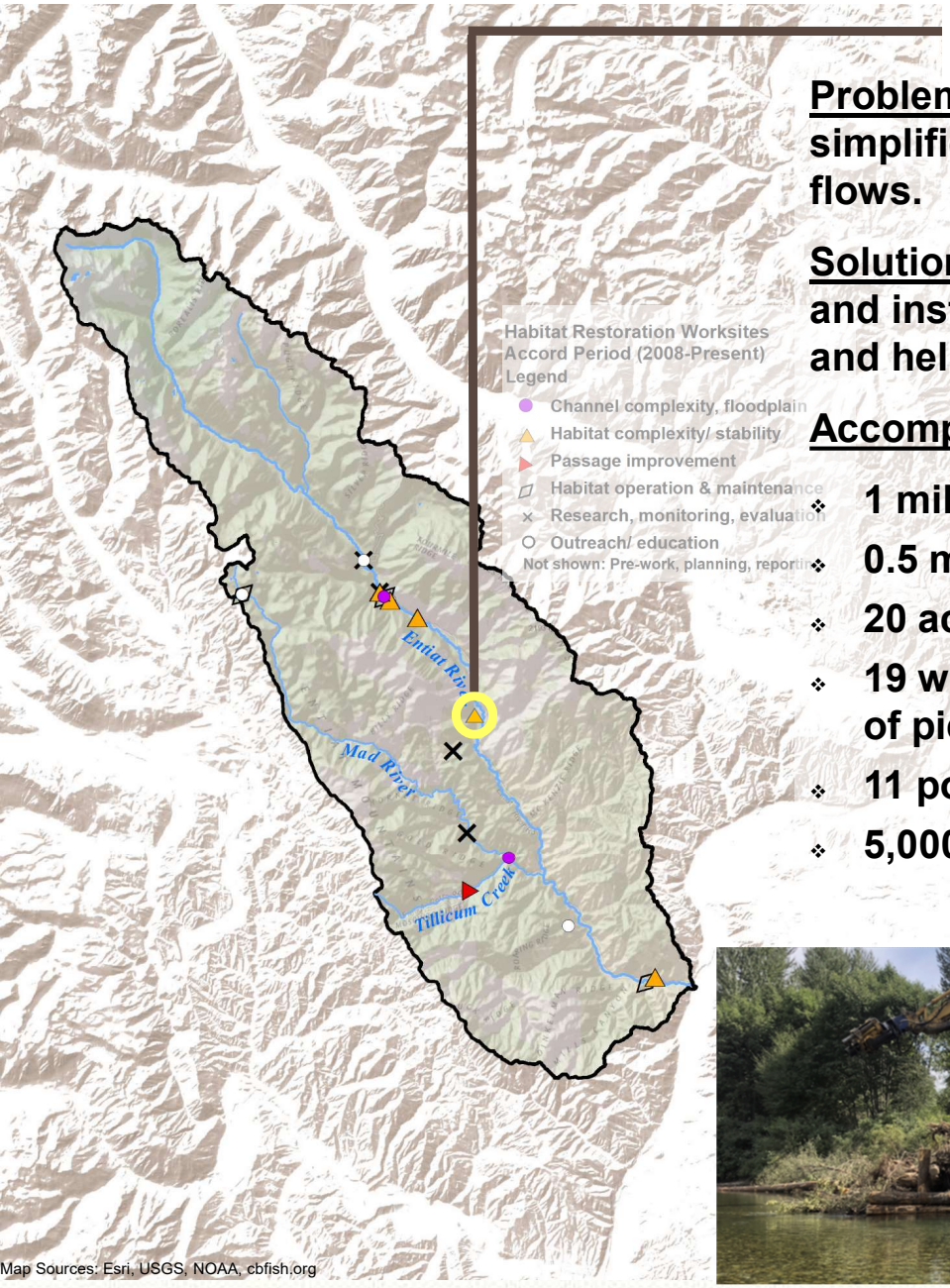
- 2 wood structures installed
- 3 pools created
- 1 log weir
- 2 wood structures installed



Map of Upper Kahler meander bend and associated spawning data.

Wood structures buried along the streambank at the project site. (Photo: YN)

ENTIAT SUBBASIN– 2019 HABITAT SPOTLIGHT



Stormy A Project

Problem: Land clearing and historic instream wood removal simplified the stream, reduced habitat availability, and disrupted flows.

Solution: Restoring floodplain connections and side channels and installing instream wood provides refuges from high flows, and helps maintain good quality habitat and perennial flow.

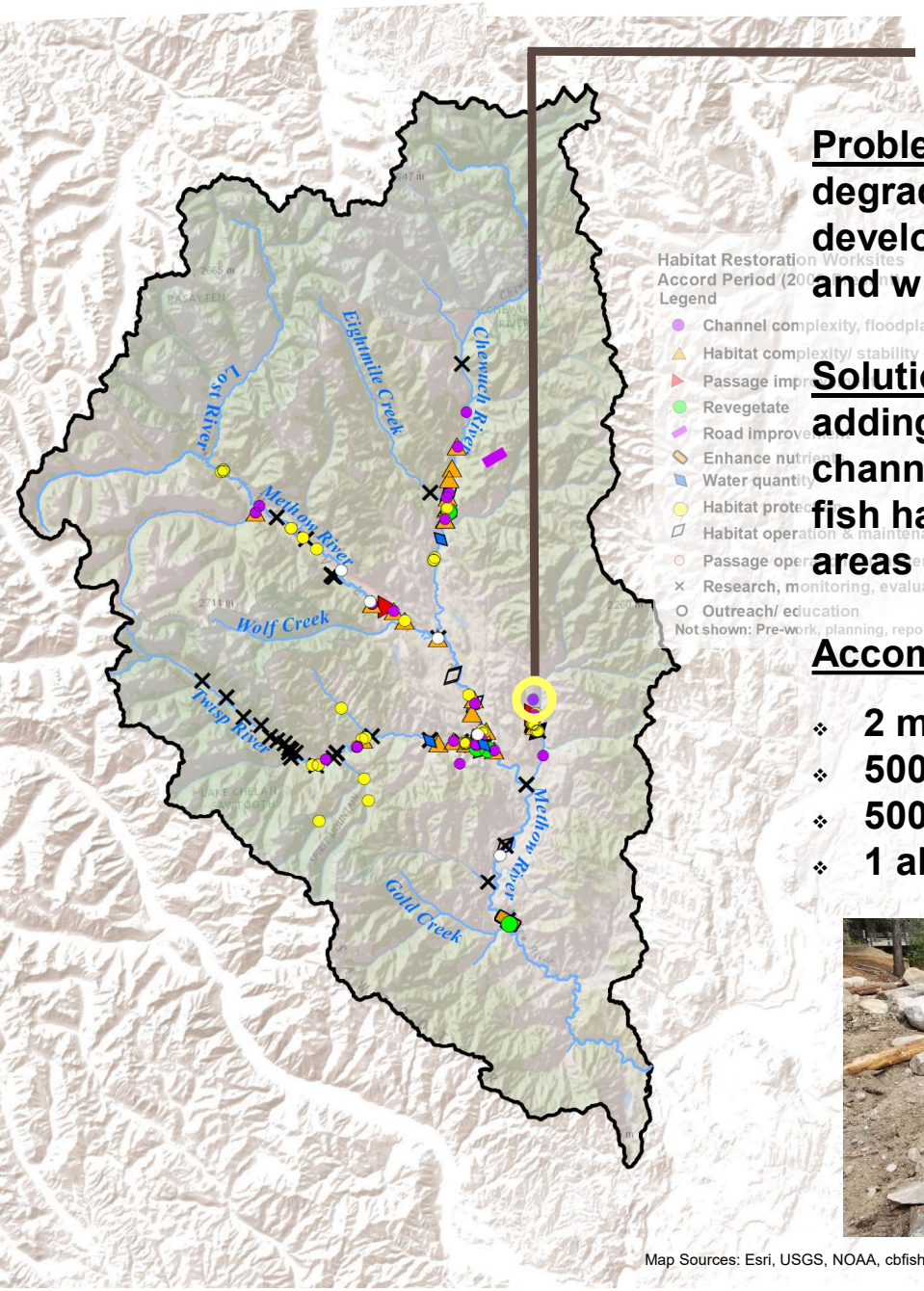
Accomplishments:

- 1 mile stream restoration
- 0.5 miles of perennial side channel restored
- 20 acres of floodplain reconnected
- 19 wood structures installed instream, consisting of hundreds of pieces of wood
- 11 pools created
- 5,000+ native trees/shrubs and 13,000 wetland plugs installed

Log structure during construction. (Photo: YN)

Project in progress, with temporary bridge in place. (Photo: YN)

METHOW SUBBASIN– 2019 HABITAT SPOTLIGHT



Map Sources: Esri, USGS, NOAA, cbfish.org

Beaver Creek (Reach 5)

Problem: High-value habitats have been degraded and flows impaired by development, natural resource extraction and wildfires.

Solution: Using floodplain reconnection, adding logs instream, and restoring side-channels and alluvial fans helps restore fish habitat complexity, cover, spawning areas and flows.

