

Yakima River Basin Integrated Water Resource Management Plan Status Update

Science Management Conference
Ellensburg, WA
June 14, 2017

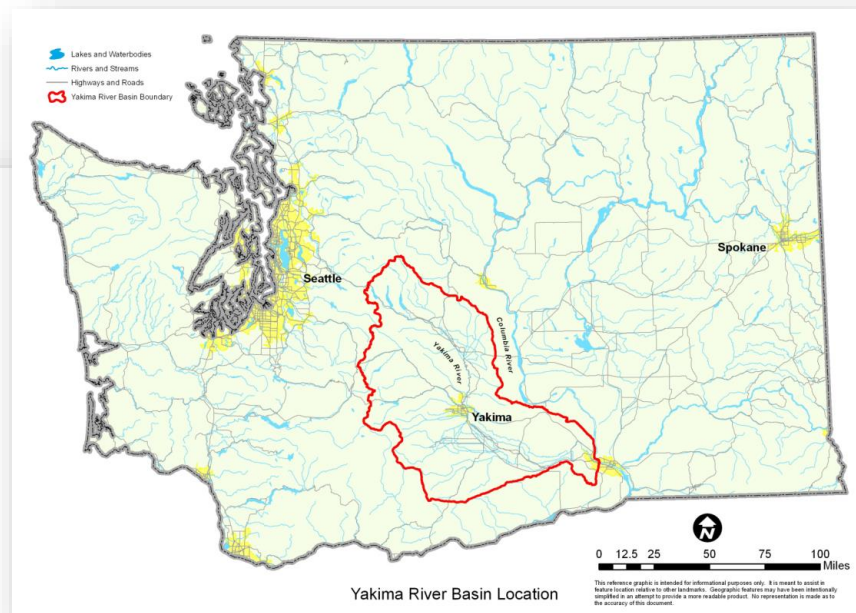
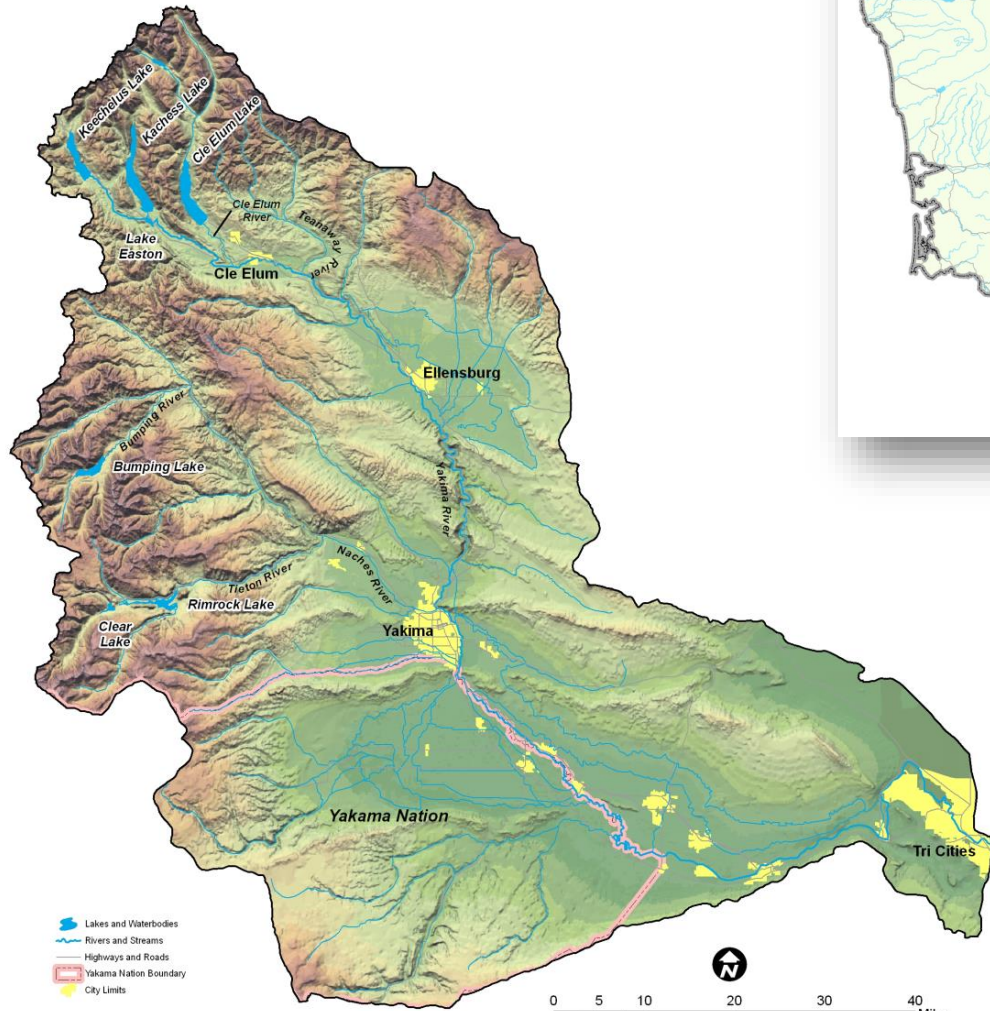


Presented by:

