

# Yakima Basin Integrated Plan Update

June 12, 2019



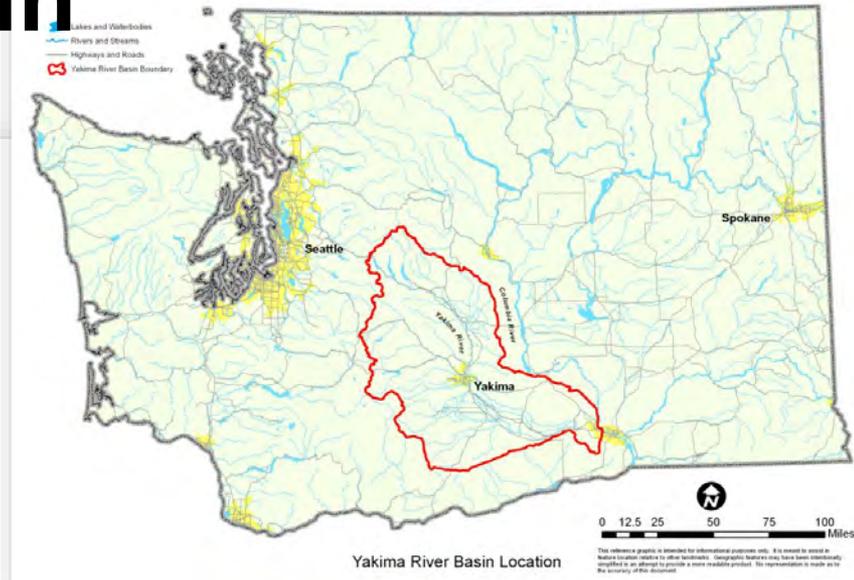
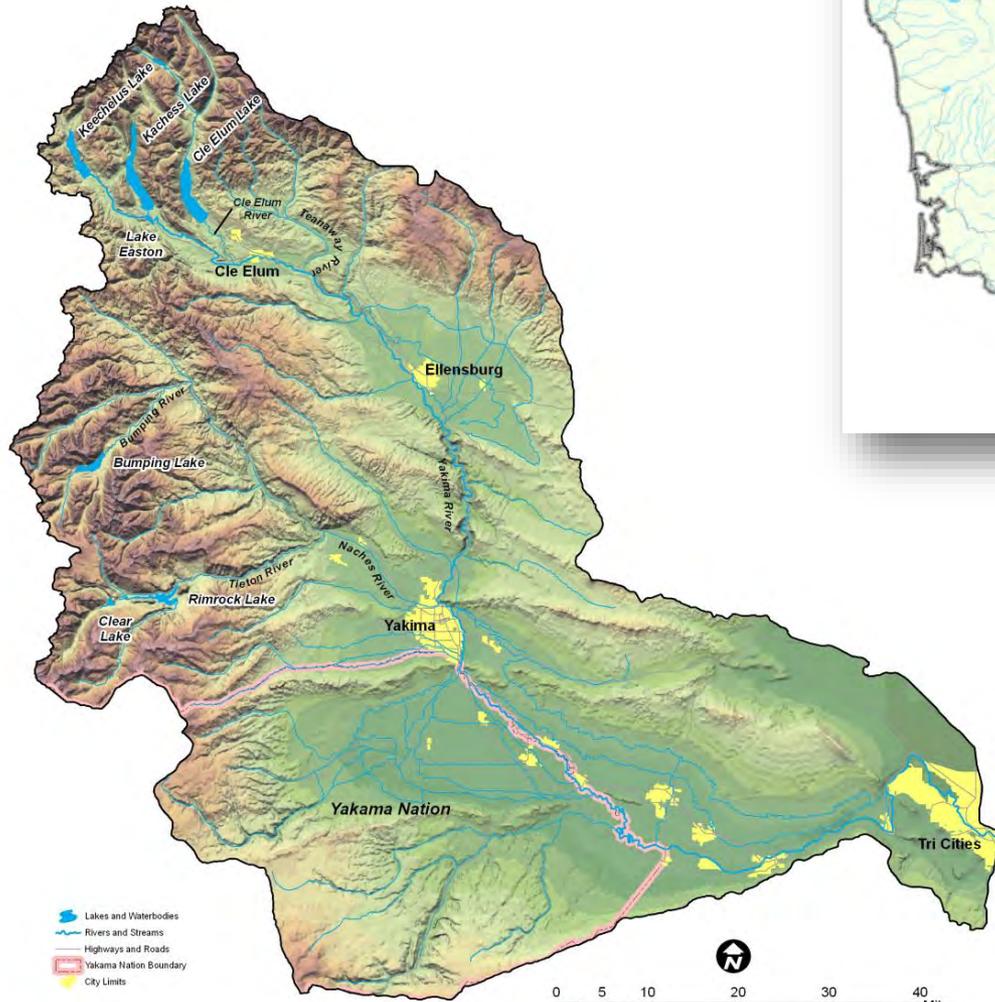
*Presented by:*

**Danielle Squeochs, PhD, LHg, P.E.**, Washington State Department of Ecology

**Wendy Christensen, P.E.**, Bureau of Reclamation



# Yakima River Basin Overview

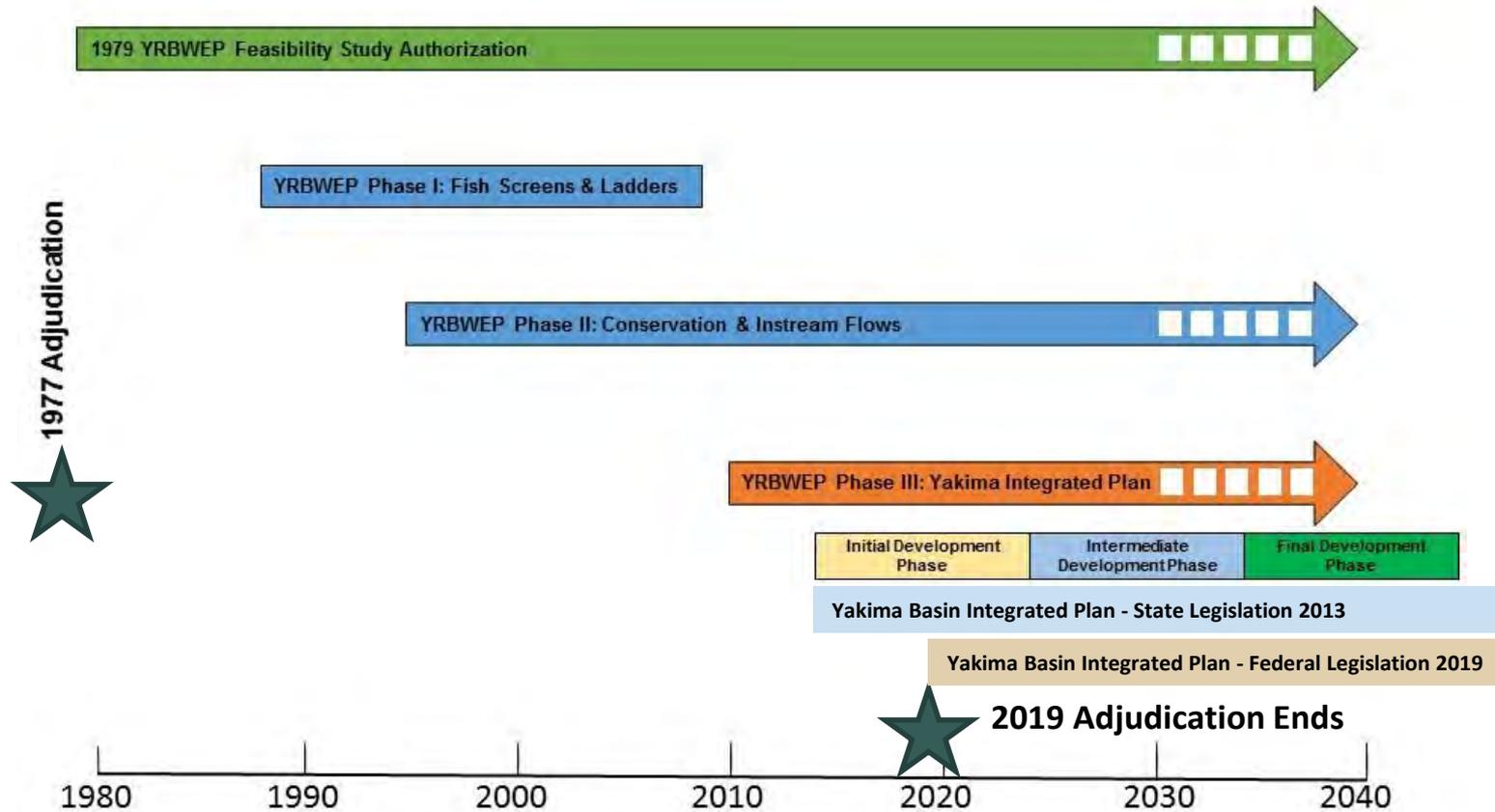


- 6,155 sq. miles w/464,000 irrigated acres
- 5 reservoirs w/ 1M AF capacity, irrigation deliveries 2.3M AF
- Droughts in 1992-1994, 2001, 2005, and 2015
- Reduced Fisheries
- \$4.5 Billion agriculture economy

This reference graphic is intended for informational purposes only. It is meant to assist in feature location relative to other landmarks. Geographic features may have been intentionally simplified in an attempt to provide a more readable product. No representation is made as to the accuracy of this document.



# Yakima River Basin Water Enhancement Project Timeline



# Federal Law: March 12, 2019 P.L. 116-9

NEW

- YRBWEP Phase III, Yakima Basin Integrated Plan Authorized in **10-Year Phases**:
  - Implementation of **Initial Phase** beginning in 2019
  - Plan development and completion of studies for the **Intermediate** and **Final** phases
- All Seven Elements authorized
- KDRPP authorized, non-federally funded
- Groundwater recharge and ASR projects
- Water conservation projects - provide conserved water for instream flow
- Market Reallocation
- Tributary Enhancement
- Wapato Irrigation Project: \$75 million in additional funding



# Surface Water Supply KDRPP

## New Authorization in P.L. 116-9, Sec 8201

- Authorizes long-term agreements with a proratable irrigation entity for non-Federal financing, construction operation, or maintenance of the Drought Relief Pumping Plant or the Keechelus to Kachess Pipeline
- Pumped storage to be considered Yakima Project water, to provide 70% water supply for participating proratable irrigation entities, Wapato Irrigation Project and Yakama Nation may elect to participate
- Pumped storage water is not a part of Total Water Supply Available, and pumping must continue to ensure no negative impact to successive-year TWSA
- BPA shall provide pumping power, when Washington State declares drought and Reclamation declares 70% or worse prorationing, the costs shall be borne by the participating irrigation entities



# In Summary

- 1994 Federal Legislation – Authorizes Reclamation to work with Ecology, Irrigation Districts and Yakama Nation to Conserve water, provide Habitat Restoration and Tributary Enhancement to see what could be done with Conservation and Instream flows.
- 2013 State Legislation – Authorizes Ecology to implement Integrated Plan in coordination with Reclamation and Yakama Nation and fund up to ½ of the Integrated Plan.
- 2019 Federal Legislation – Authorizes Reclamation to implement the Integrated Plan with Ecology, Yakama Nation and others, including storage as well as all elements of Integrated Plan.



