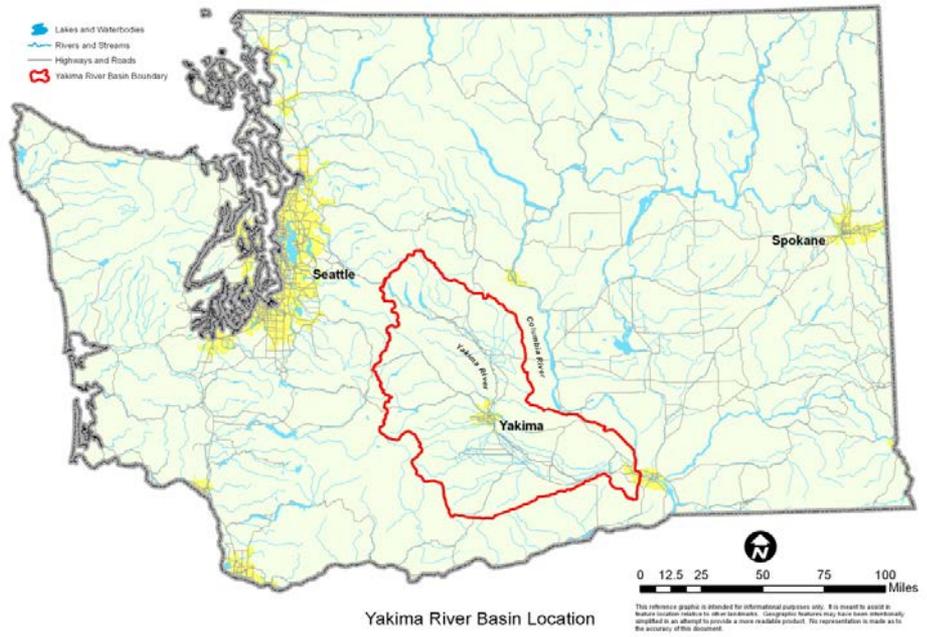
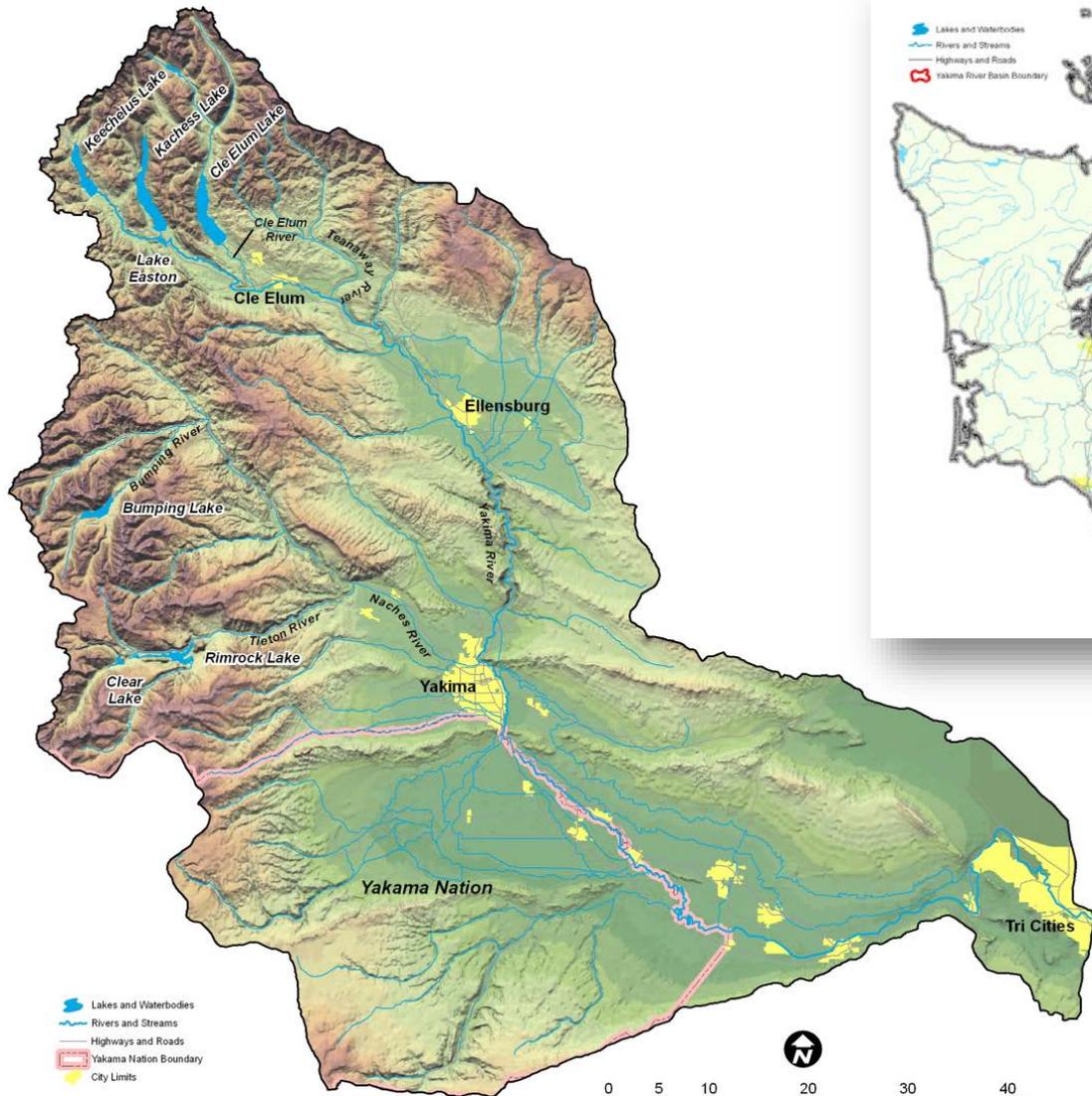