Wendy Christensen, Reclamation



Yakima River Basin Overview

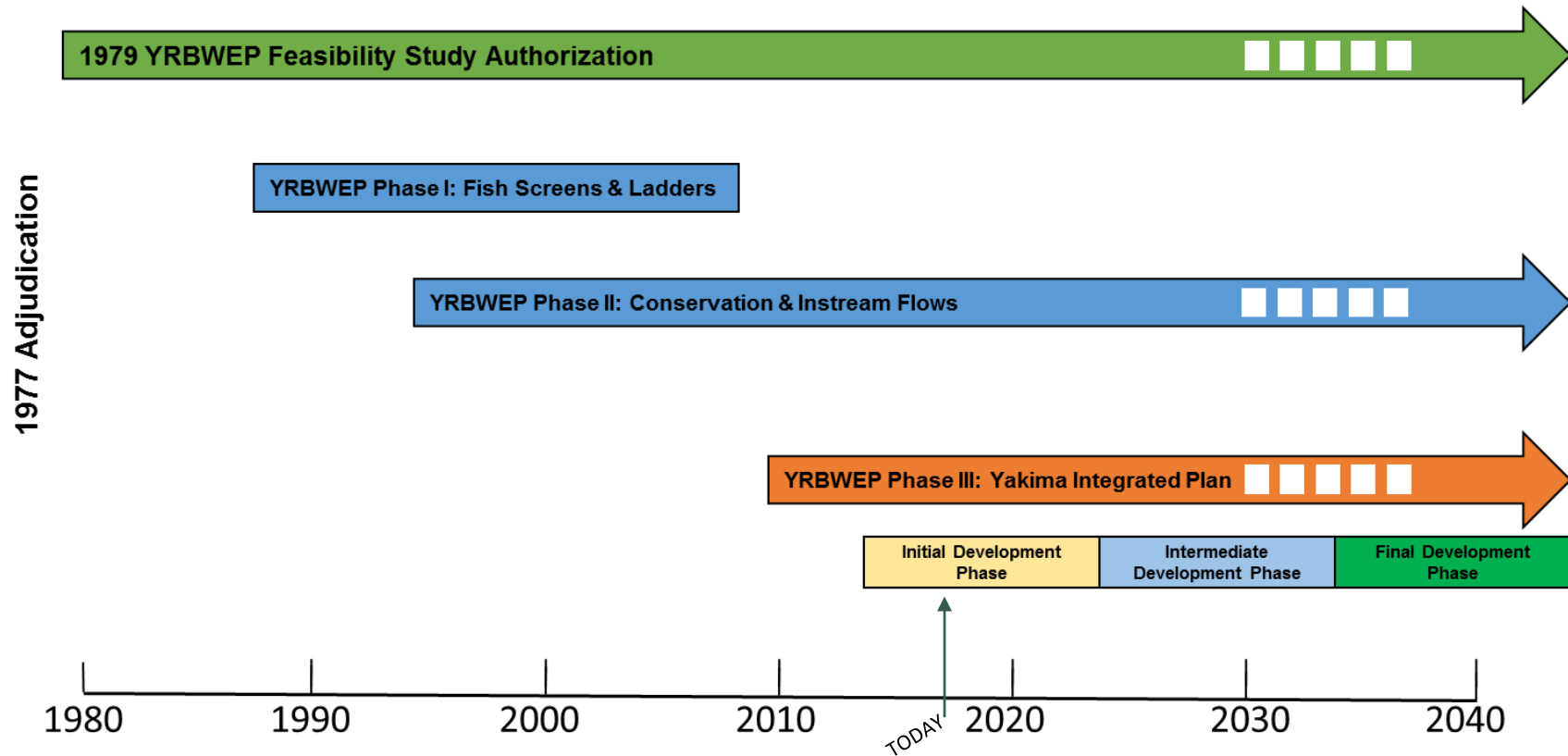


- 6,155 sq. miles w/464,000 irrigated acres
- 5 reservoirs w/ 1M AF capacity, irrigation deliveries 2.3M AF
- Droughts in 1992-1994, 2001, 2005, and 2015
- Reduced Fisheries
- \$4 Billion agriculture economy



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



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**



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

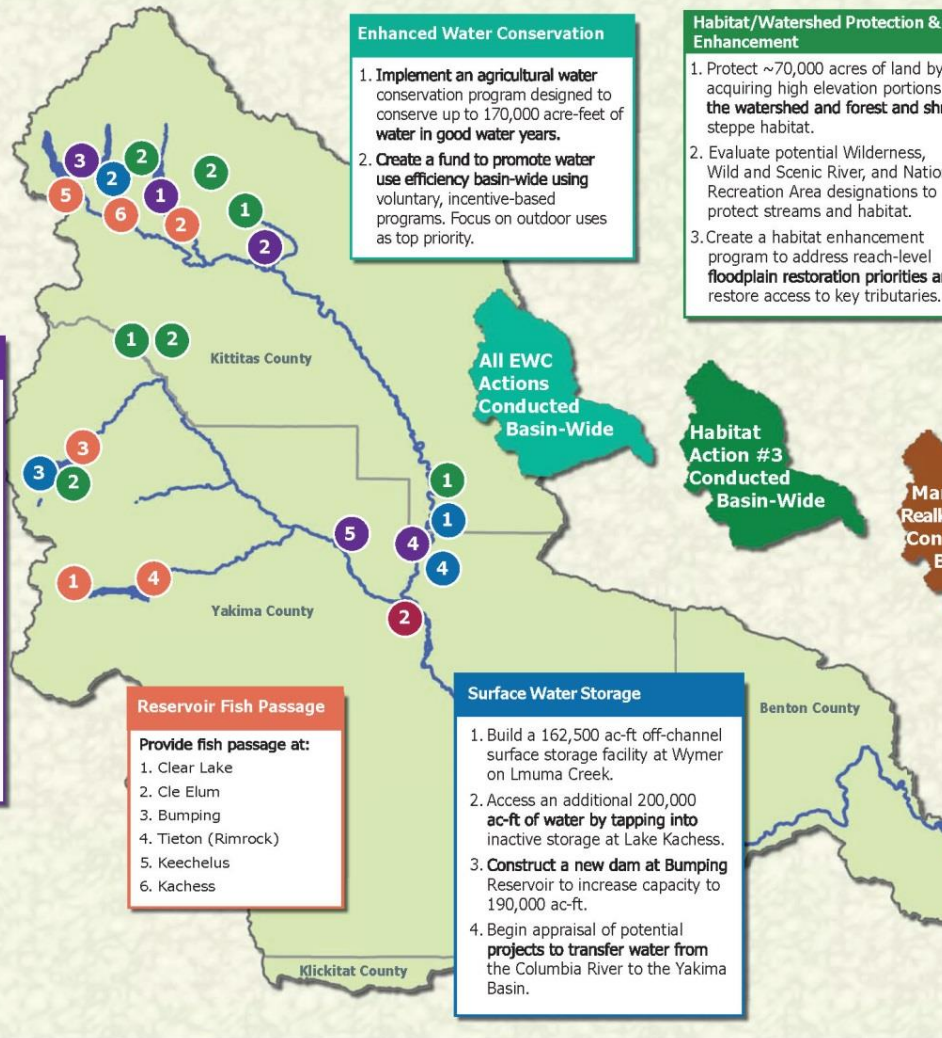
1. Protect ~70,000 acres of land by acquiring high elevation portions of the watershed and forest and shrub steppe habitat.
2. Evaluate potential Wilderness, Wild and Scenic River, and National Recreation Area designations to protect streams and habitat.
3. Create a habitat enhancement program to address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