# Yakima Integrated Plan Goals:

- **Provide opportunities for ecological restoration and enhancement, including fish passage**
- **Improve water supply during drought years (70% proratable supply)**
- **Provide for efficient and adaptable water supply management**
- **Contribute to sustainable economy and environment**



# YRBWEP Workgroup Members

- **Federal Agencies**
  - Bureau of Reclamation
  - National Marine Fisheries Service
  - U.S. Fish and Wildlife Service
  - U.S. Forest Service
  - U.S. Army Corps of Engineers
- **Yakama Nation**
  - Yakama Nation Natural Resources
  - Yakima/Klickitat Fisheries Project
- **Washington State Agencies**
  - Department of Ecology
  - Department of Agriculture
  - Department of Fish and Wildlife
  - Department of Natural Resources
- **Local Governments**
  - Benton County
  - Kittitas County
  - Yakima County
  - City of Yakima
- **Irrigated Agriculture**
  - Kennewick Irrigation District
  - Kittitas Reclamation District
  - Roza Irrigation District
  - Sunnyside Valley Irrigation District
  - Yakima-Tieton Irrigation District
- **Other Stakeholders**
  - American Rivers
  - Yakima Basin Fish & Wildlife Recovery Board
  - Yakima Basin Storage Alliance
  - Trout Unlimited



# Yakima Integrated Plan Overview

## YAKIMA RIVER BASIN INTEGRATED WATER RESOURCE MANAGEMENT PLAN

### Structural & Operational Changes

1. Raise the Cle Elum Pool by three feet to add 14,600 ac-ft in storage capacity.
2. Modify Kittitas Reclamation District canals to provide efficiency savings.
3. Construct a pipeline from Lake Keechelus to Lake Kachess to reduce flows and improve habitat conditions during high flow releases below Keechelus and to provide more water storage in Lake Kachess for downstream needs.
4. Decrease power generation at Roza Dam and Chandler power plant to support outmigration of juvenile fish.
5. Make efficiency improvements to the Wapatox Canal.

### Enhanced Water Conservation

1. Implement an agricultural water conservation program designed to conserve up to 170,000 acre-feet of water in good water years.
2. Create a fund to promote water use efficiency basin-wide using voluntary, incentive-based programs. Focus on outdoor uses as top priority.

### Habitat/Watershed Protection & Enhancement

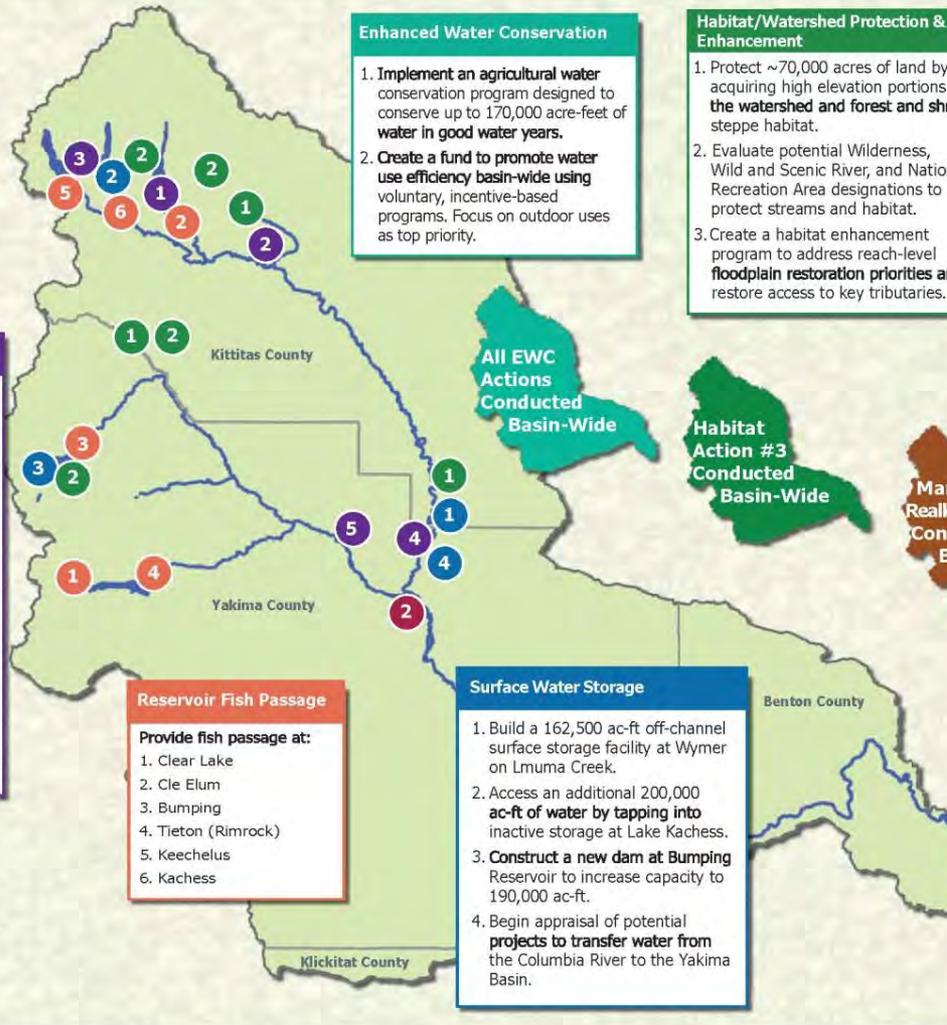
1. Protect ~70,000 acres of land by acquiring high elevation portions of the watershed and forest and shrub steppe habitat.
2. Evaluate potential Wilderness, Wild and Scenic River, and National Recreation Area designations to protect streams and habitat.
3. Create a habitat enhancement program to address reach-level floodplain restoration priorities and restore access to key tributaries.

### Market Reallocation

Employ a water market and/or a water bank to improve water supply in the Yakima River basin. Market reallocation would be conducted in two phases:

The near-term phase would continue existing water marketing and banking programs in the basin, but take additional steps to reduce barriers to water transfers.

The long-term program would focus on facilitating water transfers between irrigation districts. This would allow an irrigation district to fallow land within the district and lease water rights for that land outside the district.



### Reservoir Fish Passage

#### Provide fish passage at:

1. Clear Lake
2. Cle Elum
3. Bumping
4. Tieton (Rimrock)
5. Keechelus
6. Kachess

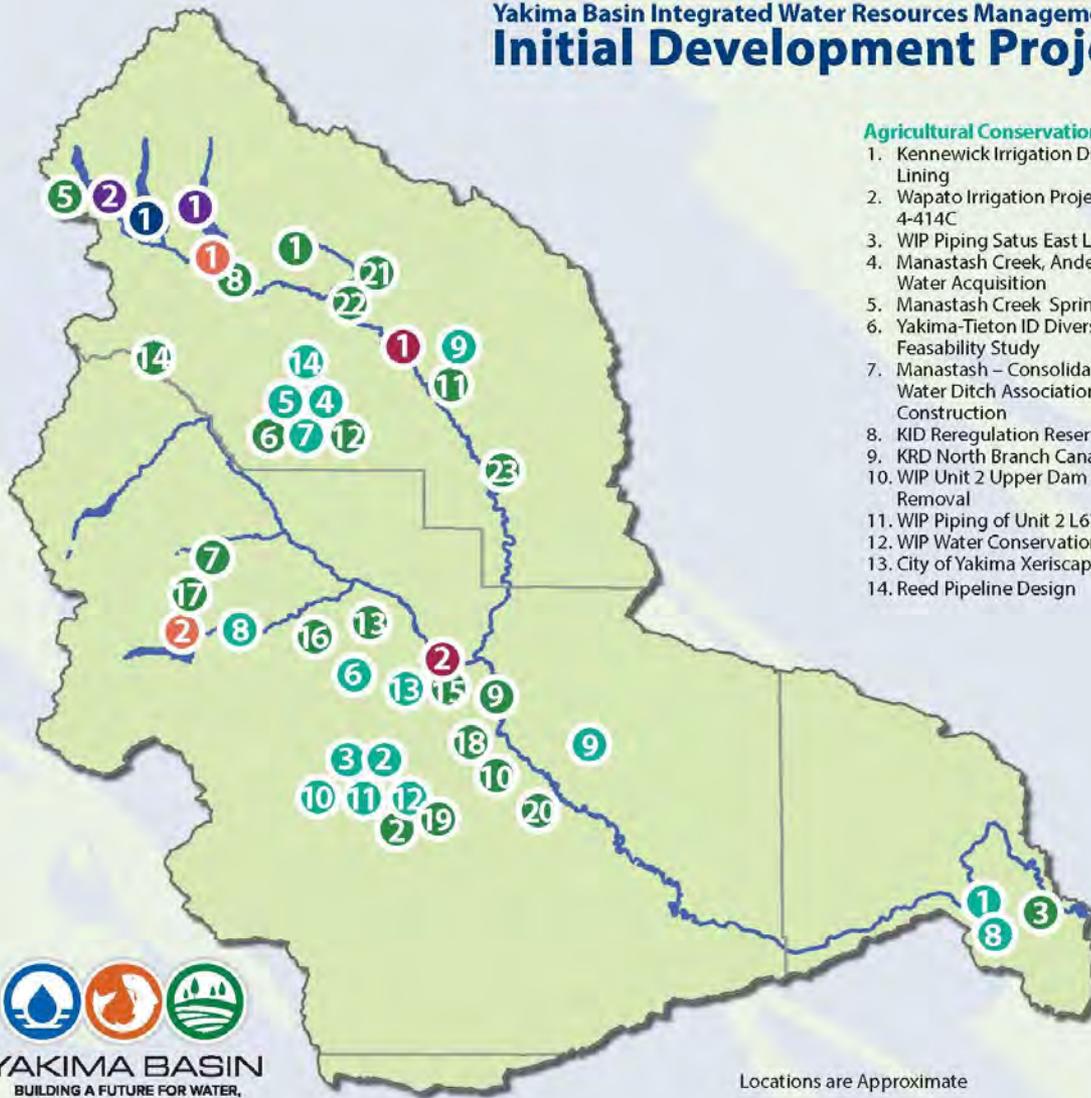
### Surface Water Storage

1. Build a 162,500 ac-ft off-channel surface storage facility at Wymer on Lmuma Creek.
2. Access an additional 200,000 ac-ft of water by tapping into inactive storage at Lake Kachess.
3. Construct a new dam at Bumping Reservoir to increase capacity to 190,000 ac-ft.
4. Begin appraisal of potential projects to transfer water from the Columbia River to the Yakima Basin.

### Groundwater Storage

1. Construct pilot projects to evaluate recharging shallow aquifers via groundwater infiltration. Full scale implementation may follow.
2. Build an aquifer storage and recovery facility allowing Yakima City to withdraw water from the Naches River during high flow periods and store it underground for use during low flow periods.

