

# Technical Projects Update

YRBWEP Workgroup Meeting  
March 11, 2015



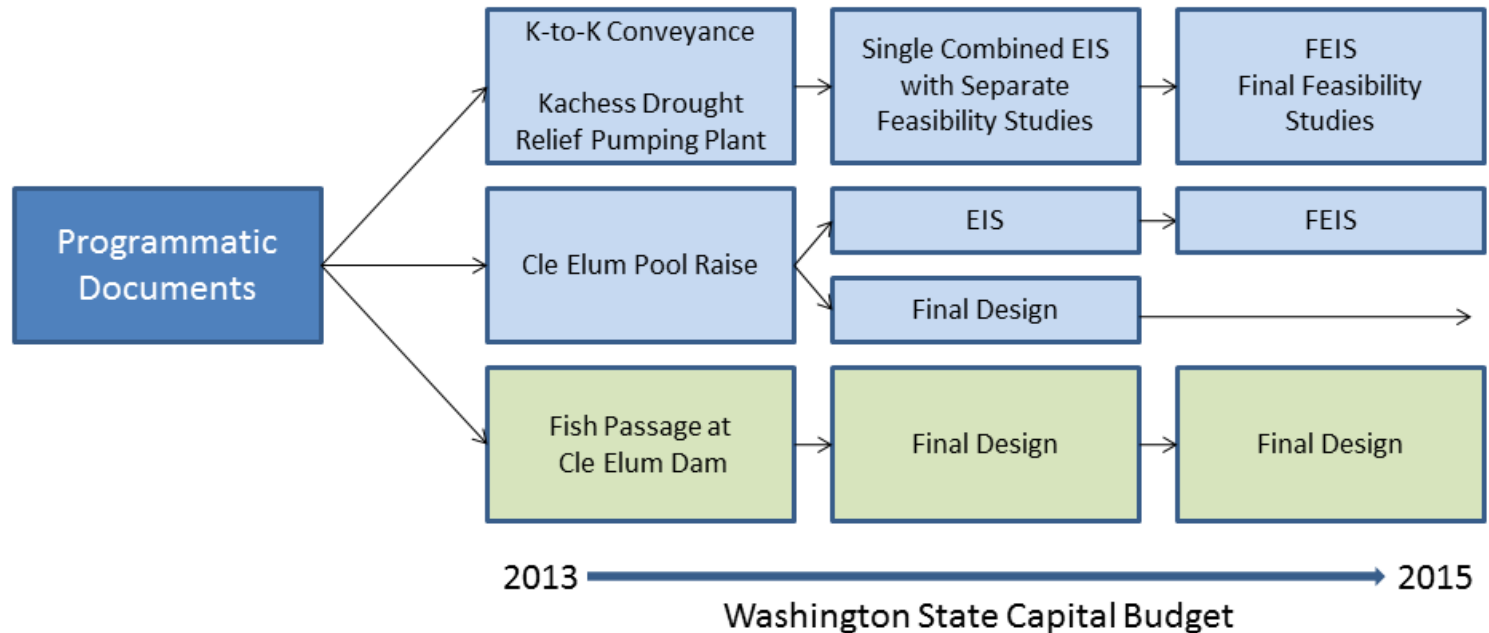
# Ongoing Projects

- **Keechelus-to-Kachess Conveyance**
- **Kachess Drought Relief Pumping Plant**
- **Bull Trout Enhancement**
- **Cle Elum Pool Raise**
- **Wymer Dam and Reservoir**
- **Reservoir Fish Passage**
- **Bumping Enlargement Geological Investigation**
- **Hydrologic Modeling Results for Bumping and Wymer Reservoirs**
- **Groundwater Storage**
- **Teanaway Community Forest**
- **Habitat Enhancement and Agricultural Conservation Projects**

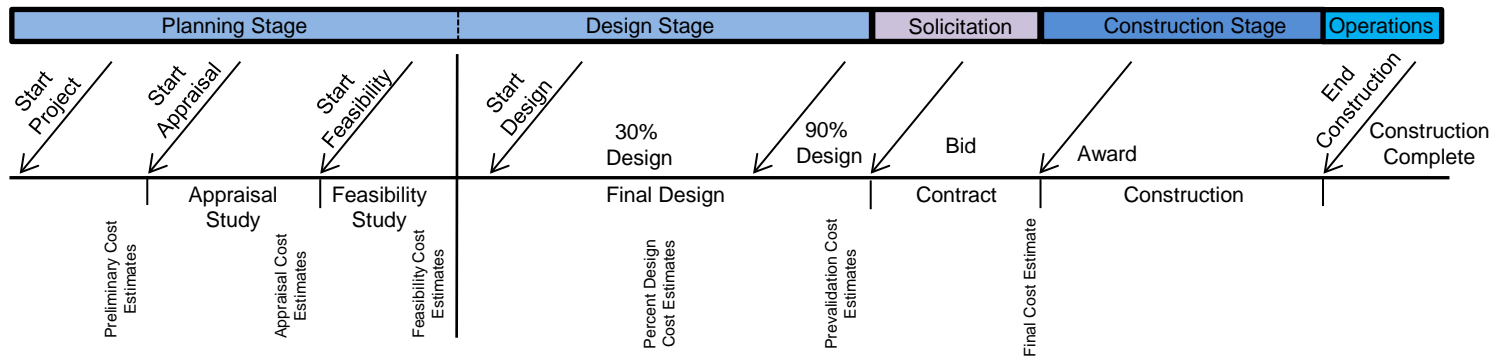


# Path Forward July 2013 to June 2015

## YRBWEP Phase III (Integrated Plan) Initial Development Phase



# Reclamation's Planning and Construction Schedule

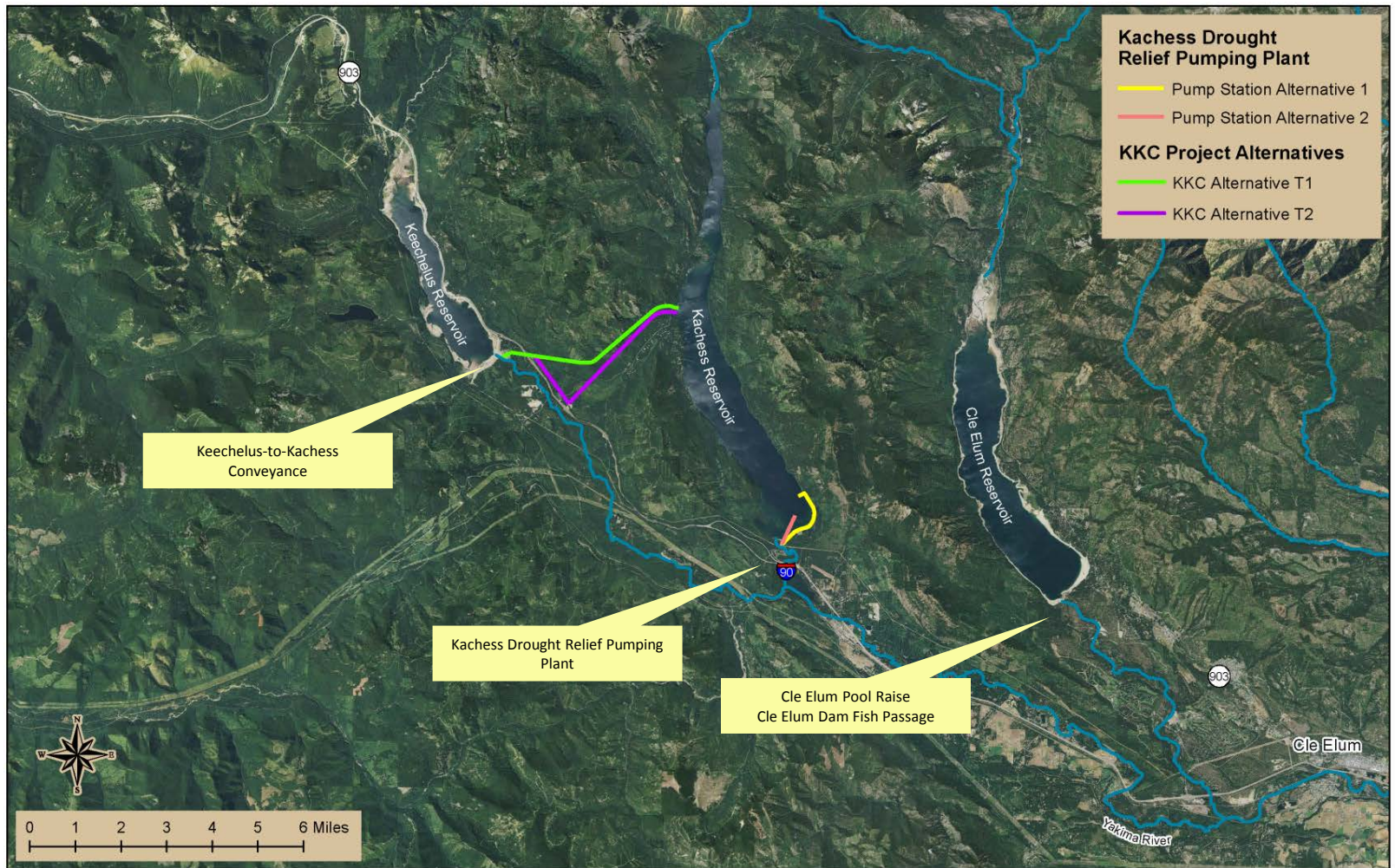




# Keechelus-to-Kachess Conveyance and Kachess Drought Relief Pumping Plant



# Project Locations



# **KKC and KDRPP**

- **Draft EIS issued January 2015**
- **Comment period closed on March 10**
- **Next steps:**
  - **Review comments and update analyses as needed**
  - **Reopen comment period for 60 days**
  - **Hold additional public meetings in May 2015**
- **Geologic investigations are continuing with further drilling planned in 2015**