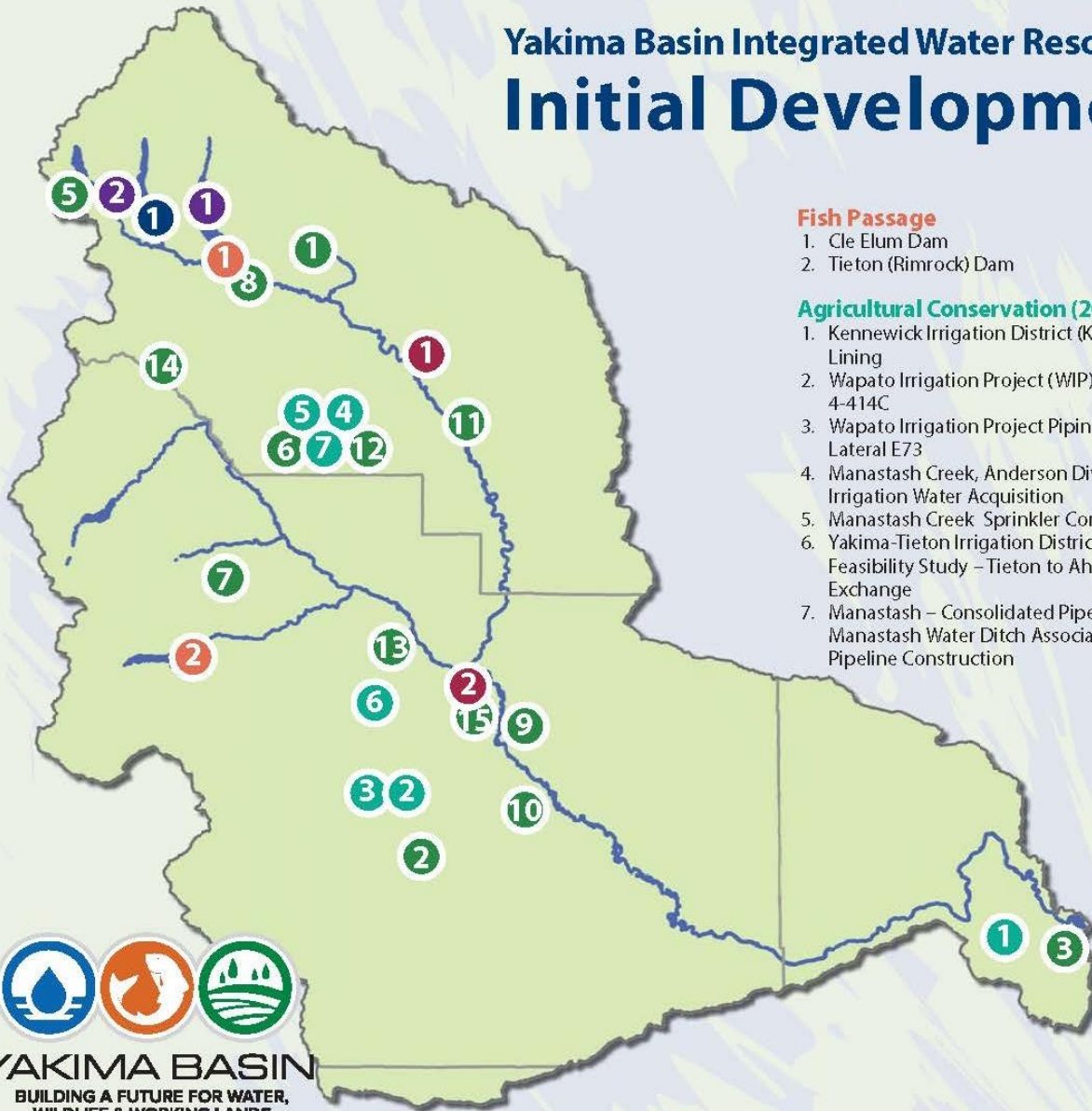
Surface Water Storage

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



Fish Passage

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

Agricultural Conservation (2013-2015)

1. Kennewick Irrigation District (KID) Division IV Lining
2. Wapato Irrigation Project (WIP) Piping Lateral 4-414C
3. Wapato Irrigation Project Piping Satus East Lateral E73
4. Manastash Creek, Anderson Diversion Irrigation Water Acquisition
5. Manastash Creek Sprinkler Conversions
6. Yakima-Tieton Irrigation District (YTID) Feasibility Study – Tieton to Ahtanum Exchange
7. Manastash – Consolidated Pipeline & Manastash Water Ditch Association (MWDA) Pipeline Construction

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

Groundwater Storage

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

Habitat Enhancement (2013-2015)

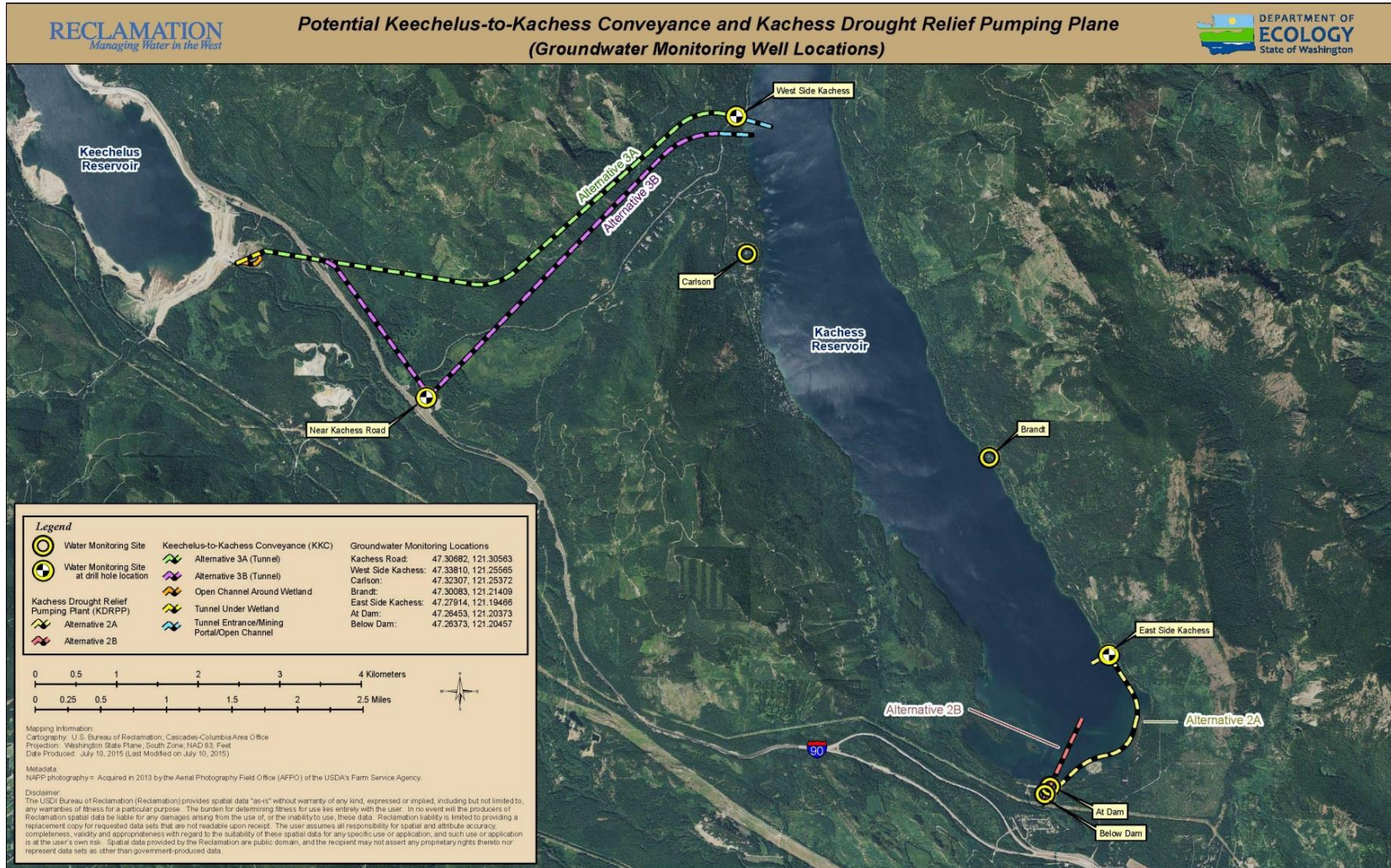
1. Teanaway Acquisition
2. Toppenish Fan
3. Bateman Island Causeway Modification Conceptual Design
4. Bull Trout Habitat Improvements
5. Gold Creek Habitat Assessment and Conceptual Design
6. Reed Diversion design Barrier Removal
7. Little Rattlesnake Road De-commissioning
8. Cle Elum River Side Channel 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