# Yakima Basin Integrated Water Resources Management Plan Initial Development Projects



Locations are Approximate

## Agricultural Conservation (2013-2017)

1. Kennewick Irrigation District (KID) Division IV Lining
2. Wapato Irrigation Project (WIP) Piping Lateral 4-414C
3. WIP Piping Satus East Lateral E73
4. Manastash Creek, Anderson Diversion Irrigation Water Acquisition
5. Manastash Creek Sprinkler Conversions
6. Yakima-Tieton ID Diversion Relocation Feasibility Study
7. Manastash – Consolidated Pipeline & Manastash Water Ditch Association (MWDA) Pipeline Construction
8. KID Reregulation Reservoir Design
9. KR D North Branch Canal Lining
10. WIP Unit 2 Upper Dam Rebuild and Lower Dam Removal
11. WIP Piping of Unit 2 L672
12. WIP Water Conservation Plan
13. City of Yakima Xeriscape Demonstration Project
14. Reed Pipeline Design

## Fish Passage

1. Cle Elum Dam
2. Tieton (Rimrock) Dam

## Groundwater Storage

1. Upper Kittitas Aquifer Storage and Recovery
2. Yakima City Aquifer Storage and Recovery

## Structural and Operational Changes

1. Cle Elum Pool Raise
2. Keechelus to Kachess Conveyance

## Surface Water Storage

1. Kachess Drought Relief Pumping Plant

## Water Bank/Exchange Programs

Basin Wide

## Habitat Enhancement (2013-2017)

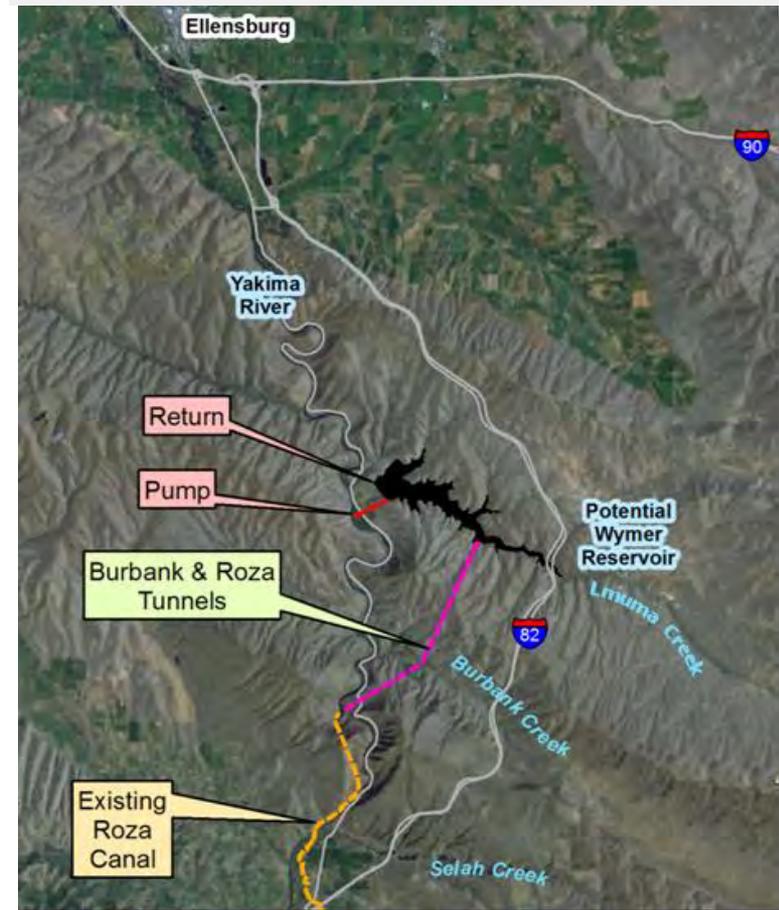
1. Teanaway Acquisition
2. Toppenish Fan Habitat Restoration
3. Bateman Island Causeway Modification Conceptual Design/Outreach/Permitting
4. Bull Trout Habitat Improvements
5. Gold Creek Habitat Assessment and Conceptual Design
6. Reed Diversion design Barrier Removal
7. Little Rattlesnake Road Decommissioning
8. Cle Elum River Side Channel Restoration Project, Phase 2
9. Gap-to-Gap Property Acquisitions
10. Upper Wapato Riparian Restoration
11. Ellensburg Water Company / Coleman Creek Restoration
12. Reed Diversion Barrier Removal
13. Trout Meadows Acquisition / Enhancement
14. Manastash/ Little Naches Land Acquisition
15. Gap-to-Gap Outfall Relocation, Land Acquisition and Levee Removal design and Restoration
16. Cowiche Easement/Design
17. South Fork Tieton Bull Trout Passage Feasibility and Design
18. Rivernile 89.5 Levee Breach
19. Island Road Floodplain Reconnection - Toppenish Creek
20. Toppenish Creek - 3-way Levee Setback
21. Teanaway/Indian Creek Restoration
22. Teanaway Habitat Restoration
23. Upper Yakima Floodplain Acquisition and Design Ringer Loop Road



# Surface Water Storage

- **Kachess Drought Relief Pumping Plant**
  - Existing Reservoir:  
Access up to 200,000 acre-feet from inactive storage pool in dry years
- **Wymer Dam & Reservoir**
  - New off-channel reservoir, 163,000 acre-feet
- **Bumping Dam & Reservoir Enlargement**
  - Replace existing dam to add 165,000 acre-feet

Proposed Wymer Reservoir

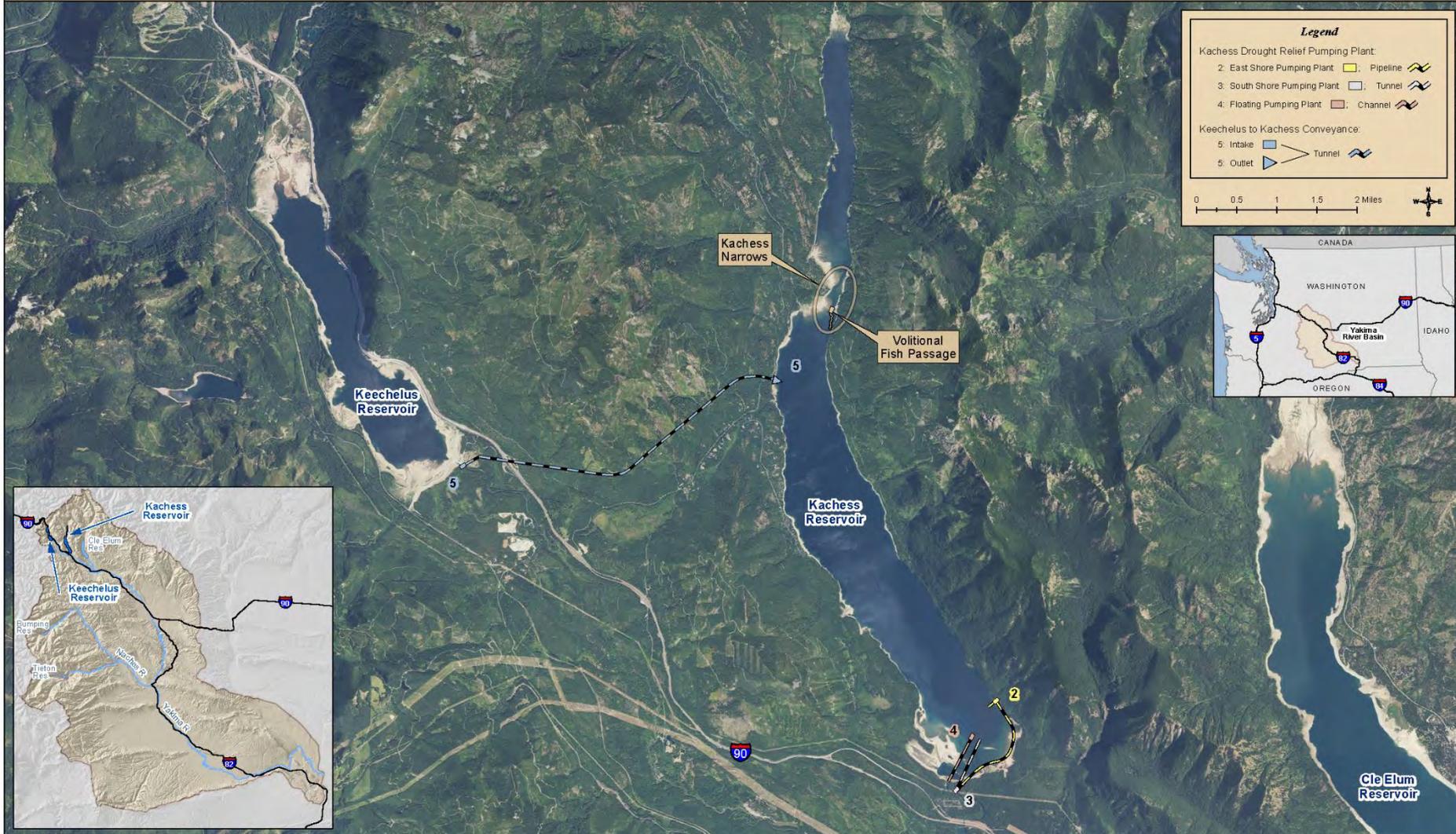


# Kachess Drought Relief Pumping Plant & Keechelus-to-Kachess Conveyance Locations

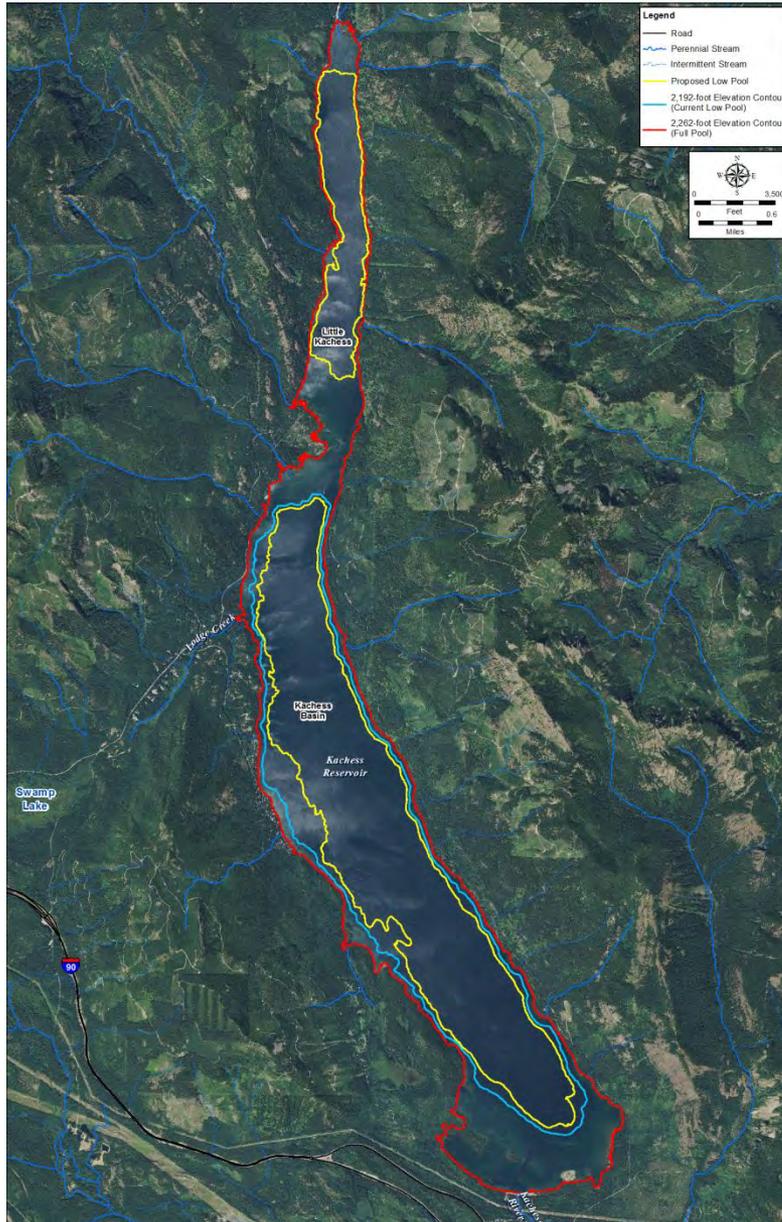
RECLAMATION  
Managing Water in the West

