



Contact: Wendy Christensen, 509-573-8050

Tom Tebb, 509-575-3989

## Agenda

### Yakima River Basin Water Enhancement Project Workgroup Meeting

Hotel Windrow, Elks Grand Ballroom, 502 N Main Street Ellensburg, WA

<https://maps.app.goo.gl/S6HdnBAPH9JAVF1L8>

March 13, 2024; 9:30 AM to 12:30 PM

[Click here to join the meeting](#)

- 
- 9:30 – 9:40      Welcome/Introductions and Agenda Overview  
*Ben Floyd, White Bluffs Consulting*
  - 9:40 – 9:50      YBIP Executive and Implementation Committee Updates  
*Wendy Christensen, Reclamation and Tom Tebb, Ecology*
  - 9:50 – 10:05    2024 Water Supply Update - Carryover Storage  
*Chad Stuart and Chris Lynch, Reclamation*
  - 10:05 – 11:05   Conservation Update and Preparations for Anticipated 2024 Drought  
*Lori Brady, SVID; Urban Eberhart, KRD; Scott Revell, Roza; Graysen Squeochs, WIP/Yakama Nation; Jason McShane, KID, and Heather Simmons and Kelsey Collins, Ecology*
  - 11:05 – 11:15    Public Comment<sup>1</sup>
  - 11:15 – 11:30    **Break**
  - 11:30 – 12:00    Lower Kittitas Reach Restoration Update  
*Arden Thomas, Kittitas County, Wendy Christensen, Reclamation and Chris Sheridan, BLM*
  - 12:00 – 12:30    Roundtable Discussion/Recognition of Steve Malloch – Workgroup Members  
*Ben Floyd, White Bluffs Consulting*
  - 12:30 – Adjourn**

**2024 YRBWEP Workgroup Meetings – June 5 (Richland), September 11 (Toppenish), December 13 (Yakima)**

For additional information, see the reports and documents available at this link:  
<http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html>

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<sup>1</sup> Those wanting to provide public comment can do so during the designated agenda item. Each commenter will be limited to 2 – 3 minutes for comments (depending upon number of commenters) to maintain meeting schedule. Additional written material can be submitted with comments for inclusion in the meeting notes. Previously provided comments are noted and not necessary to repeat.