Accomplishments:

- 2 mile-long stream restoration effort
- 500 logs placed instream
- 500-foot perennial side channel created
- 1 alluvial fan with hydrologic restoration

Completed new side channel. (Photo: YN)

Channel-spanning and habitat forming logs, sourced from adjacent hillslope. (Photos: YN)

National Recognition
Tribal Accomplishment Award

- Yakama Nation Fisheries received 2019 USFS “Rise to the Future” award for excellence and leadership.
- Nominated by Okanogan-Wenatchee National Forests.

Our Restoration Objectives:

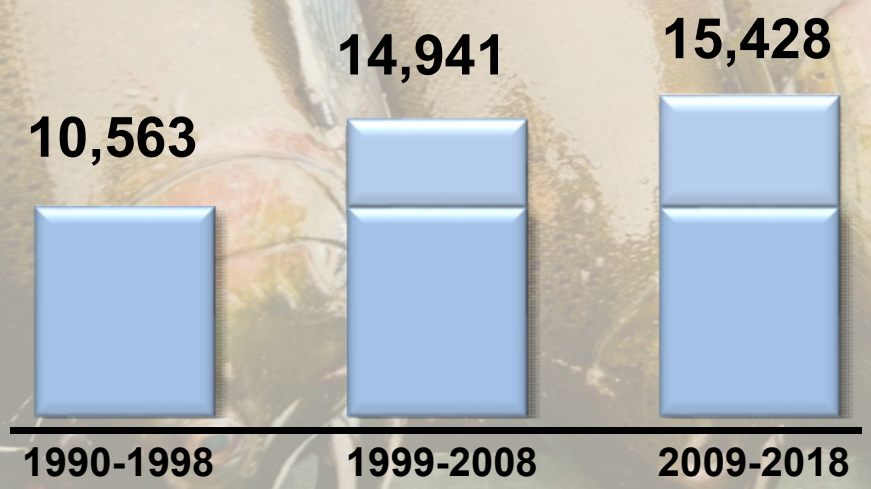
1) Increase large wood habitat
2) Restore riparian and floodplain habitat
3) Create and reconnect side channels
4) Provide for improved passage for aquatic organisms

Yakama Nation Fisheries

Background: Historic 1890’s Side Channel Project , Methow Subbasin.

WENATCHEE/ENTIAT SUBBASIN SPECIES RESTORATION

Average Annual Returns*



*Chinook, coho, and steelhead (YN, WDFW and PUD reports, natural and hatchery), Note: Entiat Summer Chinook unavailable 2018.

4

Species being restored

(Chinook, Coho, Steelhead, Lamprey)

3,497

Coho - average annual return 2009-2018*

*Wenatchee only

1,357

More spring Chinook returned annually 2009-2018 than 1990-1998

HONOR. PROTECT. RESTORE.

5

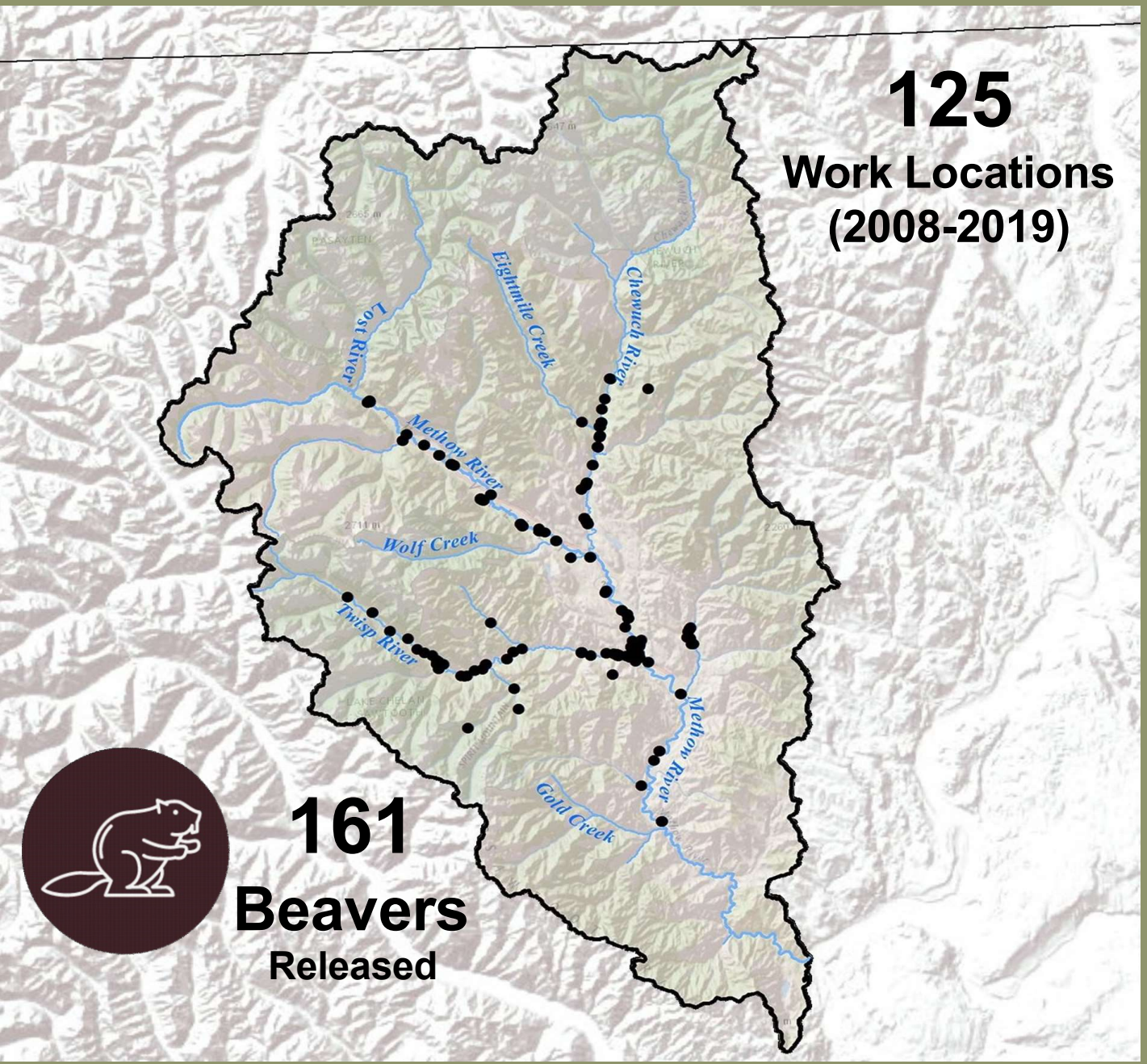
Hatchery, reintroduction, or research projects restoring species

(Spring & Summer Chinook*, Coho, Summer Steelhead, Pacific Lamprey)

*Summer Chinook not YN project

Yakama Nation Fisheries

METHOW SUBBASIN – HABITAT RESTORATION



125
Work Locations
(2008-2019)

161
Beavers
Released

37
Miles
Stream habitat treated, improved, or created

31
Miles
Riparian habitat treated, improved or protected

393
Acres
Wetland and upland habitat improved or protected

2
Miles
Stream now accessible

Yakama Nation Fisheries

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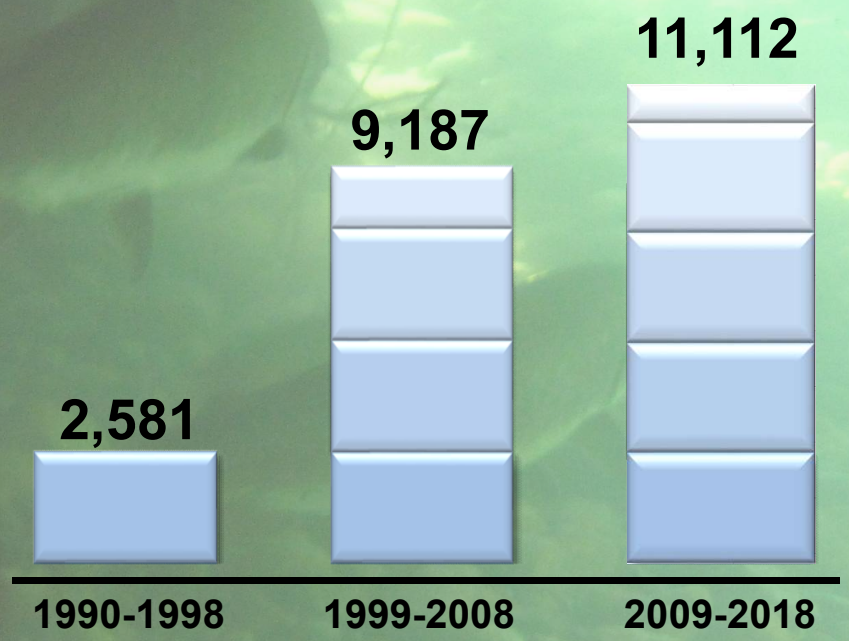
METHOW SUBBASIN – SPECIES RESTORATION

Average Annual Returns*



* Chinook, coho, and steelhead (YN, WDFW and PUD reports, natural and hatchery).

4

Species being restored

(Chinook, Coho, Steelhead, Lamprey)

2,912

More coho returned annually 2008-2018 than 2001-2007

1,109

More wild steelhead returned annually 2009-2018 than 1990-1999*

*Based on dam counts.

