

# Yakima River Basin Integrated Water Resource Management Plan Cle Elum Reservoir Projects

Columbia River Policy Advisory Group  
March 9, 2017



*Presented by:*

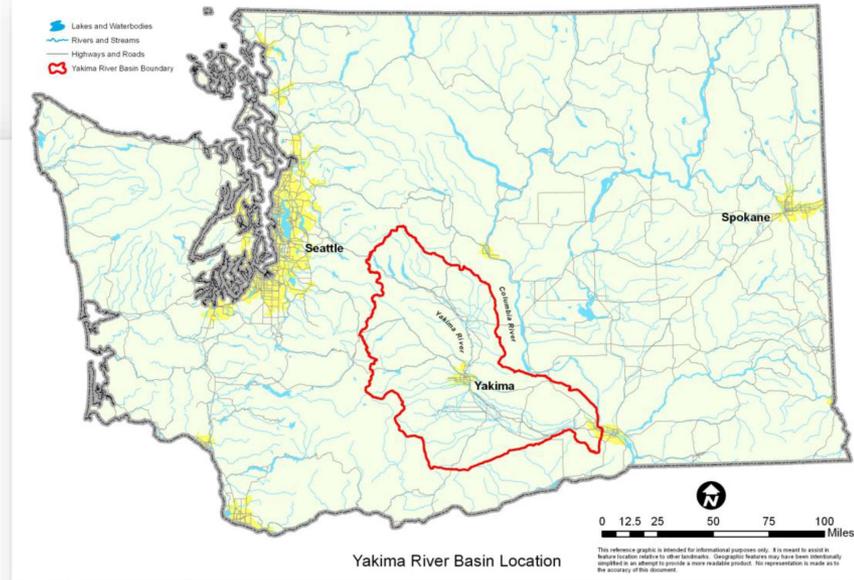
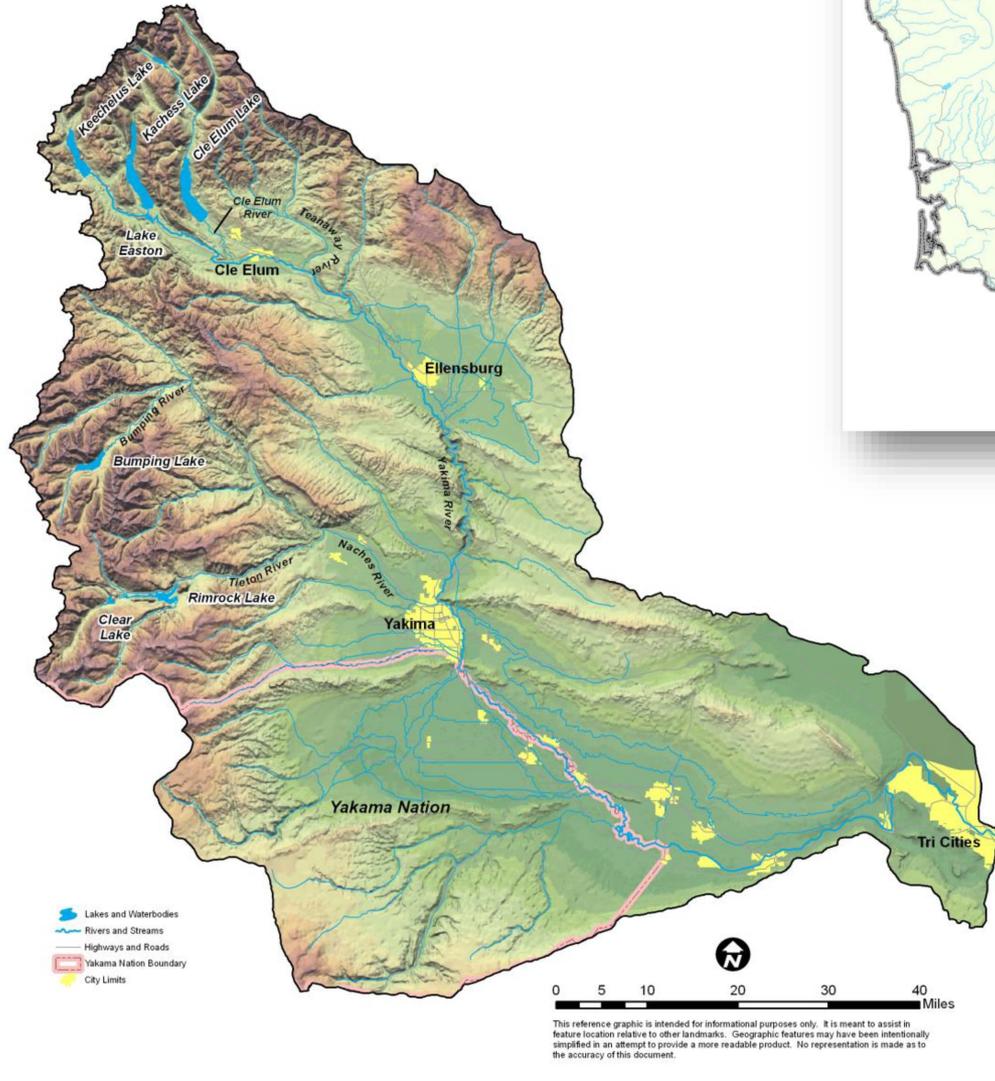
**Wendy Christensen, Reclamation**

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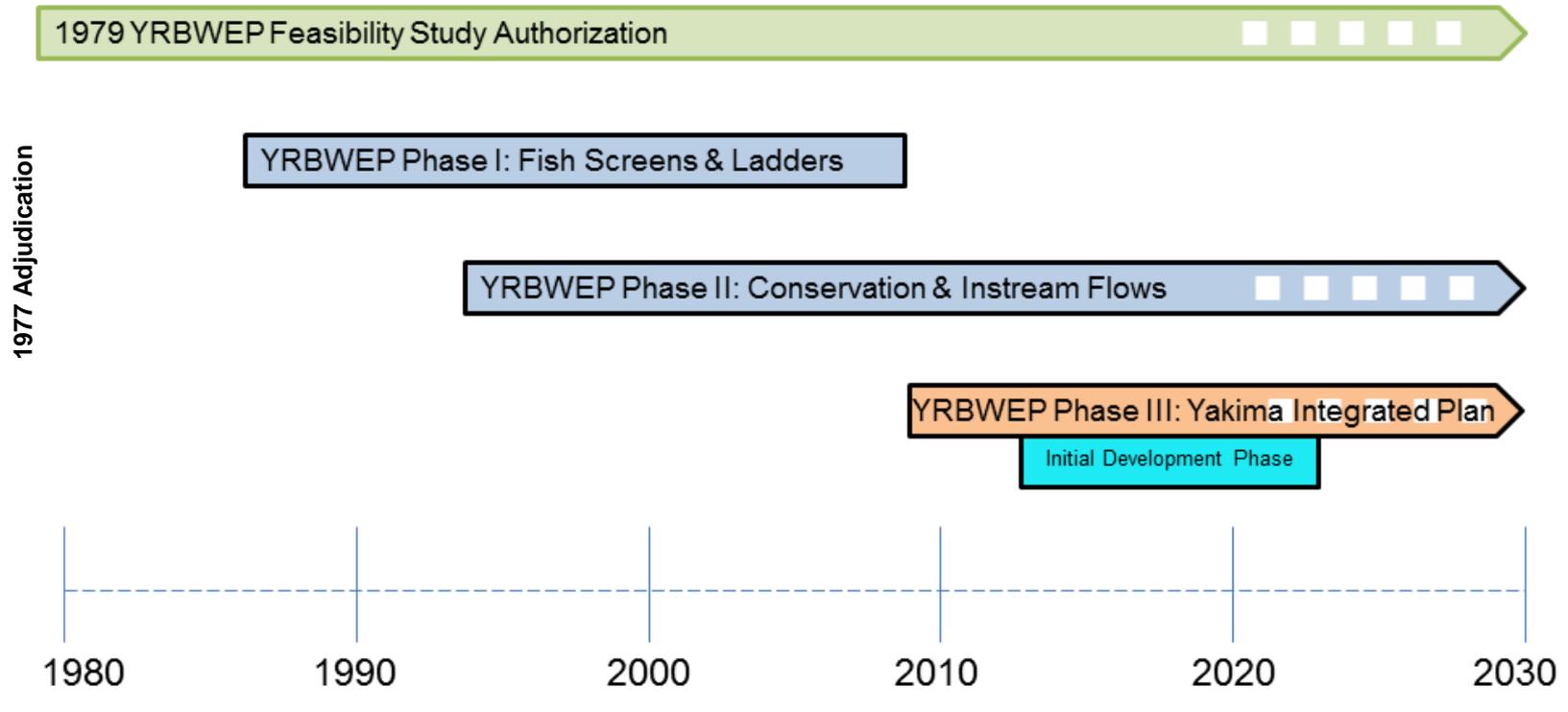
# Yakima River Basin Overview