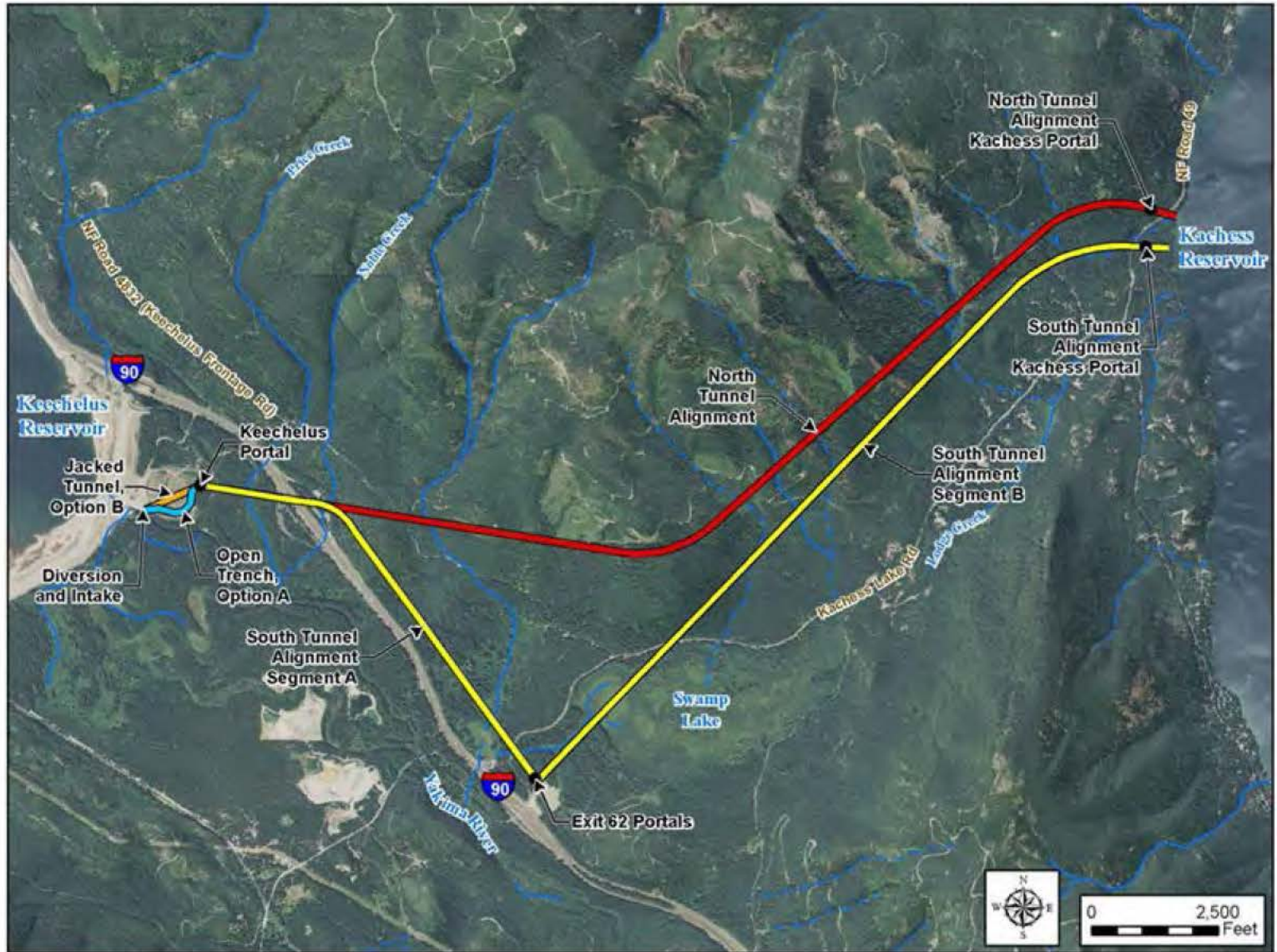


# Keechelus-to-Kachess Conveyance



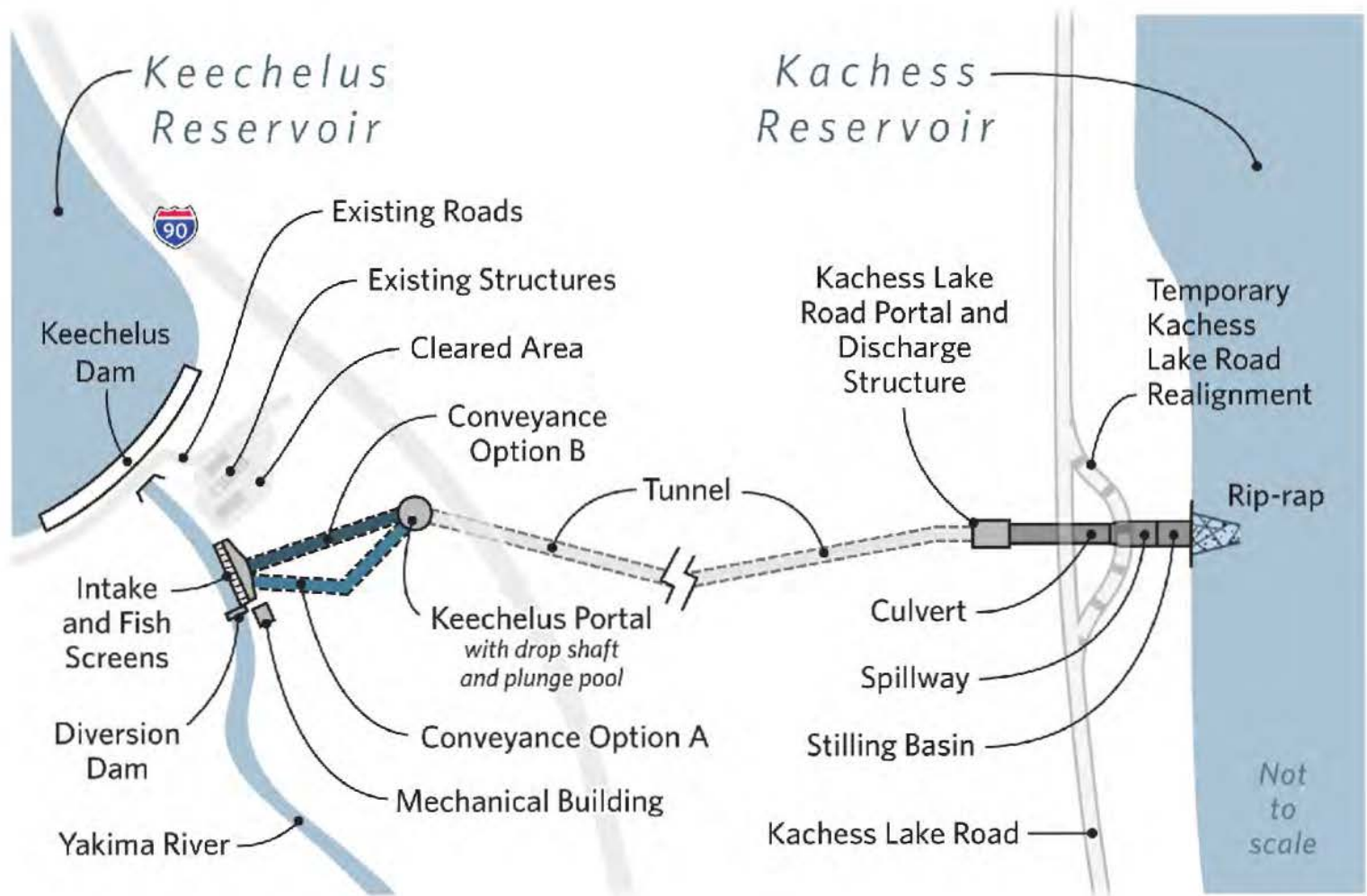


# Keechelus-to-Kachess Conveyance



# KKC Intake and Discharge Works

(not to scale)



# Mitigation – Keechelus-to-Kachess Conveyance

- **Develop a surface water quality monitoring program in cooperation with Ecology to monitor changes in water quality associated with the project.**
- **Prior to construction, conduct site-specific geotechnical studies to identify subsurface issues, unstable slopes, and other local factors that could contribute to slope instability and increase erosion potential.**
- **Prior to construction, Reclamation would conduct on-the-ground wetland surveys to avoid wetland impacts. If impacts occur, Reclamation would comply with mitigation measures as established in permit conditions from applicable agencies.**