5

Hatchery/reintroduction projects restoring species

(Spring Chinook, Summer Chinook, Coho, Summer Steelhead, Pacific Lamprey)*

*Summer Chinook not YN project

Yakama Nation Fisheries

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Upper Columbia Production/ Restoration

Coho

Mission: *To re-establish naturally spawning coho populations in mid-Columbia tributaries to biologically sustainable levels which provide significant harvest in most years*

- **Functionally extirpated by the early 1900s.**
- **YN began reintroductions in 1997/1999 (Methow, Wenatchee) using lower Columbia River stocks.**

Adult male coho

Phased Approach:

1. **Broodstock Development**
   - **Eliminate lower Columbia transfers**
   - **Ensure can reach key habitat**
2. **Natural Production**
   - **Increase range**
   - **Emphasize local adaptation**

Background: Spawning coho, Jeremy Takala, YN

Yakama Nation Fisheries

Upper Columbia Production/ Restoration

Coho

1. **Broodstock Development:**

   - **Transition to local broodstock**
     - Completed in Wenatchee and Methow Subbasins in 2005
   - **Local Adaptation**
     - Move capture sites upstream
     - Ensure reaching key habitat areas
     - Completed in the Methow Subbasin

> ➢ ***Expanded acclimation sites to increase natural origin productivity within historic spawning areas.***

Snorkel survey

Yakama Nation Fisheries

Background: Acclimation site.

Upper Columbia Production/ Restoration

Coho

2. **Natural Production**:

- **Implementation Phase**
  - Introduce to new habitats, create spawning aggregate
  - Reduce numbers released after 3 years
- **Support Phase**
  - Reduce release sizes
  - Increase proportion natural influence

➢ ***Natural reproduction is now occurring.***

Coho carcass

Yakama Nation Fisheries

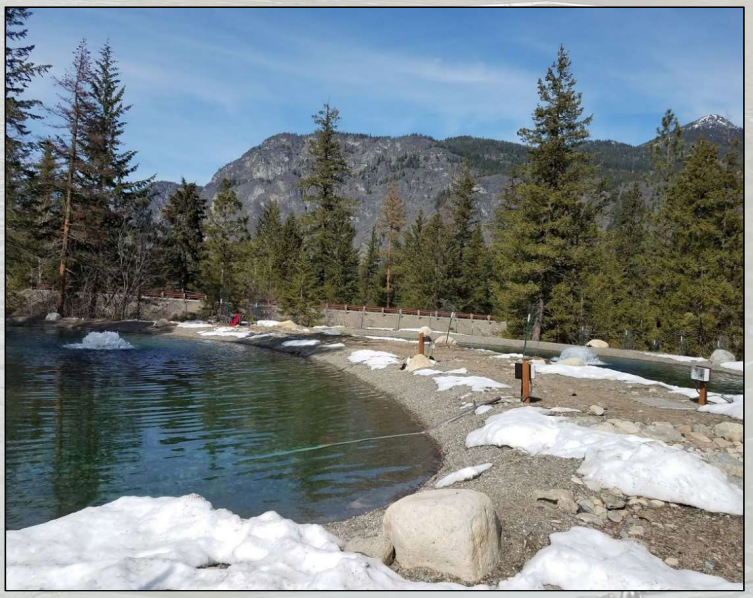
Upper Columbia Production/ Restoration

Coho

Success:

- Broodstock Development Phase goals are being achieved.
- Methow now moving into Natural Production Phase (2019).
  - 1 million smolts from 8 sites in-basin.
  - Winthrop NFH, 3 private landowners, 2 PUDs owned & operated ponds.
  - Coho acclimated & released at same time as PUD spring Chinook.

Juvenile coho



Early Winters ponds, Methow Subbasin

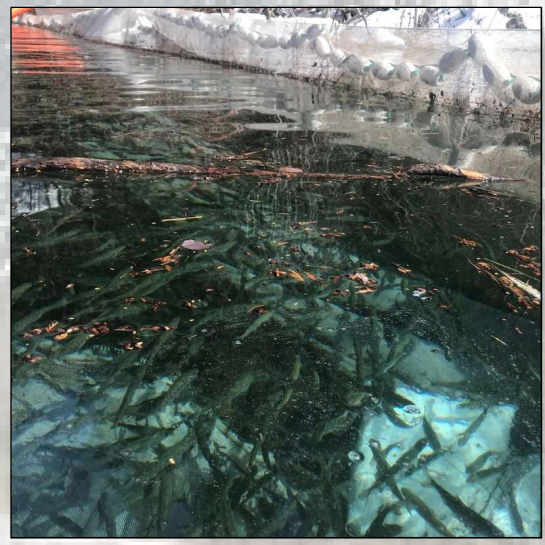
Background: 8-Mile Pond

Upper Columbia Production/ Restoration

Spring Chinook & Summer Steelhead

Multi-Species Acclimation

- 30,000 spring Chinook (DCPUD mitigation fish) released at Goat Wall acclimation site
- Utilizes suitable natural ponds to improve effectiveness.
- High in-pond and outmigration survival, minimal escapement
- Adult return data pending.
- Collaborative research evaluating improving homing and habitat use.



Chinook in acclimation pond.

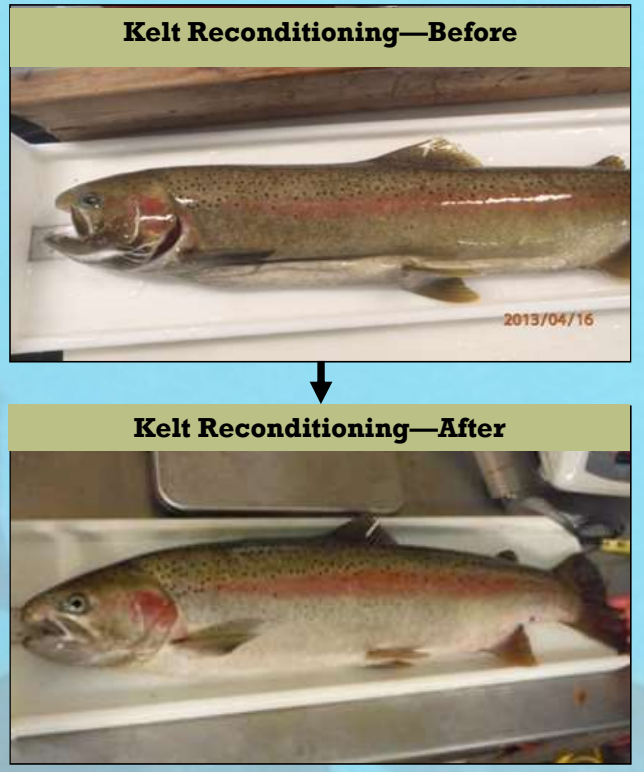
➢ ***Long-term sustainability:***
Encourages natural spawning throughout historic range.

Background: Natural acclimation site (Goat Wall, Upper Methow)

Upper Columbia Production/ Restoration

Steelhead Kelt Reconditioning

- Reconditioning allows steelhead to spawn a second time, avoiding mortality associated with migrating downstream through 7-9 dams
- YN began reconditioning natural origin steelhead kelts in the Upper Columbia in 2012.



Research:

- Partnering with WDFW on reproductive effectiveness study
- Goal: Document increased lifetime reproductive success through kelt reconditioning.
- Proven successful in the Twisp River and reconditioned kelts are contributing to steelhead populations in the wild.

Background: Steelhead kelts in reconditioning tank.

Yakama Nation Fisheries

Yakama Nation Fisheries

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YBIP Project Partnerships with WDFW

- Bateman Island
- Teanaway Community Forest restoration
- Bull Trout Rescue and Habitat Improvements
- Wapato Reach Action Plan
- Gold Creek Restoration
- Tieton River Restoration
- … and many others