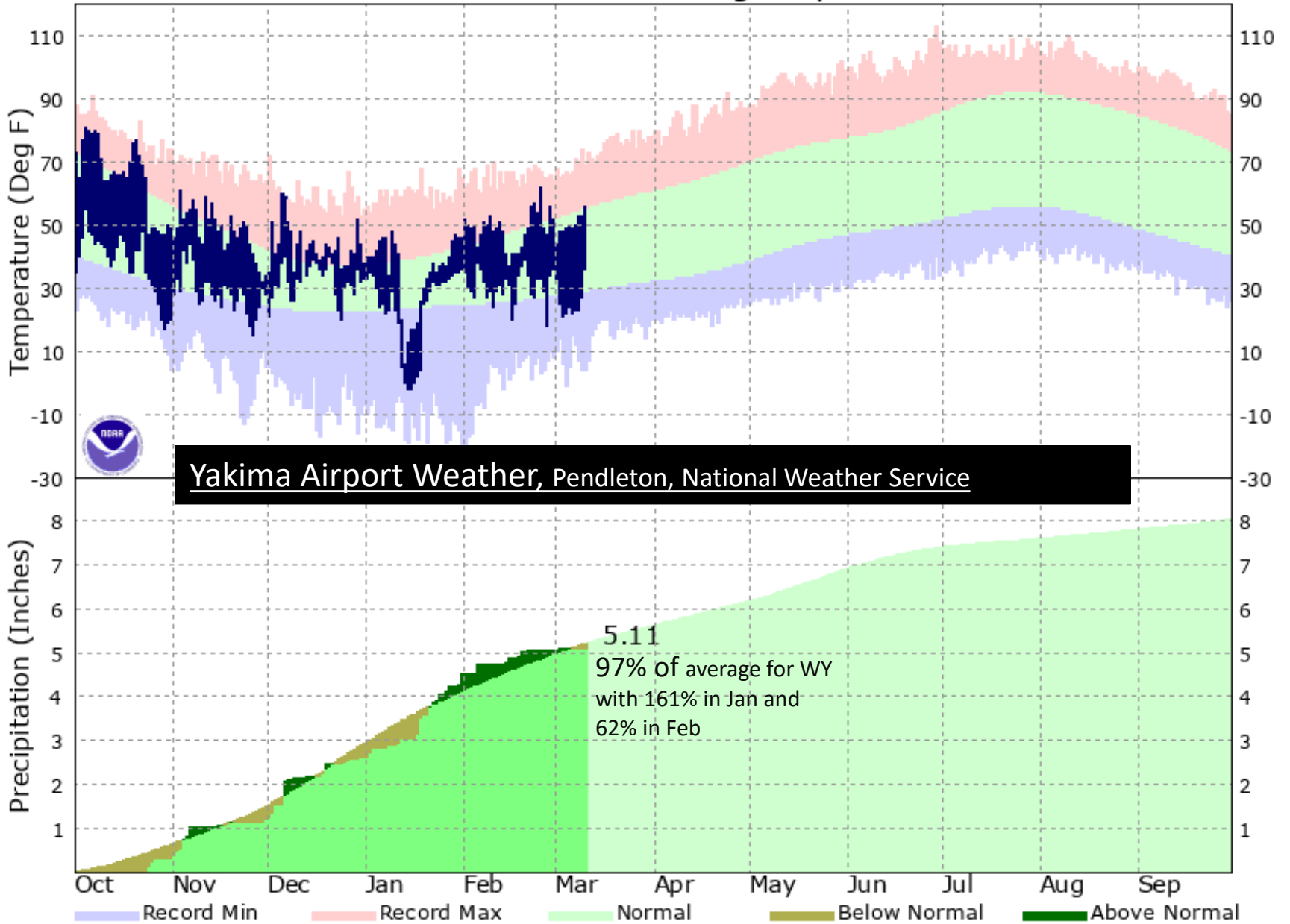


— BUREAU OF —  
RECLAMATION

# Yakima Basin, March Water Supply Update for YBIP Work Group

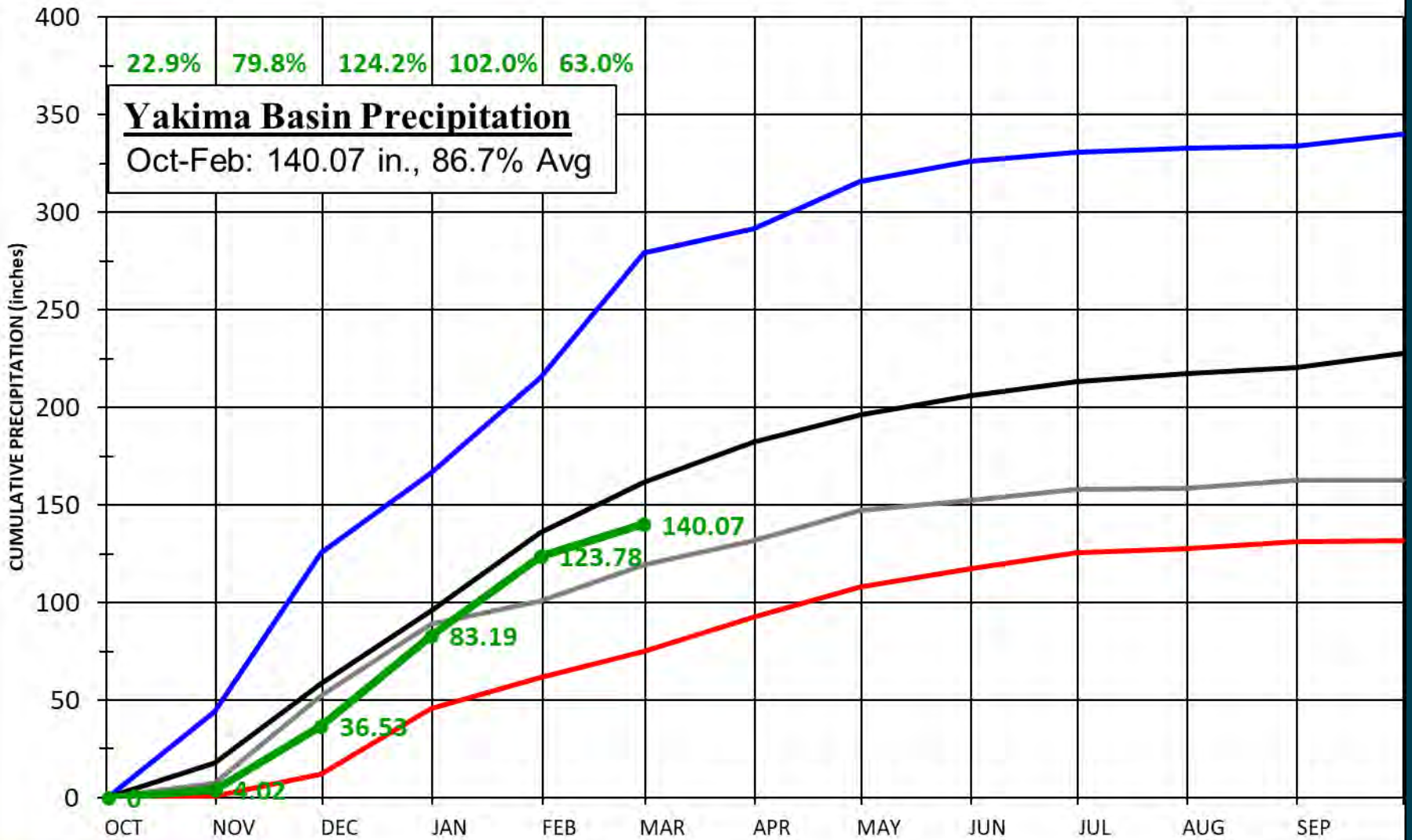
Picture compliments of Chris Lynch, looking south from HW12 over Rimrock Reservoir

