

# Yakima River Basin Integrated Water Resource Management Plan - Update

Yakima Basin Science and Management Conference  
June 17, 2015



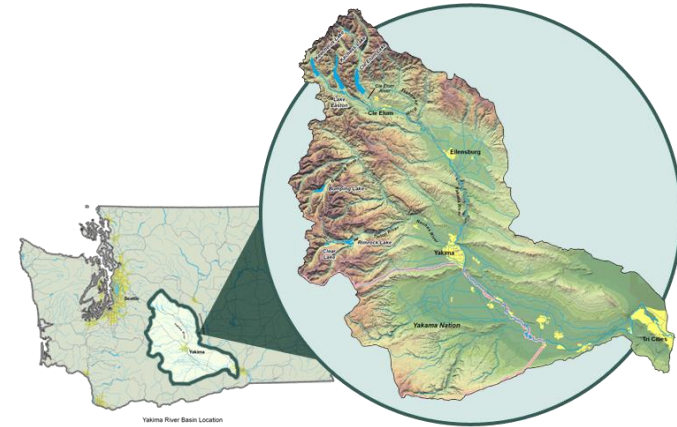
*Presented by:*

**Walter Larrick, Reclamation**



# Yakima River Basin: Overview

- **6,155 Square Miles**
- **Population 360,000**
- **Second-largest agricultural-producing region in America**
  - \$1.8 billion Ag; \$2.3 billion food-processing industry
  - Apples, wine grapes, hops, hay
- **Salmon and Steelhead Runs**
  - Second only to Snake River
- **Diverse outdoor recreation**
  - Pack and saddle, hiking, dirt biking, camping, fishing, hunting, snowmobiling



# Yakima River Basin Water Management

- **Managed by Bureau of Reclamation**
- **5 reservoirs with 1M acre-feet of capacity (average annual runoff 3.3M acre-feet)**
- **Snowpack is the “sixth reservoir”**
- **Irrigation deliveries: 1.7M acre-feet**



# Water Problems in the Yakima River Basin

- **Adjudication** ▶ 30+ year effort to determine rights
- **Droughts/Water Shortages** ▶ 1 year out of 4 since 1990
- **Anadromous fish runs** ▶ Not sustainable
  - **Sockeye, Chinook, coho, steelhead, bull trout** ▶ Extirpated, reduced, and/or threatened (800,000 historical; now averaging 15,000-20,000).
- **Climate change** ▶ Runoff timing changed and changing; creating less snow and less summer water

# Declining Water Supply

- **Surface water is over-appropriated**
- **Droughts in 1992-1994, 2001 and 2005**
- **Proratable irrigation districts reduced to as little as 37% of allotments**
- **Snowpack declining (12-71% runoff)**





# Reduced Fisheries

- **Historic salmon and steelhead run**
  - 800,000 fish
- **Average run size last 10-15 years**
  - 15,000-20,000 fish
- **Native coho, sockeye and summer Chinook extirpated**
  - Coho reestablished, sockeye being reestablished
- **Spring and fall Chinook**
  - Seriously reduced
- **Steelhead and bull trout**
  - ESA Threatened species