YAKIMA BASIN
BUILDING A FUTURE FOR WATER,
WILDLIFE & WORKING LANDS

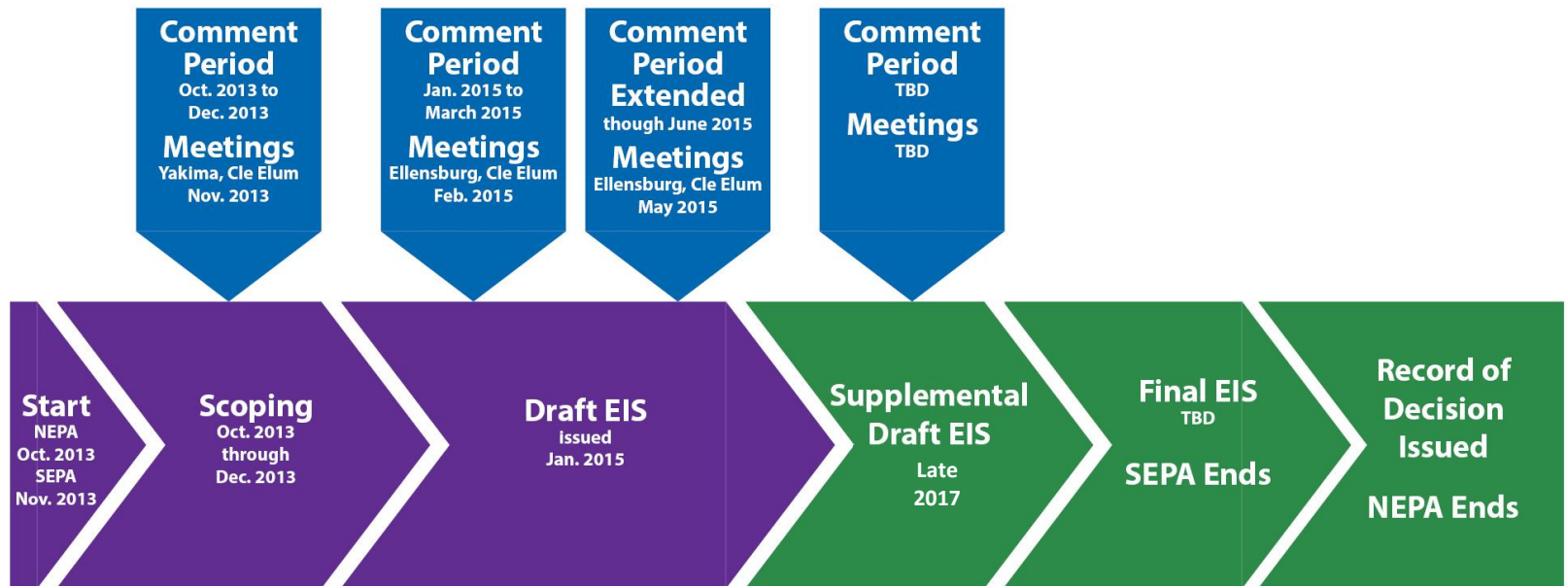


Kachess Drought Relief Pumping Plant & Keechelus-to-Kachess Conveyance Location



Milestones

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



Time not to scale



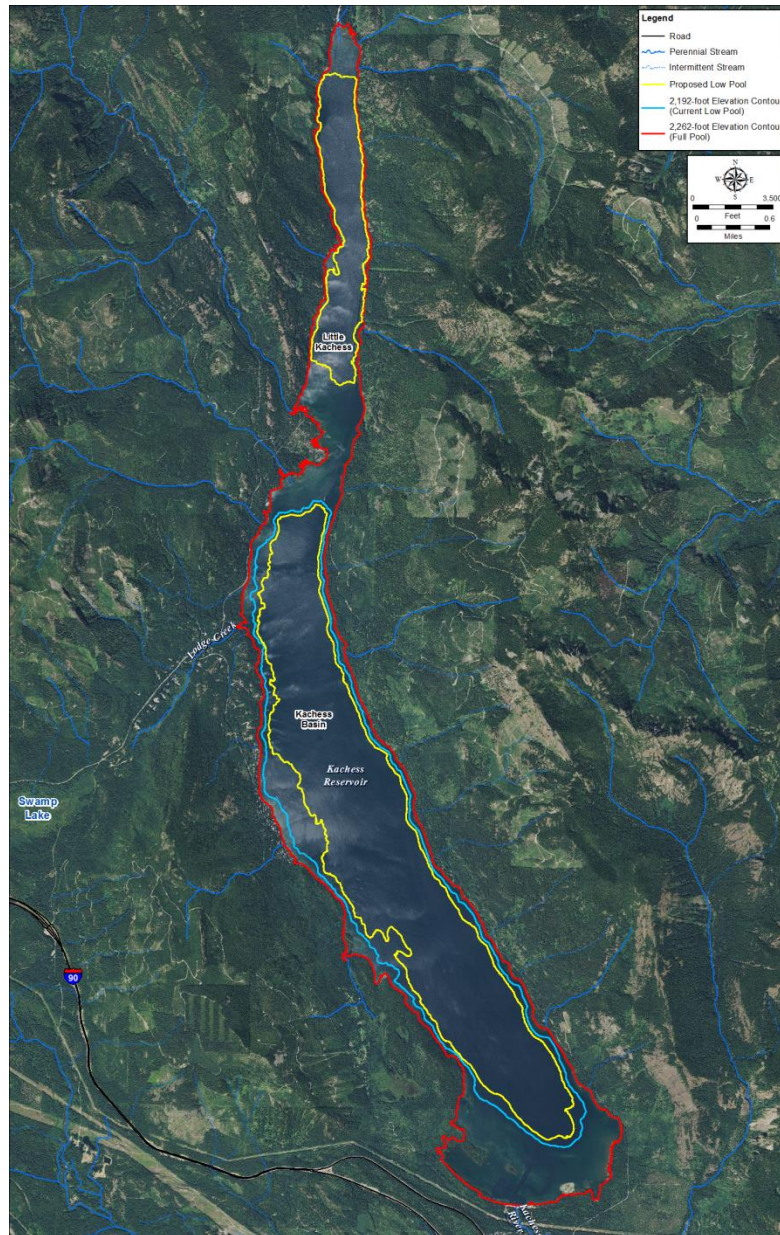
Kachess Drought Relief Pumping Plant



Oct 2015 Aerial Kachess Reservoir



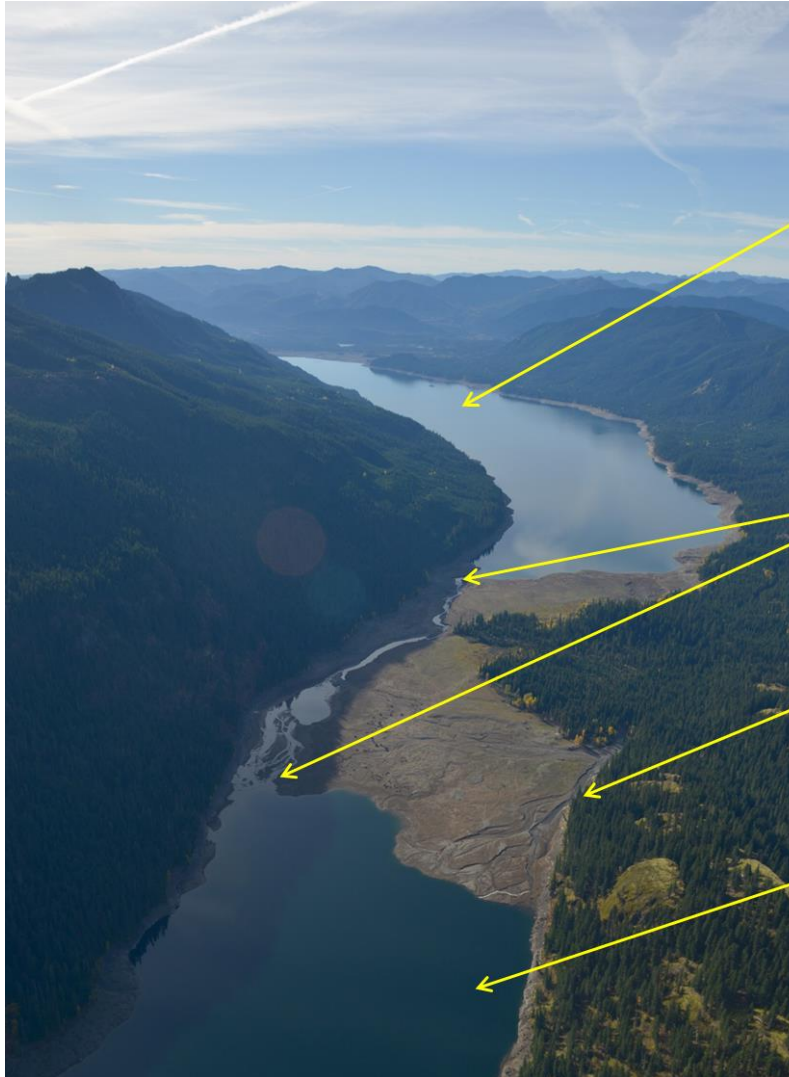
Kachess Drought Relief Pumping Plant



- Provides up to 200K acre-ft of water in <70% proration years
- Up to 14% less surface area than existing minimum pool