Kachess Drought Relief Pumping Plant and  
Keechelus to Kachess Conveyance Project Locations

DEPARTMENT OF  
ECOLOGY  
State of Washington



# Kachess Drought Relief Pumping Plant



**Surface Area:**  
**Up to 20% less surface area than existing minimum pool**

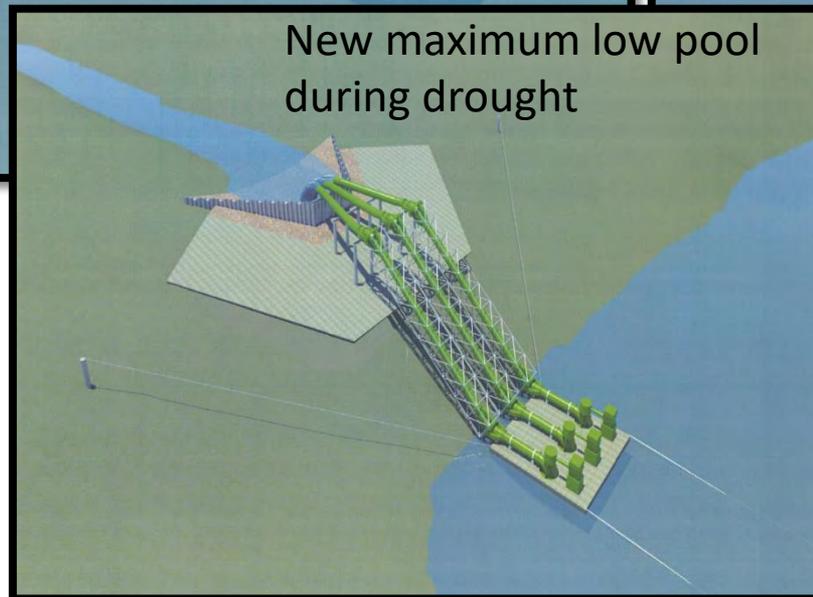
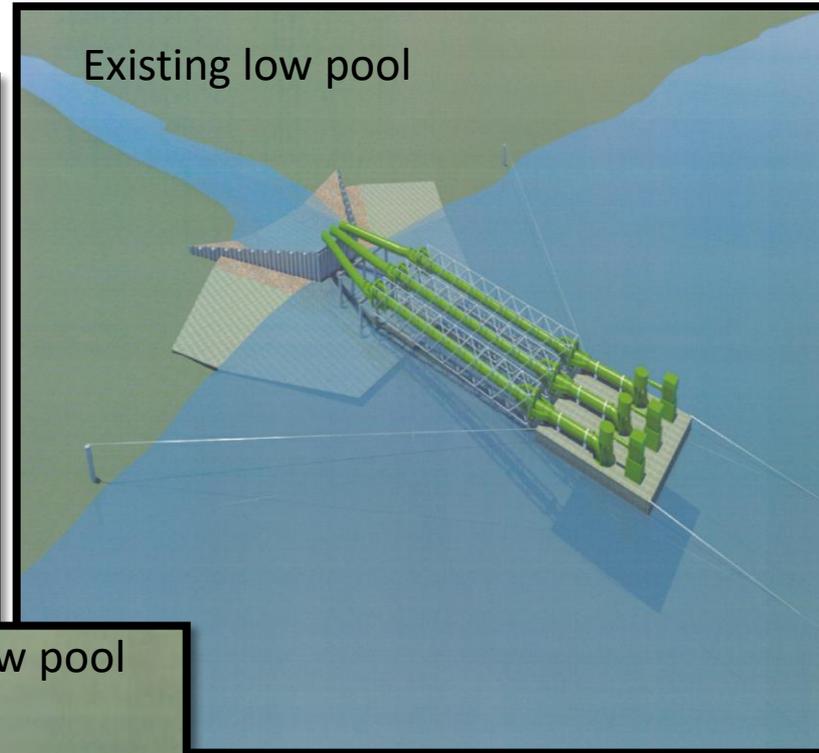
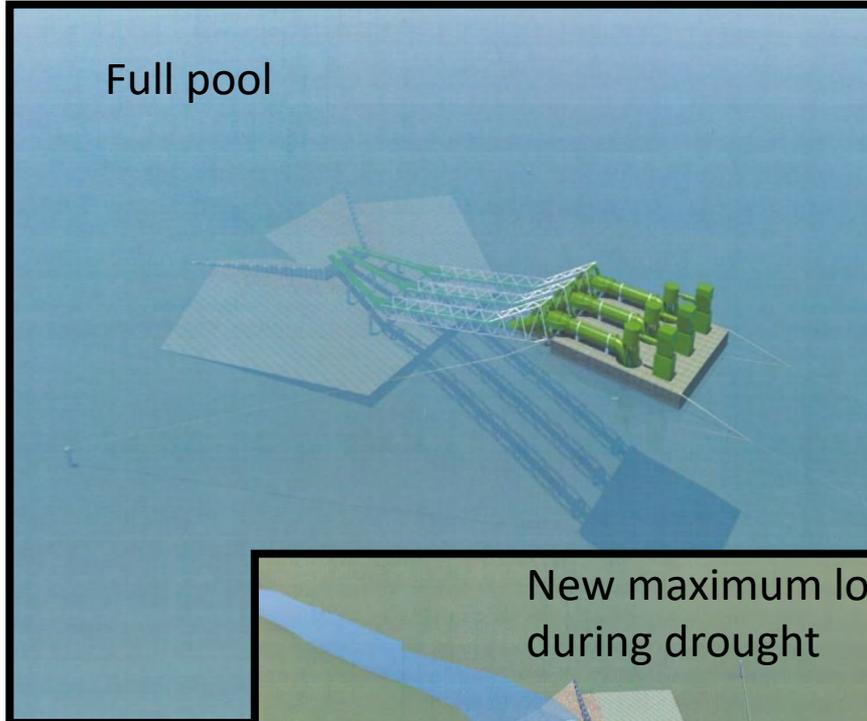
**Additional Water Supply:**  
**Up to 200,000 acre-ft for use in drought years**