# Kachess Drought Relief Pumping Plant





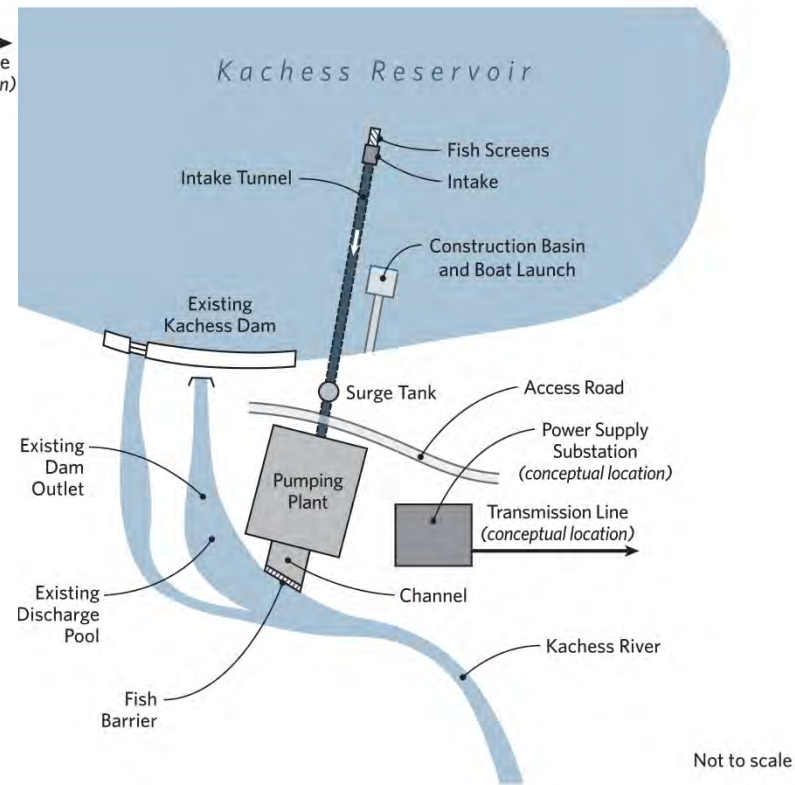
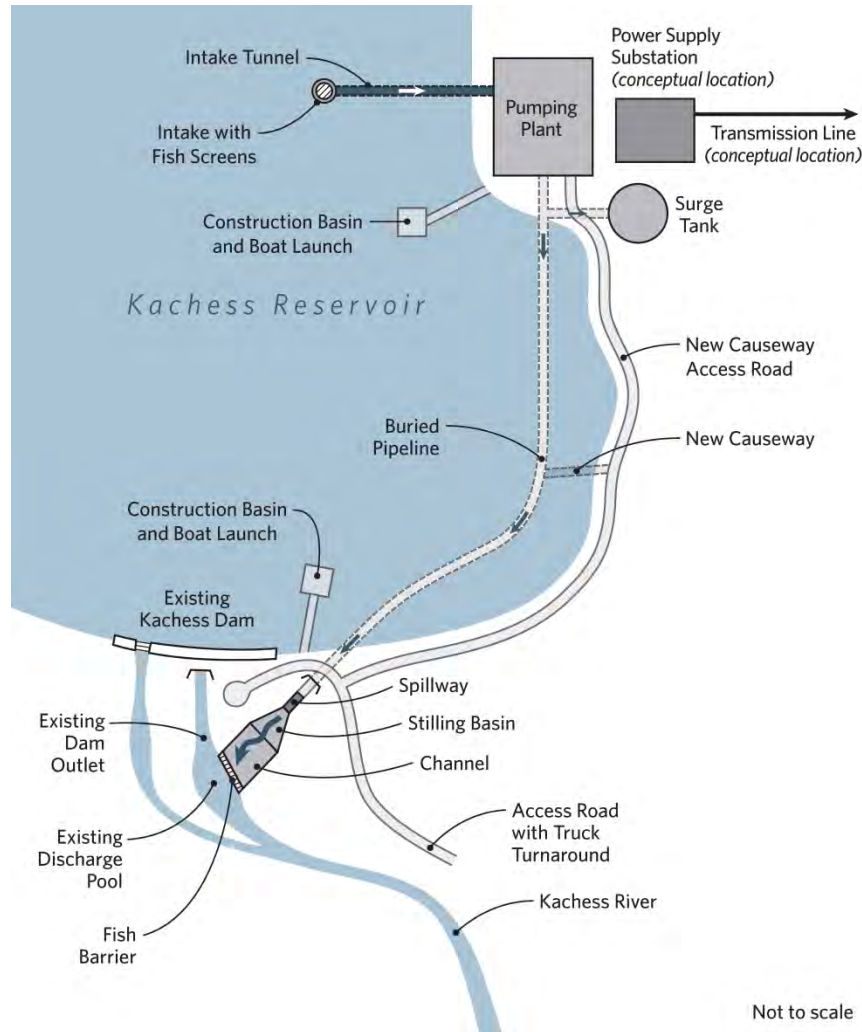
# Kachess Drought Relief Pumping Plant

- **Provide up to 200,000 acre-feet in a drought year for proratable irrigation districts**
- **Droughts occur on average every 5-10 years**
- **Up to 80-foot drawdown below existing minimum pool**



# Kachess Drought Relief Pumping Plant

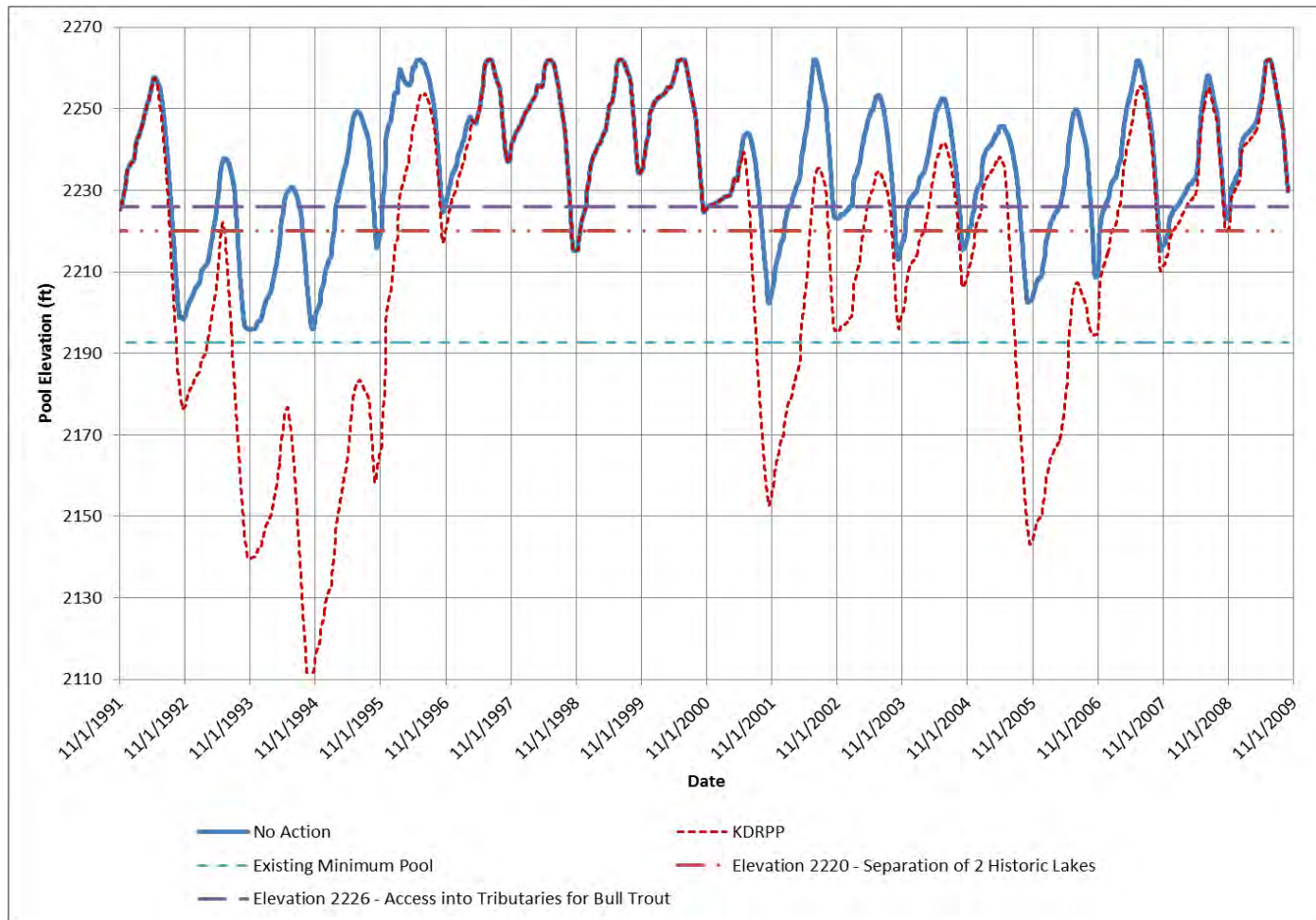
Alt. 1 - East Shore Pumping Plant      Alt. 2 - South Pumping Plant