Kachess Reservoir Bull Trout Passage



Lower Kachess Lake

Historic Min EL 1999.60' (10/18/94; Hydromet)

The Narrows

(Inflection Pt (drop off); 2199.5')

Box Canyon Creek

Upper Kachess Lake

Min EL 2223.93' (Ed Young, fall 2015)

Reference: Kachess Reservoir Bull Trout
Passage Appraisal Report 2016



Yakima Integrated Plan – A Balanced Approach

Kachess Drought Relief Pumping Plant (KDRPP)

Bull Trout Enhancement Plan (BTE)

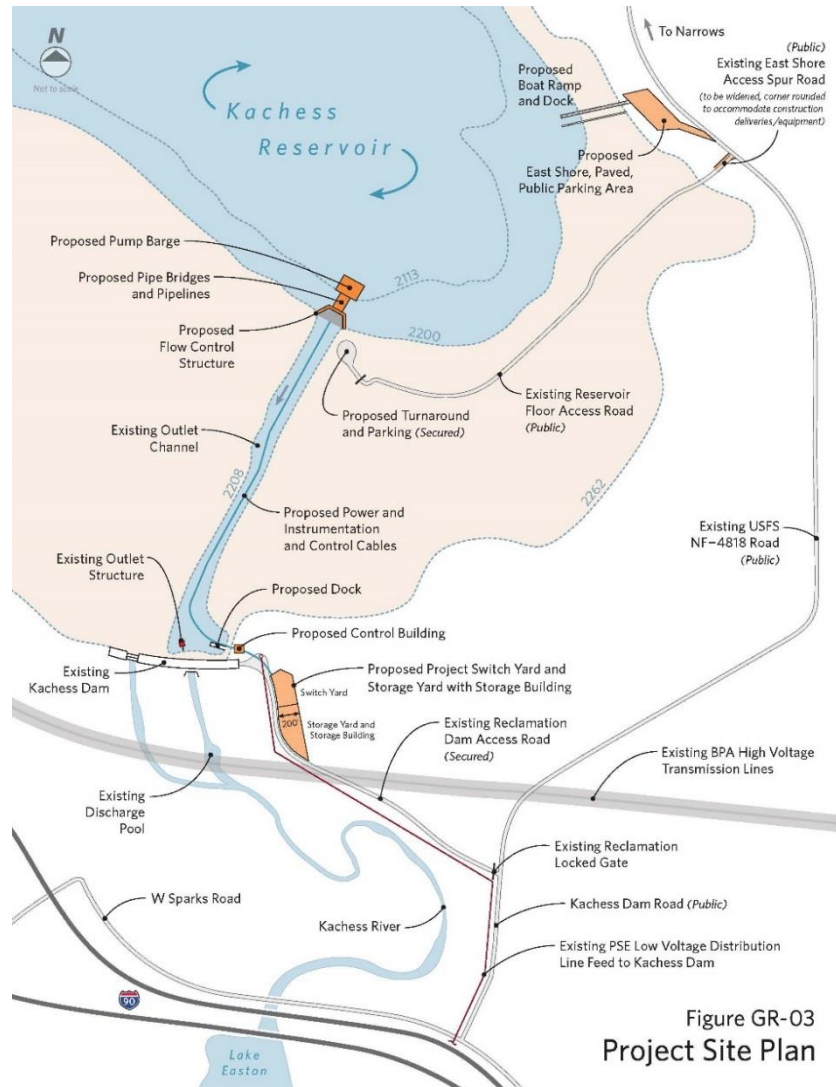


Figure GR-03
Project Site Plan

Bull Trout Enhancement

Kachess Drought Relief Pumping Plant and Keechelus-To-Kachess Conveyance

Kittitas and Yakima Counties, Washington

A Component of the Yakima River Basin
Integrated Water Resource Management Plan



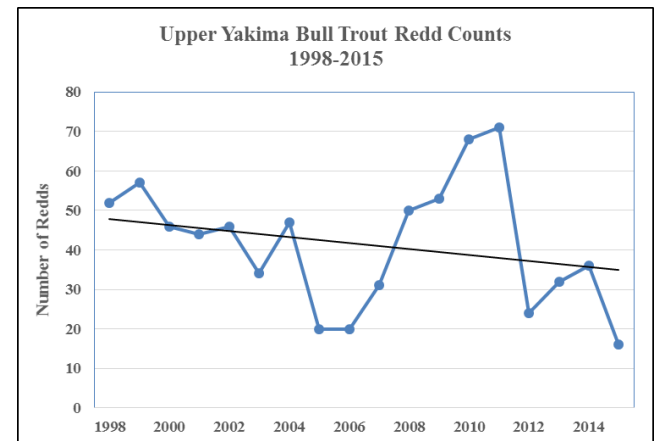
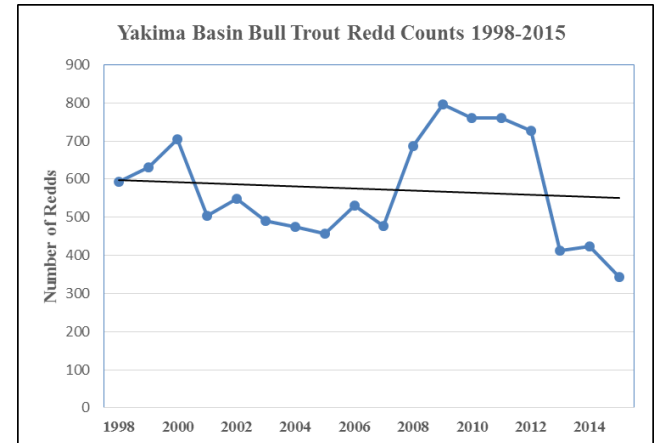
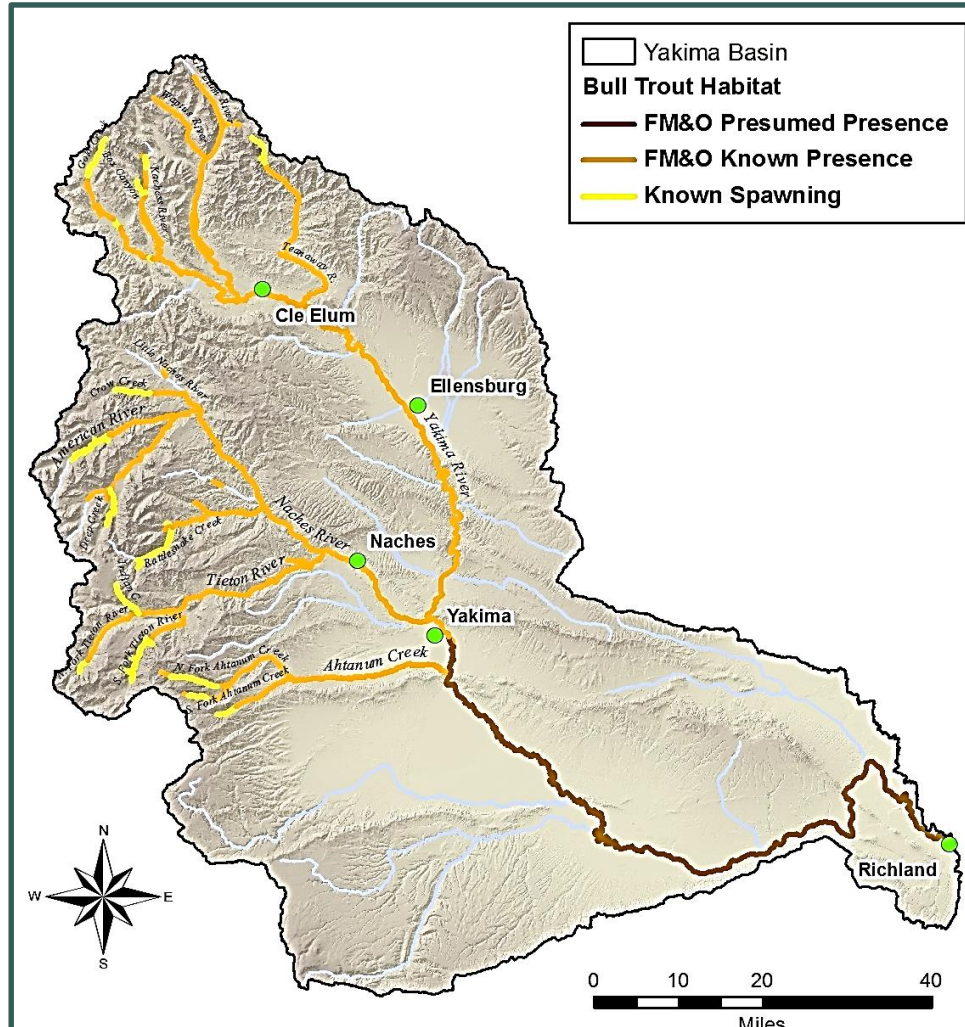
U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia-Cascade Area Office
Yakima, Washington