# KYKM - Oct 2023 Through Sep 2024



Yakima Airport Weather, Pendleton, National Weather Service



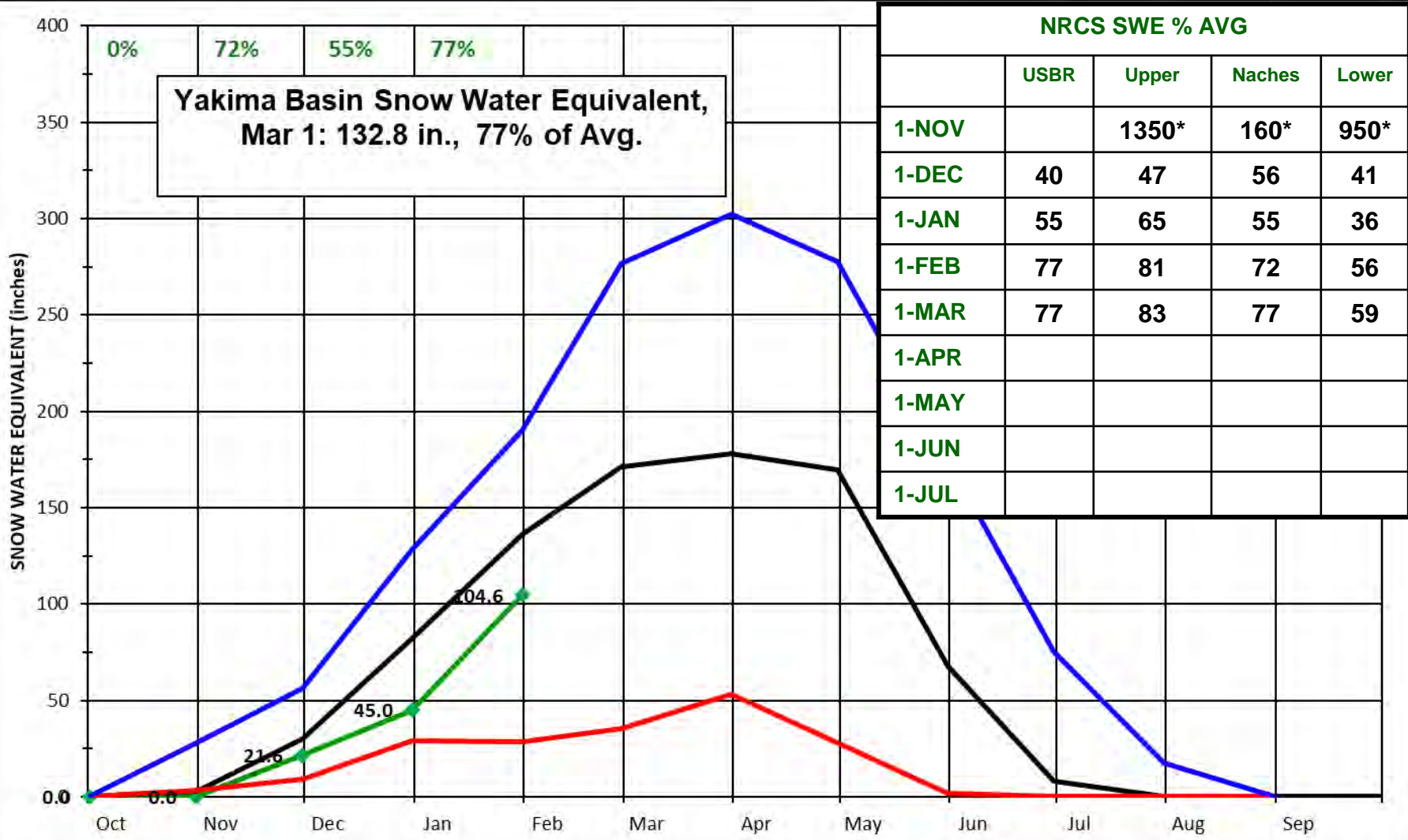


**Yakima Basin Precipitation**  
 Oct-Feb: 140.07 in., 86.7% Avg

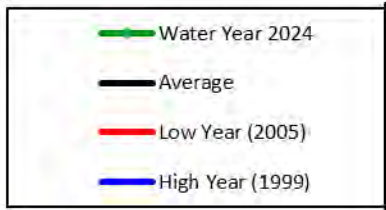
- Maximum    — Average
- Minimum    — WY2023
- WY 2024

**YAKIMA BASIN**  
 Combined Cumulative Precipitation  
 5 Reservoir Sites  
 WATER YEARS 1981-2010

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 YAKIMA FIELD OFFICE  
 1917 MARSH ROAD  
 YAKIMA, WA 98901