# Kachess Drought Relief Pumping Plant Floating Pumping Plant Alternative



# Kachess Drought Relief Pumping Plant Floating Pumping Plant



# Milestones

## Kachess Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance Projects NEPA-SEPA Process



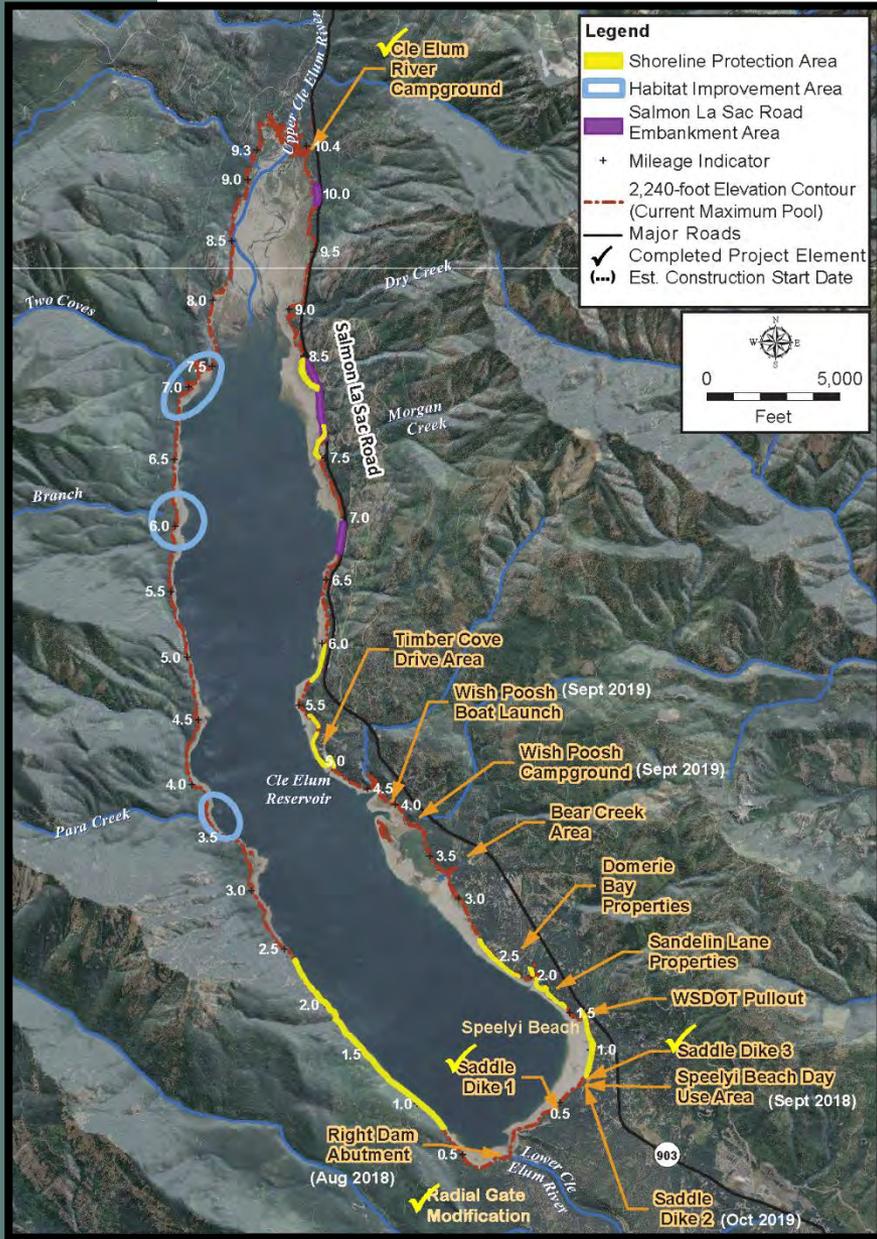
Time not to scale



# Cle Elum Pool Raise Update

## 14,600 acre-feet for Yakima River instream flows

- Modify radial gates
- Shoreline protection
- Land acquisition



# Cle Elum Dam Pool Raise Radial Gates Complete – April 2017



# Cle Elum Reservoir Existing Shoreline



Cle Elum River Campground before construction



# Cle Elum Reservoir New Shoreline



Cle Elum River Campground after construction



# Cle Elum Reservoir Shoreline Construction



Speelyi Day Use Area New Construction, not to scale



# Cle Elum Reservoir Shoreline Protection

## Speelyi Day Use Area Construction



Raising Saddle Dike #2, September 2018



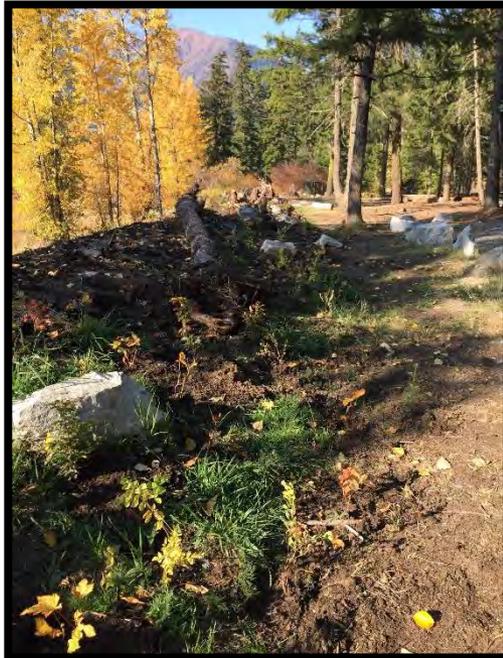
# Cle Elum Reservoir Shoreline Protection



Pre-Construction



Post-Construction Nov 2017



Re-planted  
Sept 2018

Cle Elum River Campground (USFS)



# Cle Elum Reservoir Shoreline Protection



Speelyi Day Use  
Area Construction



Pre-construction stake out/site visit, September 2018



# Cle Elum Reservoir Shoreline Protection



Speelyi Day Use Area New Construction, not to scale



# Cle Elum Reservoir Shoreline Protection



Speelyi Day Use Area Construction



Chain and channel tie down



Anchored tree log installation, September 2018



# Cle Elum Reservoir Shoreline Protection

Speelyi Day Use  
Area Construction

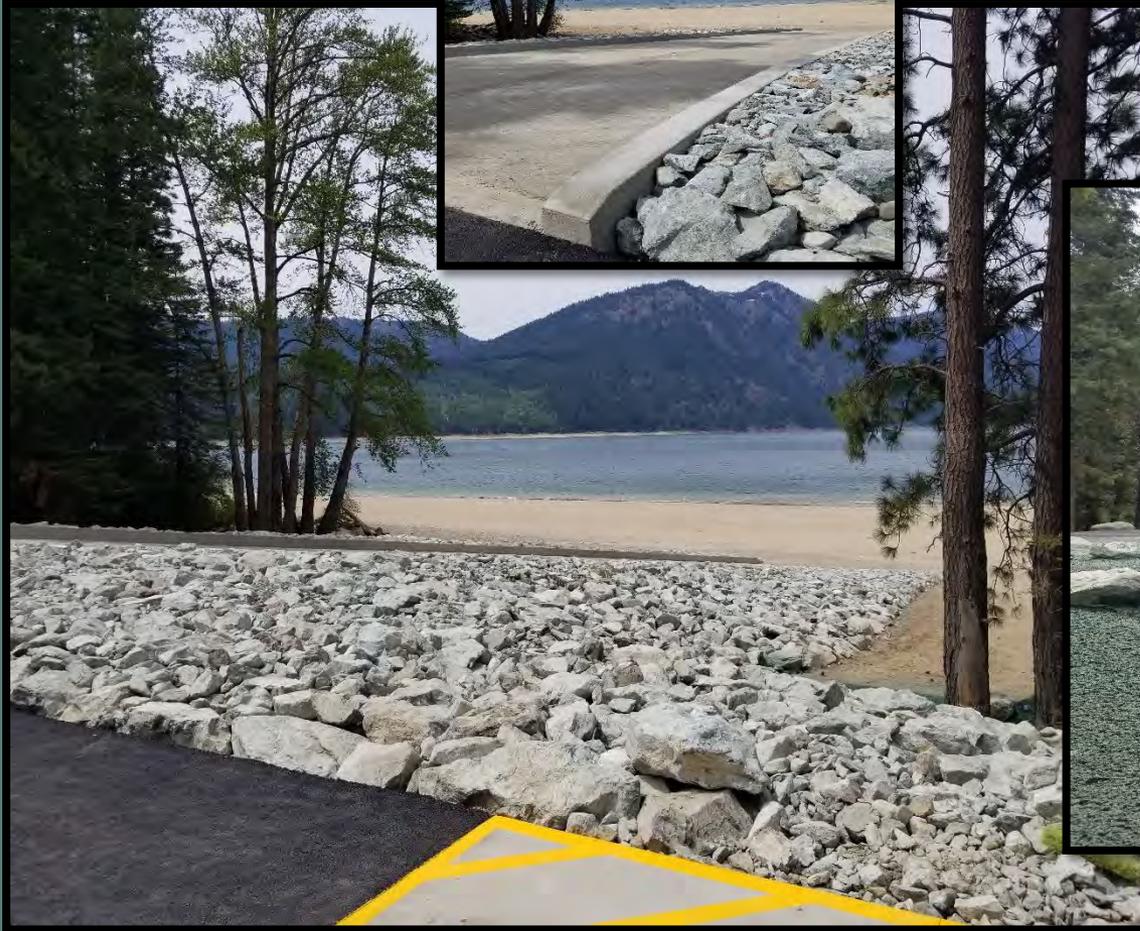


Installation of riprap along boat launch and vault toilet



# Cle Elum Reservoir Shoreline Protection

Speelyi Day Use  
Area Construction  
Complete



Construction Complete May 15, 2019



# Cle Elum Reservoir Shoreline Construction



Wishpoosh Campground and Boat Launch, not to scale



# Cle Elum Pool Raise Project

## Contracts/Timeline

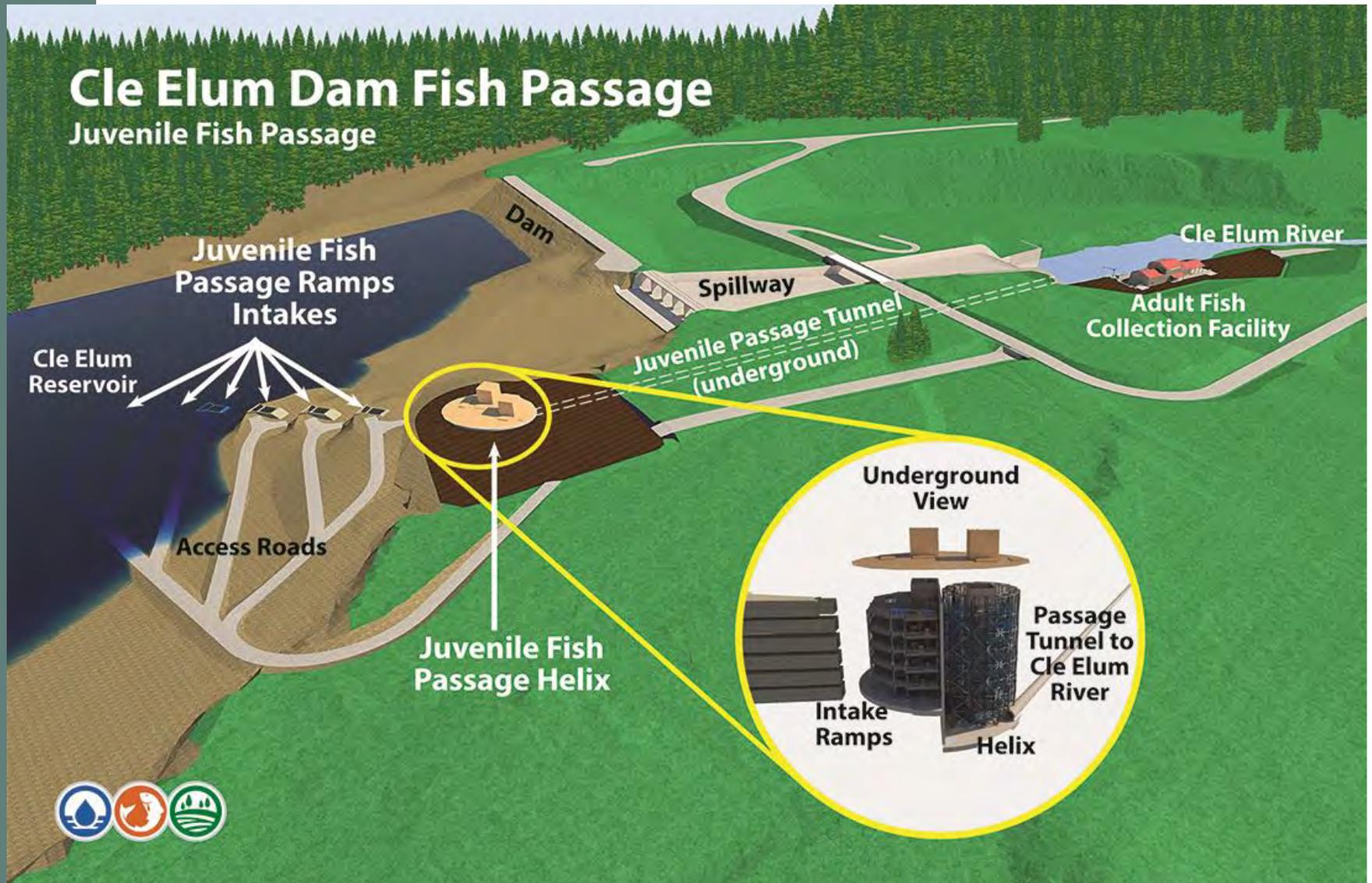
Cle Elum Dam Pool Raise Contracts	Duration	Status
Radial Gates	2 years	Completed – April 2017
Cle Elum River Campground	2 months	Completed – Nov 2017
**Land Acquisitions	5 years*	In-progress
** Speelyi Beach Day Use	1 year	Completed – May 2019
Wish Poosh Campground and Boat Launch	1 year	Award - 2019
Timber Cove	1 to 2 years	Award – TBD*
Morgan Creek & Night Sky Drive	1 to 2 years	Award – TBD*
Domerie Bay	1 to 2 years	Award – TBD*
Sandelin	1 to 2 years	Award – TBD*
Speelyi Beach	1 to 2 years	Award – TBD*
Anna Bell	1 to 2 years	Award – TBD*