# KDRPP – Area between upper and lower reservoirs



# Kachess Reservoir Pool Elevations Under Alternative 2A





# Mitigation – Kachess Drought Relief Pumping Plant

- **Provide fish passage between Box Canyon Creek and Kachess Reservoir and between the Little Kachess and Kachess basins to offset impacts of additional drawdown at Kachess Reservoir.**
- **Conduct passage improvement activities within Kachess and Keechelus reservoirs.**
- **Monitor wells near Kachess Reservoir to determine if water levels are lowered by additional reservoir drawdown. Develop appropriate mitigation strategies if water levels are impacted.**



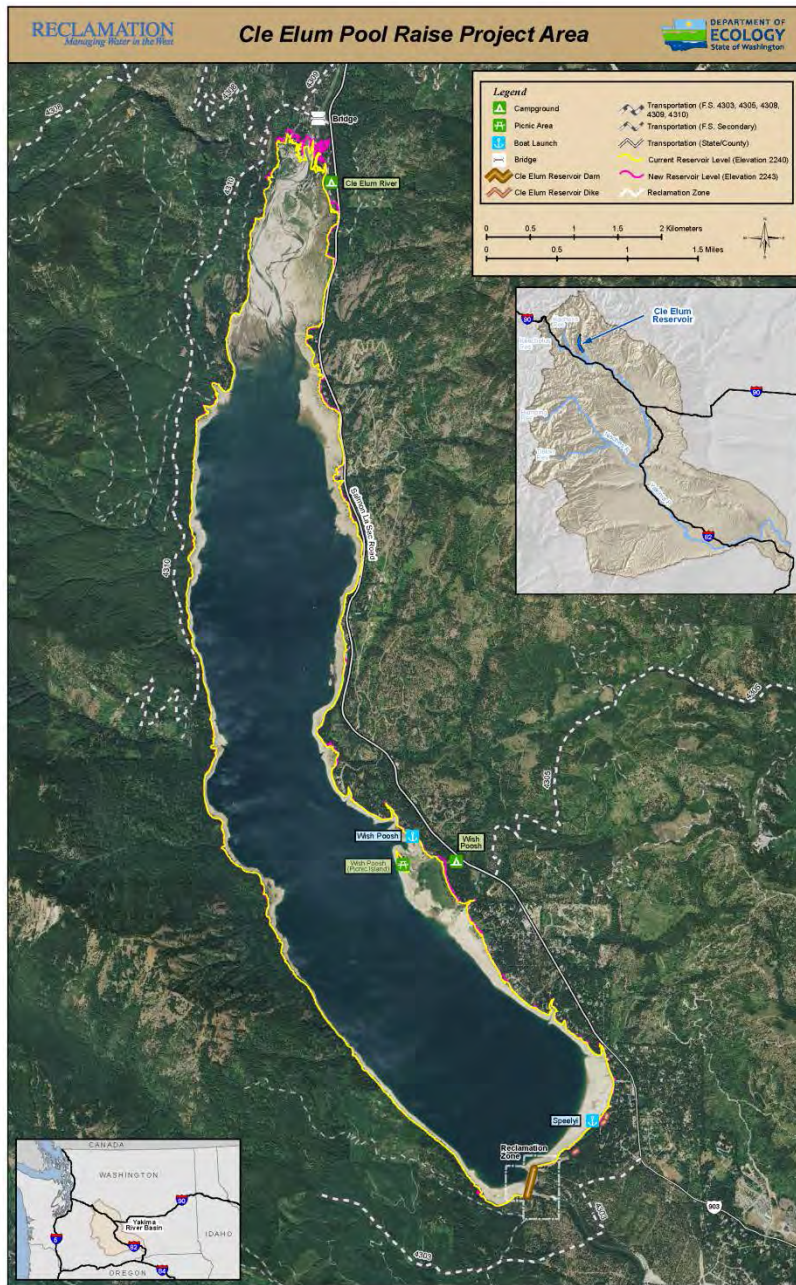
# Bull Trout Enhancement

- Reclamation and Ecology have coordinated with USFWS, USFS, Yakama Nation, WDFW, and NMFS to formulate Bull Trout Enhancement program.
  - Gold Creek
  - Cold Creek
  - Nutrient Enhancement
  - Assessments
- BTE is part of all action alternatives in KKC/KDRPP EIS
- MOU with Reclamation, Ecology, Yakama Nation, USFWS, WDFW, USFS



# Cle Elum Pool Raise





# Cle Elum Pool Raise

- Final EIS is now being prepared, responding to comments on Draft EIS
- ROD scheduled 2015





# Reservoir Fish Passage



# Cle Elum Fish Reintroduction

**2013 – First Sockeye to be born and raised in the Yakima River Basin in over 100 years return, released into Cle Elum Reservoir**

| 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             |







**Phase I - Bridge & Access Road Construction – begin 2015**  
**Phase II – Fish Passage Facilities Final EIS Spring 2015**

# Tieton Dam Fish Passage Facilities Study



## Appraisal Assessment Report - Fall 2015





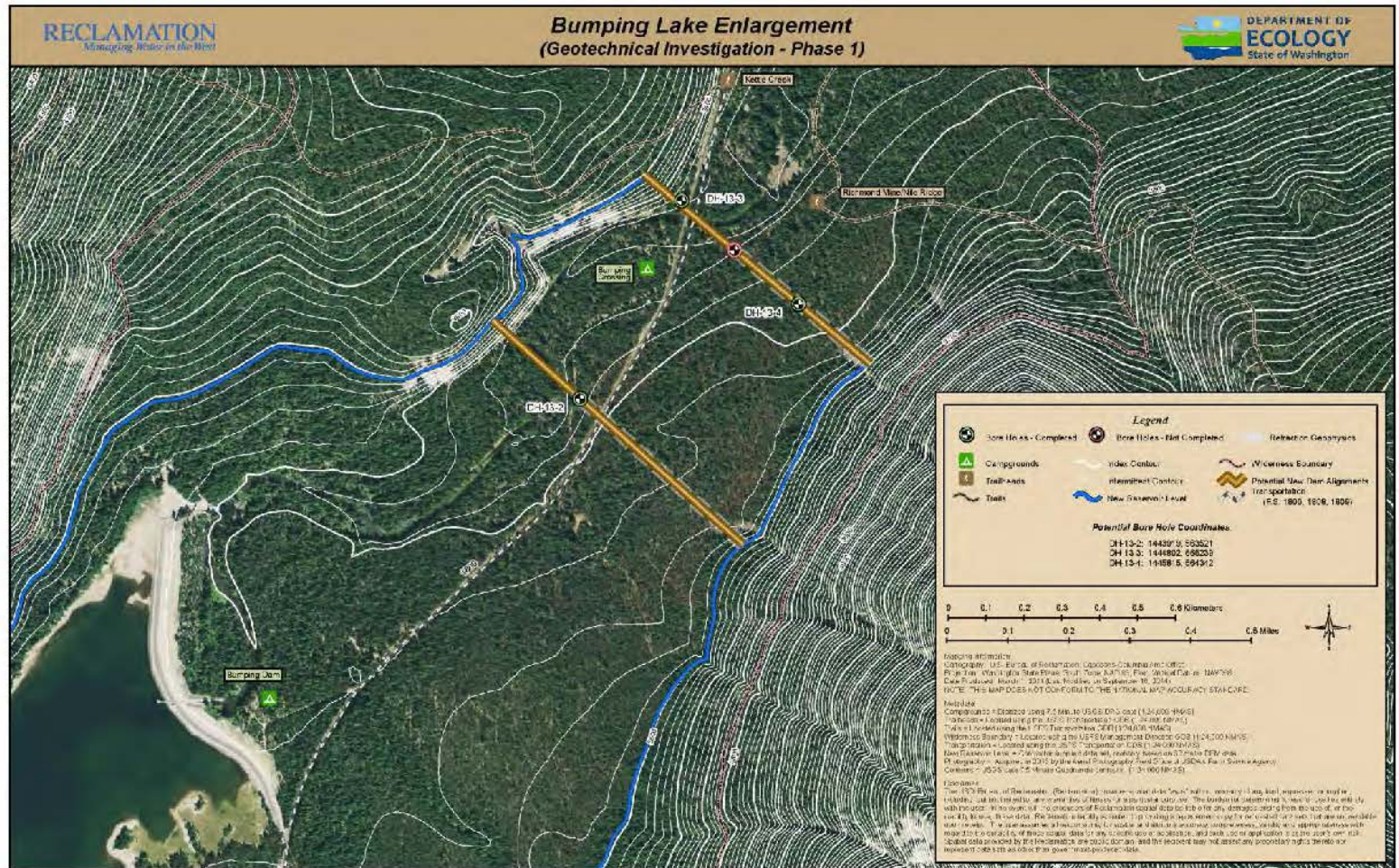
# Bumping Enlargement Geological Investigation



# Bumping Dam and Reservoir Enlargement







# Hydrologic Modeling Results for Bumping and Wymer Reservoirs





# Hydrologic Modeling Activities

- Modeling of Initial Development Phase projects completed summer 2014
- Modeling of Wymer Dam and Reservoir and Bumping Reservoir Enlargement completed December 2014
- Coming next: more detailed examination of how water conservation affects return flows and lower basin supply availability
- Modeling includes protocols to guide how the model stores and releases water at different reservoirs
- As projects come on line, these protocols will need further definition, with stakeholder participation



# How do we Measure Results?

- **Water Supply**
  - Change in prorationing level
  - Change in Total Water Supply Available
  - Change in deliveries to water users
  - Examine effects under a range of supply conditions
  - One-year droughts vs. multiyear droughts



# How do we Measure Results?

- **Streamflow and Fisheries**
  - How closely can we match flow objectives defined by biologists in Integrated Plan?
    - Various rivers/reaches
    - Different seasons
  - What's the magnitude of improvement? How much of the time will it occur?
  - Which species and life stages will benefit?