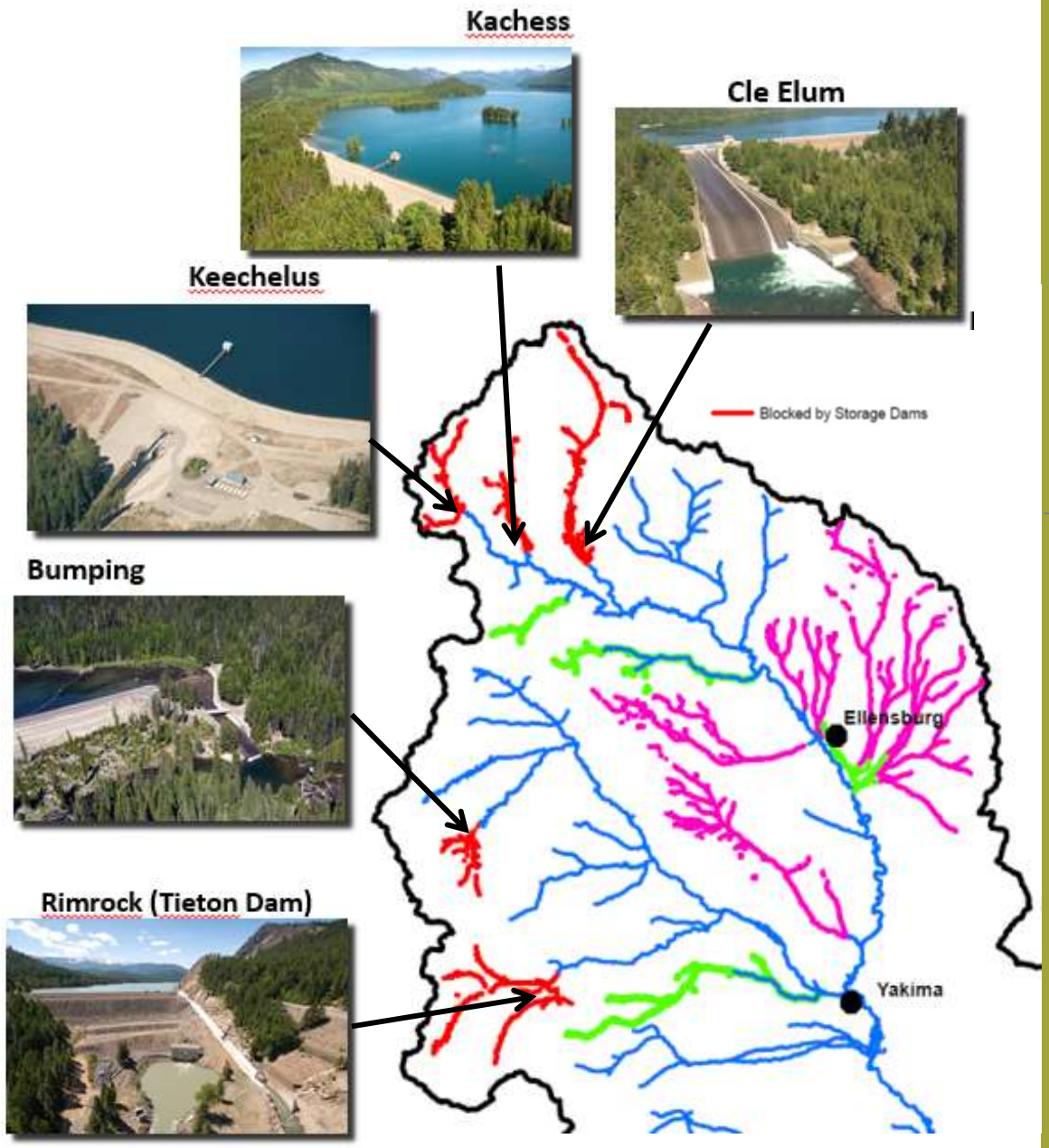
Photos of the August 2019 Large Wood placement in the Teanaway Community Forest

Importance of Fish Passage at Reclamation Reservoirs

- Increase anadromous species abundance and diversity.
- Enable full reestablishment of Sockeye Salmon runs.
- Provide greater genetic interchange for listed bull trout.
- Open much high quality, high elevation habitat with unregulated flows, cool temperatures, public ownership.

Cle Elum River above Lake
- from Cathedral Rock

Photo: Tom Ring



Yakima River Basin Integrated

Water Resource Management Plan

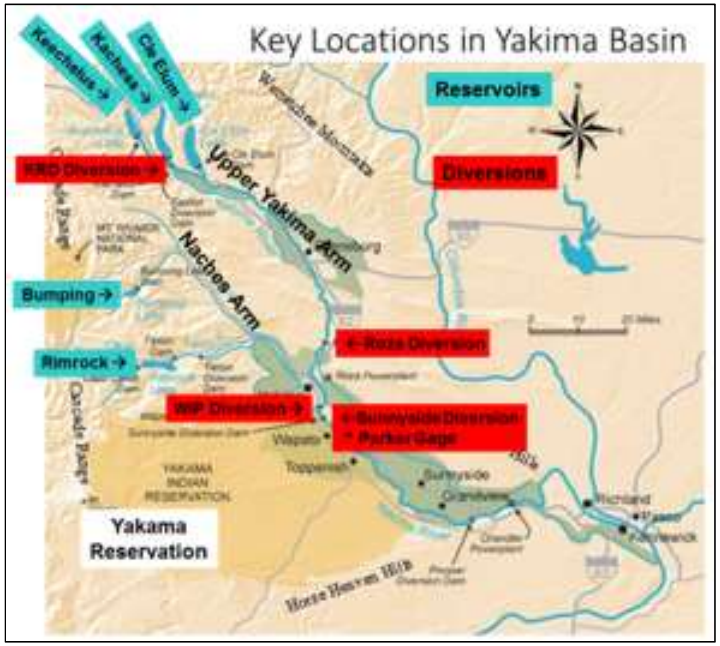
Reservoir Fish Passage Element

"Provide upstream and downstream fish passage at all Reclamation reservoirs."

Benefits:

- **Allow reintroduction of sockeye runs**
- **Increase anadromous species abundance**
- **Provide greater genetic interchange for bull trout**
- **Providing access to high quality, publicly owned, cold water habitat at higher elevations**

The Storage Reservoirs

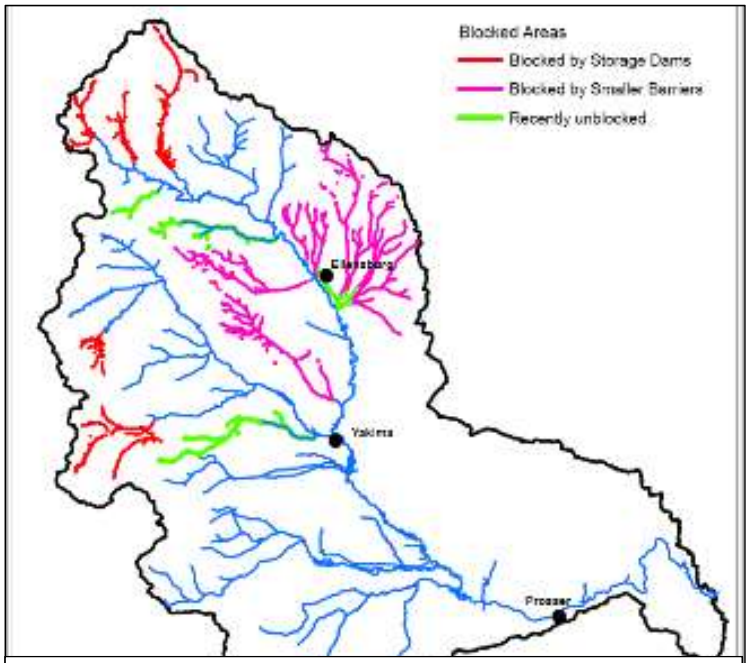


Bumping Reservoir:
A century without Sockeye

← Dams completely blocked fish passage for salmon, steelhead, and bull trout. →

Profoundly altered streamflow patterns needed for salmon spawning and migration

← Construction of Bumping Lake Dam in 1910 killed off the last Sockeye run in the Yakima Basin



Tributary and mainstem habitat blocked by irrigation development

Habitat Above Cle Elum Dam

Why We Never Give Up

After 99 years of forced absence from the Yakima Basin, in 2009, the Yakama Nation Reintroduced Sockeye to Cle Elum Lake.

- 1000 adults released in 2009
- 85,000 juvenile Sockeye outmigrated in 2011
- 800 adults returned in 2013
- 2514 adults returned in 2014

Yakama Nation Fisheries

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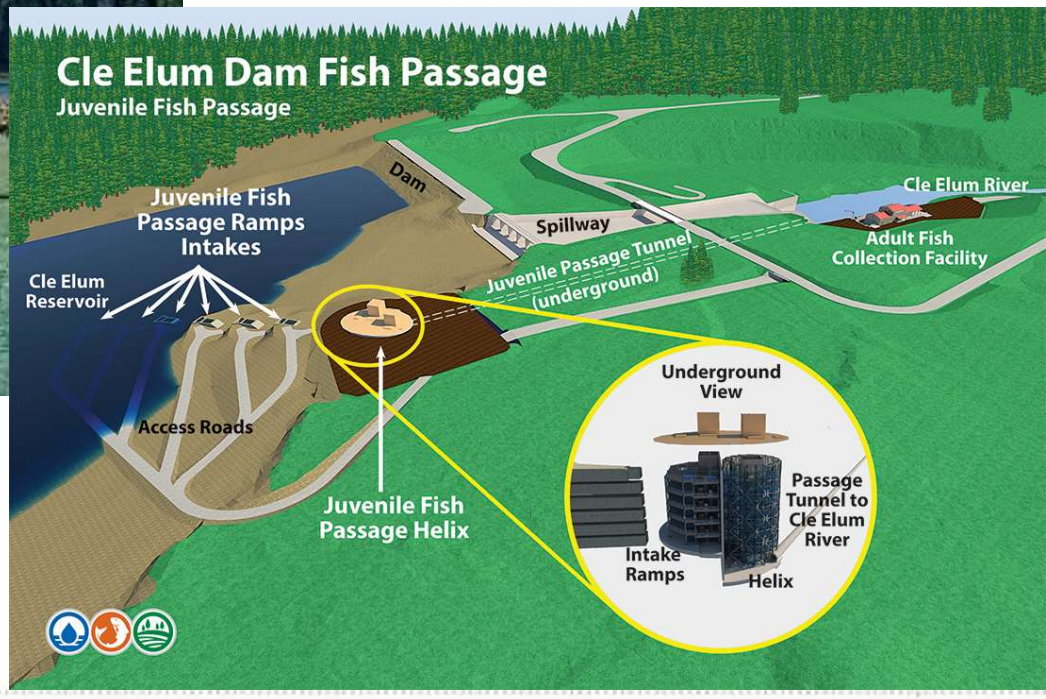
Early Successes