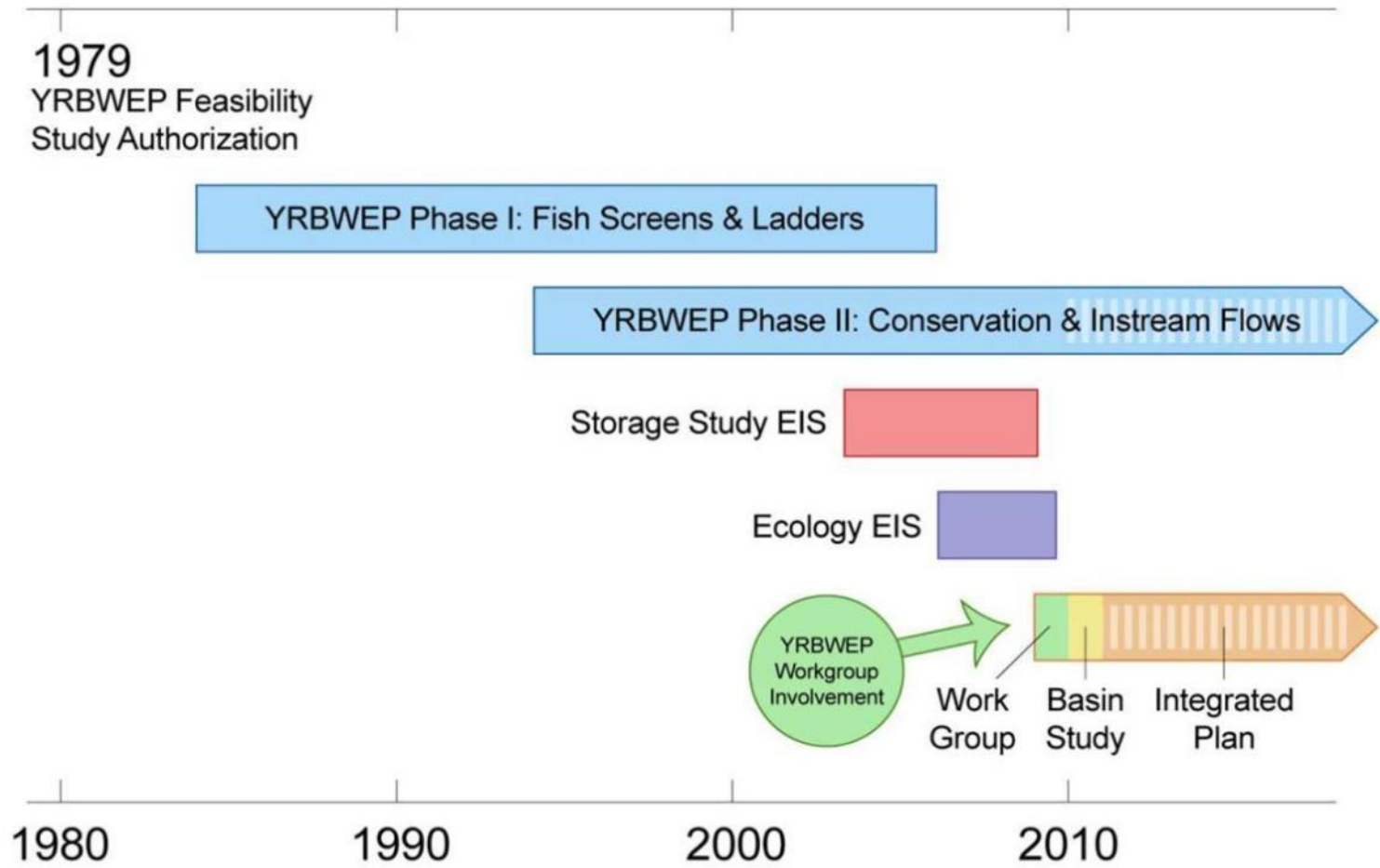


# An Emerging Solution

- **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



# Yakima River Basin Water Enhancement Project Timeline





# YRBWEP Workgroup Members

- **Federal Agencies**
  - Bureau of Reclamation
  - National Marine Fisheries Service
  - U.S. Fish and Wildlife Service
  - U.S. Forest Service
- **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



# Integrated Water Resource Management Plan (IWRMP)

- **Seven elements:**
  - **Fish passage at existing reservoirs**
  - **Habitat protection and enhancements**
  - **New or expanded storage reservoirs**
  - **Groundwater storage**
  - **Enhanced conservation**
  - **Market-based reallocation of water resources**
  - **Structural and operational changes to existing facilities**



# 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.

**RECLAMATION**  
Managing Water in the West

<http://www.usbr.gov/pn/pr/programs/yrbwsp/2011integratedplan/index.html>

**DEPARTMENT OF ECOLOGY**  
State of Washington

<http://www.ecy.wa.gov/programs/er/icwp/IBIP.html>



### 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 area and wild and scenic river 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 198,000 ac-ft.
4. Begin appraisal of potential projects to transfer water from the Columbia River to the Yakima Basin.