State of Washington
Department of Ecology
Office of Columbia River
Yakima, Washington

December 2014

Yakima Basin Bull Trout Population



ESA Listed as Threatened 1998



Bull Trout MOU

- Purpose to coordinate parties to support, develop, and implement BT enhancement actions
- Goal - self-sustainable, healthy, harvestable populations
- The MOU was signed in October 2015
 - Yakama Nation,
 - Bureau of Reclamation,
 - Washington State Department of Ecology,
 - Washington State Department of Fish and Wildlife,
 - U.S. Fish and Wildlife Service,
 - U.S. Forest Service



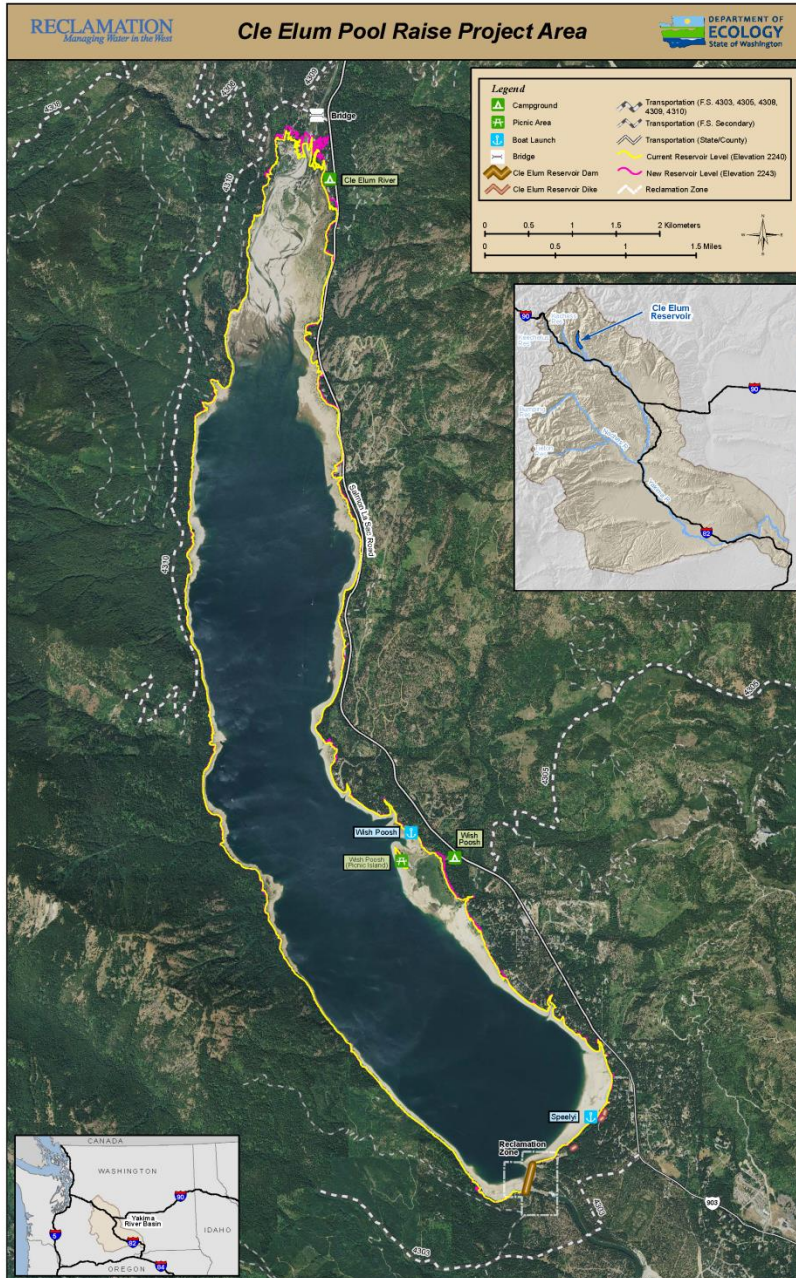
Bull Trout Enhancement Plan (BTE)

Table 6. Summary of Estimated Project Costs for Phase 1 of the BTE

Project	Assessment and Design Costs	Construction and Implementation	Total
Gold Creek Passage & Habitat Improvements*			
• Gold Creek Instream Actions	\$250,000	\$3,000,000	3,250,000
• Gold Creek Pond Actions	\$300,000	TBD	\$300,000
• Drain Decommissioning	N/A	\$50,000	\$50,000
• Helis Pond Actions	\$50,000	\$100,000	\$150,000
Gold Creek USFS Bridge Replacement	N/A	\$5,600,000	\$5,600,000
Cold Creek Passage Improvement*	\$250,000	\$1,600,000	\$1,850,000
Bull Trout Task Force	N/A	\$66,000	\$66,000
Box Canyon Reservoir/Tributary Passage	\$200,000	\$600,000	\$800,000
Kachess River Passage & Habitat Assessment and Design*	\$300,000	TBD	\$300,000
Box Canyon Passage Assessment and Design	\$200,000	TBD	\$200,000
FS Projects Kachess Watershed Health	N/A	TBD	TBD
South Fork Tieton River Passage Assessment & Design*	\$550,000	TBD	\$550,000
North Fork Tieton River Passage Assessment & Design*	600,000	TBD	600,000
Bull Trout Population Enhancement Evaluation*	\$500,000	TBD	\$500,000
Improve Productivity and Food Resources (nutrient enhancement)*	\$200,000	\$500,000	\$700,000







Cle Elum Pool Raise

14,600 acre-feet managed for instream flows

- Modify radial gates
- Shoreline protection
- Land acquisition



Cle Elum Pool Raise

- **Final EIS; Record of Decision signed June 2015**
- **Radial Gate Modification**
 - Awarded contract in September 2015
 - Construction completed April 2017
- **Shoreline Protection**
 - Dikes raised and update completed September 2016
 - Preparing bid packages
 - Continued coordination with USFS and landowners
 - Award contract 2017 for USFS facilities