Cle Elum Fish Passage Construction in Progress

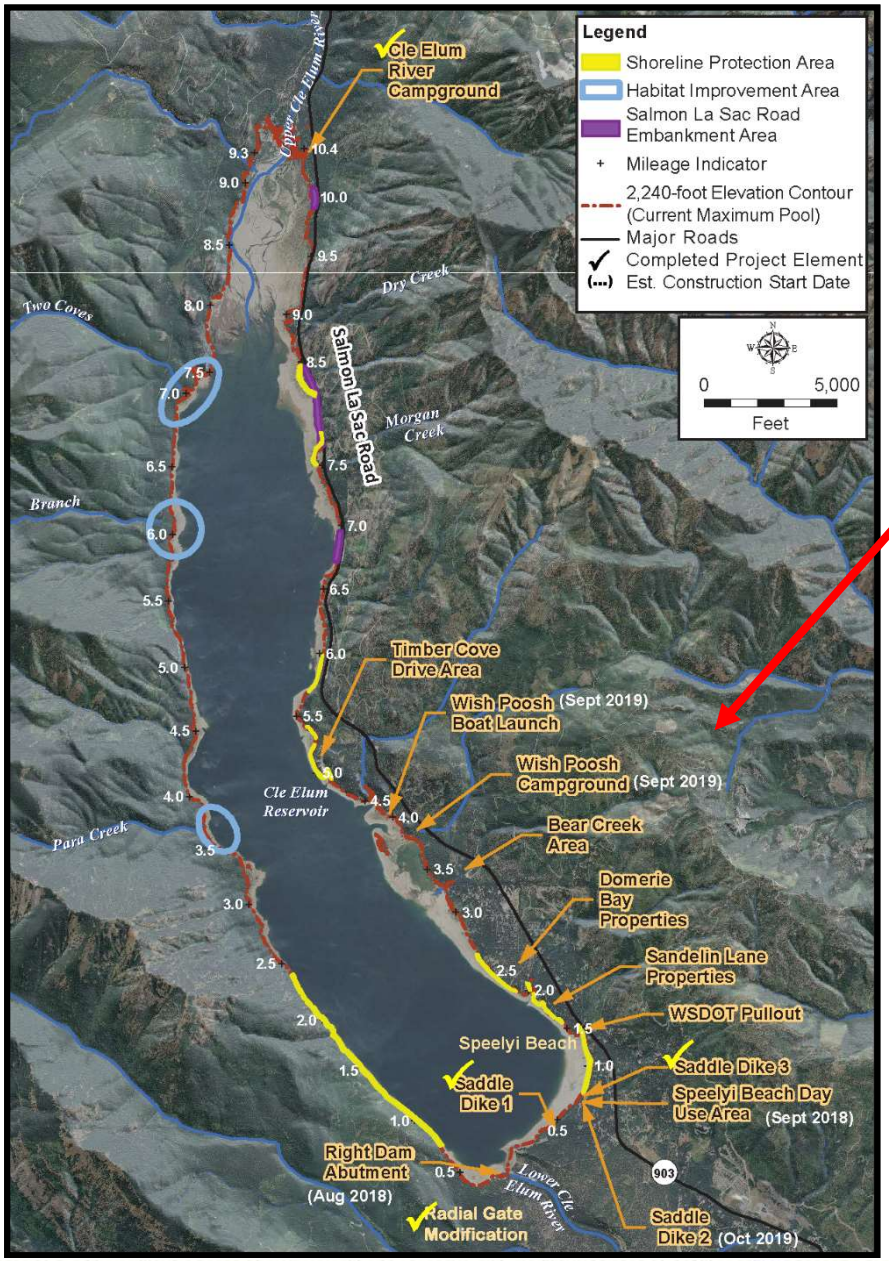
Construction on permanent juvenile passage
Cle Elum Lake, July 2017

- Passage blocked since early 1900s
- Juvenile (downstream) passage currently under construction
- Scheduled completion 2023



- Adult (upstream) passage will be constructed later

Cle Elum Pool Raise/ Shoreline Protection



- 3 foot pool raise will provide 14,600 acre-feet dedicated by Congress for fisheries
- Modification of radial gates complete
- Shoreline protection in progress

Radial gates extended by 3 feet

Yakama Nation Fisheries

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Combining water right acquisition, mitigation, and watershed restoration to protect and restore Tribal resources:

The Teanaway Example

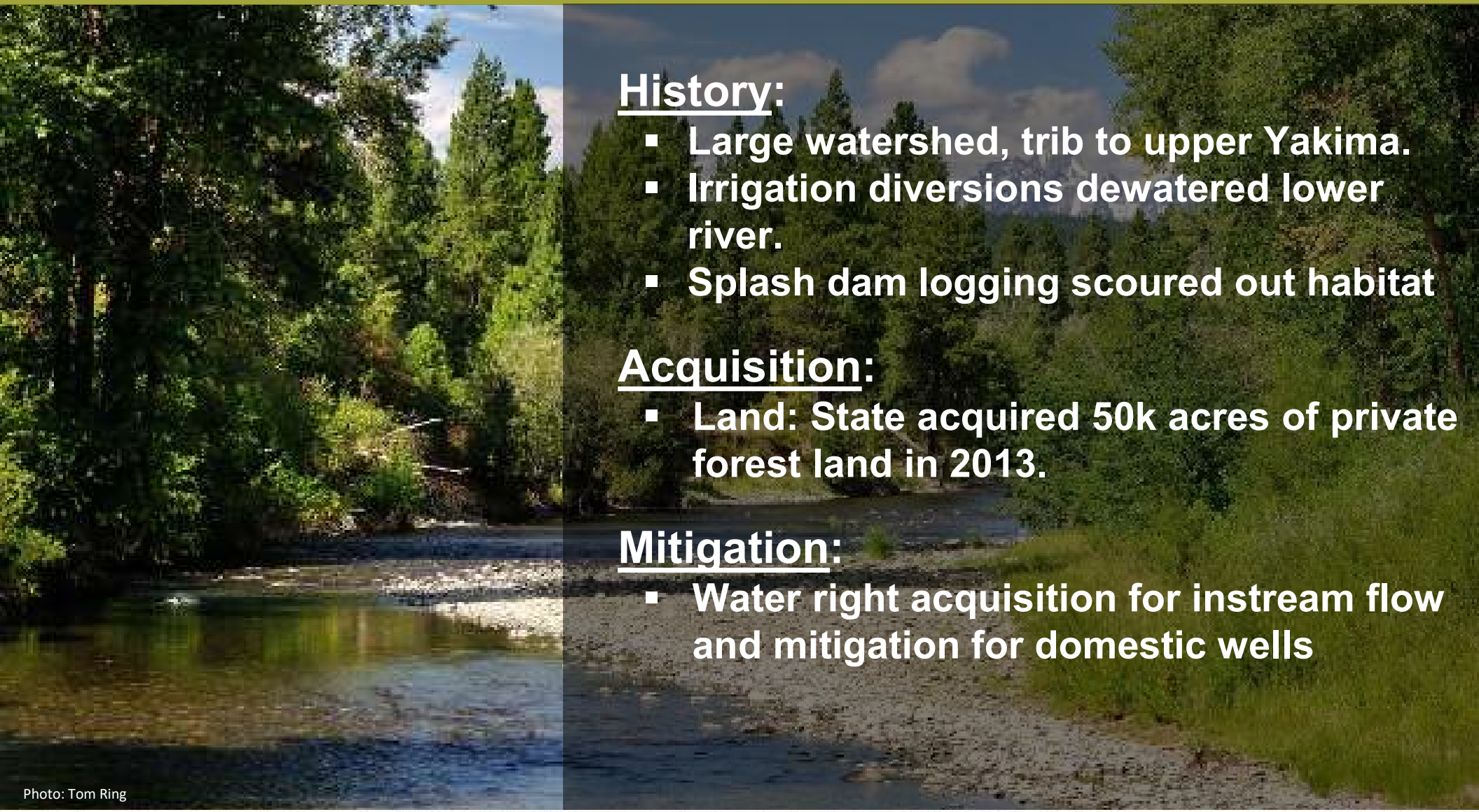


Photo: Tom Ring

History:

- Large watershed, trib to upper Yakima.
- Irrigation diversions dewatered lower river.
- Splash dam logging scoured out habitat

Acquisition:

- Land: State acquired 50k acres of private forest land in 2013.