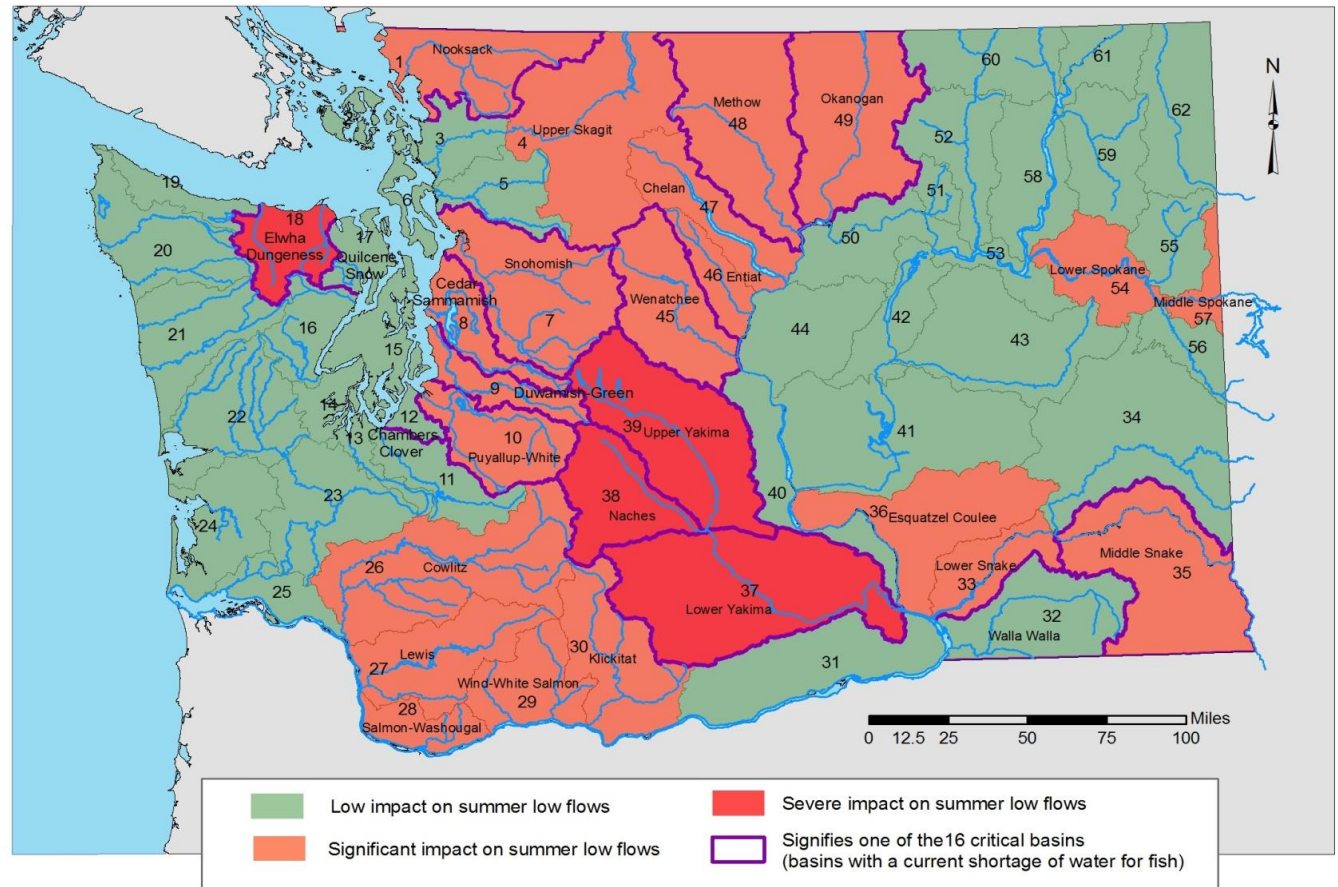
### Groundwater Storage

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.



# Climate Change Forecast

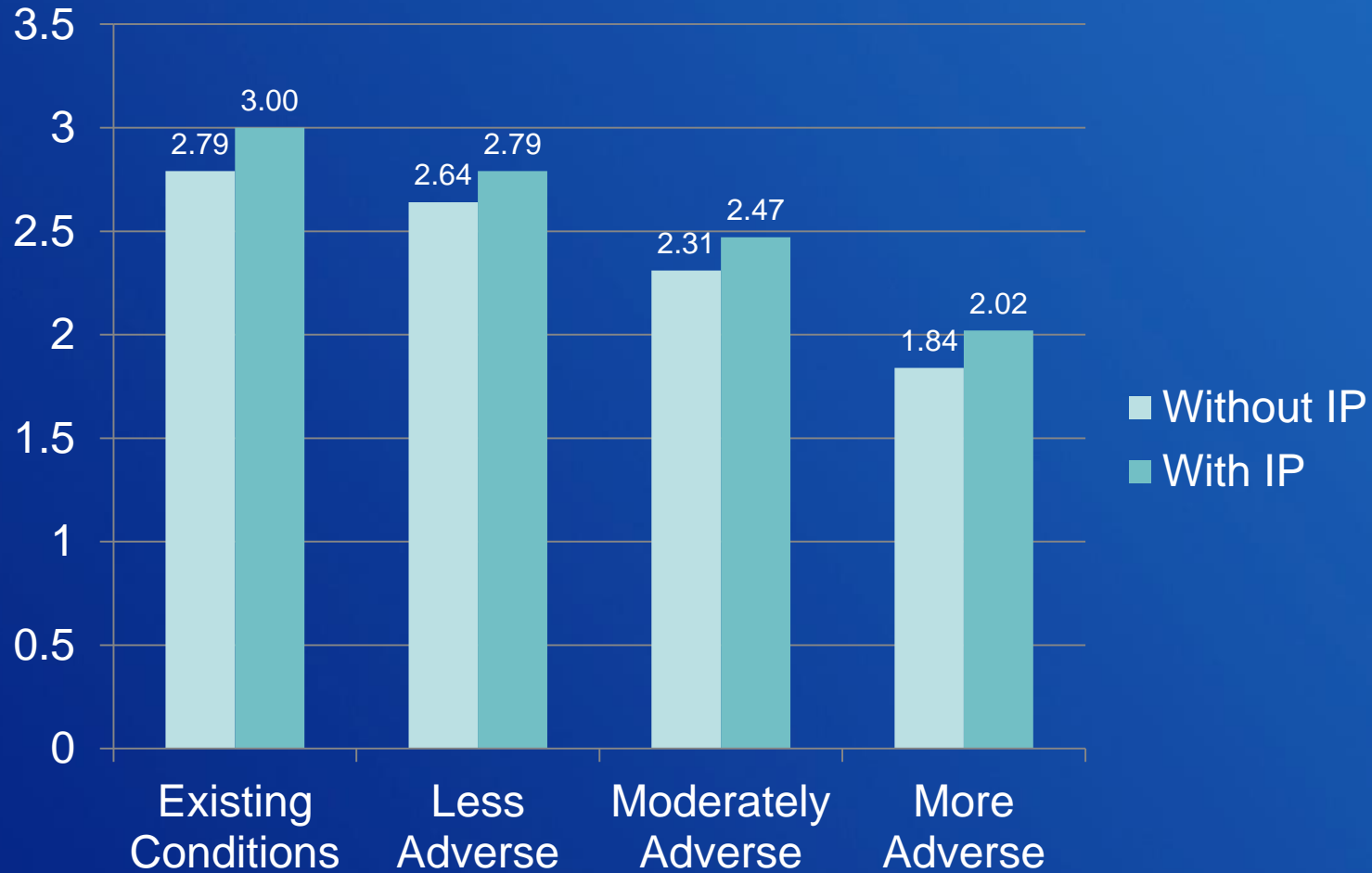
2040 Projected Climate Change Impact on Summer Flows by WRIA