Yakima River Basin Integrated Water Resource Management Plan

2011 Yakima Basin Science & Management Conference

**Central Washington University
Ellensburg, WA
June 15, 2011**





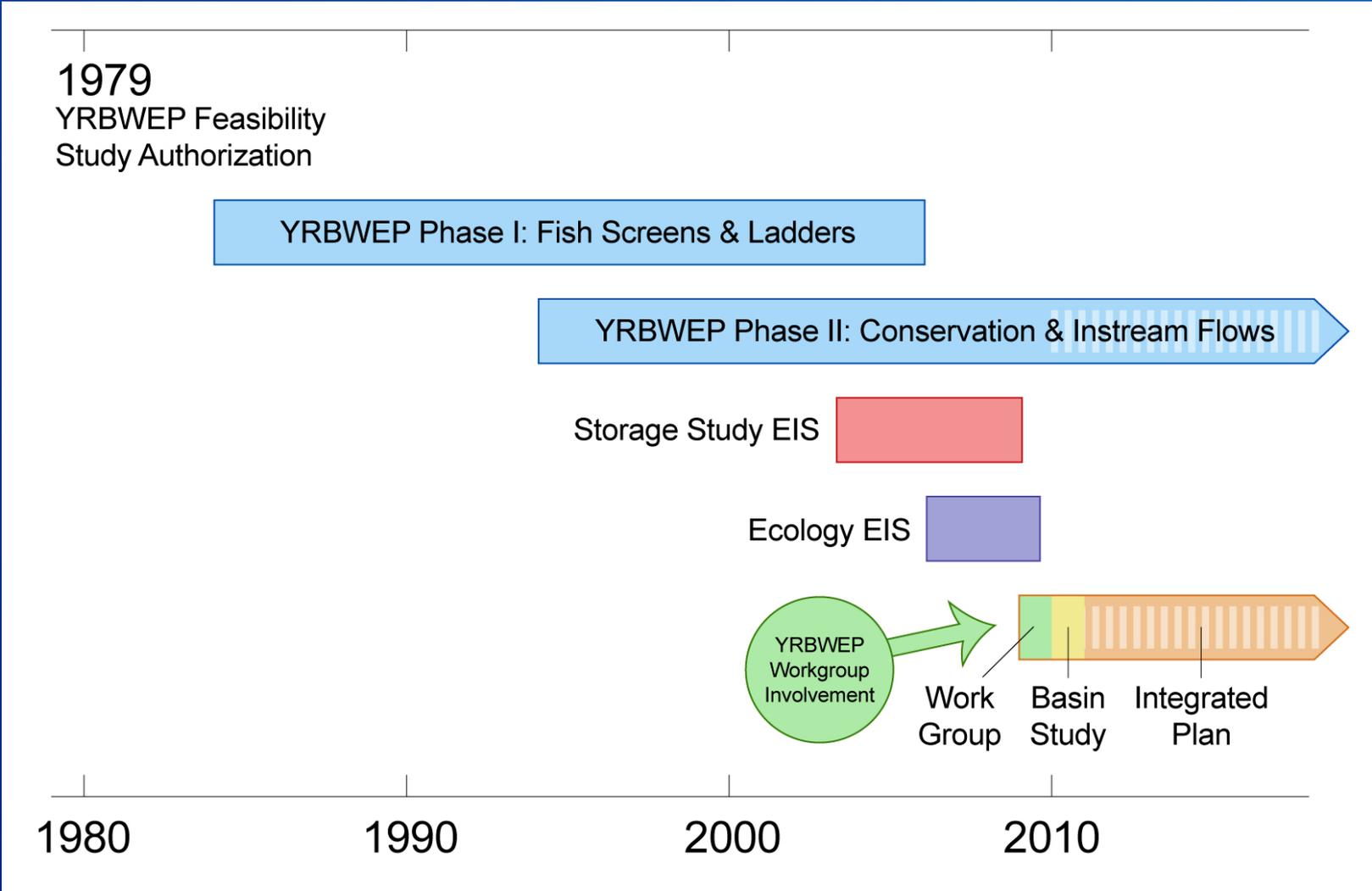
- Basin Size = 6,155 sq. miles
- Irrigated cropland = 500,000 acres
- Avg. runoff = 3.3 MAF
Reservoirs store 1.0 MAF
Deliveries = 1.7 MAF

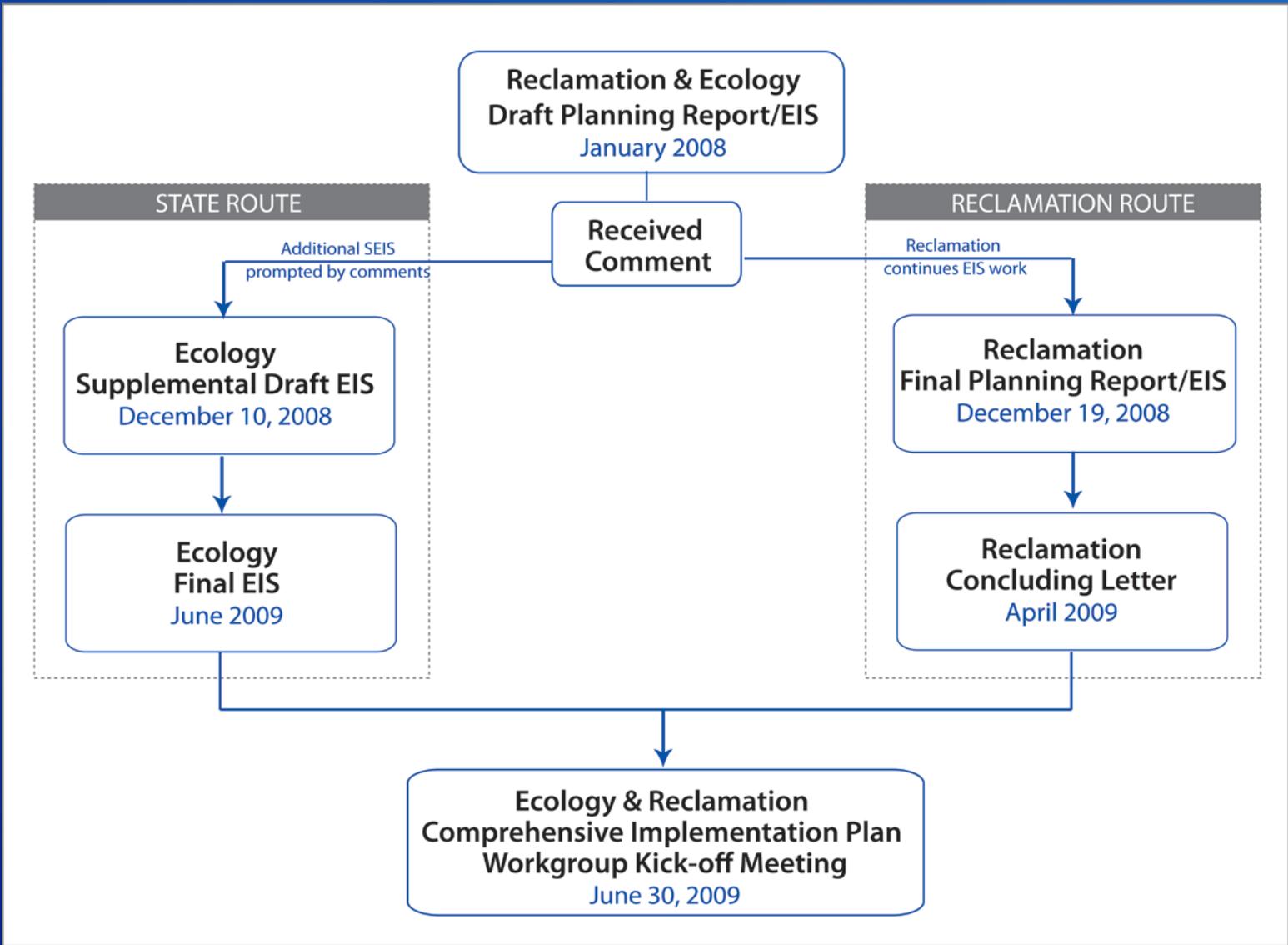
Water Problems in the Yakima River Basin