- 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
- \$3.5 Billion agriculture economy



# Yakima River Basin Water Enhancement Project Timeline



- **Yakima River Basin 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**



# 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 follow 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

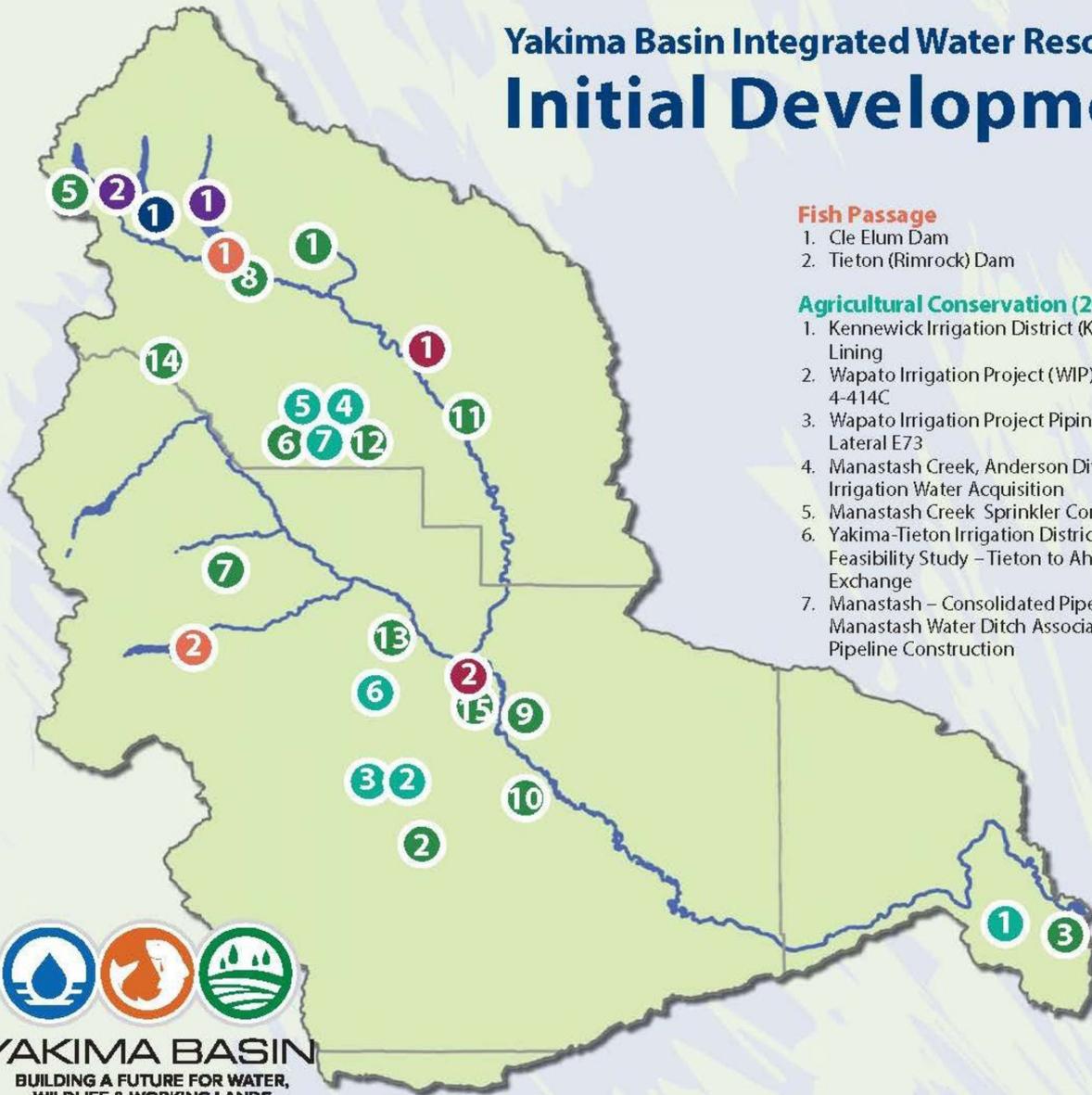
### Surface Water Storage

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

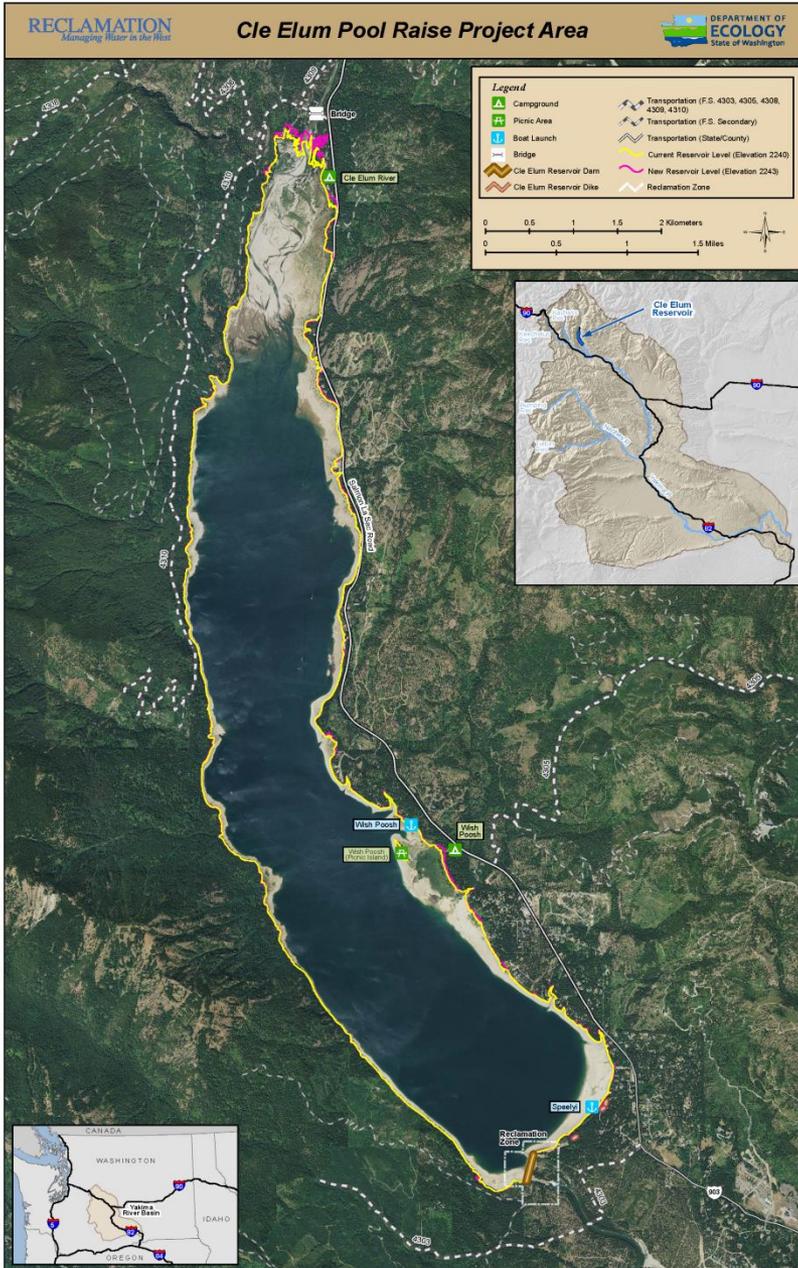