# Climate Change Scenario Results

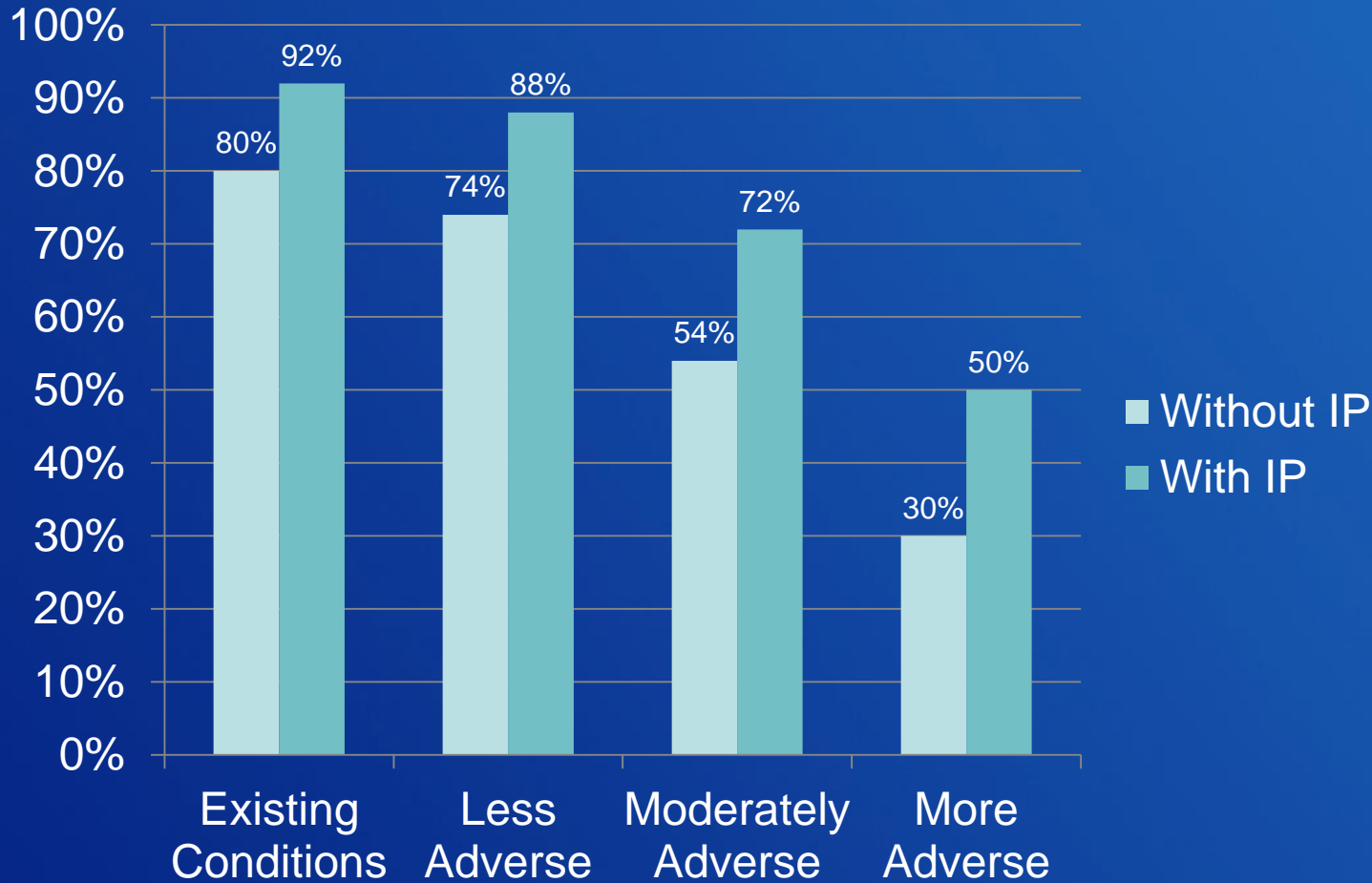
## Average April 1 TWSA (MAF)