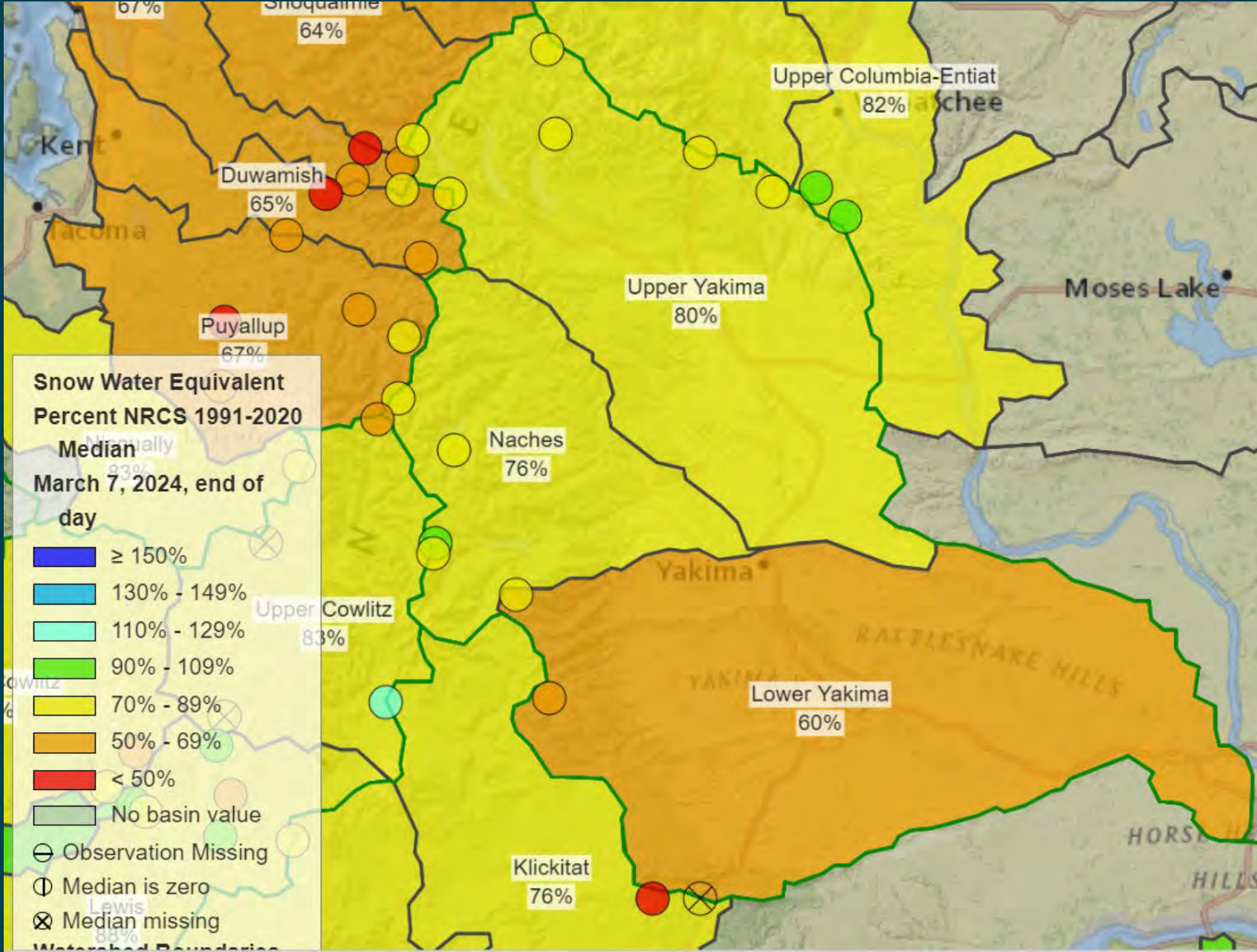
NRCS SWE % AVG				
	USBR	Upper	Naches	Lower
1-NOV		1350*	160*	950*
1-DEC	40	47	56	41
1-JAN	55	65	55	36
1-FEB	77	81	72	56
1-MAR	77	83	77	59
1-APR				
1-MAY				
1-JUN				
1-JUL				

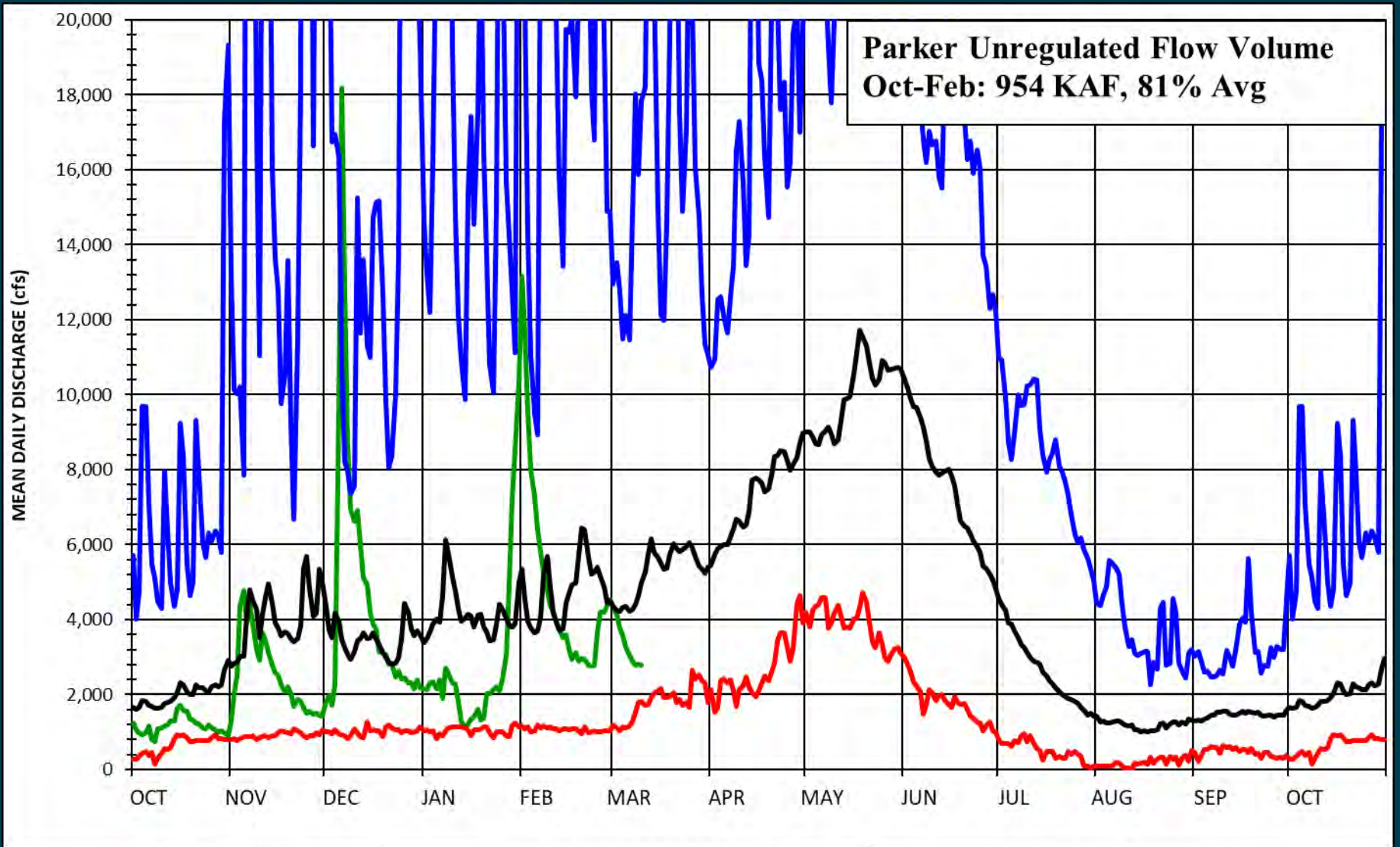


**YAKIMA BASIN WATER YEAR  
SNOW WATER EQUIVALENT**

Average based on greater of 1981-2010 or POR-1995  
Totals derived from 8 Yakima forecast sites  
Corral, Stampede, Olallie, Fish, Bumping, Domerie, & Tunnel Avenue