## Habitat Enhancement (2013-2015)

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



# Cle Elum Pool Raise





# Cle Elum Pool Raise

- Modify radial gates
- Shoreline protection
- Land acquisition

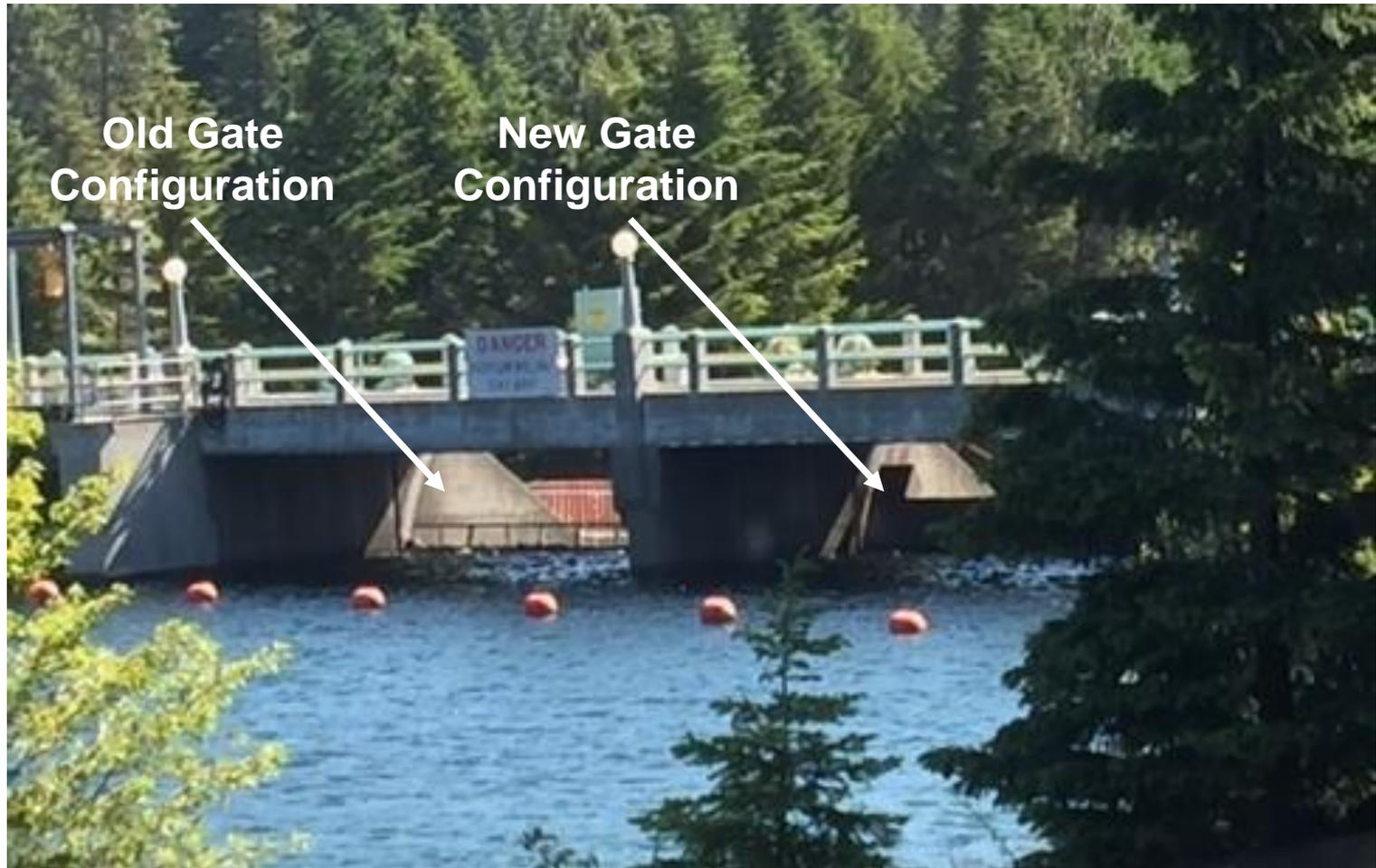


# Cle Elum Pool Raise

- **Final EIS; Record of Decision signed June 2015**
- **Radial Gate Modification**
  - Awarded contract in September 2015
  - Construction completion March 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