# Scenarios Modeled

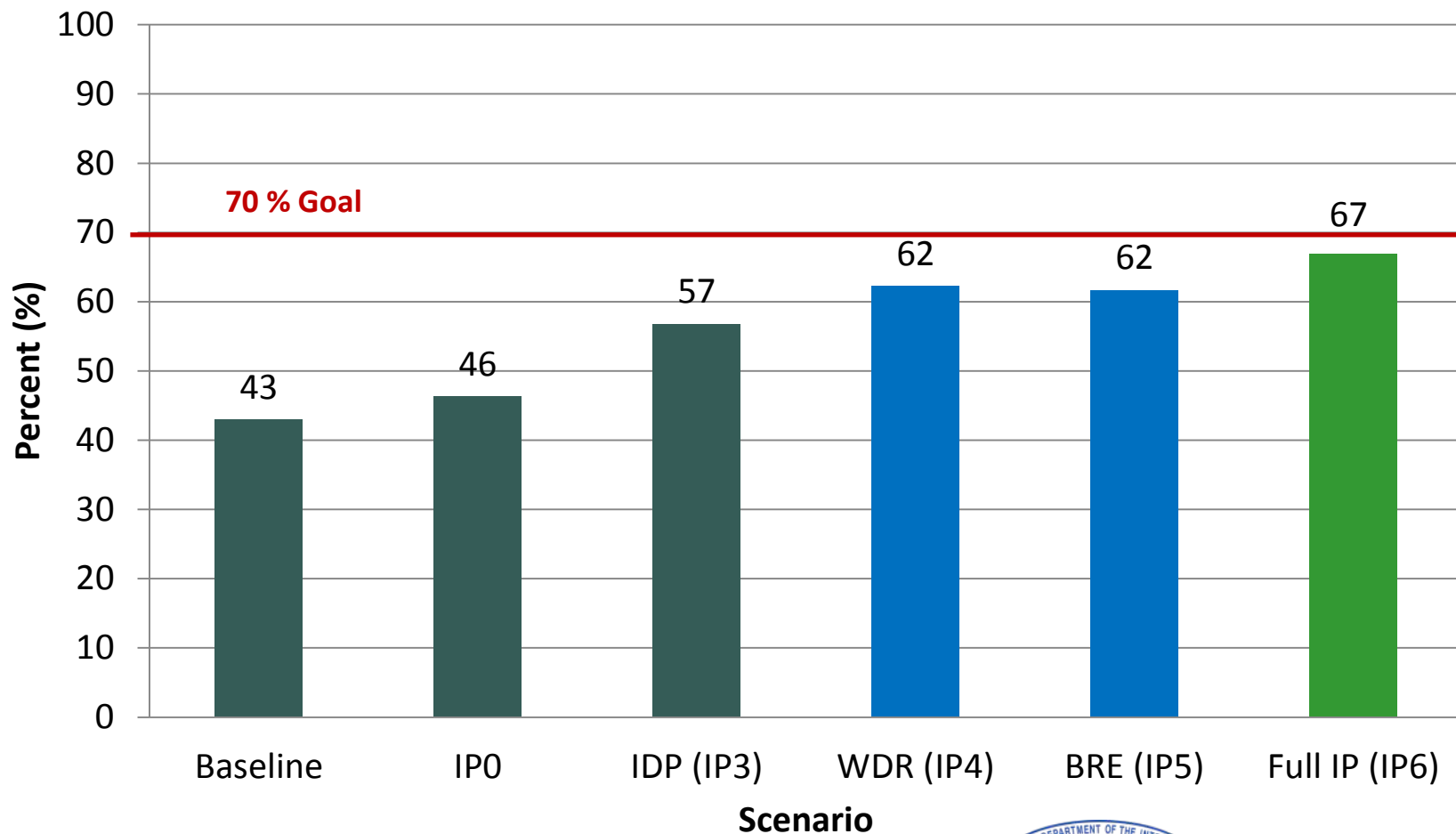
| Scenario # | Name                | Water Supply Objective | Instream Flow Objective        |
|------------|---------------------|------------------------|--------------------------------|
| BASELINE   | Baseline            | Future without IP      | Existing Requirements          |
| IP0*       | Future Conservation | Future without IP      | Varies by project              |
| IP1        | KKC Only            | No Additional          | Keechelus Reach                |
| IP2        | KKC & KDRPP         | Improve Prorationing   | Keechelus Reach                |
| IP3        | KKC, KDRPP, & CEPR  | Improve Prorationing   | Cle Elum River                 |
| IP4        | IP3 + WDR           | Improve Prorationing   | Upper Yakima, Cle Elum, Tieton |
| IP5        | IP3 + BRE           | Improve Prorationing   | Bumping, Naches, Lower Yakima  |
| IP6        | All Five Projects   | 70% Prorationing       | All of the above               |

\* The IP0 conservation projects are included in all subsequent scenarios.



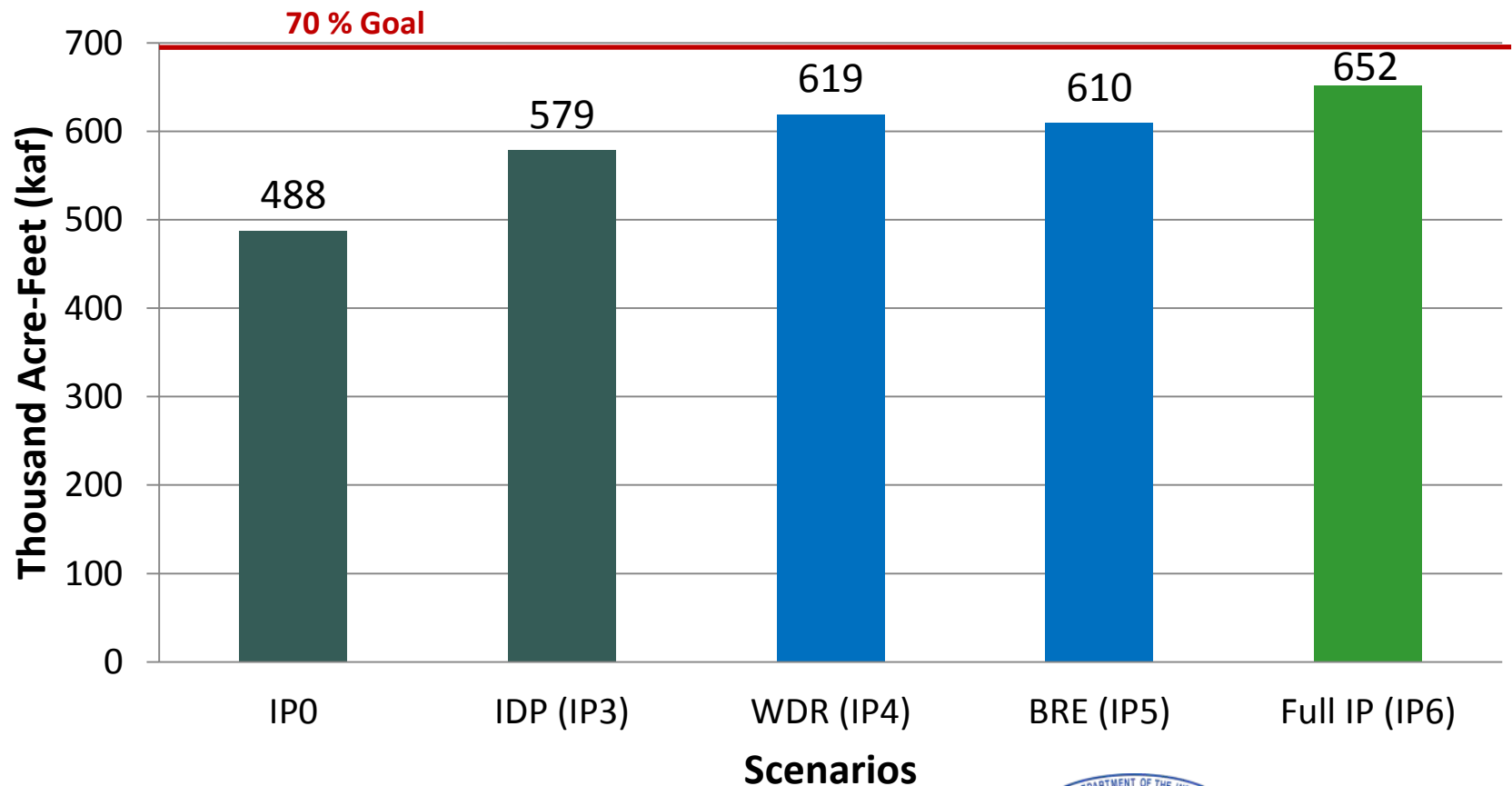
# Summary of Water Supply Benefits of Each Scenario (for Years when Prorationing Would Remain Below 70% with Initial Development Phase Completed)