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DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
YAKIMA FIELD OFFICE  
1917 MARSH ROAD  
YAKIMA, WA 98901



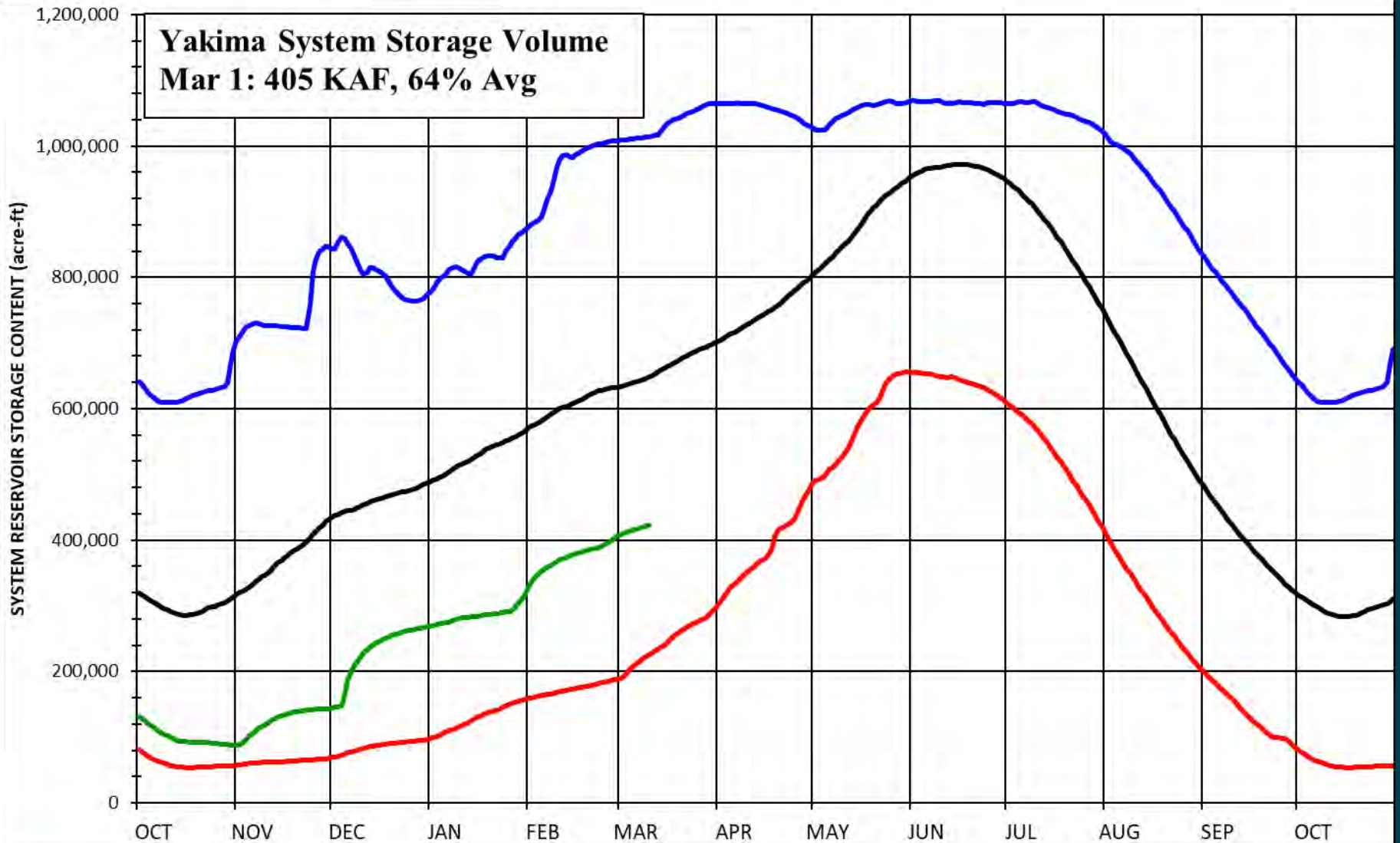


- Water Year 2024
- Minimum
- Average
- Maximum

**YAKIMA RIVER NEAR PARKER  
MEAN DAILY UNREGULATED DISCHARGE  
SUMMARY HYDROGRAPH  
WATER YEARS 1981-2010**

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1917 MARSH ROAD  
YAKIMA, WA 98901

**Yakima System Storage Volume**  
**Mar 1: 405 KAF, 64% Avg**



- Min
- Avg
- max
- Water Year 2024

**YAKIMA PROJECT STORAGE**  
**MEAN DAILY RESERVOIR VOLUME**  
**SUMMARY HYDROGRAPH**  
**WATER YEARS 1991-2020**

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 YAKIMA FIELD OFFICE  
 1917 MARSH ROAD  
 YAKIMA, WA 98901