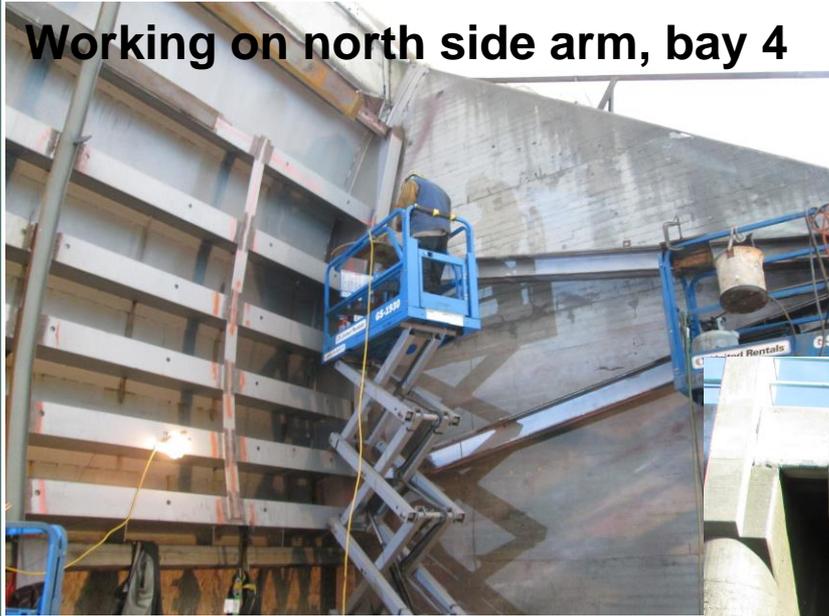


# Cle Elum Pool Raise Construction



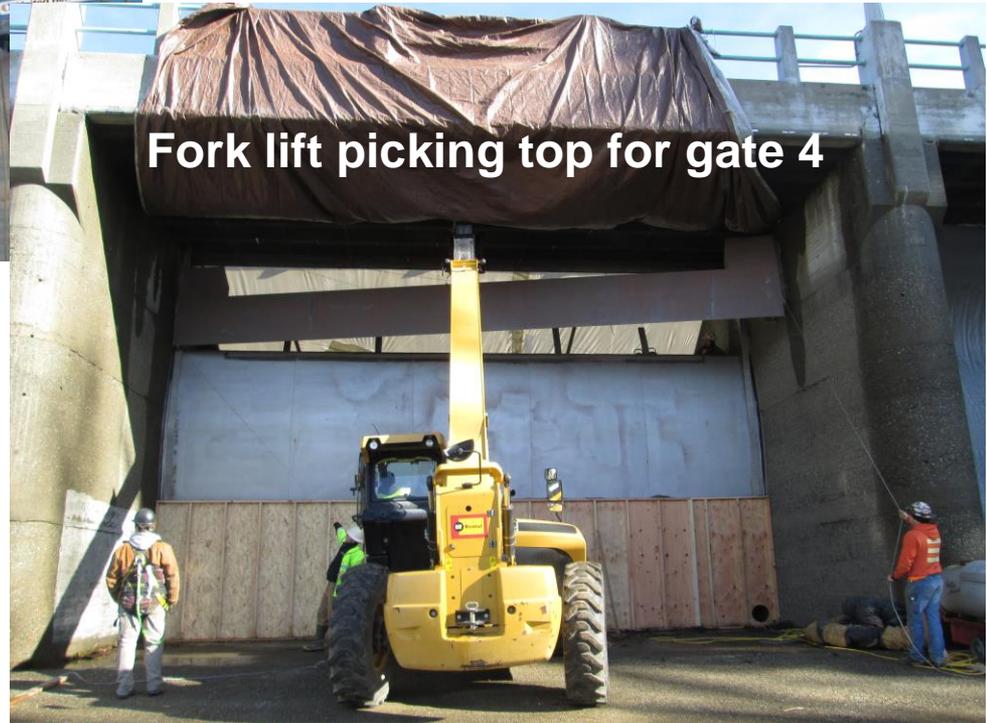
# Cle Elum Dam Pool Raise Construction

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 Pool Raise - Dikes



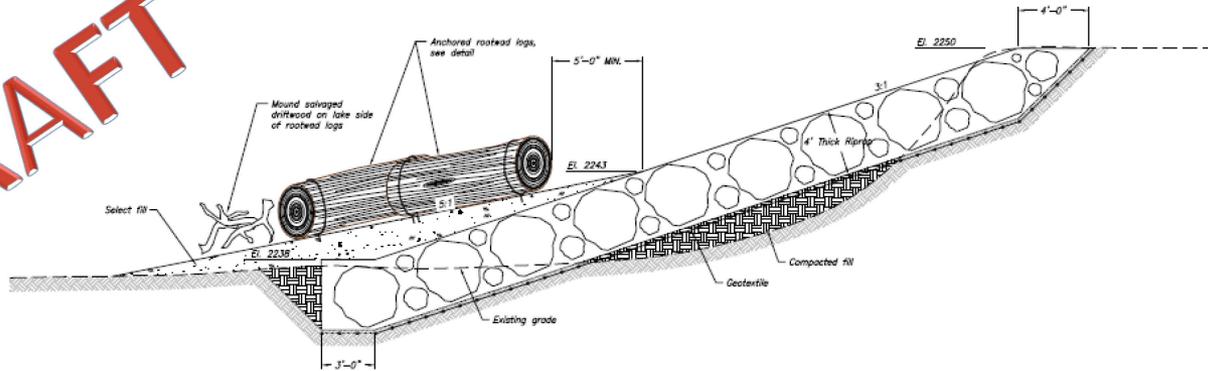
# Cle Elum Pool Raise

## Shoreline Protection



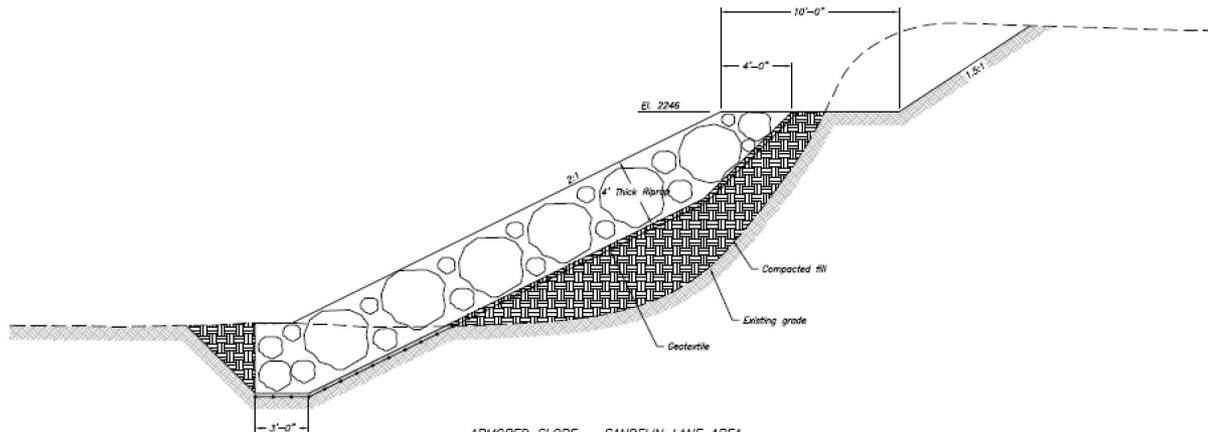
# Cle Elum Pool Raise – Shoreline Protection

**DRAFT**



SLOPE PROTECTION - RIGHT ABUTMENT  
TYPICAL SECTION

SCALE OF FEET



ARMORED SLOPE - SANDELIN LANE AREA  
TYPICAL SECTION

SCALE OF FEET

RECLAMATION  
Managing Water to the West

ALWAYS THINK SAFETY  
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
FOR USE ONLY  
MODIFICATIONS FOR 3rd POOL RAISE  
SHORELINE PROTECTION  
Not For Final Construction