- **Adjudication** ▶ 30+ year effort to determine rights
- **Droughts/Water Shortages** ▶ 1 year out of 4 since 1990
- **Anadromous fish runs** ▶ Not sustainable
 - **Chinook, sockeye coho, steelhead, bull trout** ▶ Extirpated, reduced, and/or threatened (300,000 to 960,000 historical, now averaging 8,000).
- **Climate change** ▶ Runoff timing changed and changing creating less snow and less summer water

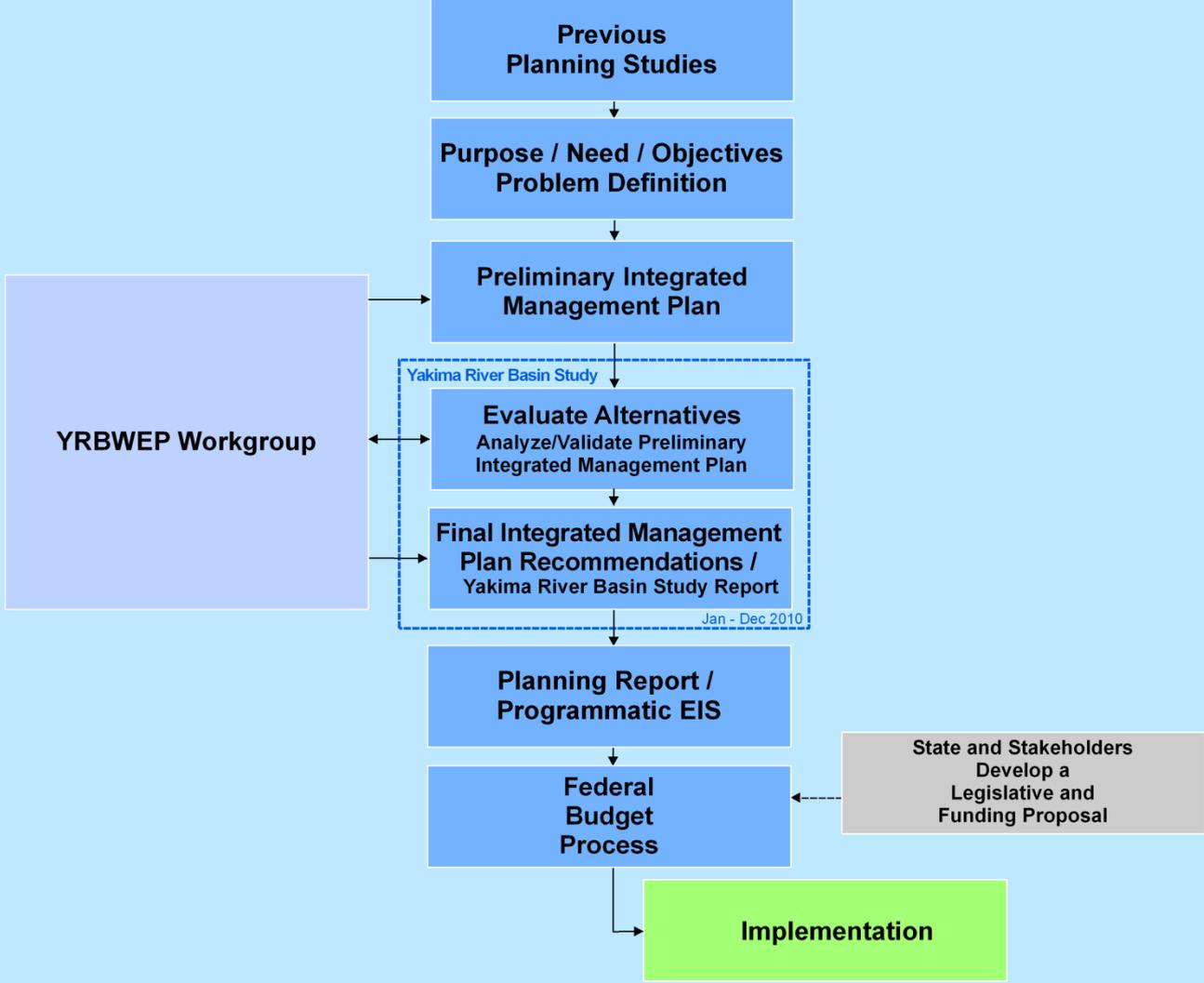


Yakima River Basin - Timeline





YAKIMA BASIN INTEGRATED WATER RESOURCE MANAGEMENT PLAN



YRBWEP Workgroup Members

- Washington Department of Agriculture
- NOAA, National Marine Fisheries Service
- Benton County
- Yakima Basin Fish & Wildlife Recovery Board
- Yakima – Tieton Irrigation District
- Yakama Nation – Yakima/Klickitat Fisheries Project
- American Rivers
- Kittitas Reclamation District
- Yakima County
- City of Yakima
- Kittitas County
- Yakima Basin Storage Alliance
- Kennewick Irrigation District
- Yakama Nation – Natural Resources
- Washington Department of Ecology
- Washington Department of Fish and Wildlife
- US Fish and Wildlife Service
- Sunnyside Valley Irrigation District
- Roza Irrigation District
- Bureau of Reclamation