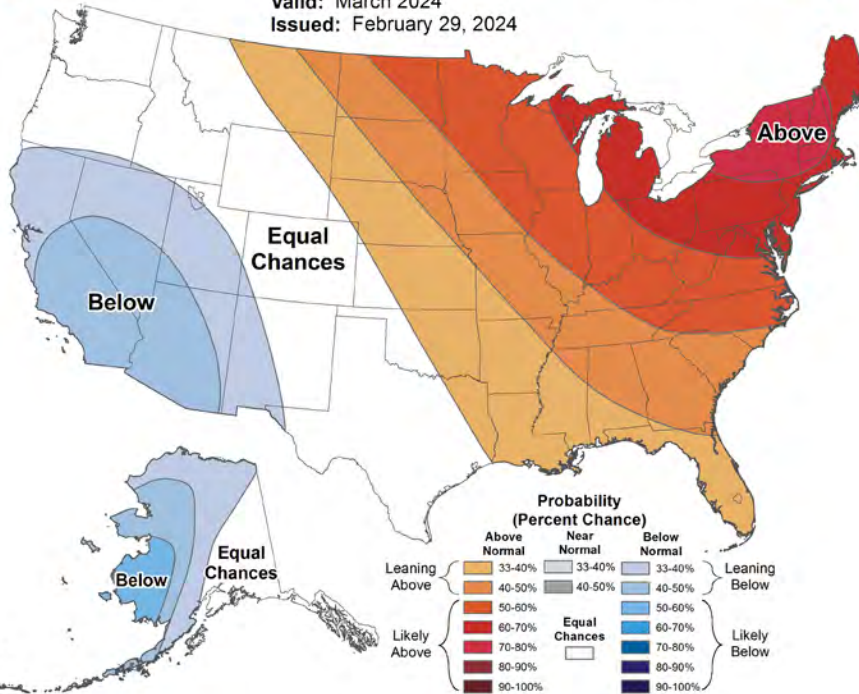
# 30-Day Forecast



## Monthly Temperature Outlook



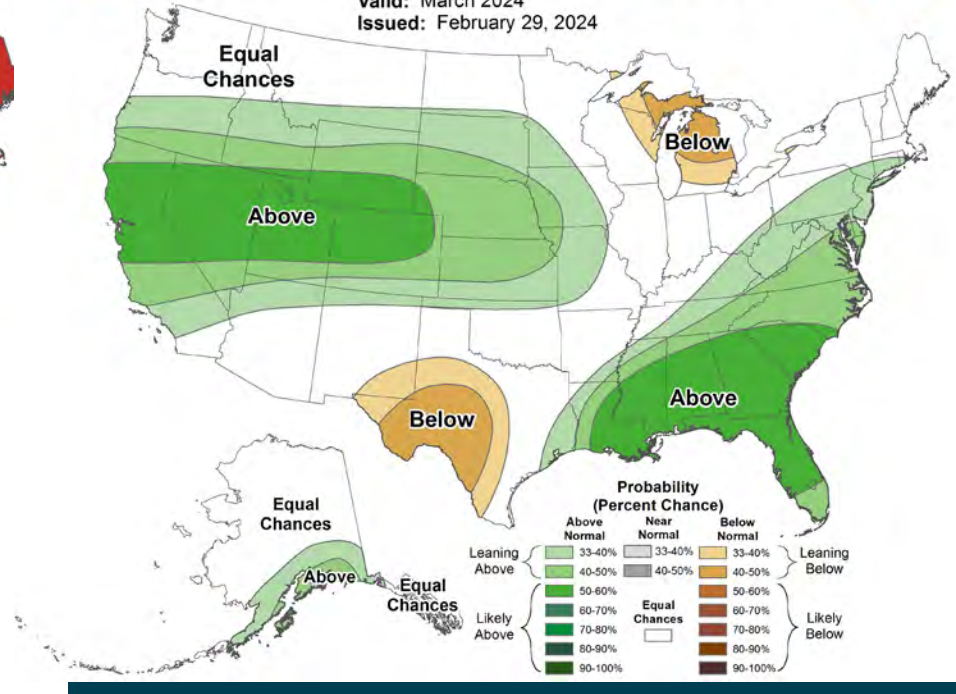
Valid: March 2024  
Issued: February 29, 2024