DESIGNED	Checked
DRAWN	Checked
CHECKED	Checked
SCALE APPROV.	SCALE APPROV.
DATE APPROVAL	DATE APPROVAL
DATE	DATE

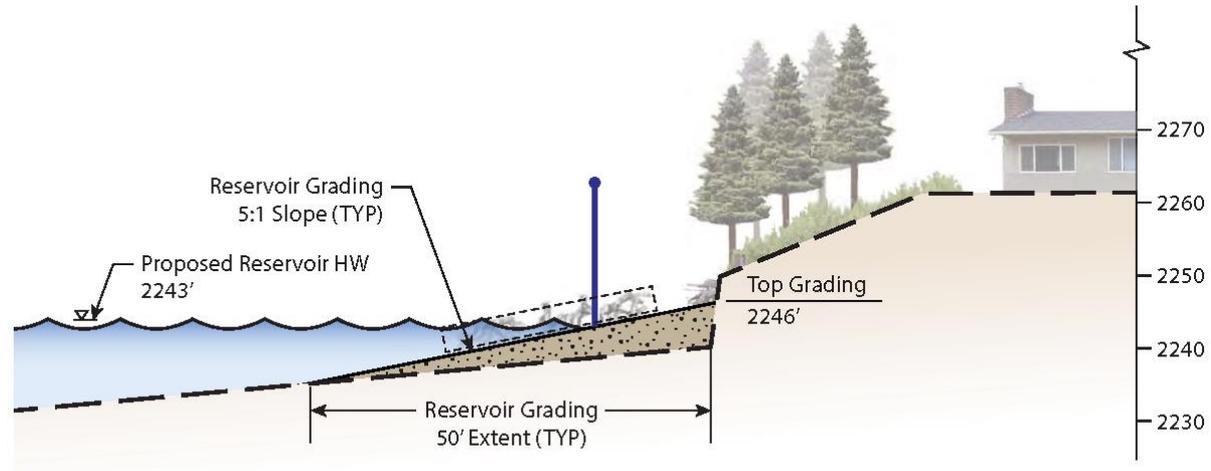
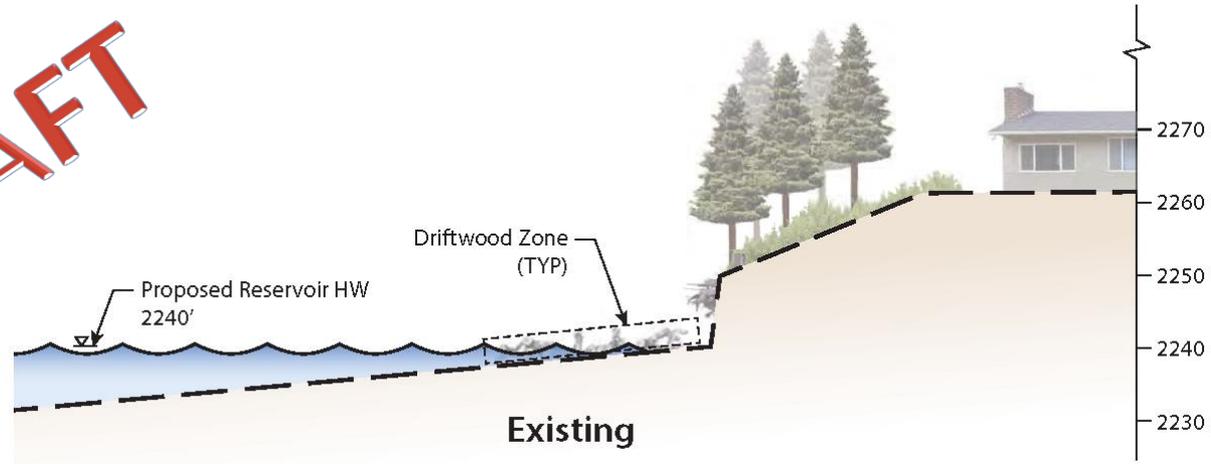
RIGHT ABUTMENT AND  
SANDELIN LANE AREA  
TYPICAL SECTIONS

C-22  
SHEET 1 OF 1



# Cle Elum Pool Raise – Adaptive Shoreline Protection Concepts

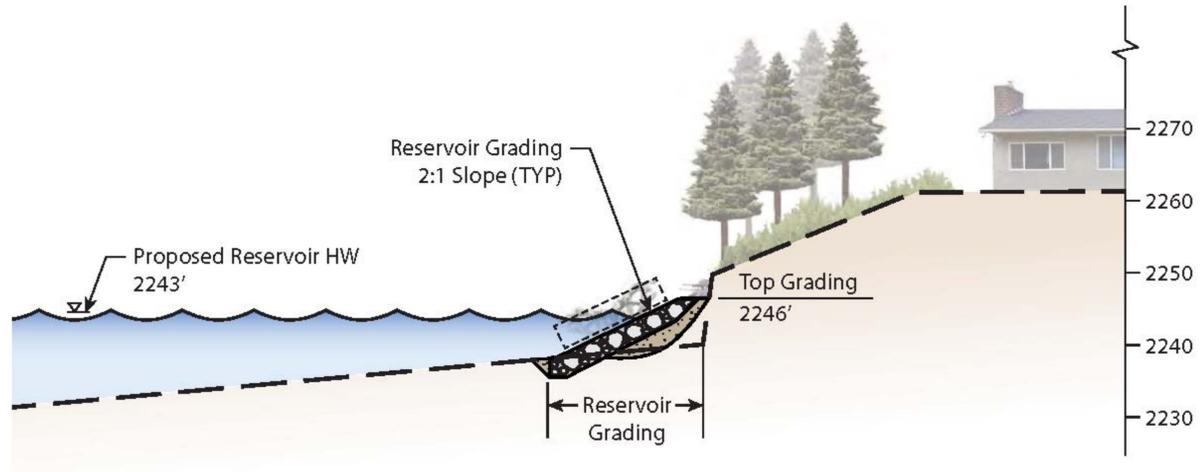
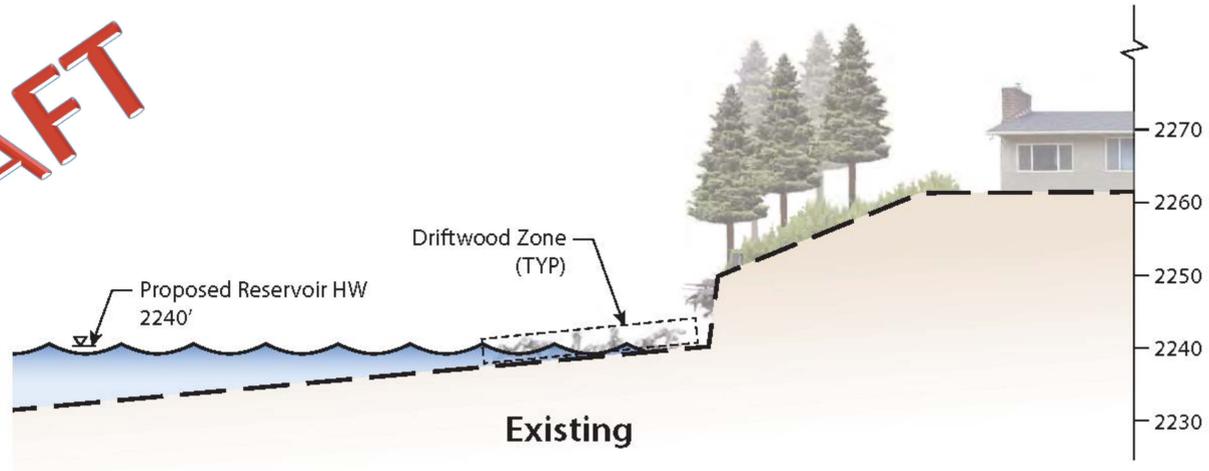
**DRAFT**