Objectives

- **Achieve consensus around a set of strategies for addressing water supply and streamflow imbalances as well as other aquatic resource issues**
- **A plan to move forward with a solution to the basin water shortages – Final IWRMP**
- **Affordable and adaptable program that can adjust to future needs of the basin to accommodate climate change and population growth**



Integrated Water Resource Management Plan (IWRMP)

- **Categories:**
 - **Habitat**
 - **Water Supply**
 - **Structural and Operational Changes**



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**



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.

Fish Passage

Provide fish passage at:

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

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 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 critical habitat.
3. Create a fish 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.

Surface Water Storage

1. Build a 162,500 ac-ft off-channel surface storage facility at Wymer on Lumma 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 work on 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.



RECLAMATION
Managing Water in the West

DEPARTMENT OF
ECOLOGY
State of Washington

Rev. 2-04-19-11

FISH PASSAGE ELEMENT

◆ Restore access to habitat above five existing reservoirs -- **Cle Elum, Bumping, Kachess, Keechelus, and Rimrock (Tieton Dam)** -- and provide upstream and downstream passage to salmon, bull trout, and other fish. This would have the benefits:

- Increase anadromous species abundance throughout the system
- Allow reintroduction of sockeye runs
- Provide greater genetic interchange for bull trout and other native fish
- Help fish cope with climate change impacts by providing access to high quality habitat at higher elevations

◆ Improve upstream and downstream passage for bull trout at **Clear Lake Dam** by modifying the existing fishway or building a new one



Keechelus



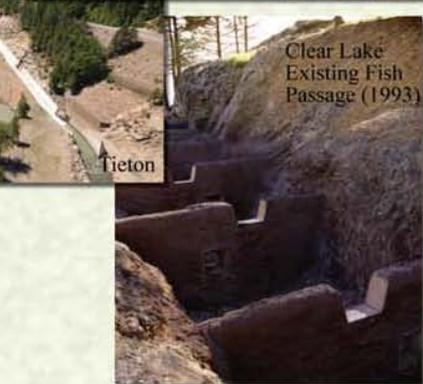
Kachess



Cle Elum



Bumping



Tieton

Clear Lake Existing Fish Passage (1993)

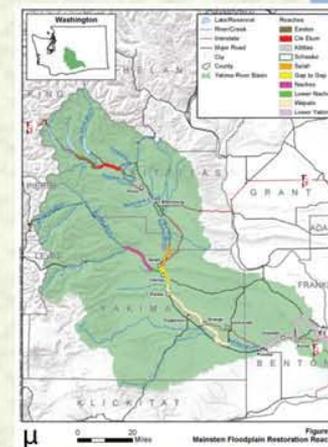
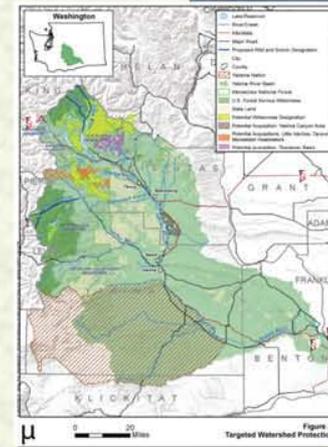
HABITAT PROTECTION AND ENHANCEMENT ELEMENT

Targeted Watershed Protections and Enhancements

- ◆ Three key areas targeted for land acquisition actions, if available (or equivalent habitat type/size)
 - 46,000 acres in middle and lower Teanaway River Basin
 - 15,000 acres in Yakima River Canyon from Yakima River to I-82
 - 10,000 acres at Little Naches River headwaters and lands surrounding Taneum and Manastash Creeks headwaters
- ◆ Consider potential Wilderness and Wild and Scenic River designations

Mainstem Floodplain and Tributaries Fish Habitat Enhancement Program

- ◆ Habitat enhancement – stable wood and other large organic debris
- ◆ Flow restoration through irrigation system improvements
- ◆ Fish barrier removal; restore fish passage in tributaries
- ◆ Screening of diversions
- ◆ Reconnect side channels and off-channel habitat to stream channels
- ◆ Create improved spawning, incubation, rearing, and migration conditions
- ◆ Mainstem floodplain improvements – channel and habitat restoration
- ◆ Toppenish Creek Corridor Restoration Project



SURFACE WATER STORAGE

Additional water storage would supply instream and out-of-stream flows to meet agricultural, municipal, and domestic needs. The three projects described below focus on in-basin solutions to address water supply and aquatic resource problems. Power generation is being considered for each facility.