\*Contingent on funding

\*\* Funded by WIIN Act 2016 received \$2M FY 2017



# Cle Elum Dam Fish Passage



# Cle Elum Dam Fish Passage Construction

7/15/2014

7/24/2018



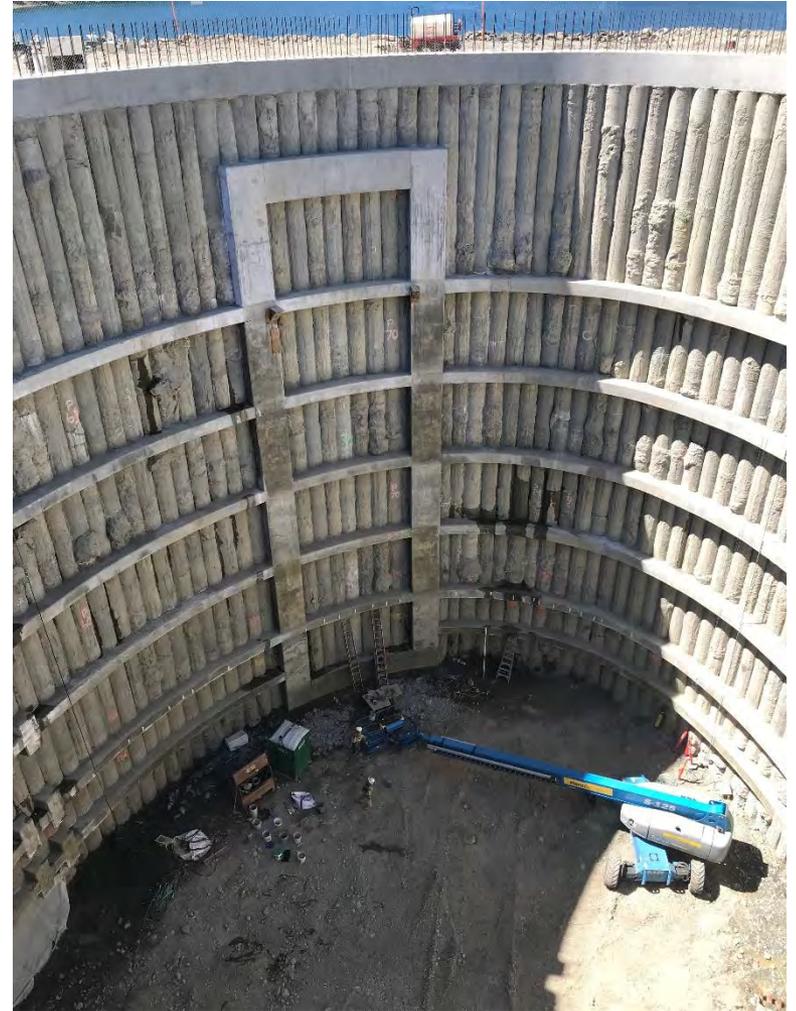
# Secant Pile Contract – Complete



**Completion of Cle Elum Secant Pile Contract**  
Cle Elum Dam Fish Passage Project, Washington  
2016 – 2018

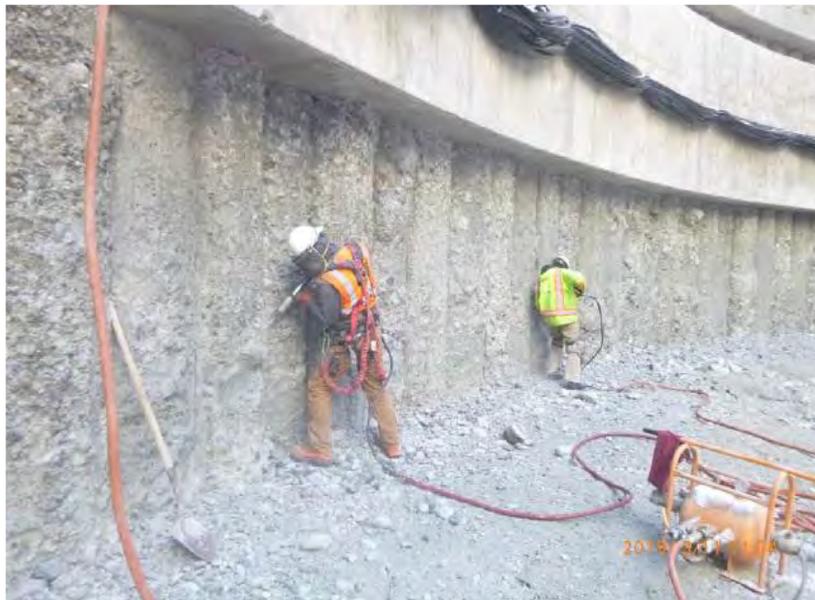


# Secant – Intake Frame (6)



# Cle Elum Fish Passage - Tunnel Contract

Secant Vault Work – 12/2018 to 3/2019



# Secant – Tunnel Entrance Point



# Tunnel Construction - Portal Entry



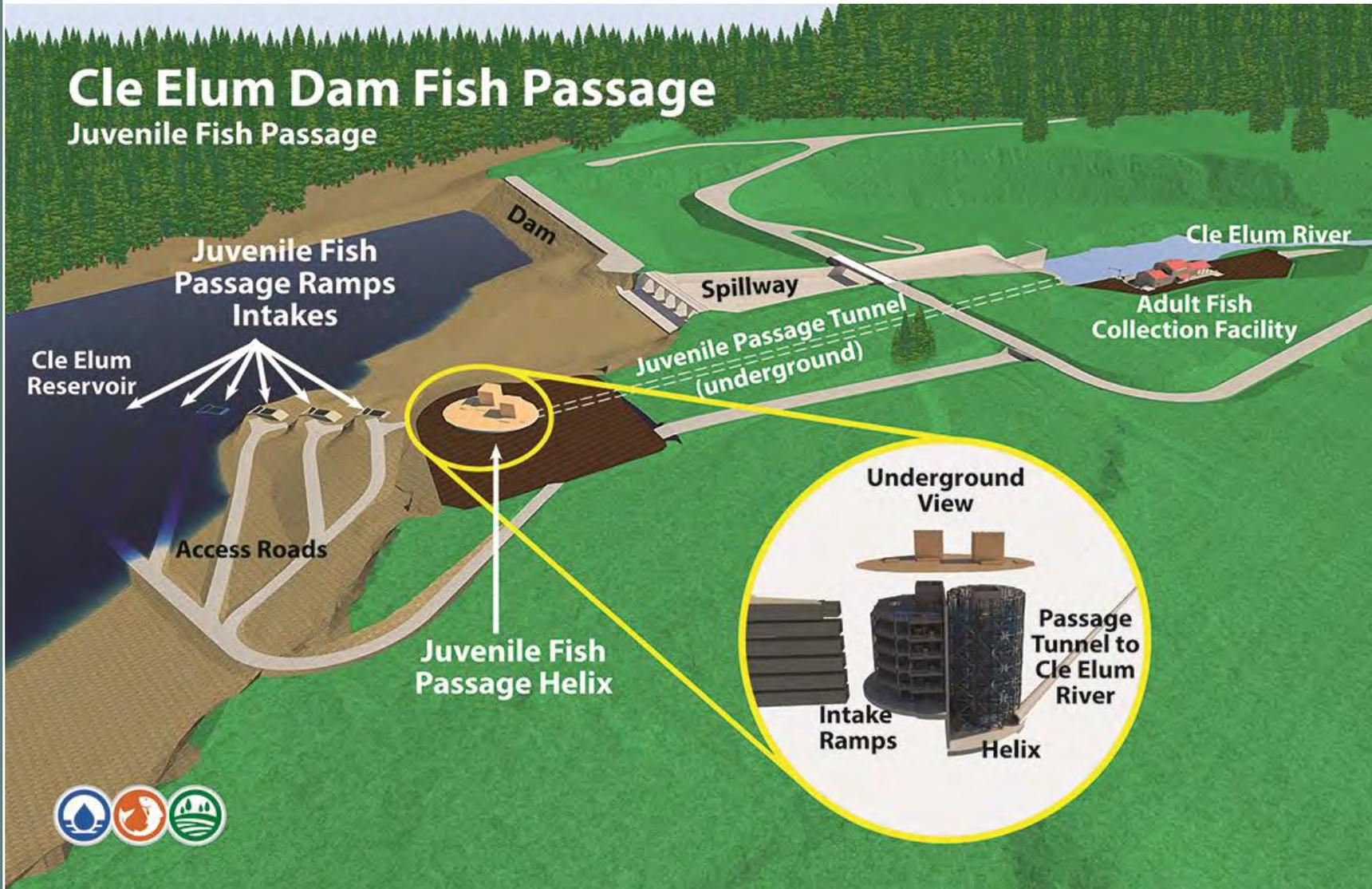
# Tunnel Excavation Machine & Liner Installation



# About 200 feet of Tunnel Excavation and Liner installed to date



# Intake, Gate and Helix Update



# Intakes, Gates and Helix Construction

- On the ground work began in May 2019
- Schedule to be Complete in 2023



# Cle Elum Fish Passage – looking down stream at dam and secant pile vault (right side) 3/2019



# Cle Elum Fish Passage – looking upstream at dam/spillway and tunnel portal location 3/2019



# 2013 - First Sockeye to be born and raised in the Yakima River Basin in over 100 years to return, released into Cle Elum Lake

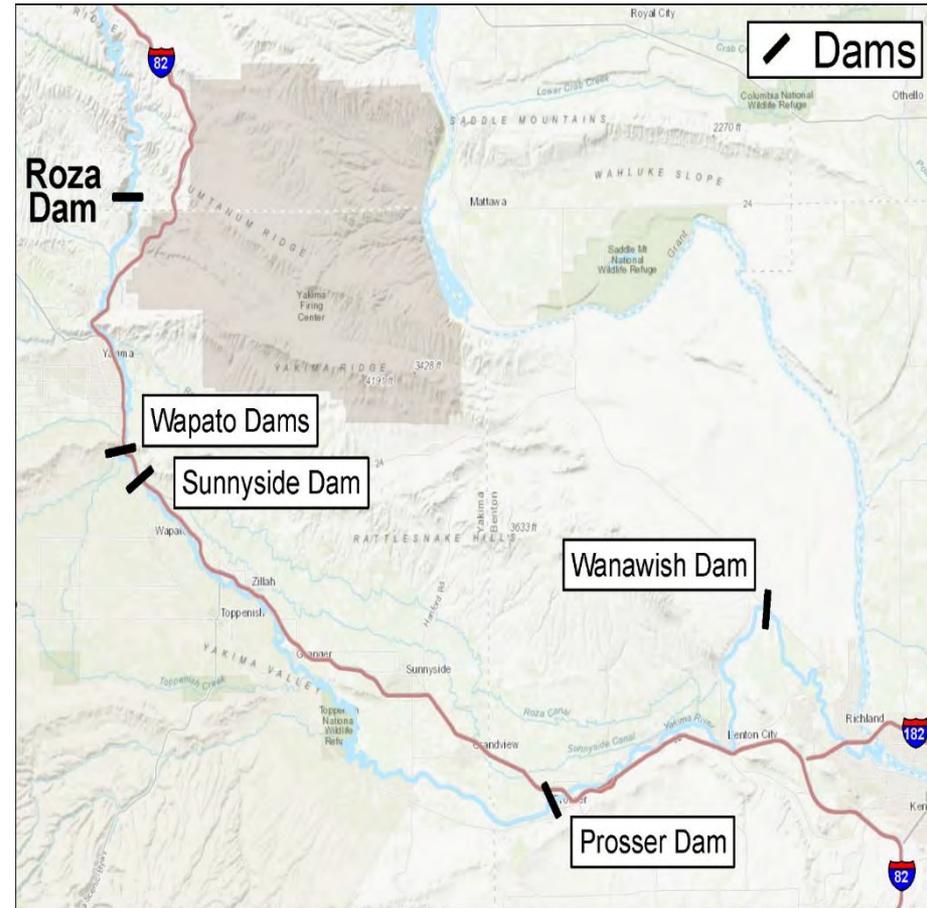
Year	Adult Sockeye Released in Reservoir	Returning Sockeye
2009	1,000	
2010	2,500	
2011	4,100	
2012	10,000	
2013	4,000	800
2014	10,000	2,600
2015	10,000	300
2016	10,000	4,600
2017	1,000	350 - estimate



# Mouth to Roza Dam in 2019

- Tag up to 60 Sockeye
- Radio Tags and Temp Recorders
- Passage Issues at Dams
- Straying (irrigation spills)
- Micro Climate Use

USGS Report Expected  
March 31<sup>st</sup>. 2020.