# Climate Change Scenario Results

## Average Irrigation Proration Level

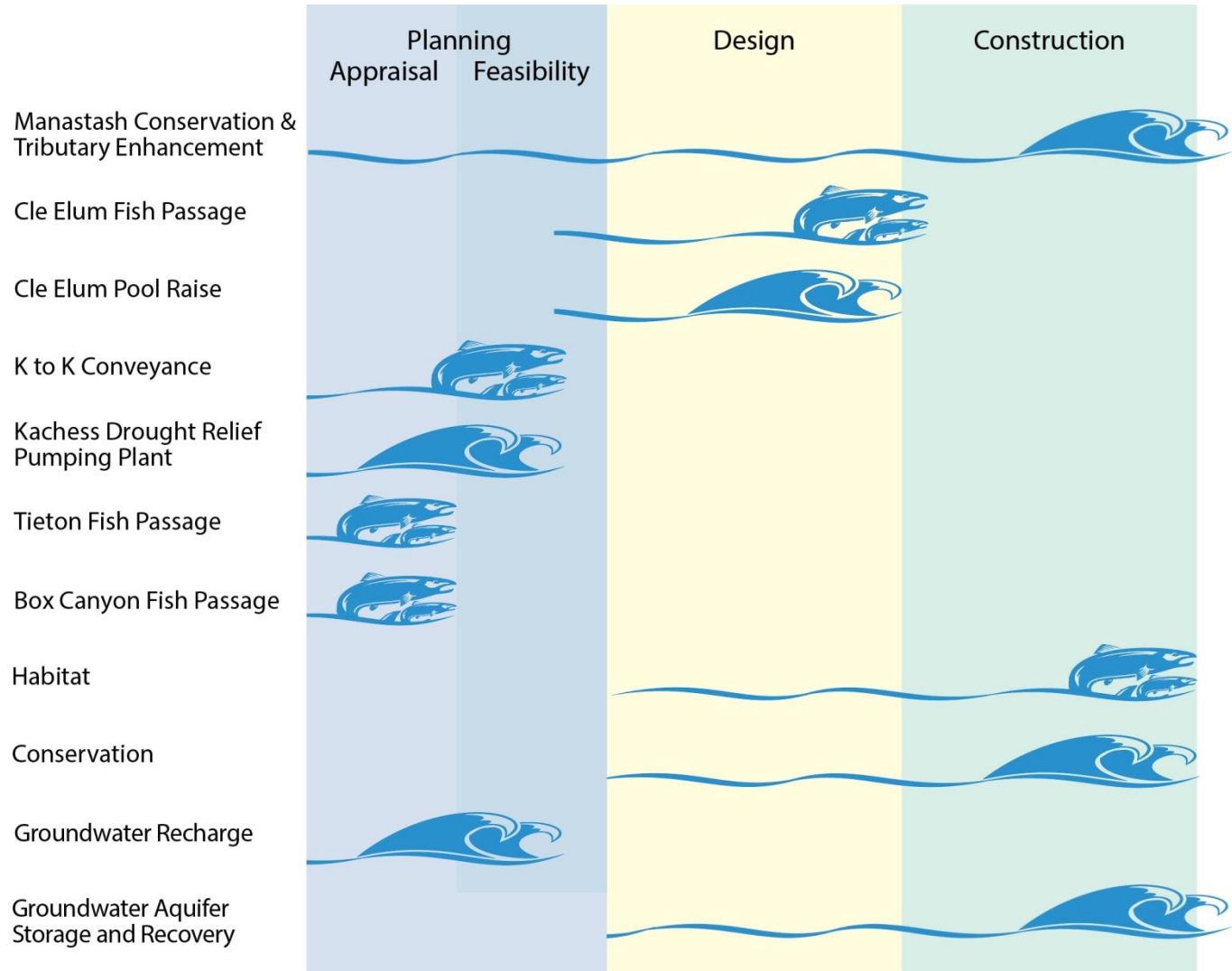


# Ongoing Projects

- Kachess Drought Relief Pumping Plant
- Keechelus-to-Kachess Conveyance
- Bull Trout Enhancement
- Wymer Dam and Reservoir
- Bumping Dam and Reservoir Enlargement
- Cle Elum Pool Raise
- Cle Elum Dam Fish Passage Facilities
- Tieton Dam Fish Passage Facilities Study
- Clear Lake Dam Fish Passage
- Groundwater Storage – Basinwide Analysis
- Groundwater Storage – City of Yakima Aquifer Storage and Recovery (ASR)
- Manastash Creek Conservation and Tributary Enhancement
- Habitat Enhancement and Agricultural Conservation Projects
- Teanaway Community Forest