Wymer Dam and Pump Station

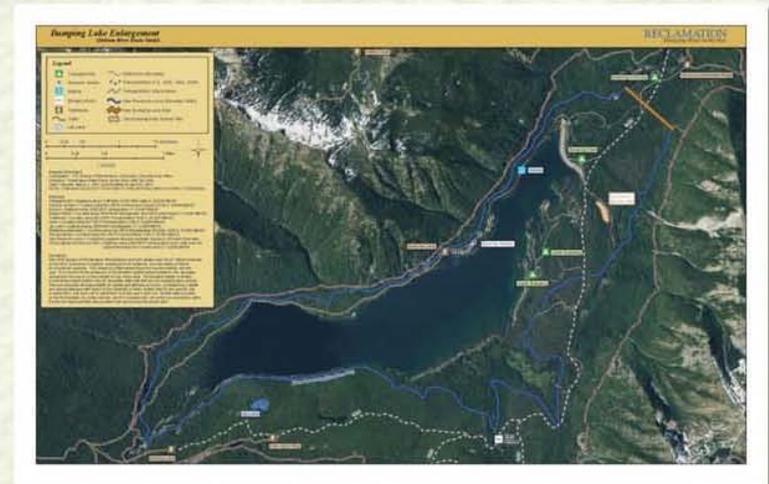
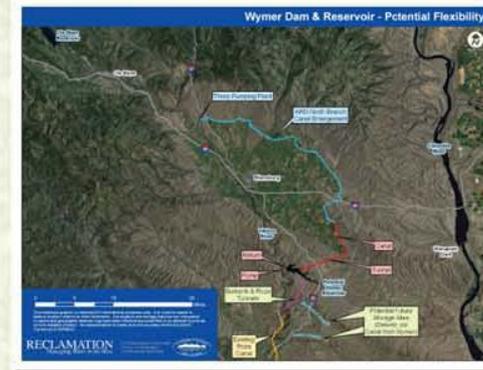
- ▶ Construct a new dam and 162,500-acre-foot-capacity reservoir
- ▶ Options for pump station at Thorp or upstream of Lmuma Creek
- ▶ Provides fish, drought relief benefits

Lake Kachess Inactive Storage

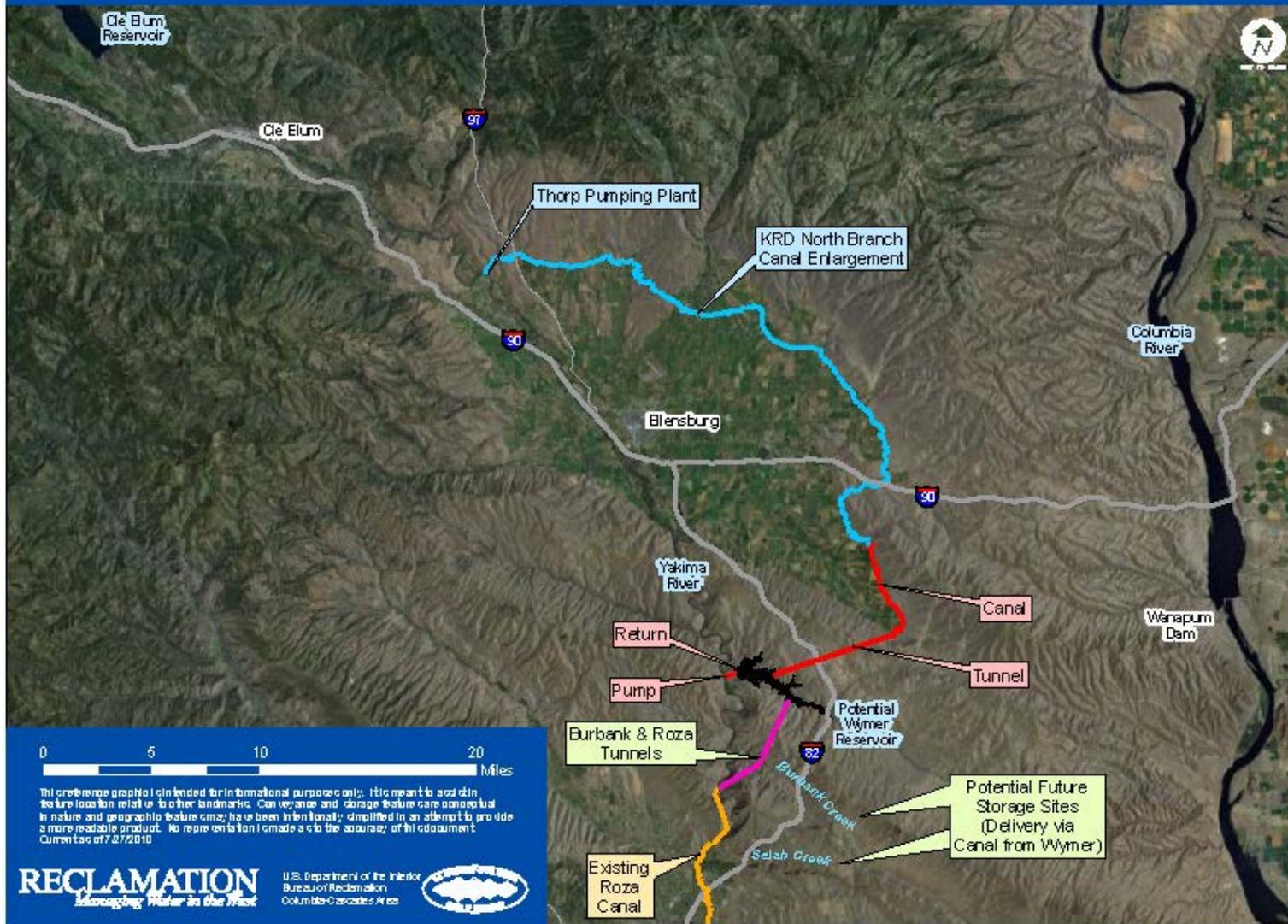
- ▶ Pump additional 200,000 acre-feet from inactive storage for drought years

Bumping Lake Enlargement

- ▶ Construct new dam downstream from existing dam for an additional 164,500 acre-feet storage
- ▶ Provide carryover storage for irrigation, instream flows, flood control, fish passage



Wymer Dam & Reservoir - Potential Flexibility



Bumping Lake Enlargement (Yakima River Basin Study)

RECLAMATION
Managing Water in the West

- Legend**
- Campgrounds
 - Summer Homes
 - Marina
 - Bridges (New)
 - Trailheads
 - Trails
 - Lily Lake
 - Wilderness Boundary
 - Transportation (F.S. 1800, 1808, 1809)
 - Transportation (Secondary)
 - New Reservoir Level (Elevation 3490)
 - New Bumping Lake Dam
 - Old Bumping Dam Borrow Site