# Other Fish Passage Facilities

## Tieton Dam Appraisal Assessment

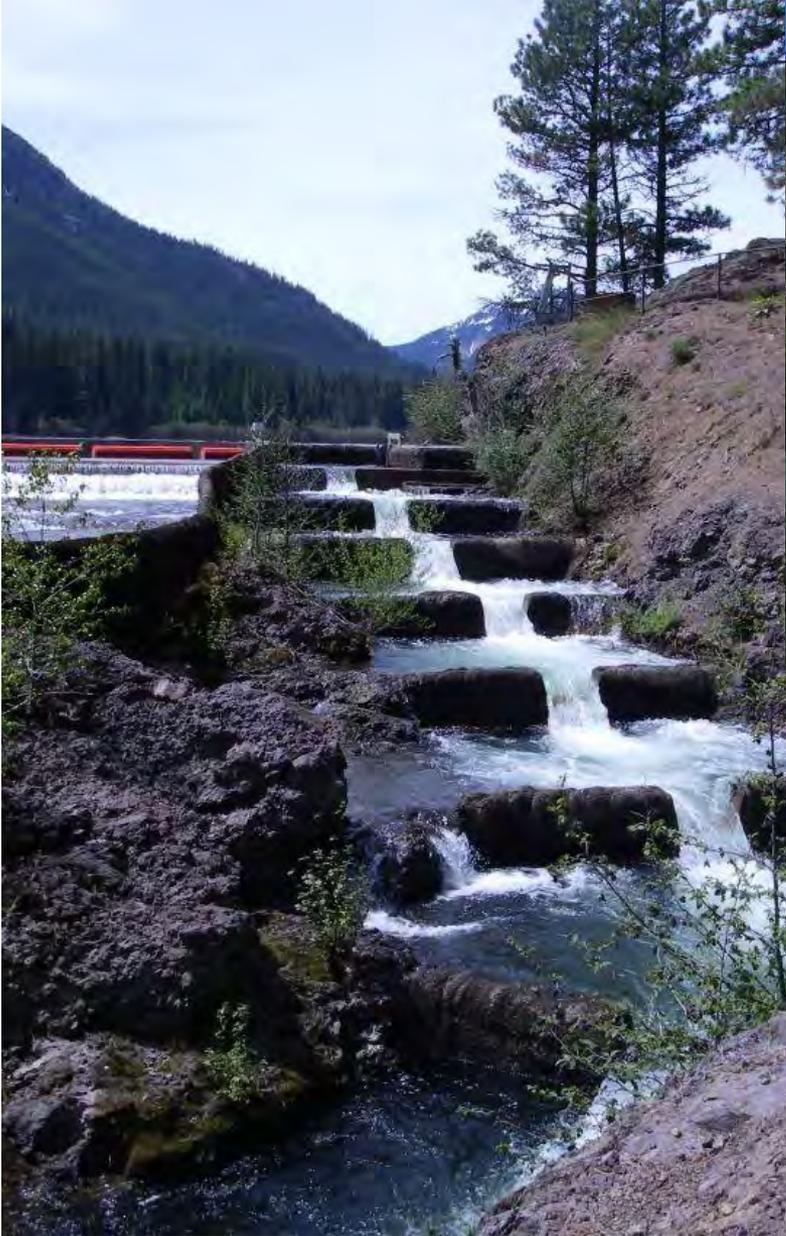


### Draft Alternatives:

- **One Upstream Alternative**
  - Trap and Haul
- **Two Downstream Alternatives**
  - Floating Collector - preferred
  - Fixed Collector
- **Appraisal Assessment completed October 2015**



# Clear Creek Dam & Spillway

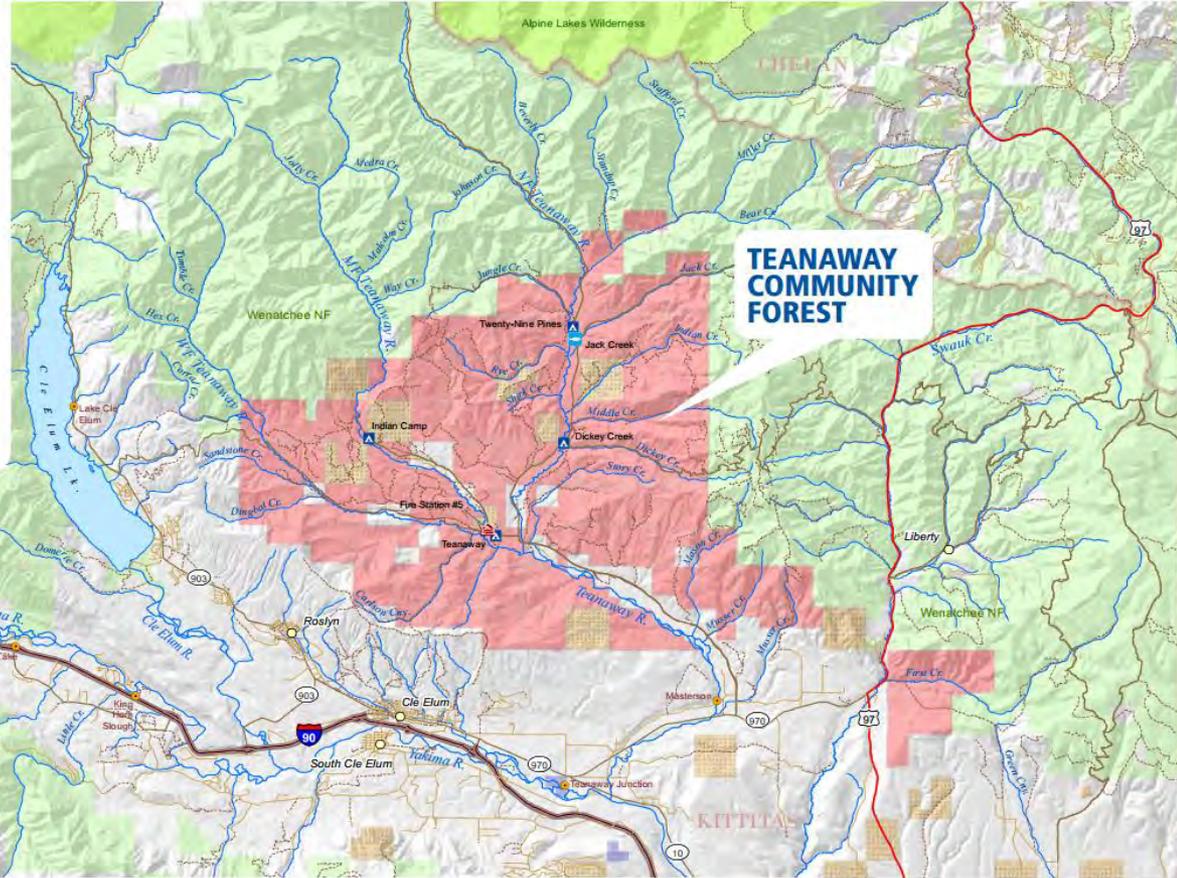


# TEANAWAY COMMUNITY FOREST

The Teanaway Community Forest is a 50,272-acre forest situated at the headwaters of the Yakima Basin watershed. The forest will be managed through a partnership between the Washington state departments of Natural Resources (DNR) and Fish & Wildlife, with input from the local community and interested stakeholders.

DNR designed the community forest model, which was approved by state lawmakers in 2011. The model is a tool to involve local citizens in protecting working forests that support healthy communities through grazing, forestry, recreation, and conservation.

The Teanaway property was identified as part of the Yakima Basin Integrated Plan as an area of importance to safeguard the Yakima Basin water supply and associated habitat, and to support the economy by preserving working lands and enhancing recreation opportunities. The Basin Plan was developed by a coalition of public and private organizations committed to increasing the quantity and quality of water in the Yakima River Basin.



#### FACILITIES

- Building
- Campground
- Acclimation Pond
- WDFW Water Access Sites

#### ROADS

- Interstate
- Major Highway
- Road
- Local Road
- Unimproved Road

#### HYDROGRAPHY

- Rivers
- Streams

#### LAND MANAGEMENT

- Teanaway Community Forest
- Washington Dept. of Natural Resources
- USFS Wilderness Areas
- US Forest Service
- Washington State Parks
- Washington Dept. of Fish & Wildlife