September 30 Prorationing (%)



# Summary of Water Supply Benefits of Each Scenario (for Years when Prorating Would Remain Below 70% with Initial Development Phase Completed)

April 1 to Sept 30 Major Proratable Deliveries (kaf)



# Streamflow and Fisheries Benefits of Wymer Dam and Reservoir

- Easton Reach of Yakima River (17 miles). Winter flow improved by 30 to 60 cfs (15% - 30%).
- Cle Elum River (8 miles). Winter flow improved by 80 to 120 cfs (35% - 65%).
- Keechelus Reach minimum flow increased.
- Tieton River minimum flow increased.
- Benefits spring Chinook spawning/rearing (and eventually steelhead).





# Streamflow and Fisheries Benefits of Bumping Reservoir Enlargement

- Tieton River (21 miles). Minimum flow improved by 25 to 35 cfs to achieve 125 cfs 99% of the time.
- Bumping River (17 miles) and Naches River (45 miles). Spring pulse generated to assist outmigration (55,000 acre-feet in drought years).
- Yakima River from Yakima to Kennewick (116 miles). Higher spring flows to assist outmigration.
- Spring pulse benefits all anadromous fish.





# Other Considerations

- **Modeling includes protocols to guide storing and releasing water at different reservoirs.**
- **As projects come online, protocols will need further definition, with stakeholder participation.**



# Groundwater Storage



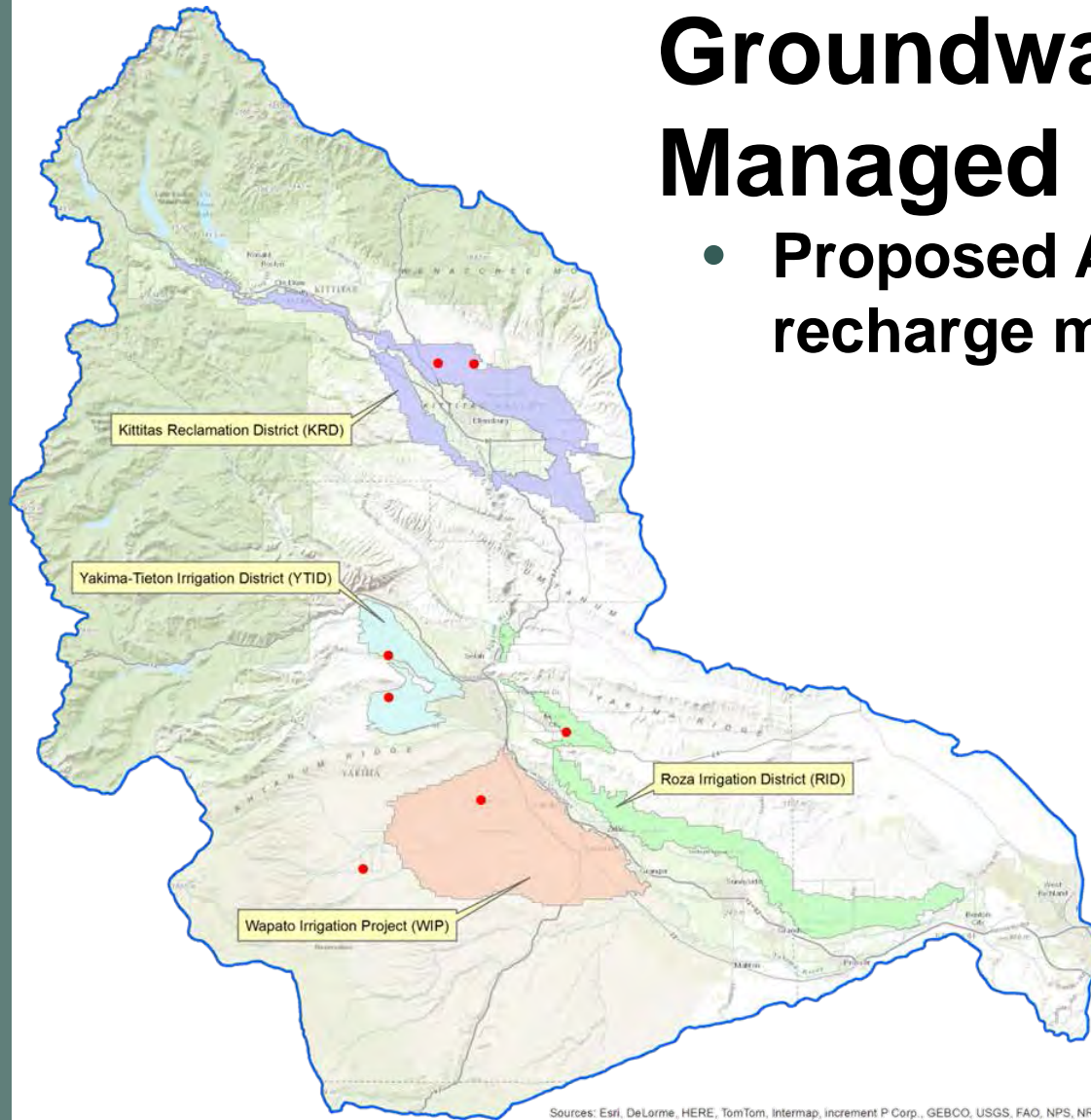
# Groundwater Storage Activities

- Ecology has issued temporary permit to City of Yakima for ASR project – recharge is beginning now
- Long-term permit planned, pending completion of backup documentation
- Four monitoring wells completed associated with KRD
- Dry Creek stream gage in place for monitoring



# Groundwater Managed Recharge

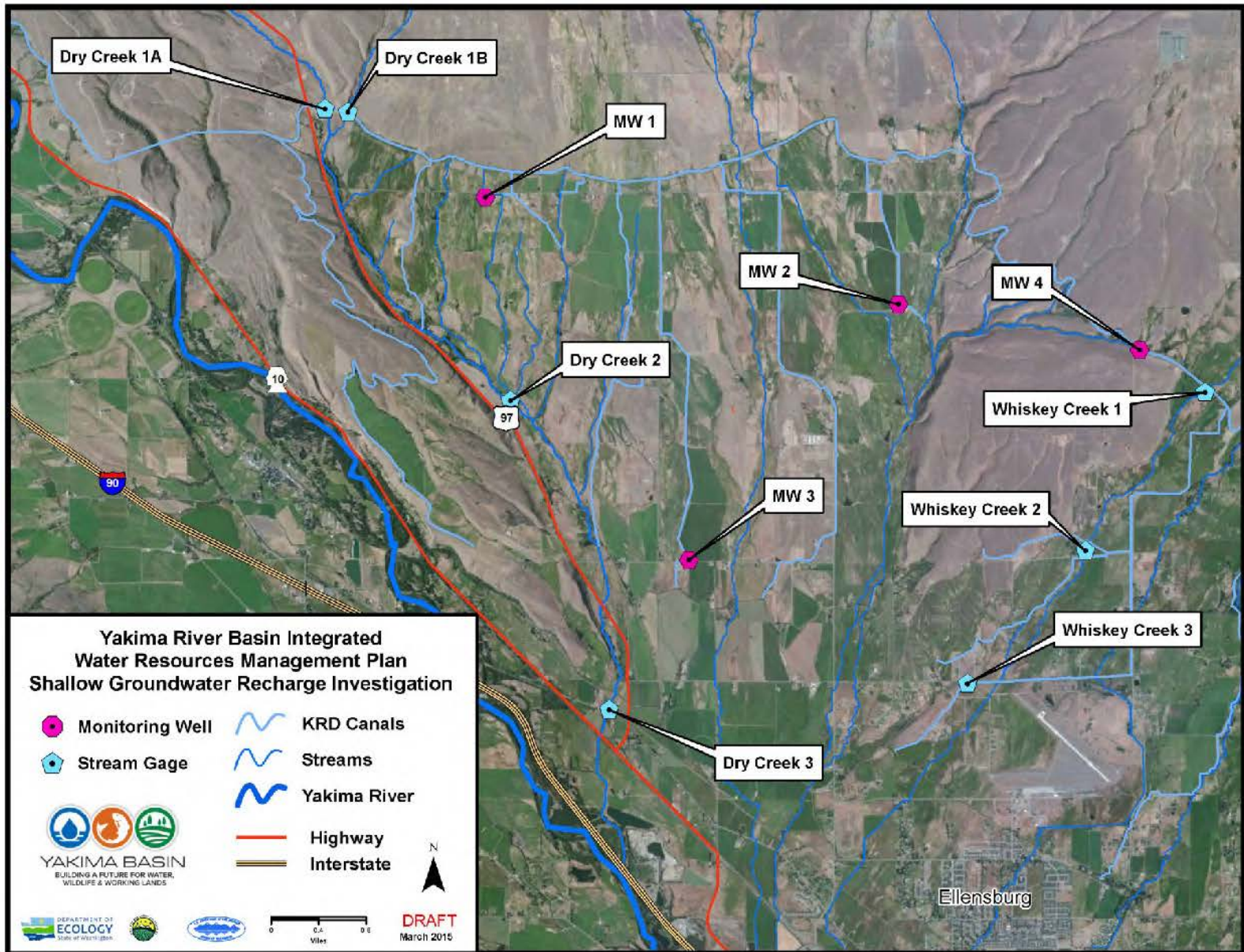
- Proposed Areas for managed recharge modeling