Mitigation:

- Water right acquisition for instream flow and mitigation for domestic wells

Restoring Degraded Habitat in Indian Creek, Teanaway Tributary

Project designed to:

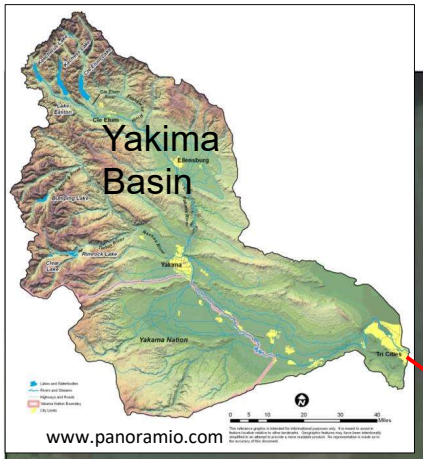
- Increase base flows
- Decrease peak flows
- Restore stream-floodplain interactions
- Moderate temperature
- Incrementally increase downstream water supply and mitigate for domestic water use

➢ Much more of this in progress

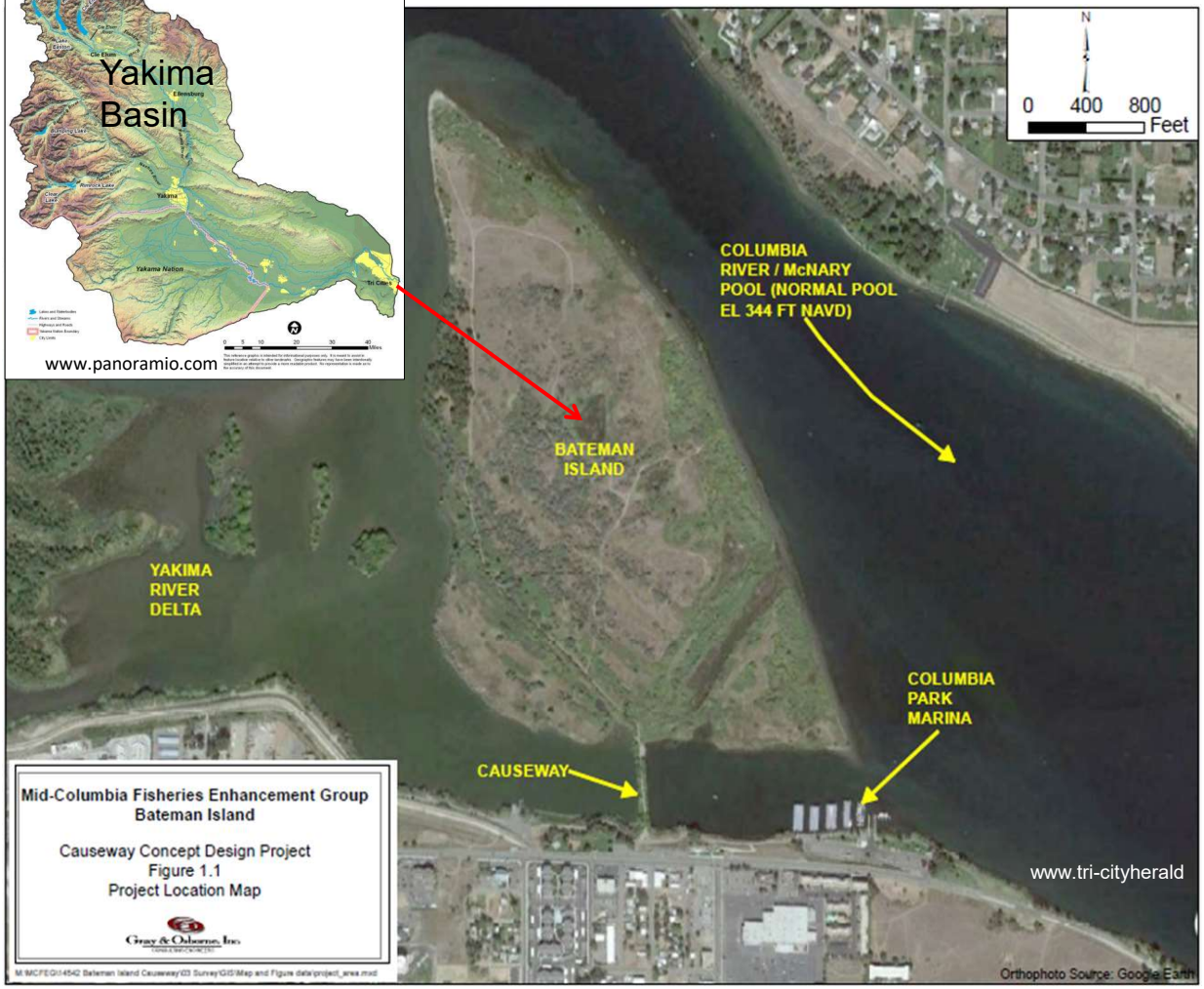
Bateman Island - Gateway to Yakima Basin

Yakima River Delta

- Bateman Island Causeway
- Blocks river flow
- Creates warm back waters that increase river temperatures
- Limiting adult and juvenile salmon passage
- Degrading habitat



Bateman Island



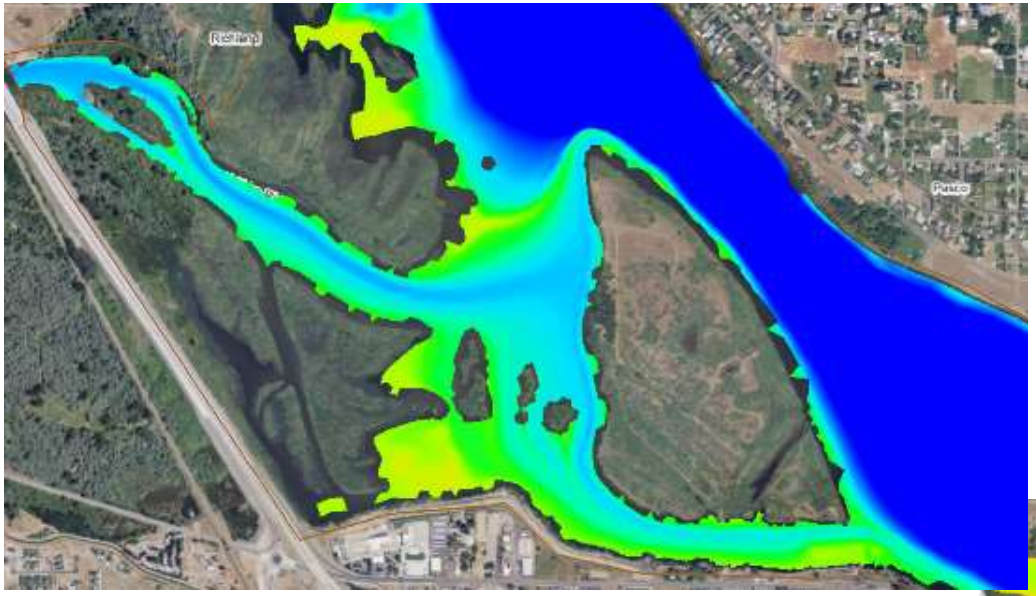
Yakima River Delta

Fish Predators

- Yakima Delta assessed for fish species by Yakama Nation and Mid-Columbia Fisheries in 2012 to 2014
- High numbers of introduced fish predators, primarily Bass and Catfish
- Nursery area for these predators