**Proposed Graded Berm  
(Perched Beach)**

# Cle Elum Pool Raise – Rock Embankment Shoreline Protection Concepts

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**Proposed Rock Embankment**

# Cle Elum Reservoir Existing Shoreline



Speelyi Beach



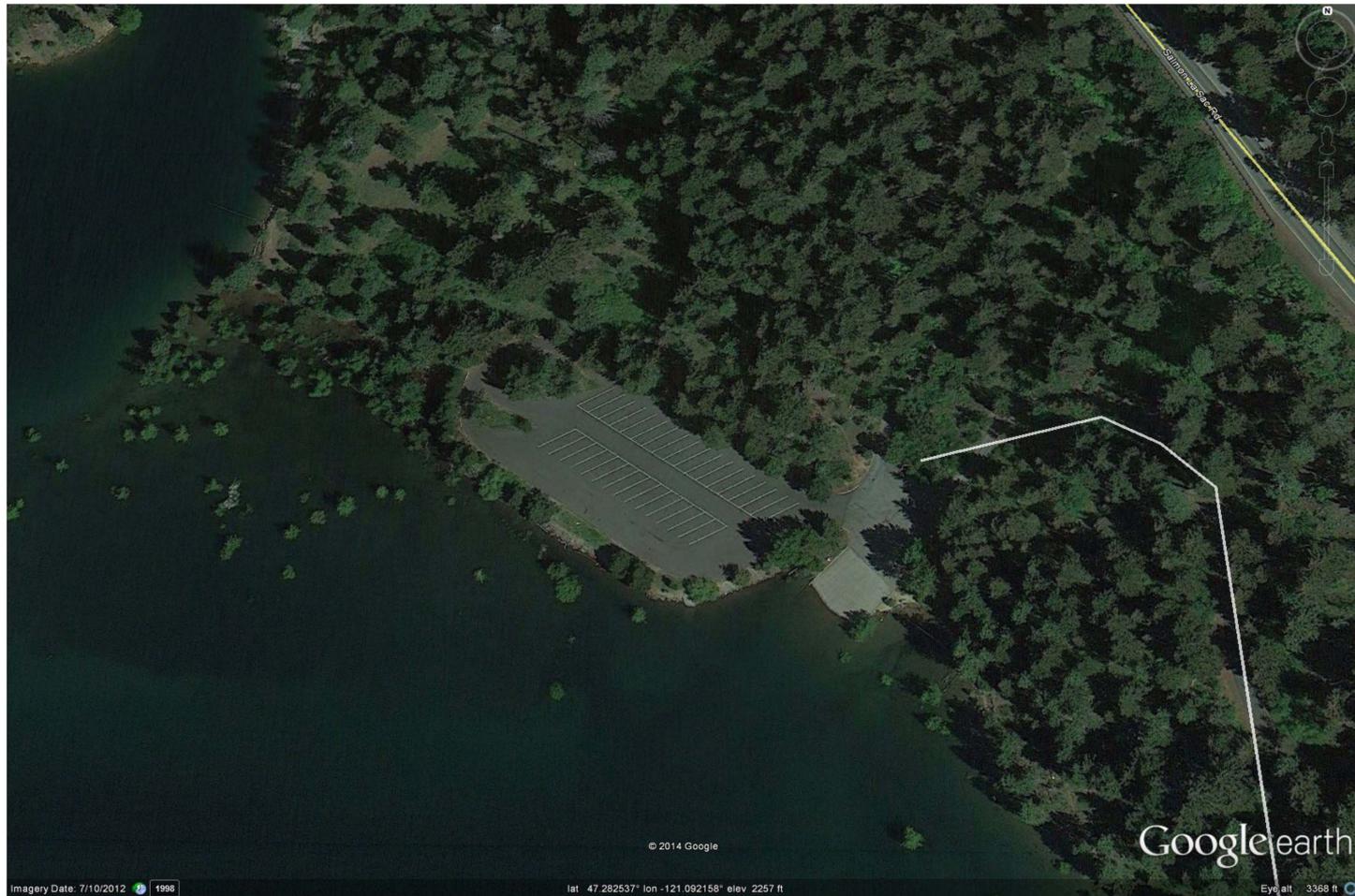
# Cle Elum Reservoir Existing Shoreline



Speelyi Boat Ramp



# Cle Elum Reservoir Existing Shoreline



Wish-Poosh



# Cle Elum Reservoir Existing Shoreline



Wish-Poosh Access Road



# Cle Elum Reservoir Existing Shoreline



Cle Elum River Campground



# Cle Elum Reservoir Existing Shoreline



Cle Elum River Campground



# Cle Elum Reservoir Existing Shoreline



# Cle Elum Reservoir Existing Shoreline



Shoreline without treatment



# Cle Elum Reservoir Existing Shoreline



Rootwad Shoreline Treatment



# Cle Elum Reservoir Existing Shoreline



Rootwad Shoreline Treatment



# Cle Elum Pool Raise Timeline

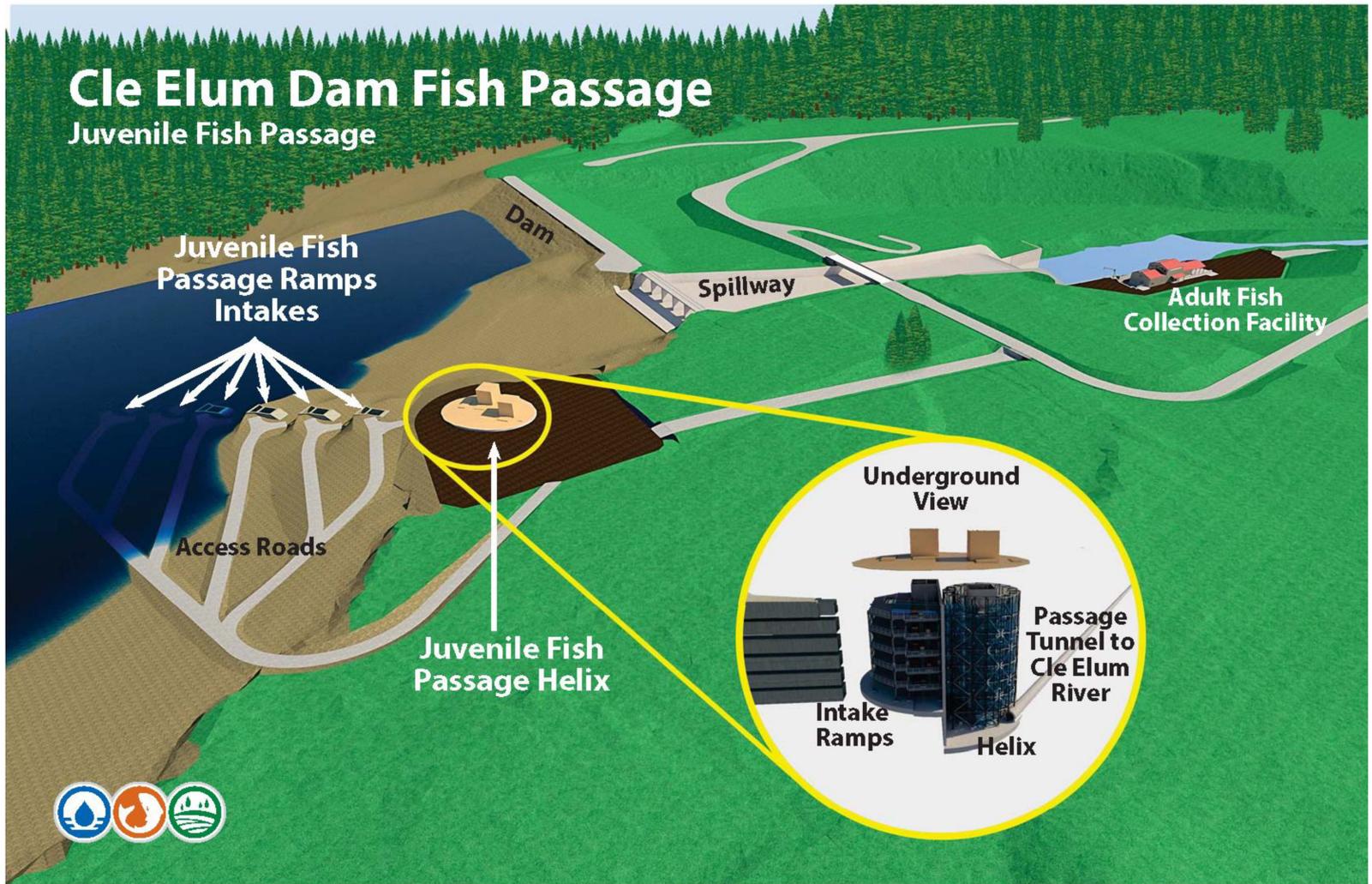
Cle Elum Dam Pool Raise	Duration	Status
Radial Gates	2 to 3 years	In Progress
Cle Elum River Campground & Speelyi Beach Day Use	1 year	Award - 2017
Wishpoosh & Speelyi Beach	1 to 2 years	Award - 2018
Sandelin	1 to 2 years	Award - TBD
Domerie Bay	1 to 2 years	Award - TBD
Timber Cove	1 to 2 years	Award - 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 Facilities