Cle Elum Pool Raise Construction



Cle Elum Dam Pool Raise Construction

Working on north side arm, bay 4



Modification of Radial Gates –
under construction

Fork lift picking top for gate 4



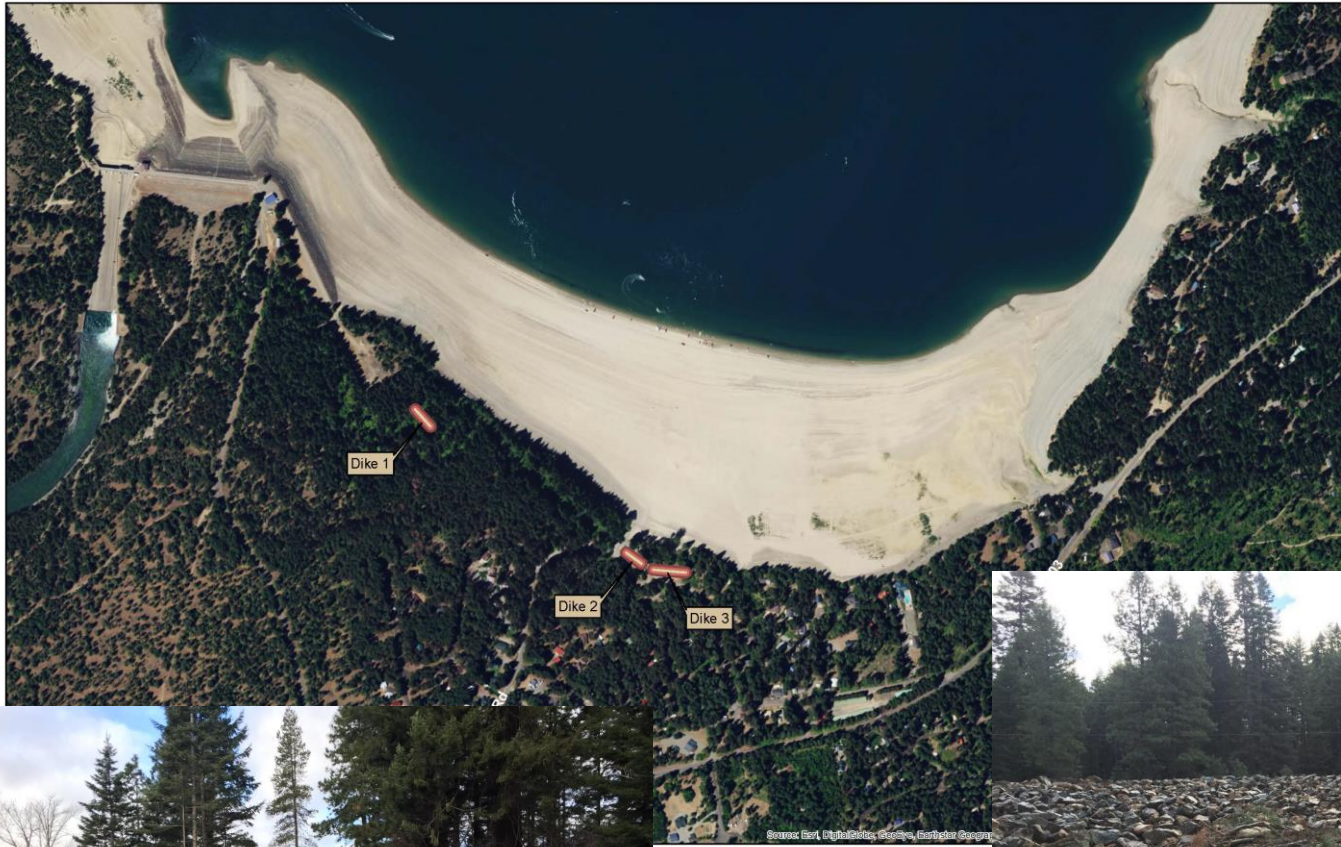
Cle Elum Dam Pool Raise Construction



Cle Elum Dam Pool Raise Construction



Cle Elum Pool Raise - Dikes



Cle Elum Pool Raise

Shoreline Protection



Cle Elum Reservoir Existing Shoreline



Cle Elum River Campground



Cle Elum Reservoir Existing Shoreline



Cle Elum River Campground



Cle Elum Reservoir Existing Shoreline



Rootwad Shoreline Treatment

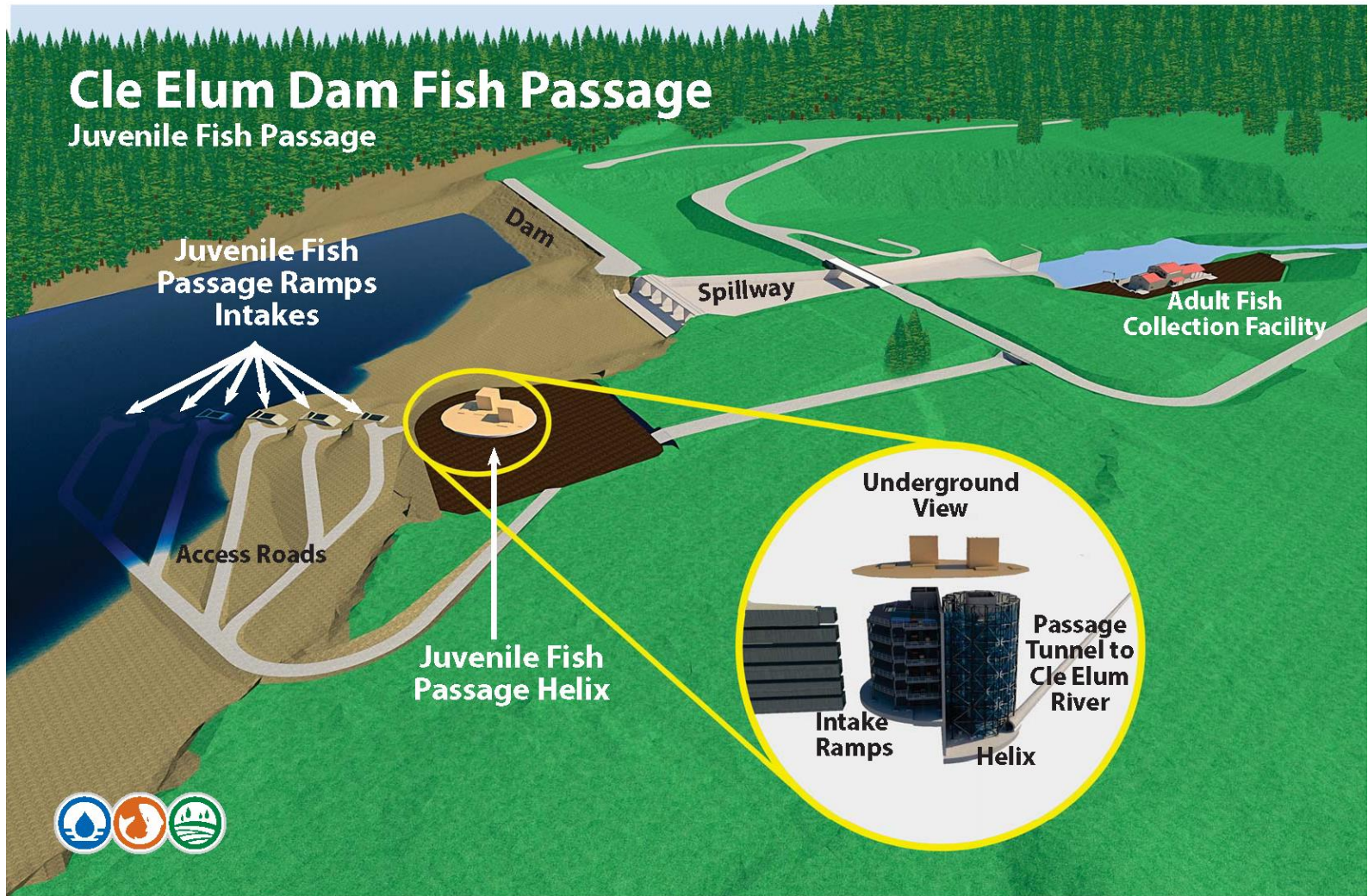


Cle Elum Pool Raise Timeline

Cle Elum Dam Pool Raise	Duration	Status
Radial Gates	2 to 3 years	Completed
Cle Elum River Campground & Speelyi Beach Day Use	1 year	Award - 2017
Wishpoosh & Speelyi Beach	1 to 2 years	Award - 2018
Sandelin	1 to 2 years	Award - TBD
Domerie Bay	1 to 2 years	Award - TBD
Timber Cove	1 to 2 years	Award - TBD
Anna Bell	1 to 2 years	Award - TBD
Morgan Creek & Night Sky Drive	1 to 2 years	Award - TBD



Cle Elum Dam Fish Passage



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	Spawning 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

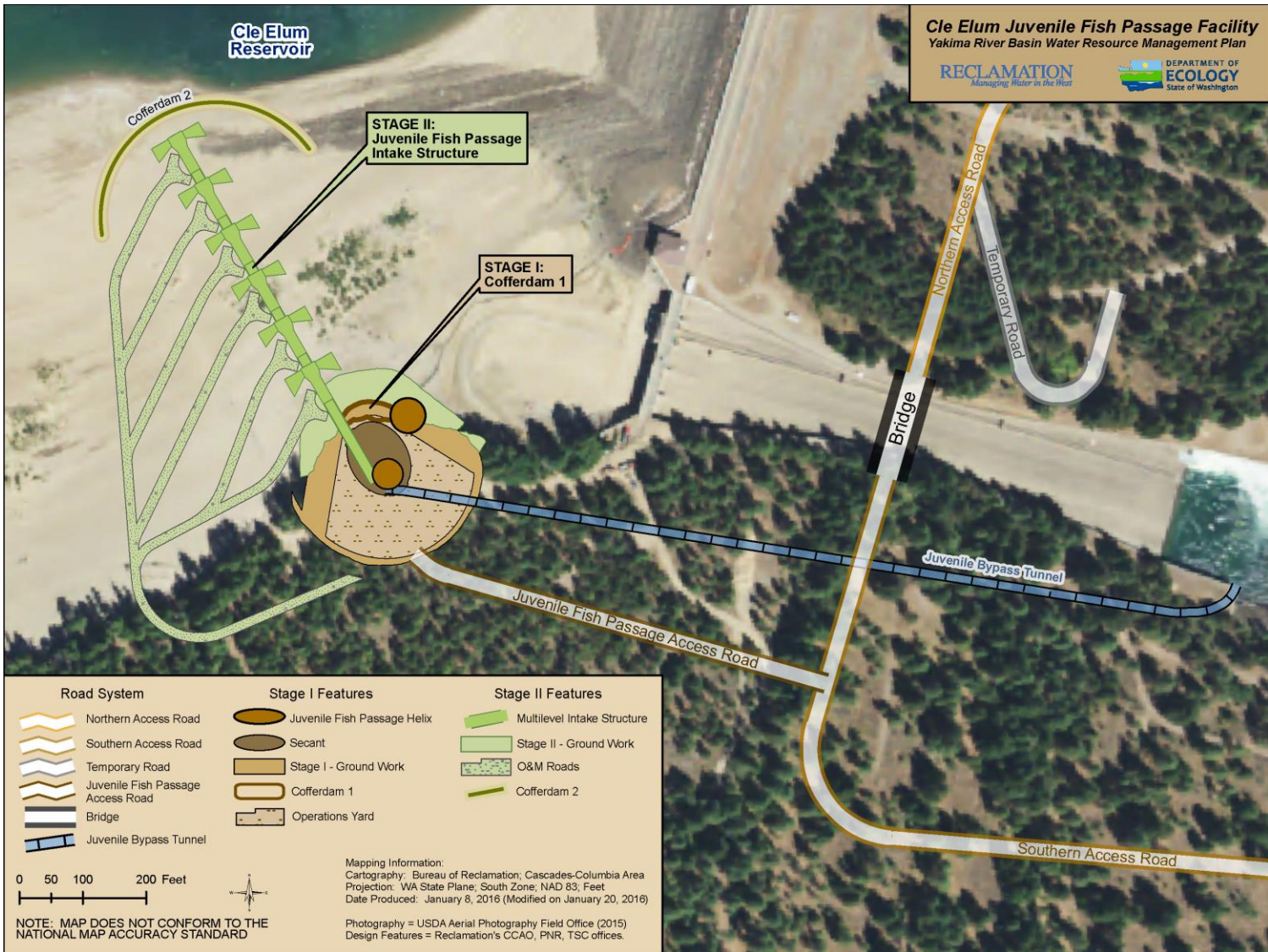


Cle Elum Dam Fish Passage Construction - Schedule

- **Final Design complete in 2015**
- **Road and bridge construction contract awarded July 2015 and completed in October 2016.**
- **Secant Pile contract awarded in July 2016, mobilization scheduled for Spring 2017.**
- **Tunnel contract awarded Summer 2017, mobilization scheduled for Spring 2018.**



Cle Elum Dam Fish Passage Construction



Cle Elum Fish Passage Secant Pile Example



Secant Pile Example