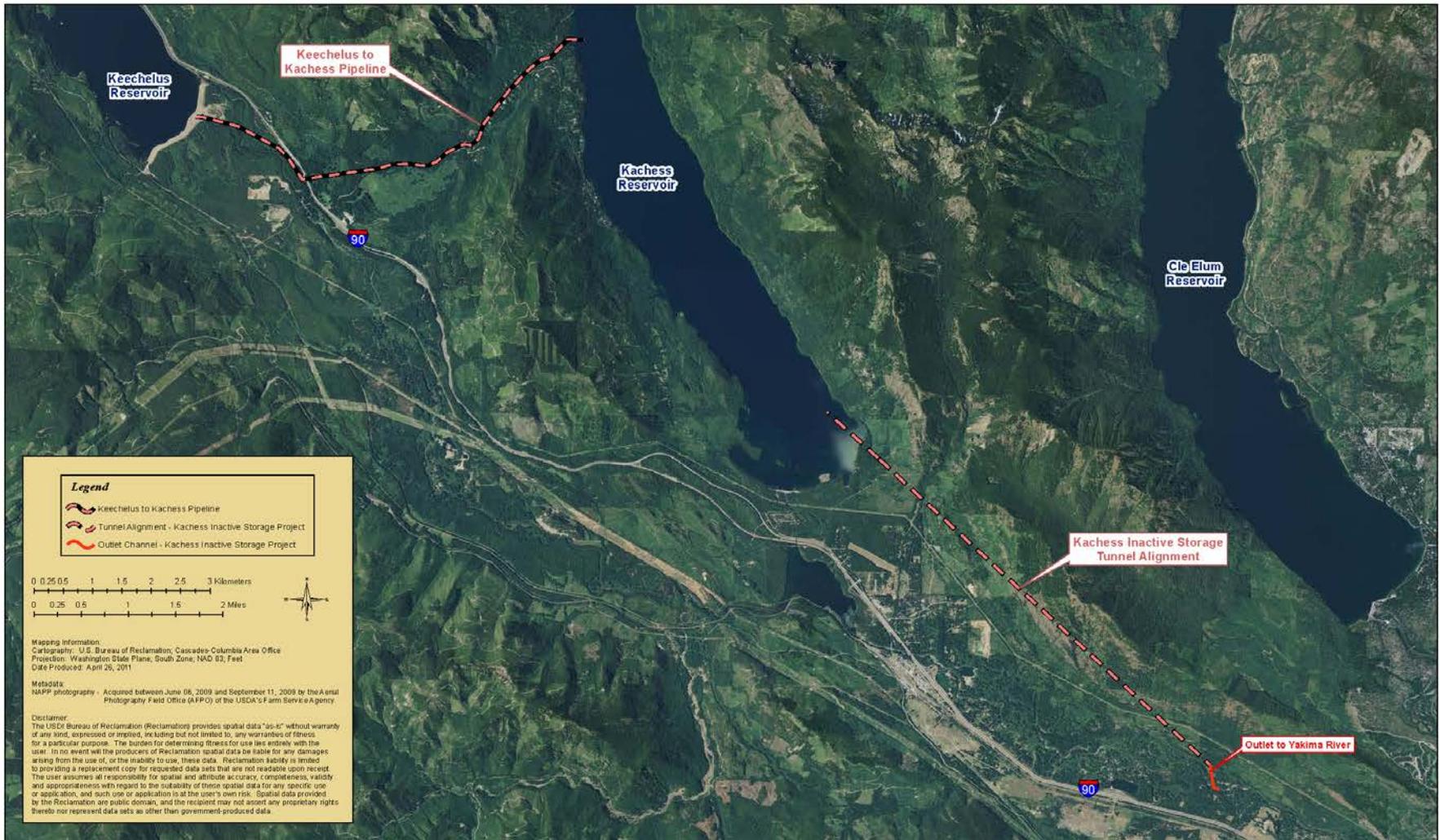


Mapping Information:
Cartography - U.S. Bureau of Reclamation, Cascade-Columbia Area Office
Projection - Washington State Plane, South Zone, NAD 83, Feet
Date Produced - March 1, 2011 (Last Modified on APR 13, 2011)
NOTE: THIS MAP DOES NOT CONFORM TO THE NATIONAL MAP ACCURACY STANDARD

Metadata:
Campgrounds = Digitized using 7.5 Minute USGS DRG data (1:24,000 NMAAS)
Summer Homes = Located using the USFS Constructed Features GDB (1:24,000 NMAAS)
Marina = Digitized using 2009 NAIP photography (1:12,000 NMAAS)
Bridges (New) = Located using 2009 NAIP photography and USFS information (1:12,000 NMAAS)
Trailheads = Located using the USFS Transportation GDB (1:24,000 NMAAS)
Trails = Located using the USFS Transportation GDB (1:24,000 NMAAS)
Lily Lake = Digitized using 2009 NAIP photography (1:12,000 NMAAS)
Wilderness Boundary = Located using the USFS Management Direction GDB (1:24,000 NMAAS)
Transportation = Located using the USFS Transportation GDB (1:24,000 NMAAS)
New Reservoir Level = Contractor supplied data set probably based on 30 meter DEM data
Old Bumping Dam Borrow Site = Digitized using 2009 NAIP photography and a map from the original Bumping Dam construction (1:12,000 NMAAS)

Disclaimer:
The USGS Bureau of Reclamation (Reclamation) provides spatial data "as is" without warranty of any kind, expressed or implied, including but not limited to, any warranties of fitness for a particular purpose. The burden for determining fitness for use was entirely with the user. In no event will the producers of Reclamation spatial data be liable for any damages arising from the use of, or the inability to use, these data. Reclamation liability is limited to providing a replacement copy for requested data sets that are not available upon receipt. The user assumes all responsibility for spatial and attribute accuracy, completeness, validity and appropriateness with regard to the suitability of these spatial data for any specific use or application, and such use or application is at the user's own risk. Spatial data provided by the Reclamation are public domain, and the recipient may not assert any proprietary rights thereto nor represent data sets as other than government-produced data.