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



# KRD Proposed Observation Wells





# KRD Site 1 – Start of Drilling



# KRD Site 3 – Drilling Completed





# KRD Monitoring Wells



**Dry Creek Stream Gage**

# Teanaway Community Forest



# Advisory Committee

**Charged with making recommendations to WDFW and WDNR on strategic plan for Teanaway Community Forest**

|                         |   |
|-------------------------|---|
|                         |   |
| <b>Spring 2014</b>      | Advisory Committee scoping;<br>Initial field trip to understand issues and opportunities  |
| <b>Summer 2014</b>      | Brainstorm desired future conditions for Goals 1, 2, 3, and 4;<br>Public open house #1;<br>Field trip to understand recreation issues and opportunities |
| <b>Fall 2014</b>        | Review objectives and strategies for Goals 1, 2, 3, and 4;<br>Brainstorm ideas for Goal 5;<br>Public open house #2                                      |
| <b>Winter 2014-2015</b> | Review objectives and strategies for all Goals;<br>Identify and resolve cross-cutting issues;<br>Public open house #3                                   |
| <b>Spring 2015</b>      | Finalize draft management plan;<br>Final public review via SEPA process   |
| <b>Summer 2015</b>      | Release Plan  |





# Habitat and Conservation Project Implementation

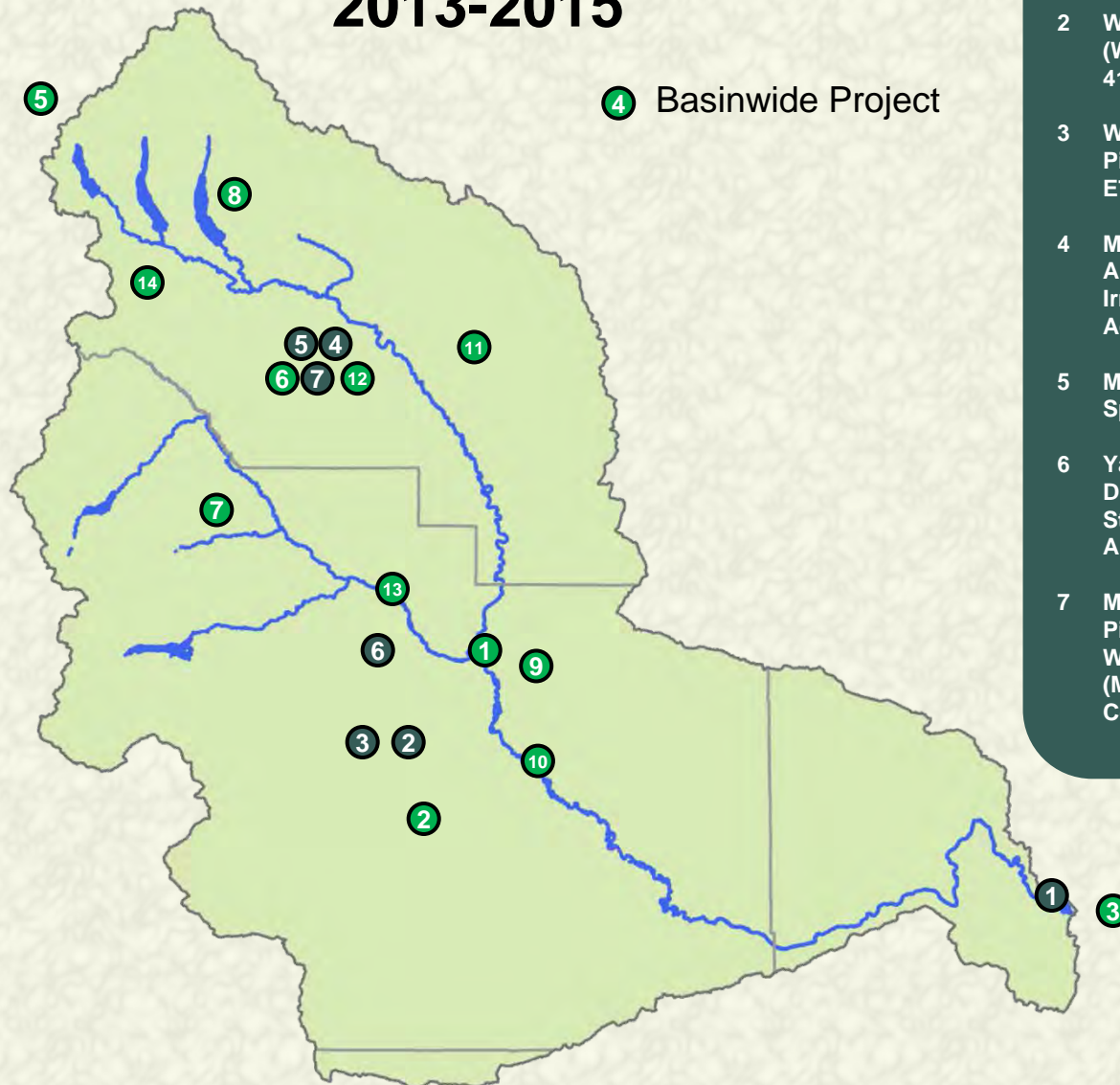


## Habitat Enhancement Projects

# Yakima Integrated Plan

## Habitat Enhancement/Enhanced Agricultural Conservation Projects 2013-2015

## Agricultural Conservation Projects

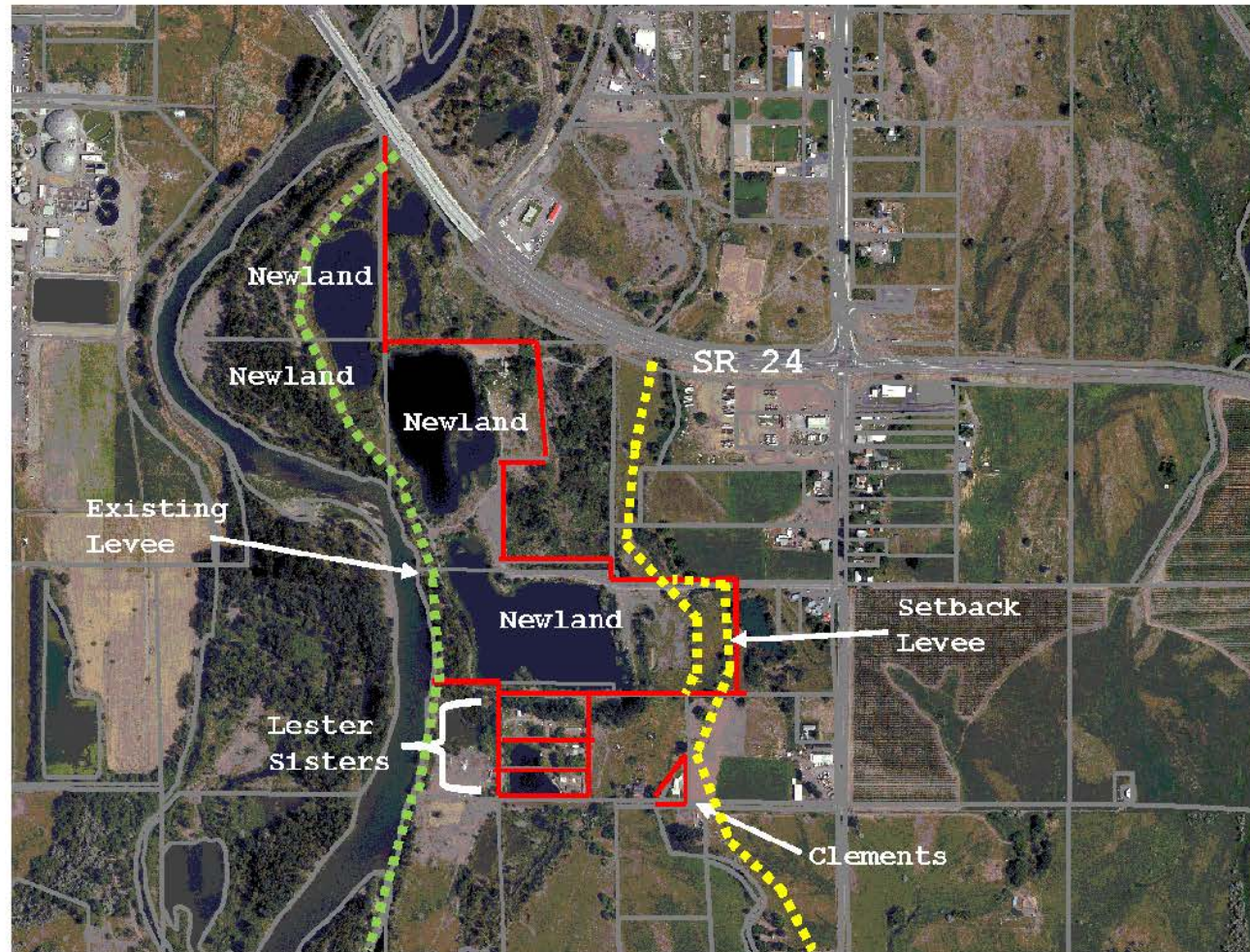


4 Basinwide Project

- 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

- 1 Gap to Gap Outfall Relocation
- 2 Toppenish Fan
- 3 Bateman Island Causeway Modification Conceptual Design
- 4 Bull Trout Task Force Habitat Improvements
- 5 Gold Creek Habitat Assessment and Conceptual Design