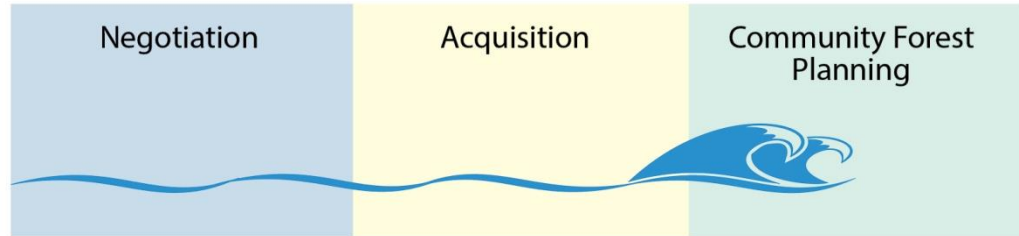


# Accomplishments 2013-2015



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Teanaway Watershed  
Protection



# Structural and Operational Changes





# Structural & Operational Changes

- Raise the Cle Elum Pool by 3 feet, adding 14,600 acre-feet to storage
  - **Final EIS released**
  - **Radial gate modification design complete**
  - **Construction could begin Fall 2015, contingent on completion of environmental compliance and funding.**
- Modify Kittitas Reclamation District canals for efficiency savings
  - **Manastash Creek Restoration - construction complete on Lateral 13.8 and project is operating successfully**
  - **KRD working on developing other projects with coordination with NMFS and Yakama Nation**
  - **Pilot project in process this year for tributary enhancement during drought year**



# Structural & Operational Changes (con't)

- Construct a pipeline from Keechelus to 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
  - **Draft EIS released to public**
  - **Feasibility study in process**
- Decrease power generation at Roza Dam and Chandler Power Plants to support outmigration of juvenile fish
  - **Chandler**
    - ✓ **Reviewing Chandler Pumping Plant electrification**
  - **Roza**
    - ✓ **Conducted 3-year study; draft final report - May 2015**
    - ✓ **Defined flow-to-survival rate in reach**
    - ✓ **Survival rate based on dam operations**



# 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**
  - **Assessments**
- **BTE is part of all action alternatives in KKC/KDRPP EIS**
- **MOU with Reclamation, Ecology, YN, USFWS, WDFW, USFS**



# Reservoir Fish Passage



# Reservoir Fish Passage

- Clear Lake Dam
  - **Third year of study completed**
- Cle Elum Dam
  - **Construction to begin Fall 2015**
- Bumping Dam
- Tieton Dam
  - **Appraisal Assessment to be complete Fall 2015**
- Keechelus Dam
  - **Conceptual Design Report drafted, to be finalized after meeting with Yakima Storage Dam Fish Passage Core Team mid-June.**
- Kachess Dam
  - **Conceptual Design Report drafted, to be finalized after meeting with Yakima Storage Dam Fish Passage Core Team in mid-June.**





# Surface Water Storage



# Surface Water Storage

- Build 162,500 acre-feet off-channel surface storage facility at Wymer on Lmuma Creek
  - **Key Consideration Analysis and WDFW surveys in process**
- Access an additional 200,000 acre-feet of water by tapping into inactive storage at Lake Kachess
  - **Draft EIS released to public**
  - **Feasibility study in process**
- Construct a new dam at Bumping Reservoir to increase capacity to 190,000 acre-feet
  - **Key Consideration Analysis and WDFW surveys in process**
- Begin appraisal of potential projects to transfer water from the Columbia River to the Yakima Basin.



# Groundwater Storage



# Groundwater Storage

- Construct pilot projects to evaluate recharging shallow aquifers via groundwater infiltration. Full-scale implementation may follow.
  - **Initial siting analysis complete, pilot study in process**
- Build an aquifer storage and recovery facility allowing City of Yakima to withdraw water from the Naches River during high-flow periods and store it under-ground for use during low-flow periods.
  - **City of Yakima began recharging water to the aquifer in March 2015, under a temporary ASR permit issued by Ecology.**



# Enhanced Water Conservation



# Enhanced Water Conservation

- Implement an agricultural water conservation program designed to conserve up to 170,000 acre-feet of water in average water years
  - **Completed 5 out of 7 projects for 2013-2015**
  - **Water savings 2,874 acre-feet, in addition to the 40,000 acre-feet that has been acquired through YRBWEP.**