ENHANCED WATER CONSERVATION ELEMENT

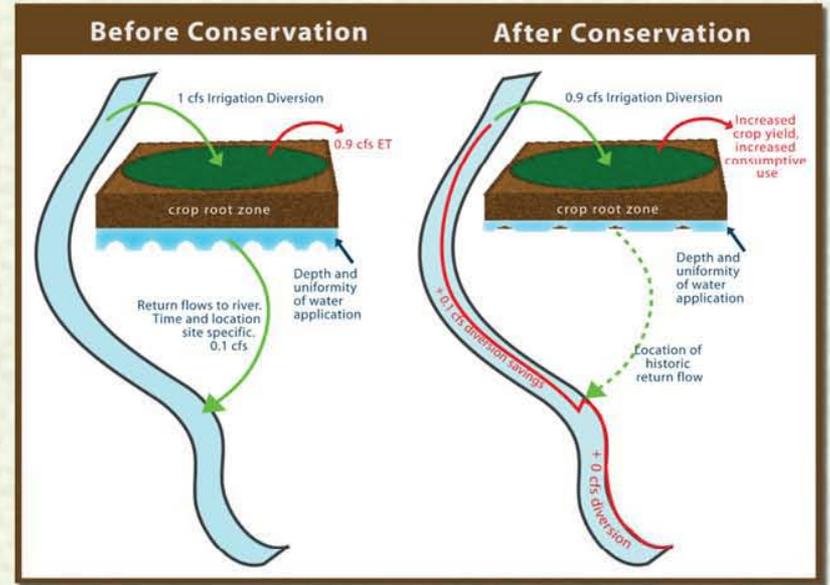
Consists of additional agricultural conservation actions not included in the current Yakima River Basin Water Enhancement Project implementation plans, along with municipal and domestic water conservation programs.

Agricultural Conservation - up to 170,000 acre-feet

- ◆ Line or pipe existing canals or laterals
- ◆ Construct re-regulation reservoirs
- ◆ Install higher efficiency sprinklers
- ◆ Reduce seepage, evaporation, and spills

Municipal and Domestic Conservation Program

- ◆ Assess opportunities to improve efficiency for residential, commercial, industrial, and urban recreational uses
- ◆ Promote efficient landscape irrigation practices
- ◆ Expand education, incentives, and other measures to encourage voluntary efficiency
- ◆ Establish best practice standards for accessing new water supplies



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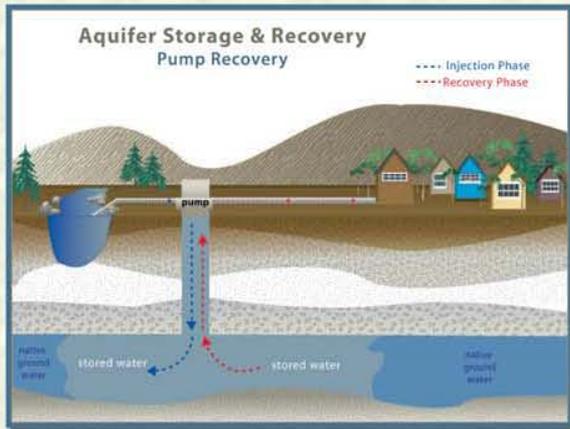


GROUNDWATER STORAGE ELEMENT

Groundwater storage actions would use surface water to recharge aquifers and store water for later withdrawal and use:

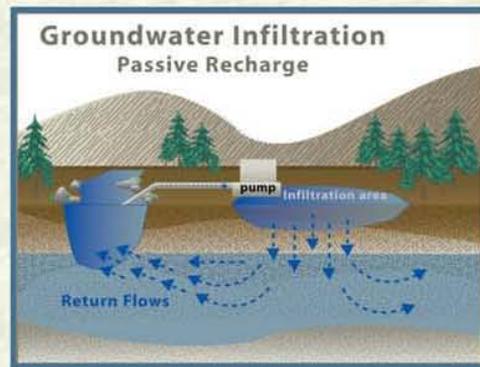
Aquifer Storage and Recovery

- ◆ New aquifer storage and recovery facility for City of Yakima



Groundwater Infiltration

- ◆ Diverts water into designed ground infiltration systems (ponds, canals) during periods of excess runoff
- ◆ Proposed pilot-testing in Kittitas Reclamation District and Wapato Irrigation Project (1-2 acres)



MARKET REALLOCATION ELEMENT

Market Reallocation is a process by which water resources would be reallocated through a “water market” and/or “water bank.”

- ◆ Water rights could be bought, sold, or leased
- ◆ Would improve water supply and instream flow conditions
- ◆ Two phases:
 - Near-term effort
 - » Would 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
 - » Would require substantial changes to existing laws/policies.

STRUCTURAL AND OPERATIONAL CHANGES ELEMENT

Modify existing structures and operations to improve flows, fish bypass, and smolt outmigration. Activities include:

Lake Keechelus to Lake Kachess Pipeline and new power generation facility

Kittitas Reclamation District canal modifications

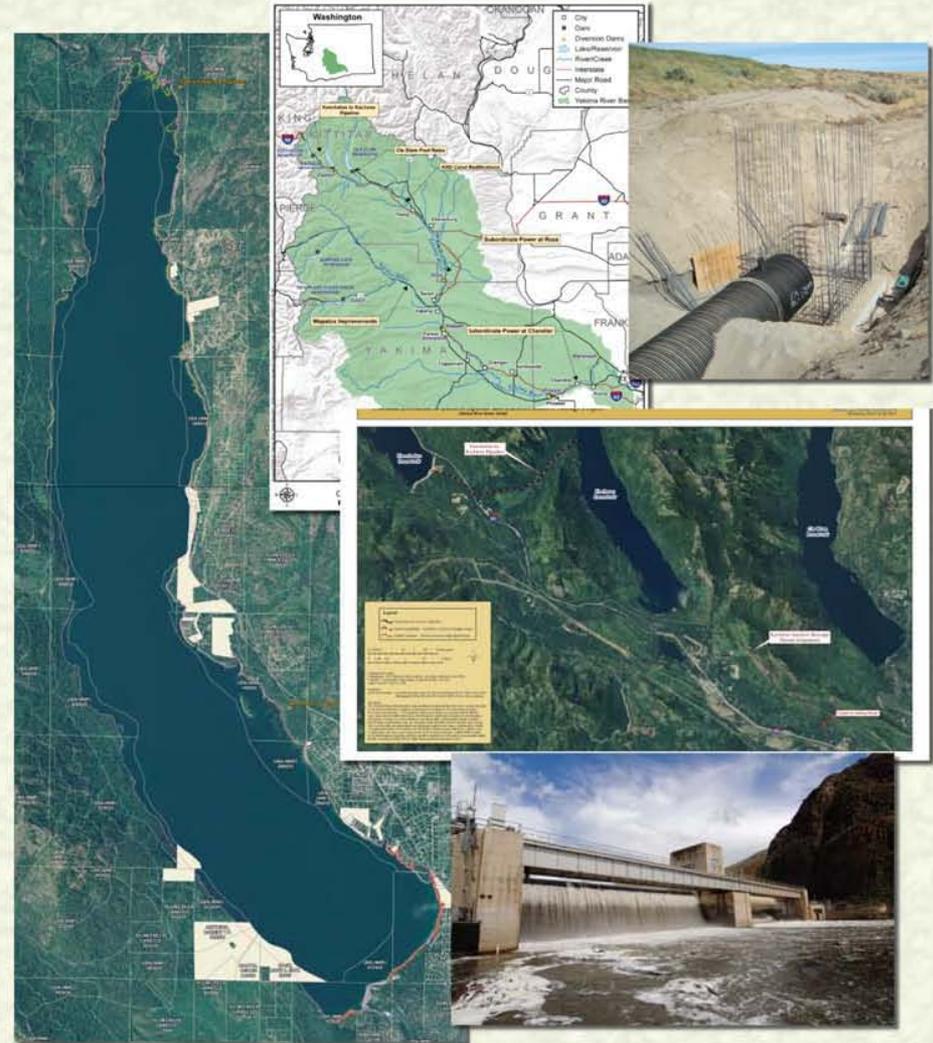
- ◆ Pipe irrigation laterals along KRD main canal and south branch canal
- ◆ Construct re-regulation reservoir to capture operational spills at Manastash Creek
- ◆ Construct pump station on Yakima River to deliver flows to Manastash Creek water users

Reduce diversions for power generation at Roza and Chandler Dams to provide instream flows for fish outmigration

Wapatox Canal – pipe or replace lining; consolidate diversions

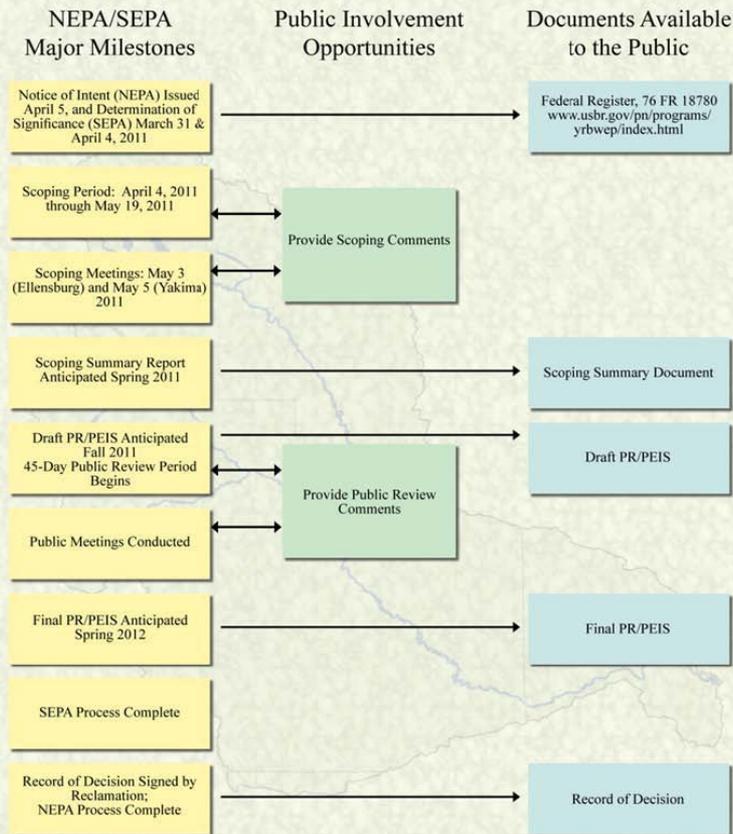
Raise maximum water level of Cle Elum Lake by 3 feet to add 14,600 acre-feet and improve instream flows

RECLAMATION
Managing Water in the West



NEPA/SEPA PROCESS

Yakima River Basin Integrated Water Resource Management Planning Report/Programmatic Environmental Impact Statement (PR/PEIS)



WHAT IS A PROGRAMMATIC EIS?

A “programmatic” environmental impact statement (PEIS) is a broad analysis of a proposal and its alternatives. This document is then followed by a narrower analysis that covers site-specific actions. This approach is referred to as a “tiered environmental review” because it relies on different levels of analysis at different stages, moving from a broad initial focus to greater detail in subsequent documents. The two tiers are:

Tier I – Programmatic EIS

- ◆ Considers broad proposals containing a wide range of elements
- ◆ Considers proposals covering a long timeframe and/or large geographic area
- ◆ Effective in addressing cumulative effects of other past, present, and foreseeable actions
- ◆ Identifies mitigation strategies

Tier II – Site-Specific, EIS

- ◆ Analyzes site-specific effects of a proposed project or element arising from a Tier I review
- ◆ Identifies specific mitigation measures
- ◆ Enables detailed studies to be conducted closer in time to project implementation
- ◆ Expands opportunities for public and agency input



Yakima River Basin Integrated Plan

Schedule

- **Scoping - April 4 – June 15, 2011**
- **Draft Planning Report / Programmatic EIS - Fall 2011**
- **Final Planning Report / Programmatic EIS - Spring 2012**



For Information:

- Ecology's Website:

http://www.ecy.wa.gov/programs/wr/cwp/cr_yak_storage.html

- Reclamation's Website: <http://www.usbr.gov/pn/programs/yrbwep/>