- 6 Reed Diversion 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 Plum Creek / Little Naches Land Acquisition

# Habitat Enhancement – Yakima County: Gap-to-Gap Property Acquisitions

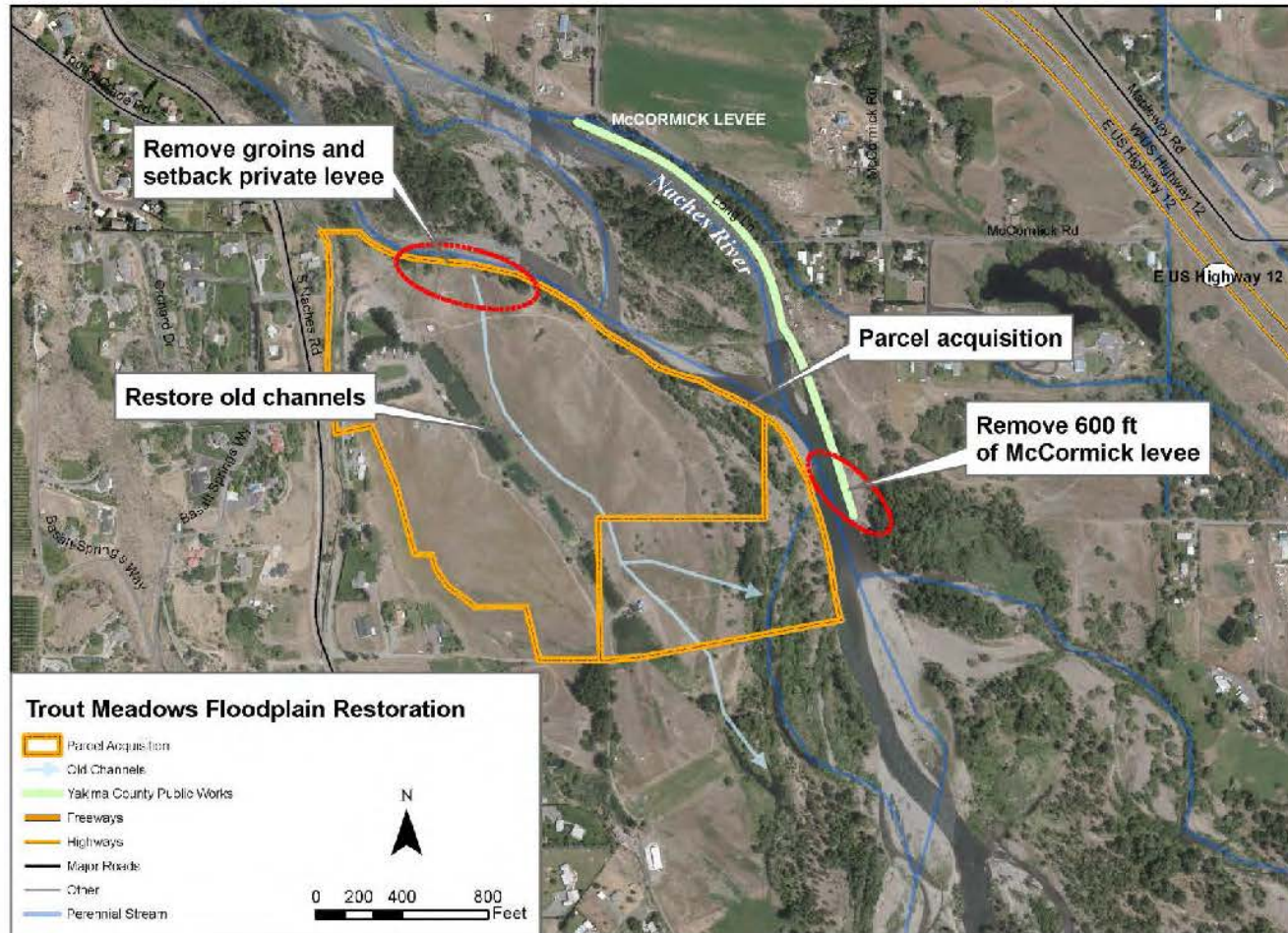


Appraisals to be conducted in near future





# Habitat Enhancement – Yakima County: Trout Meadows



**Close to finalizing acquisition purchase and sale agreements**



# Habitat Enhancement – Kittitas Conservation Trust: Cle Elum River Side-Channel Restoration Project



Engineered logjam



Beaver dam and wetland restoration

- Construction completed and project documentation being finalized
- Check out YouTube video! Google “Cle Elum River Side Channel Restoration”



Engineered channel roughness





# Habitat Enhancement – Kittitas Conservation Trust: Gold Creek Project



- Modeling and geomorphic assessment completed
- Restoration workshop held
- Refining conceptual designs





# Little Rattlesnake Road Decommissioning



- Road closed and asphalt removed
- New bypass road constructed
- Large wood to be used in stream restoration





# Reed Diversion Dam Removal Design

- Design process getting underway



# Kennewick Irrigation District



**The canal lining project will be complete  
(water on) at end of March 2015**





# Toppenish Fan Recharge

Over 1,000 acre-feet of water has been distributed from the Olney Diversion to the alluvial fan and seeped into the ground this irrigation off-season



**Distributary Recharge Channel  
near White Swan, WA**



**Olney Diversion on Toppenish Creek**



# Lateral 4-414C Pipeline



**Delivery Installation**



**Mainline Installation**



# Manastash Creek Sprinkler Conversion



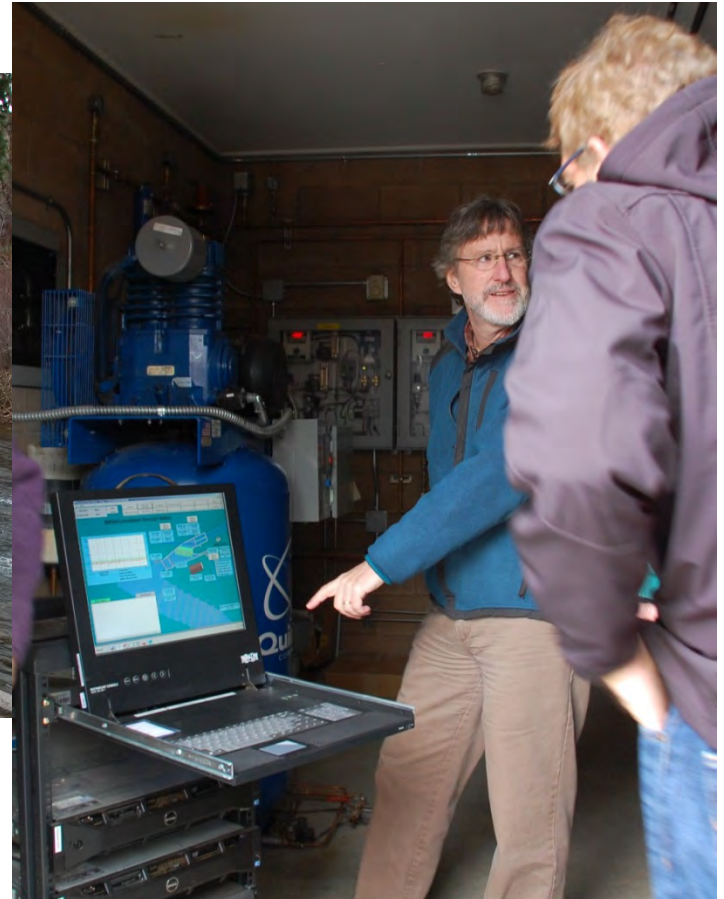
**Project will be completed and tested prior  
to the 2015 irrigation season**



# Manastash Consolidated Pipeline & Manastash Water Ditch Association Pipeline



**MWDA Diversion – Location of Transducer that is used to monitor streamflow**



**SCADA System**