Proposed Bateman Causeway Breaching Would Cool the Yakima Delta

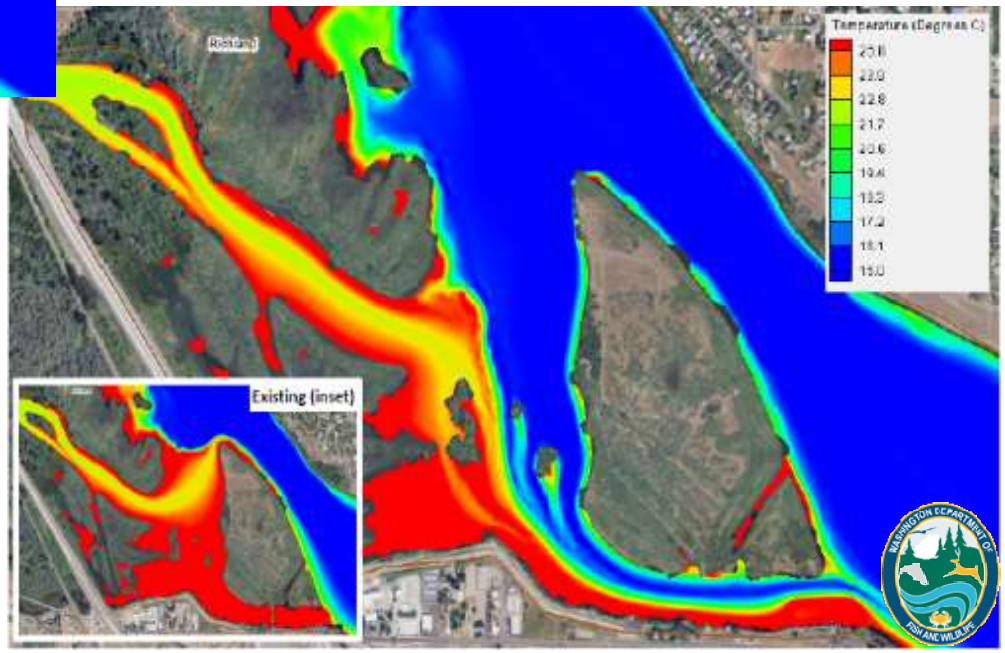
Needed for Adult Sockeye Restoration



Adult Salmon Passage Thermal Barrier

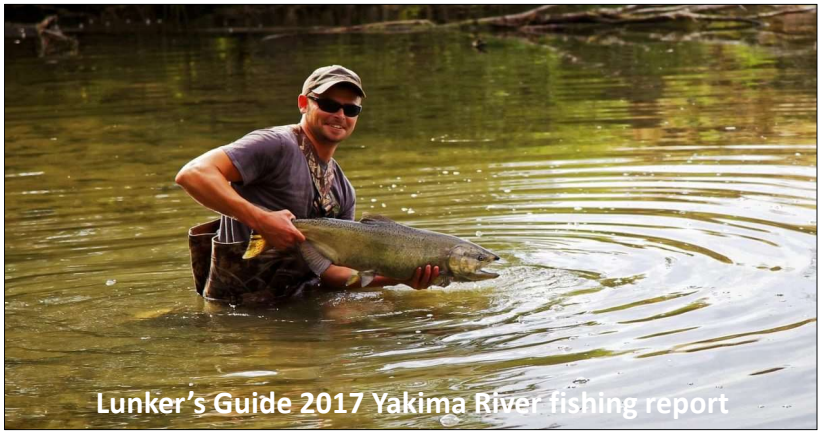
- High river temperatures at the delta delay or prevent Salmon from entering the Yakima River
- River water quality is negatively impacted
- Recent stargrass bloom around island impacts recreational fisheries for salmon

- Varying causeway breach sizes and configurations
- *Breaches of 260 feet and greater produced the most benefit of decreasing water temperature west and south of Bateman Island.*



Yakima River Delta USACE 1135 Restoration Project

- USACE has reached out to Yakima Basin Integrated Plan collaborating members to help find solutions for the causeway impacts
- Currently the USACE is in the study phase of identifying improvement options


Lunker's Guide 2017 Yakima River fishing report


Delta Habitat: Mid-Columbia Fisheries


Delta Recreation Mid-Columbia Fisheries

- Goals for the project include:
  - Recovery of the rivers natural functions and habitat
  - Restoration of salmon passage
  - Enhancement of public recreation

Lower Yakima River Smolt Survival Study

Migration Survival of Juvenile Chinook Salmon and Steelhead from Wapato Dam to the Mouth of the Yakima River, Washington, 2018-2020

- **What:** Acoustic telemetry tagging cooperative study with YN and USGS
- **Goal:** Identifying sources of smolt mortality
- **Species:** Chinook, steelhead, lamprey
- **Where:** Lower Yakima River (Yakima to Richland), mainstem Columbia River
- **Duration:** 2018- (possibly) 2021

Benefit: Helping to guide the Integrated Plan and options for salmon passage improvements

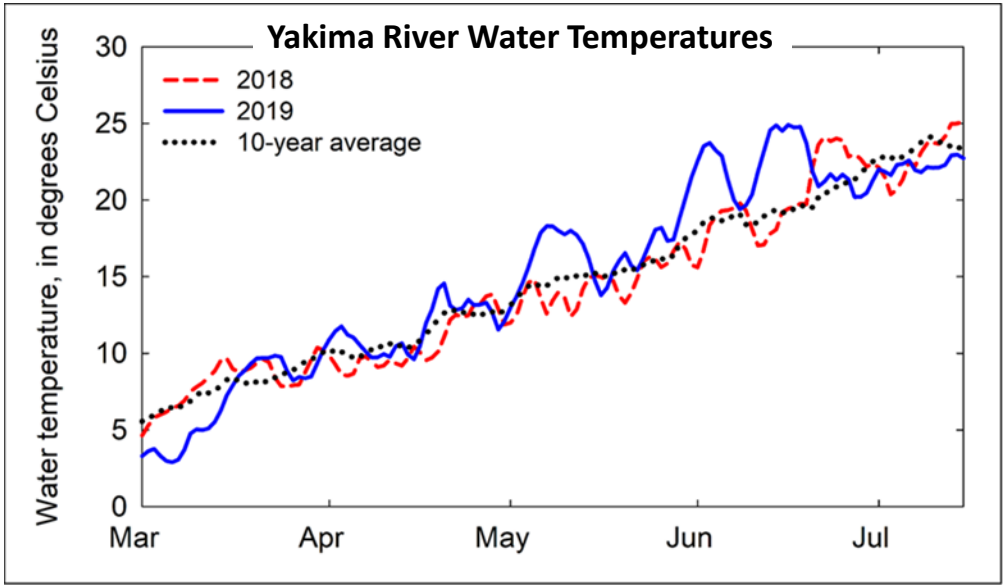
Funding Sources: Yakama Nation, Bureau of Reclamation, Yakima Basin Joint Board, Kennewick Irrigation District, Kittitas Irrigation District

Identifying Sources of Smolt Mortality

Results

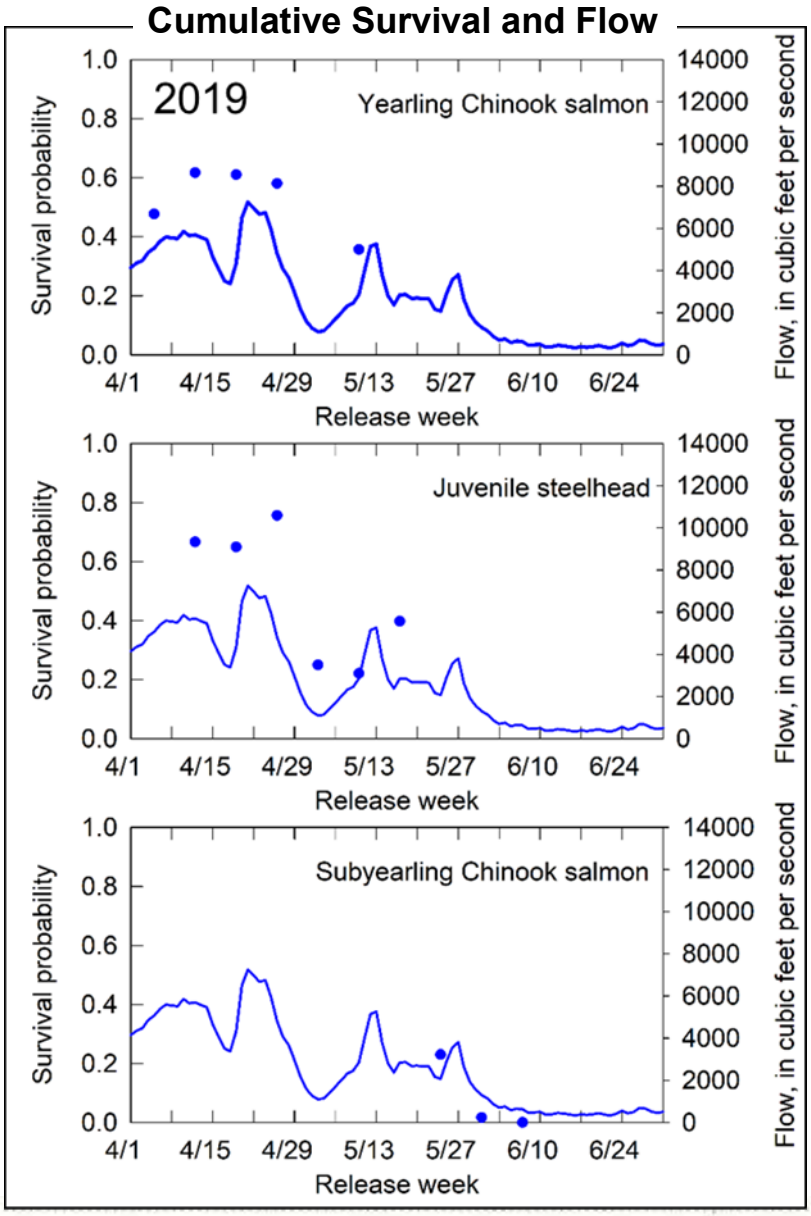
Temperature:

- Extremely high during Steelhead and subyearling Chinook out-migration ➡
- Late migration period exceed salmonid temp. thresholds



Flow:

- Lower flows increase mortality ➔
- Extreme mortality at current biological base flows