# Habitat/Watershed Protection and Enhancement

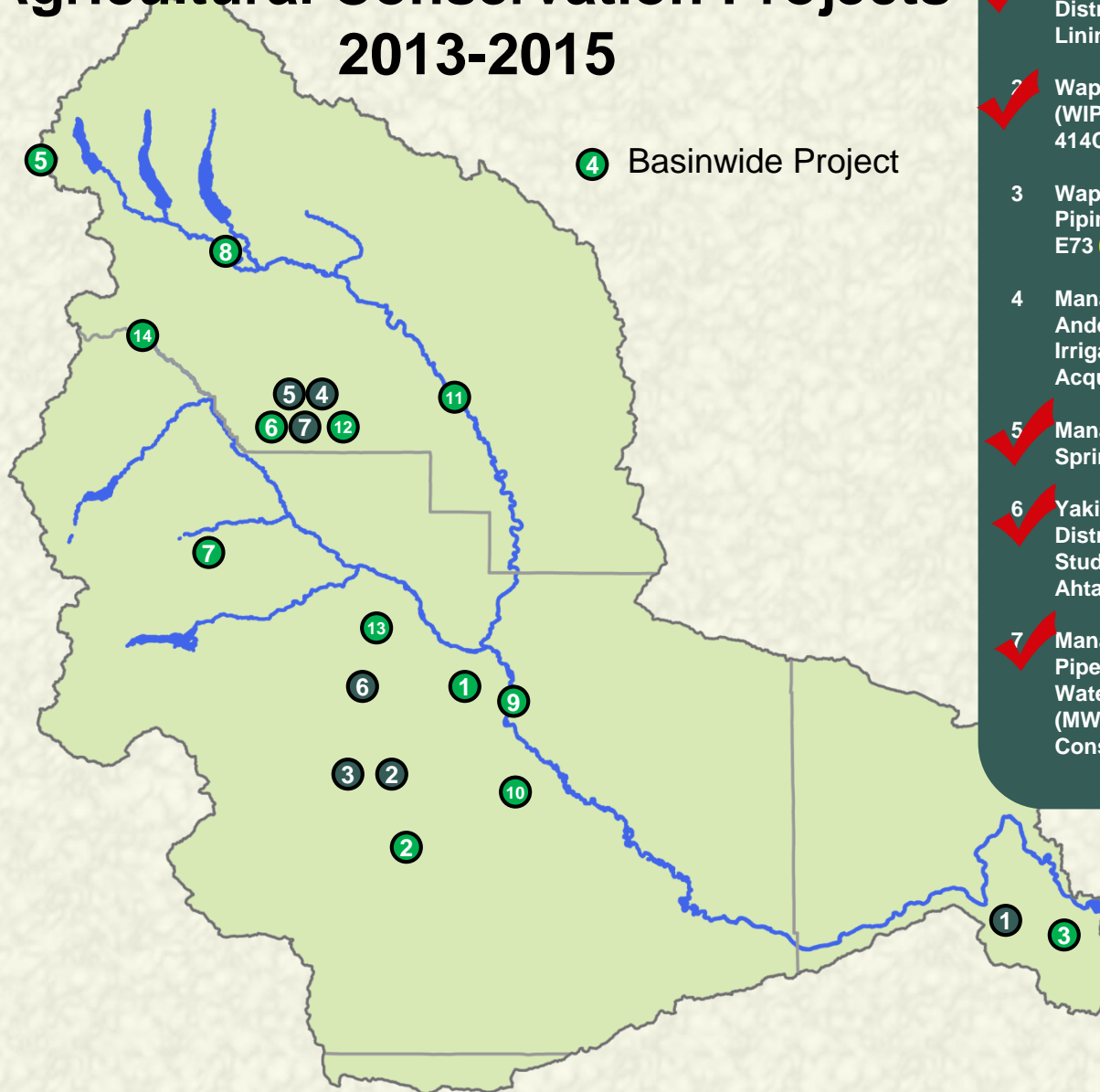


# Habitat/Watershed Protection and Enhancement

- Protect ~ 70,000 acres of land by acquiring high-elevation portions of the watershed and forest and shrub-steppe habitat
  - **Over 55,000 acres of land has been acquired**
- Create a habitat enhancement program to address reach-level floodplain restoration priorities and restore access to key tributaries
  - **5 out of 14 projects for 2013-2015 have been completed**
  - **3,170 acres of floodplain connectivity**
  - **47,921 acres forested lands in little Naches**
  - **1.9 cfs winter stock in trust Nov-Mar in Manastash Creek**
  - **5 miles of improved instream flow in Cle Elum River side channel**