# Cle Elum Dam Fish Passage



# **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.**



# Cle Elum Dam Fish Passage Facilities

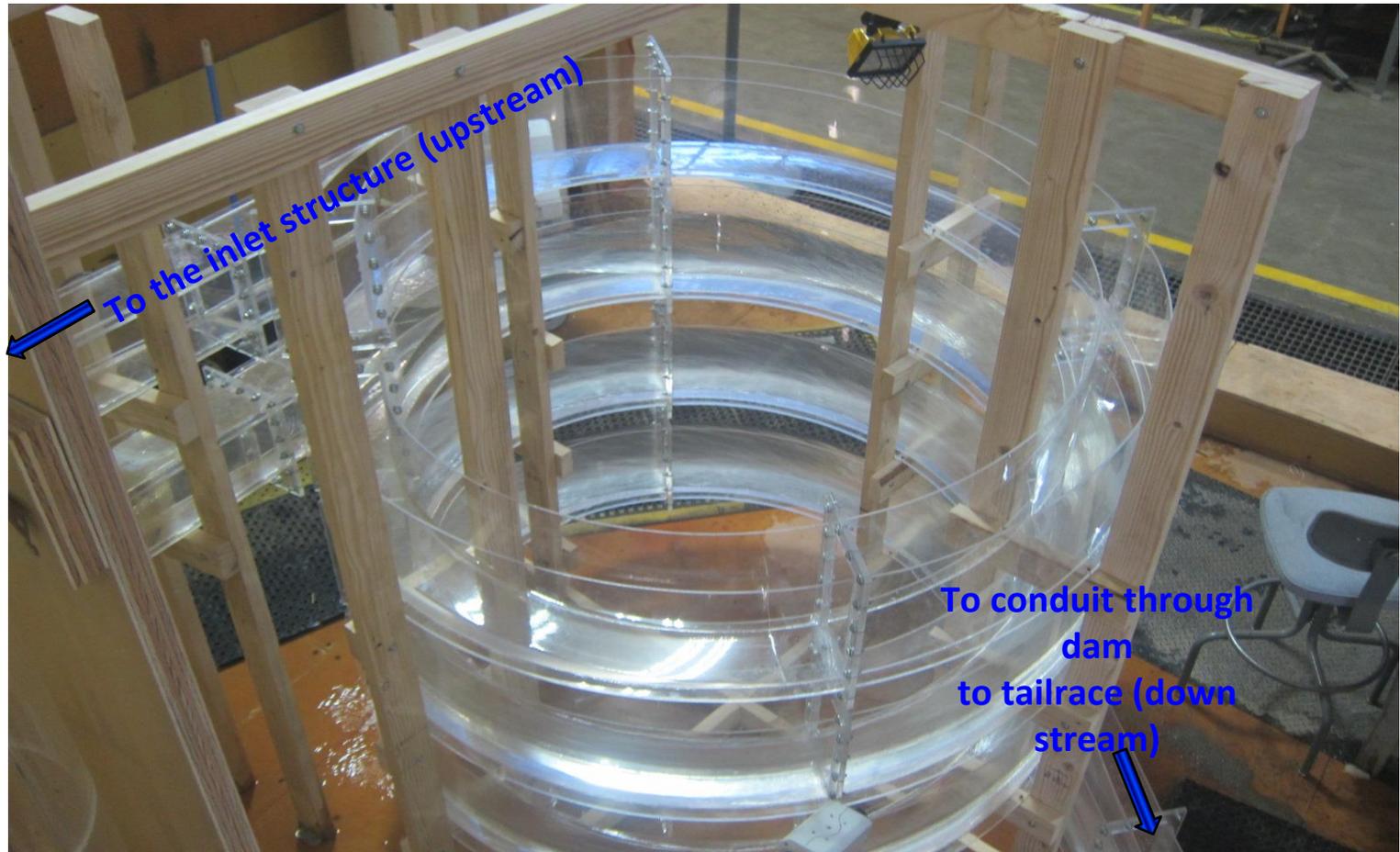
## 4<sup>th</sup> Inlet Structure Design