## Monthly Precipitation Outlook



Valid: March 2024  
Issued: February 29, 2024



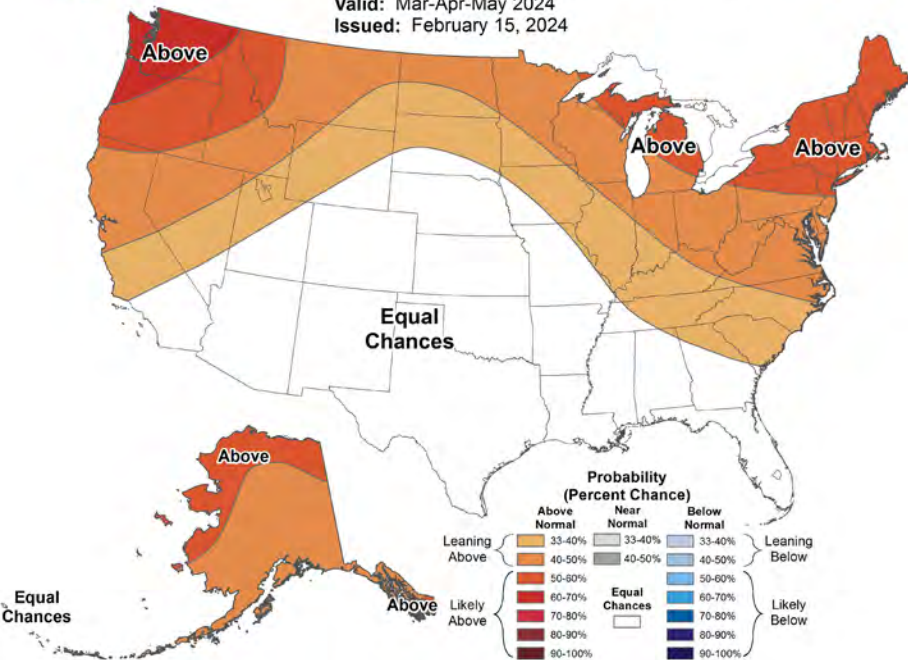
# 90-Day Forecast



## Seasonal Temperature Outlook



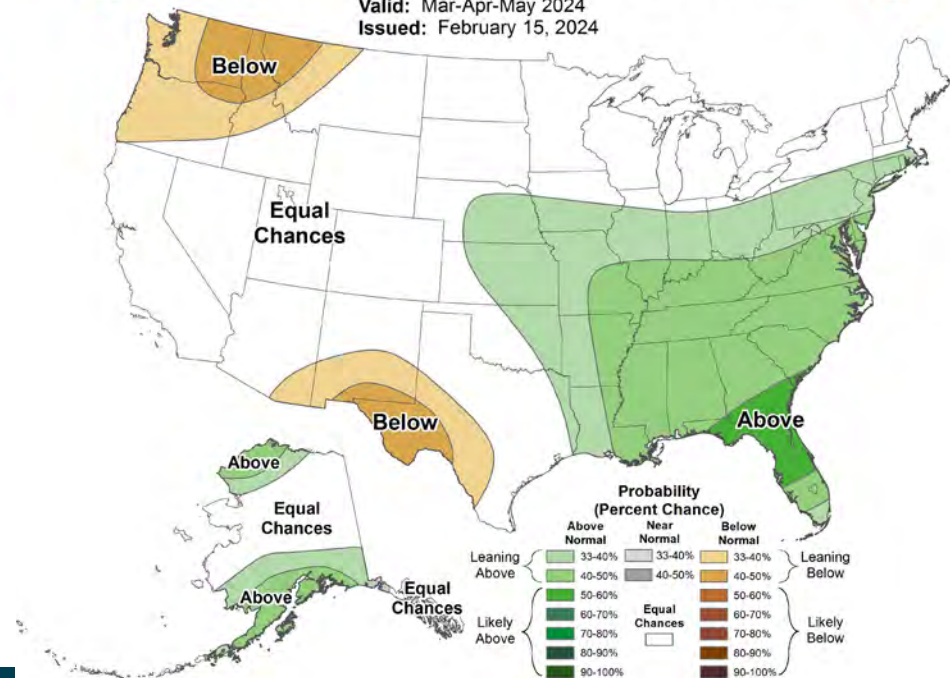
Valid: Mar-Apr-May 2024  
 Issued: February 15, 2024



## Seasonal Precipitation Outlook



Valid: Mar-Apr-May 2024  
 Issued: February 15, 2024



# Yakima Subbasin forecasts

## Yakima Basin Forecasts, Mar-Jul, AF

Mar, 2024	Low	Composite	High	Low	Adopted	High
Parw	1335515	<b>1777742</b>	2317954	67%	<b>90%</b>	117%
kee	77465	<b>117398</b>	152192	57%	<b>87%</b>	112%
kac	70661	<b>109113</b>	133284	58%	<b>89%</b>	109%
cle	294299	<b>388518</b>	462893	69%	<b>91%</b>	108%
bum	84211	<b>115405</b>	144389	66%	<b>90%</b>	113%
rim	153840	<b>194118</b>	239627	72%	<b>91%</b>	112%
Yumw	552891	<b>783021</b>	964807	63%	<b>89%</b>	110%
Nacw	465387	<b>709407</b>	950700	58%	<b>88%</b>	118%
System	680477	<b>924551</b>	1132384	66%	<b>90%</b>	110%



# March's April 1, 2024 TWSA ESTIMATE

## April 1 - September 30

Parameter*	+/-/=	Low	Adopted	High
Apr 1-Sep 30 Natural Flow at Parker est.	+	1262	1664	2167
Return Flow Estimate, est	+	300	320	350
April 1, Reservoir Content, est	+	457	476	501
TWSA	=	<b>2019</b>	<b>2460</b>	<b>3018</b>
SEP 30 EST RESERVOIR CONTENT	-	76	76	93
FLOW OVER SUNNYSIDE DAM	-	280	420	616
TWSA FOR IRRIGATION	=	<b>1663</b>	<b>1964</b>	<b>2309</b>
NONPRORATABLE ENTITLEMENT	-	1070	1070	1070
REMAINING TWSA	=	<b>593</b>	<b>894</b>	<b>1239</b>
YRPW-KID		<b>11</b>	<b>3</b>	<b>0</b>
PRORATABLE ENTITLEMENT		1239	1239	1239
% RATIO= REMAINING TWSA/PRORATABLE ENTITLEMENT		<b>47%</b>	<b>72%</b>	<b>100%</b>
TITLE XII FLOW TARGET, cfs	<b>April</b>	<b>300</b>	<b>300</b>	<b>500</b>
Added flow available, cfs ***		<b>126</b>	<b>134</b>	<b>142</b>
Non-storeable Portion of added flow, cfs		<b>38</b>	<b>38</b>	<b>38</b>
Storable portion of added flow, cfs		<b>87</b>	<b>95</b>	<b>104</b>
BA May Pulse Flow Volume		<b>Low-BA</b>	<b>Mid-BA</b>	<b>Mid-BA</b>

\*Values are in 1,000 ac-ft unless otherwise specified.