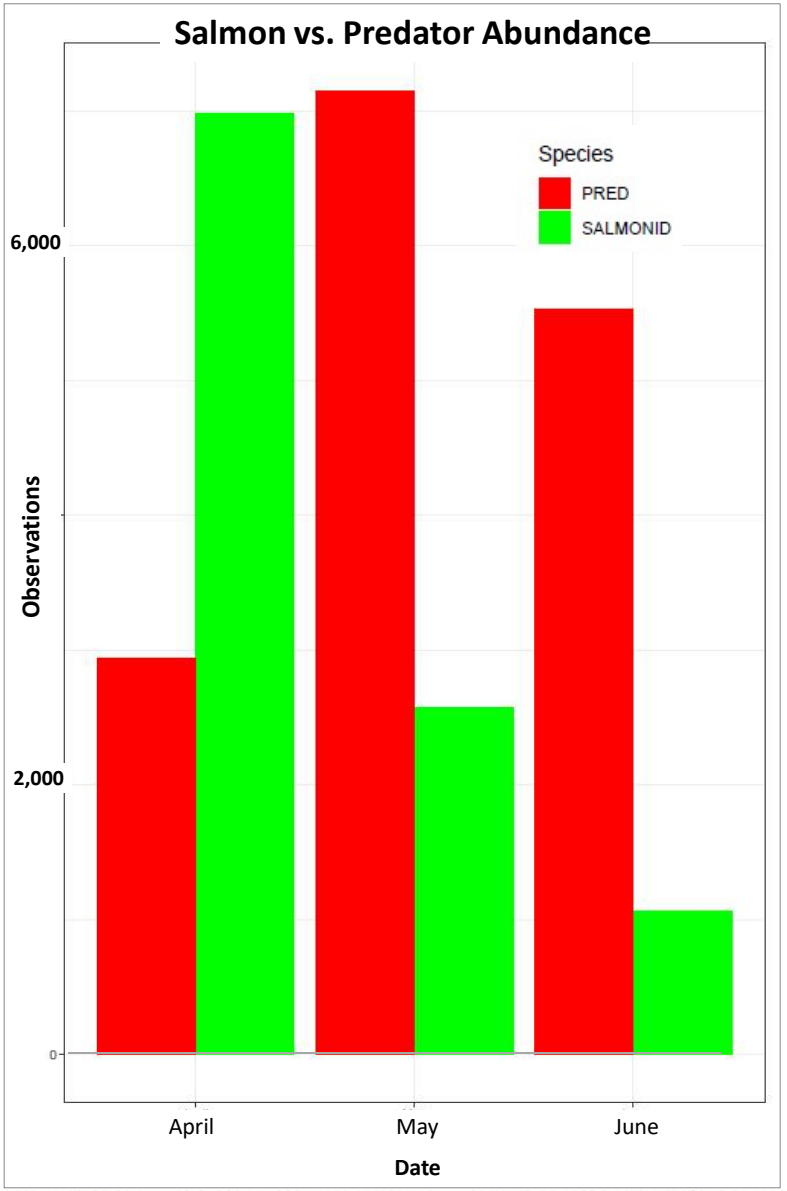


Identifying Sources of Smolt Mortality

Results

Smolt Predators

- Increased river temperatures promotes influx of non-native fish predators
- Low-flows create increased avian predator opportunities
- Shift in abundance from salmon to fish predators during the peak of smolt migration season



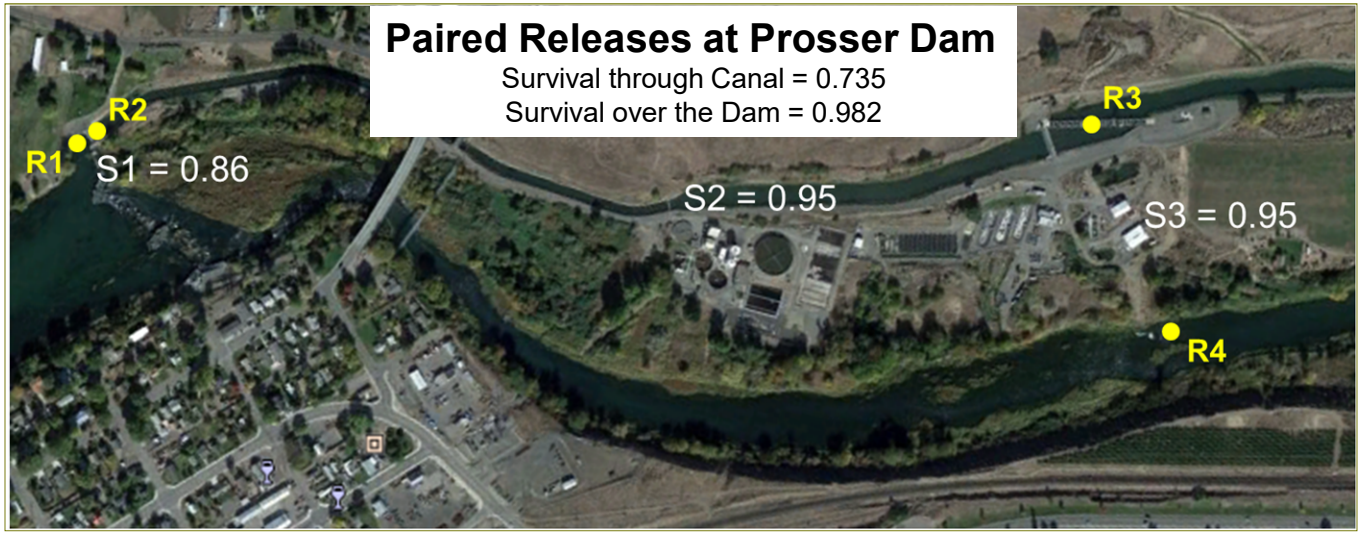
Identifying Sources of Smolt Mortality

Results

Diversion Dams

➔ Found significantly high mortality for smolts entrained into diversion canals (2018)

- Identifying areas of mortality at diversion dams (e.g. head-gates, canal, bypass pipe) (2019-2020)



Chandler Fish Bypass return pipe

➔ Higher numbers of Steelhead and Subyearling Chinook are impacted

➔ Significant predator abundance in river near fish bypass return

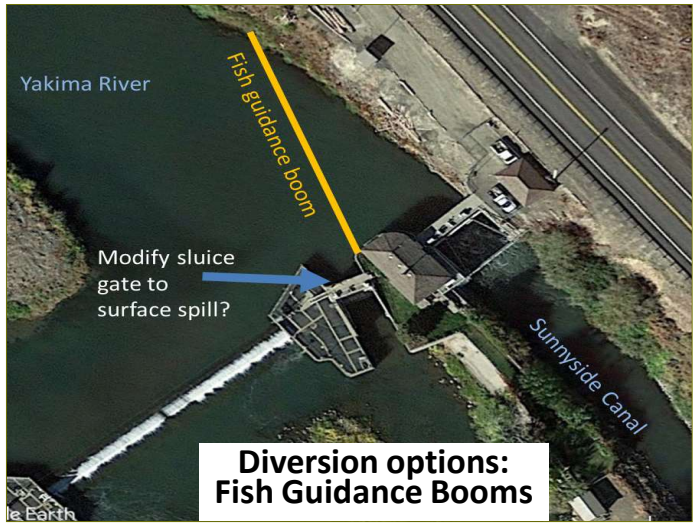
Identifying Sources of Smolt Mortality

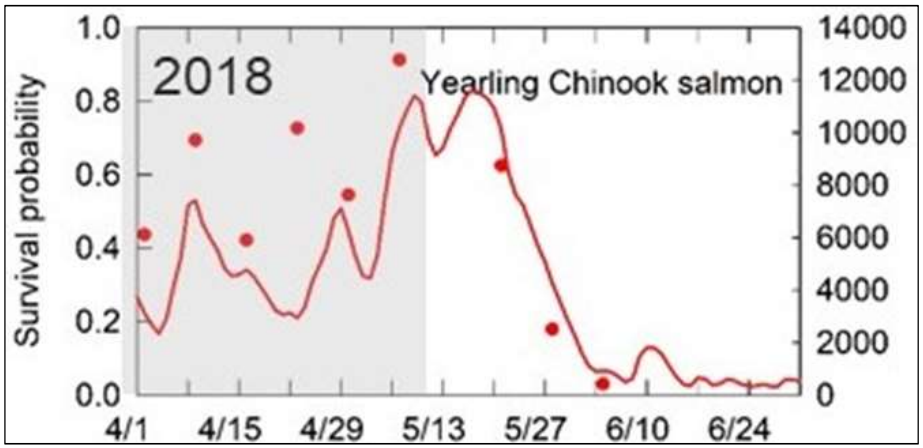
Conclusion:

➔ Diversion dams identified as greatest bottle-neck for the basin's salmon production

Next Steps:

Assessing diversion structure functions (e.g. head-gates) to develop options that reduce or eliminate salmon mortality ➔





➔ Identifying options to optimize survival flows

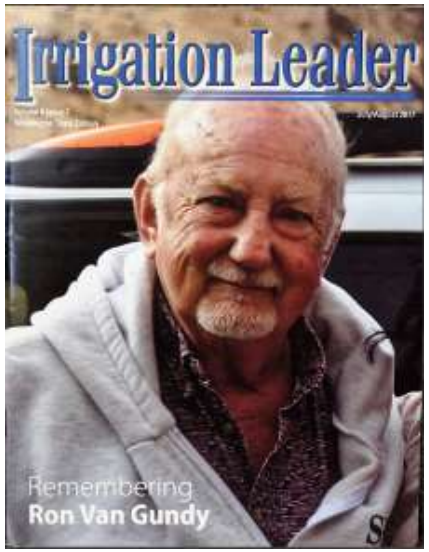
Developing options to reduce predation in hotspot locations ➔

Why it is working

"I can live with what you want if you can live with what we want"

- Not the usual "compromise"
- Adversaries become advocates (even Huskies and Cougars)
- Many dedicated participants ➔

"We can't do it without each other"




FOR MORE SEE:
yakamafish-nsn.gov
dashboard.yakamafish-star.net
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