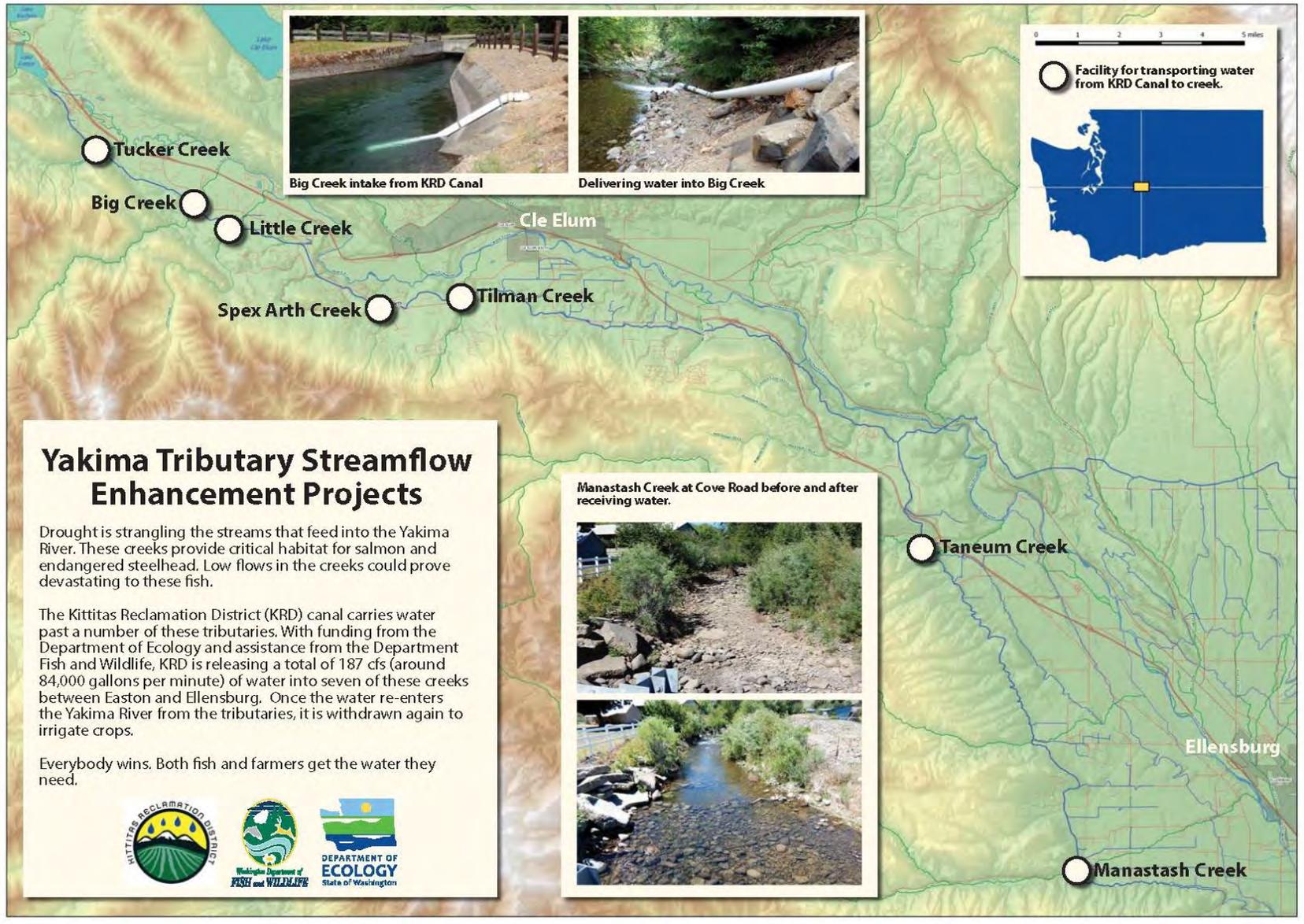


LEARN MORE  
<http://bit.ly/teanaway>



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**





Big Creek intake from KRD Canal



Delivering water into Big Creek



Facility for transporting water from KRD Canal to creek.

## Yakima Tributary Streamflow Enhancement Projects

Drought is strangling the streams that feed into the Yakima River. These creeks provide critical habitat for salmon and endangered steelhead. Low flows in the creeks could prove devastating to these fish.

The Kittitas Reclamation District (KRD) canal carries water past a number of these tributaries. With funding from the Department of Ecology and assistance from the Department Fish and Wildlife, KRD is releasing a total of 187 cfs (around 84,000 gallons per minute) of water into seven of these creeks between Easton and Ellensburg. Once the water re-enters the Yakima River from the tributaries, it is withdrawn again to irrigate crops.

Everybody wins. Both fish and farmers get the water they need.

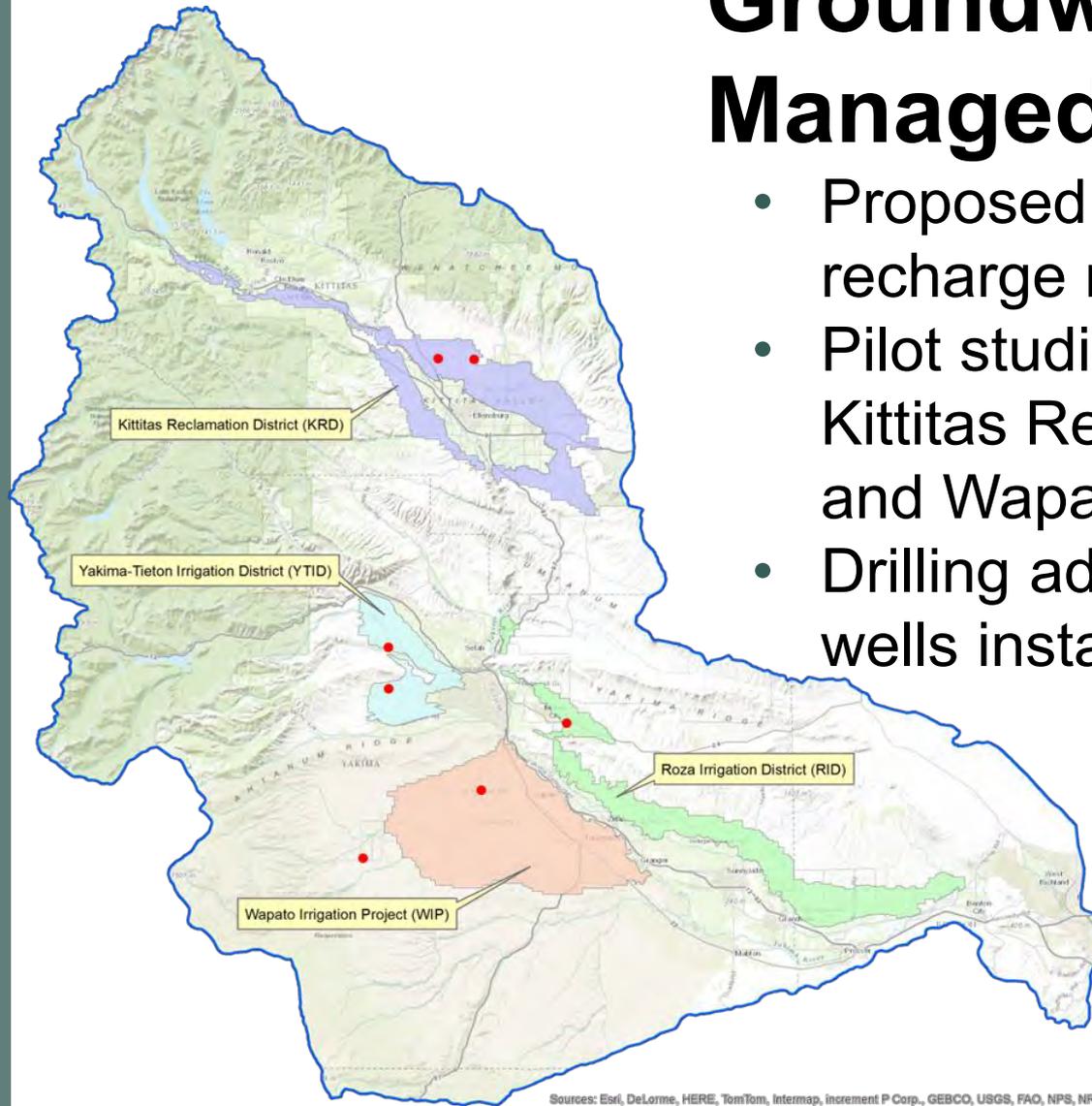


Manastash Creek at Cove Road before and after receiving water.



# Groundwater Managed Recharge

- Proposed Areas for managed recharge modeling
- Pilot studies ongoing at Kittitas Reclamation District and Wapato Irrigation Project
- Drilling additional monitoring wells installed Spring 2019

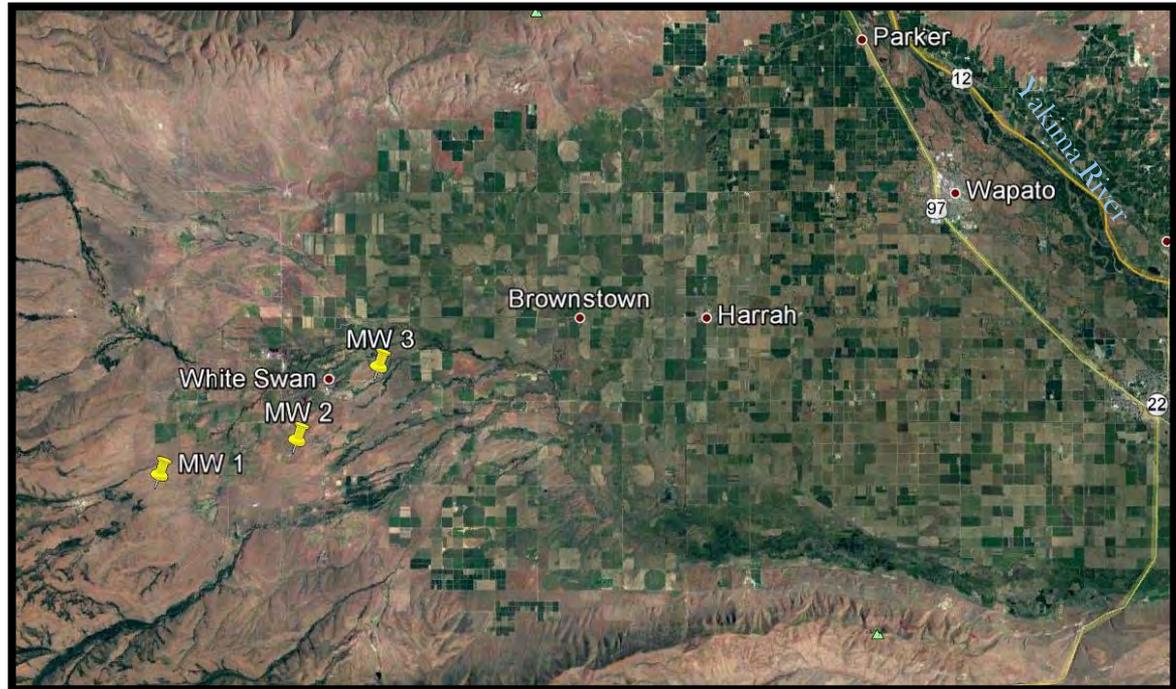


Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



# Toppenish Fan Ground Water Storage

- Coordination with Yakama Nation, Ecology and Reclamation
- 3 new monitoring wells (MW)
- Drilling/installation Completed March 2019
- Data used to understand ground water and surface water dynamics



# Market Reallocation

- **Near-term effort**
  - Build on existing water market programs
  - Take steps to reduce barriers
- **Longer-term effort**
  - Focus on water transfers between districts
  - Allow fallowing within district, leases to outside district
  - Requires substantial changes to existing laws/policies
- **WaterSMART Grant awarded to Kittitas Reclamation District in 2017 on-going**



# YRBWEP Workgroup 10-Year Anniversary



June 2019



# Some Video Resources

- The Helix: Collaborative Approach to Design
  - <https://www.youtube.com/watch?v=jj3Ovv8jXPU>
- YBIP: Habitat & Agricultural Improvements
  - <https://www.youtube.com/watch?v=-XN7txx9Lbc&feature=youtu.be>
- Whooshh Sockeye Salmon over Cle Elum Dam
  - <https://www.youtube.com/watch?v=uCxNC5cJuOo>



# Questions



For further information on the web:

<http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/>

<http://www.ecy.wa.gov/programs/wr/cwp/YBIP.html>