Cle Elum Fish Passage Secant Construction



Cle Elum Dam Fish Passage Construction



Northern Access Road



Northern Access Road Entrance



Cle Elum Dam Fish Passage Construction



Completed Bridge
Looking East



Completed Bridge Looking West



Cle Elum Dam Fish Passage Construction



**October 12, 2016 Ribbon Cutting Ceremony
for new access road and bridge across
spillway**



Cle Elum Fish Passage - Adult Facilities

Whooshh Fish Transport System

- **Moves fish through a flexible conduit, using pressure differentials to either push or pull the fish through the tube**
- **The Yakama Nation in cooperation with Reclamation, worked with Whooshh Innovations to test the technology for the Cle Elum Fish Passage Project at Roza Dam in June 2016, and at Prosser Dam October 2016, and will be tested at Cle Elum Dam July 2017**
- **Initial indications are that this technology is economical and fish friendly**
- **<http://www.whooshh.com/fish-passage.html>**



Cle Elum Fish Passage- Adult Facilities

Whooshh Fish Transport System at Roza



Prosser Fish Passage Test

Whooshh Fish Transport System at Prosser



Cle Elum Fish Passage Test Whooshh Fish Transport System, proposed test location at Cle Elum Dam



Approximately 1700' long, 150' high,
45 seconds transport time for fish



Whooshh Fish Transport System at Cle Elum



Cle Elum Fish Passage Timeline

Cle Elum Dam Fish Passage Project	Duration	Status
Roads and Bridge	1 year 3 mo	Completed - 10/16
Secant Pile	3 to 4 years	In Progress
Tunnel	3 Years	Award - 2017
Intake Structure, Gate & Helix	4 to 5 years	Award - TBD
Splitter Wall	Less than a year	Award - TBD
Adult Facility	3 to 4 years	Award - TBD



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>