# Yakima Integrated Plan Habitat Enhancement/Enhanced Agricultural Conservation Projects 2013-2015



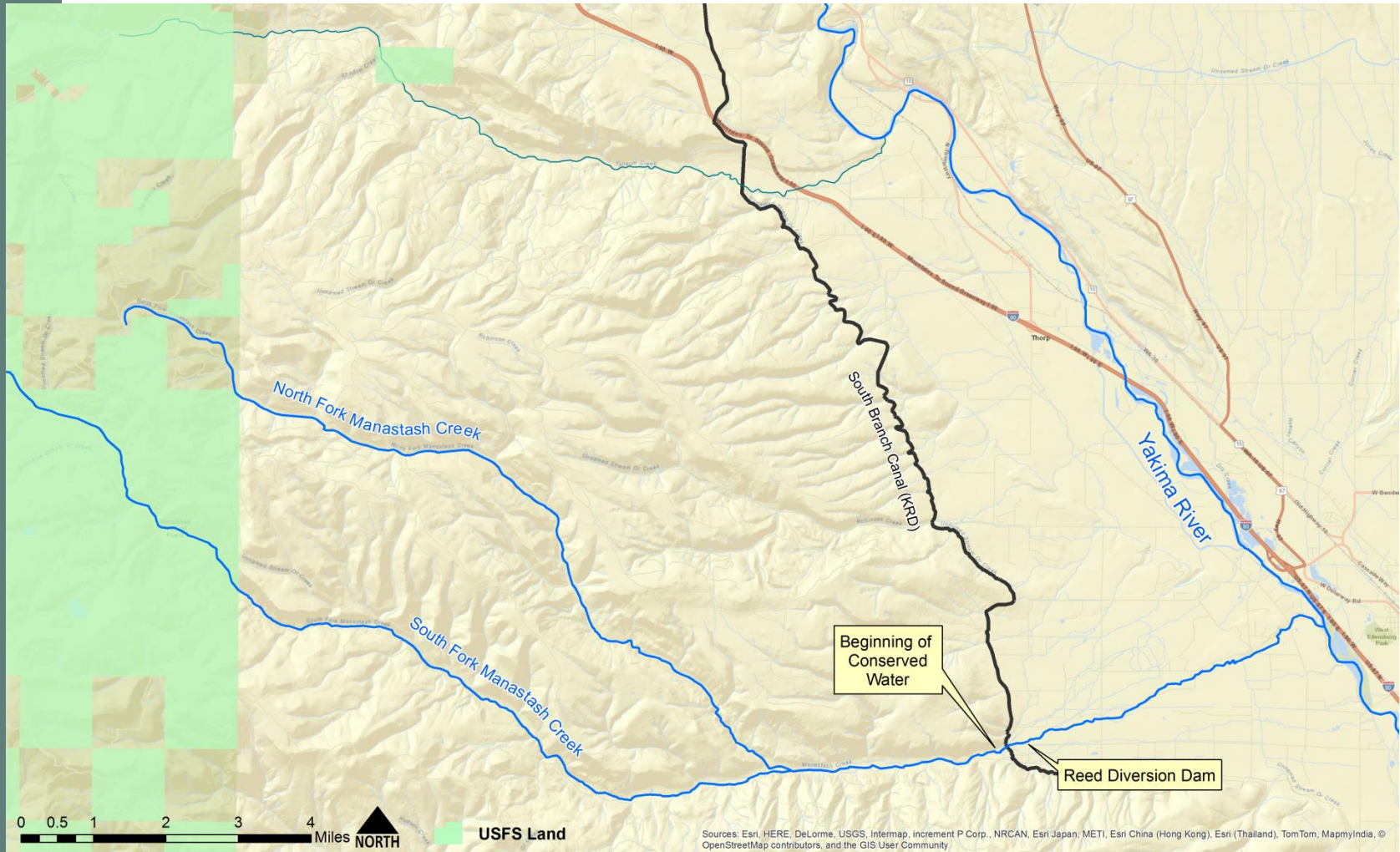
## Habitat Enhancement Projects

- 1 ✓ Gap-to-Gap Outfall Relocation
- 2 ✓ Toppenish Fan (Spring 2016)
- 3 ✓ Bateman Island Causeway Modification Conceptual Design
- 4 Bull Trout Task Force Habitat Improvements (Oct 2015)
- 5 ✓ Gold Creek Habitat Assessment and Conceptual Design
- 6 Reed Diversion design Barrier Removal (Fall 2015)
- 7 Little Rattlesnake Road Decommissioning (Fall 2015)
- 8 ✓ Cle Elum River Side Channel Restoration Project, Phase 2
- 9 Gap-to-Gap Property Acquisitions (Spring 2016)
- 10 Upper Wapato Riparian Restoration (Spring 2016)
- 11 Ellensburg Water Company / Coleman Creek Restoration (Spring 2016)
- 12 Reed Diversion Barrier Removal (Fall 2016)
- 13 Trout Meadows Acquisition / Enhancement (Spring 2016)
- 14 ✓ Manastash/ Little Naches Land Acquisition

## Agricultural Conservation Projects

- 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 (Spring 2016)
- 4 Manastash Creek, Anderson Diversion Irrigation Water Acquisition (Spring 2016)
- 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

# Manastash Creek Conservation & Tributary Enhancement





# Manastash Creek – Before and After



# Market Reallocation



# 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.
  - **Yakima County and Kittitas County continue to work on procedures to enable property development that rely, in part, on acquisition of water or mitigation credits from willing sellers.**
  - **Governor Inslee issued a drought declaration affecting the Yakima River basin, and this will enable the Department of Ecology to lease water from willing sellers to meet certain needs within the basin this year.**