**Weir Crest – similar to the interim flume**



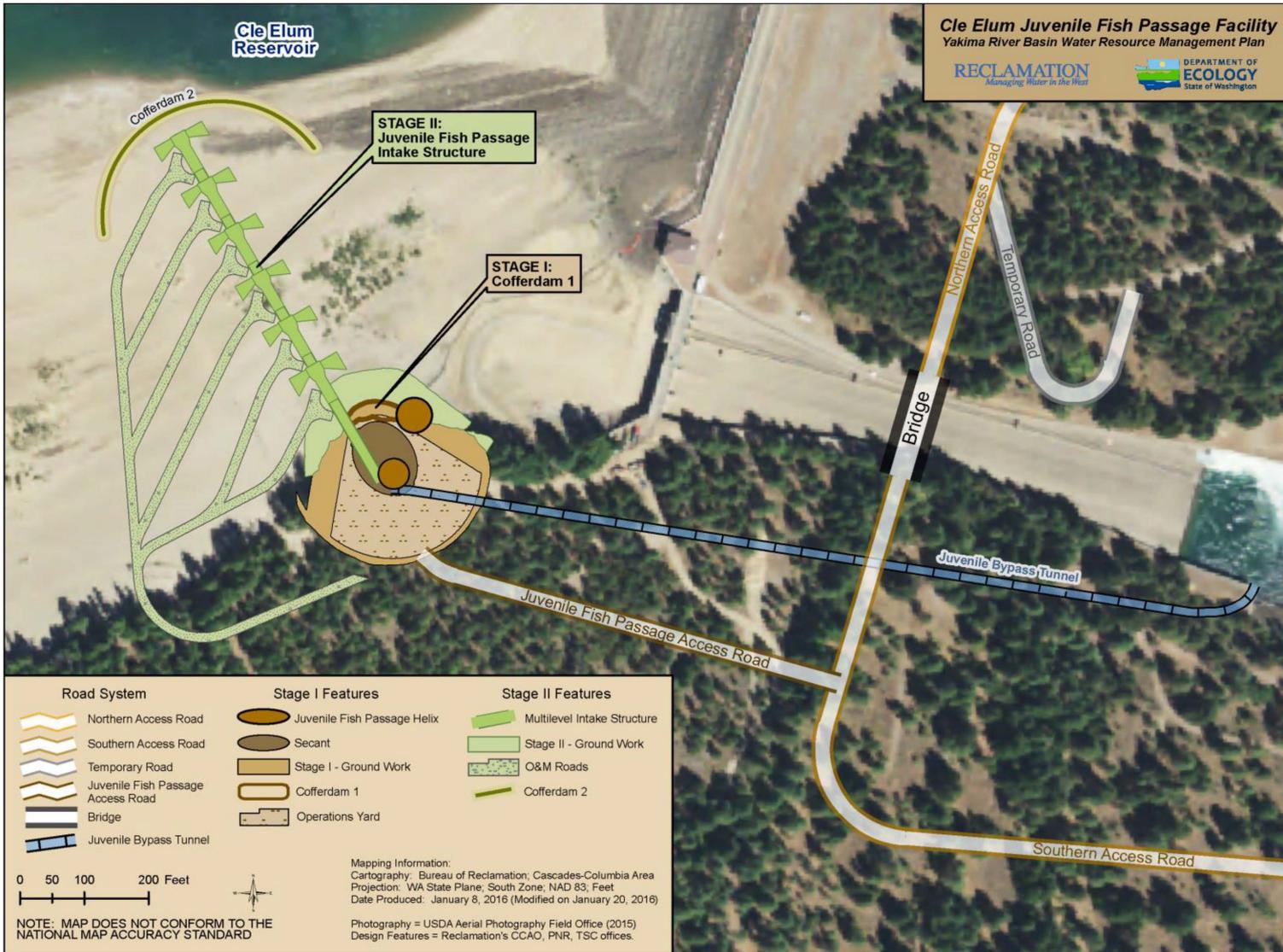
# Cle Elum Dam Fish Passage Facilities Helix Tower



**Function – moves fish from the inlet structure into conduit bypass through the dam**



# Cle Elum Dam Fish Passage Construction



# Cle Elum Fish Passage Secant Pile Example



Secant Pile Example

# Cle Elum Fish Passage Secant Piles

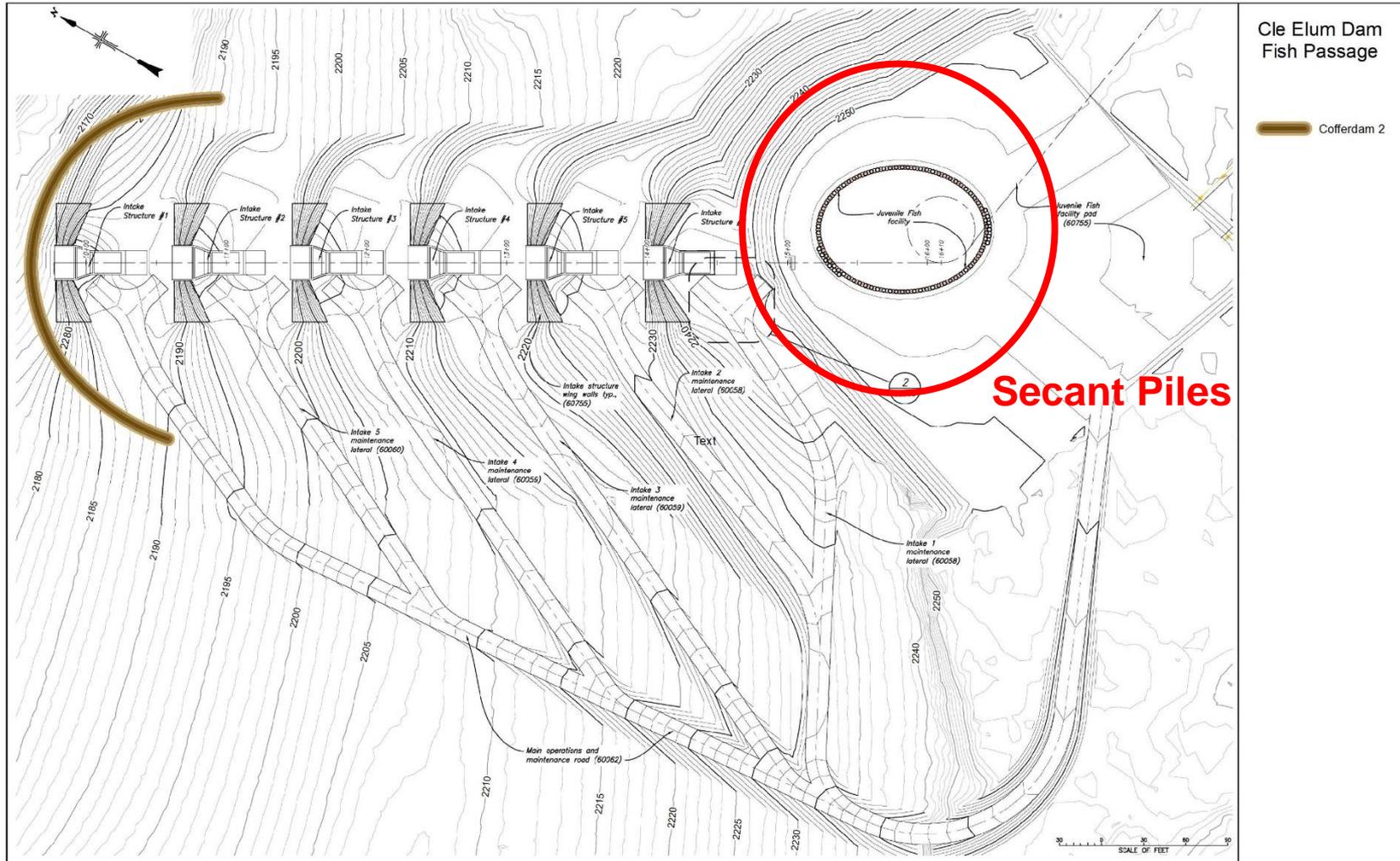


Figure 5. Juvenile Facility Intake Structure, O&M Roads, and Cofferdam #2

# Cle Elum Dam Fish Passage Construction

Trees being stacked



Timbering pushing over tree



# Cle Elum Dam Fish Passage Construction



# Cle Elum Dam Fish Passage Construction



**Temporary Bridge In Place**



**Southern Access Road to Collection Facility**



# 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



# 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>