\*\*\* State & YRBWEP Trust, Acquisition, & Conservation added to Title XII flows from 126 to 142 cfs. Subject to updates



# Hydrologic Summary

- Yakima Reservoir Storage is low, 425 KAF, 65% avg.
- Feb Precip was 75% avg.
- February forecasts are near 90% avg.
- TWSA is 2.460 MAF, 84% of normal.
- Prorationing is 72%
- Title XII flow is 300 cfs plus 134 cfs.
- April BA pulse flows would be in the mid-range.
- YRBWEP Conservation from 2023: 22.4 KAF

# YAKIMA BASIN INTEGRATED PLAN



RECENT CONSERVATION ACTIONS AND DROUGHT  
PREPAREDNESS STRATEGIES

MARCH 13, 2024

# Sunnyside Division Board of Control

- 94,614 acres
- 5<sup>th</sup> largest irrigation district in WA
- The district is 69% non-proratable and 31% proratable



# Sunnyside Division Board of Control Water Conservation Program

- Funded by the 1994 Yakima River Basin Enhancement Project Act (YRBWEB)
  - Voluntary program with 2/3 of saved water devoted to in-stream flow purposes
- Partnership with United States Bureau of Reclamation and Washington State Department of Ecology
- Multiple Benefits of conservation include, more efficient use of the water supply, improved water quality, and improved fishery benefits







## Enclosed Lateral Improvement Projects (ELIPS) Phase II

- 5 year multi-phase projects
- Reduces seepage, and evaporation loss
- Provides on-demand system for landowners



## Sunnyside Canal Improvement Project (SCIP) Phase I

- 30 fully automated check structures
- 3 equalizing reservoirs
- Supervisory Control and Data Acquisition (SCADA)



## 2023/2024 Construction Season

- Piped 4.5 miles of open channel
- Installed 59 flow meters

## 2024/2025 Construction Season

- Pipe 5.5 Miles of open channel
- Install 60 flow meters



# Conservation Improvements Summary

- Since 2004 water conservation projects have resulted in over 38,000 acre-feet of water for in-stream flows
- Average Federal Cost per acre-foot for conservation projects is \$1,989
- SVID has contributed over 20 million dollars on water conservation since 2004

# Other Upcoming Projects



- Canal Lining to reduce seepage losses in open canals
- Upgrades and modernize aging SCIP hardware



# Drought Preparedness

- Sunnyside Valley Irrigation District landowners to fallow lands
- Transfer to Roza Irrigation District if initiated by the Roza Board of Directors



A small green seedling with two leaves is growing out of a crack in dry, cracked earth. The background is a close-up of the cracked soil, with the seedling positioned in the lower-left quadrant. The text is overlaid on the right side of the image.

# KRD Conservation Efforts

Urban Eberhart, Secretary Manager  
Kittitas Reclamation District

# South Branch Canal Piping - 2024





## South Branch Canal Piping - 2024

- Save water seepage from the canals.
- Provide for more consistent water deliveries to customers within the district.
- Create more capacity in the canal system.
- Help threatened species within the vicinity of the districts canal distribution system.

# North Branch Canal Lining - 2024



Jan 30, 2024 at 8:12:22 AM  
I-90 W  
Ellensburg WA 98926  
United States  
Steven's road canal lining



Conservation Project Name	Linear feet of canal lined or piped	CFS of Conserved Water	Average Acre-feet of Conserved Water*	Date of Agreement / Agreement No.
<b>13.8 Canal Lining Project</b>	N/A	3.5	1215	March 2015
<b>North Branch Lining Phase 1</b>	2940	1.6	581.96	R16MA13720
<b>North Branch Lining Phase 2</b>	9731	5.4	1927.96	R16MA13720, 001
<b>North Branch Lining Phase 3A</b>	2185	1.2	428.44	R16MA13720, 002
<b>South Branch Lining Phase 1</b>	4300	1.4	491.73	R16MA13720, 002
<b>North Branch Lining Phase 3B1</b>	701	0.39	138.9	R16MA13720, 003
<b>North Branch Lining Phase 3B2</b>	1589	0.85	303.4	R16MA13720, 003
<b>South Branch Lining R2-3</b>	4000	1.28	449.9	R16MA13720, 004
<b>South Branch Piping</b>	2100	1.52	543.5	R16MA13720, 004
<b>South Branch Lining R4-5</b>	5800	1.76	628.4	R16MA13720, 005
<b>South Branch Piping</b>	2100	0.7	240	R16MA13720, 005
<b>North Branch above Johnson</b>	5600	3.11	1110.2	
<b>South Branch Piping</b>	8242	2.64	942	
<b>North Branch above Stevens</b>	3600	1.05	376.27	
<b>Totals</b>	52888	26.4	9377.63	

# KRD's Tributary Supplementation

Improvements create the ability for the canal to have more capacity to carry water to streams that are part of the tributary supplementation program and for future surface and ground water storage sites.



*October 2023 – Releasing spawning Coho salmon into Taneum Creek.*



# 2024 – Special Operations: Drought Planning Wapato Irrigation Project

GRAYSEN SQUEOCHS, PE  
YAKAMA NATION  
ENGINEERING

# WIP Water Supply

The Wapato Irrigation Project has senior and proratable water rights.

Existing infrastructure makes it difficult to distribute shortages equitably, WIP actively works to manage flows to all units.

Typically, WIP reduces diversion to avoid prematurely exhausting water right.

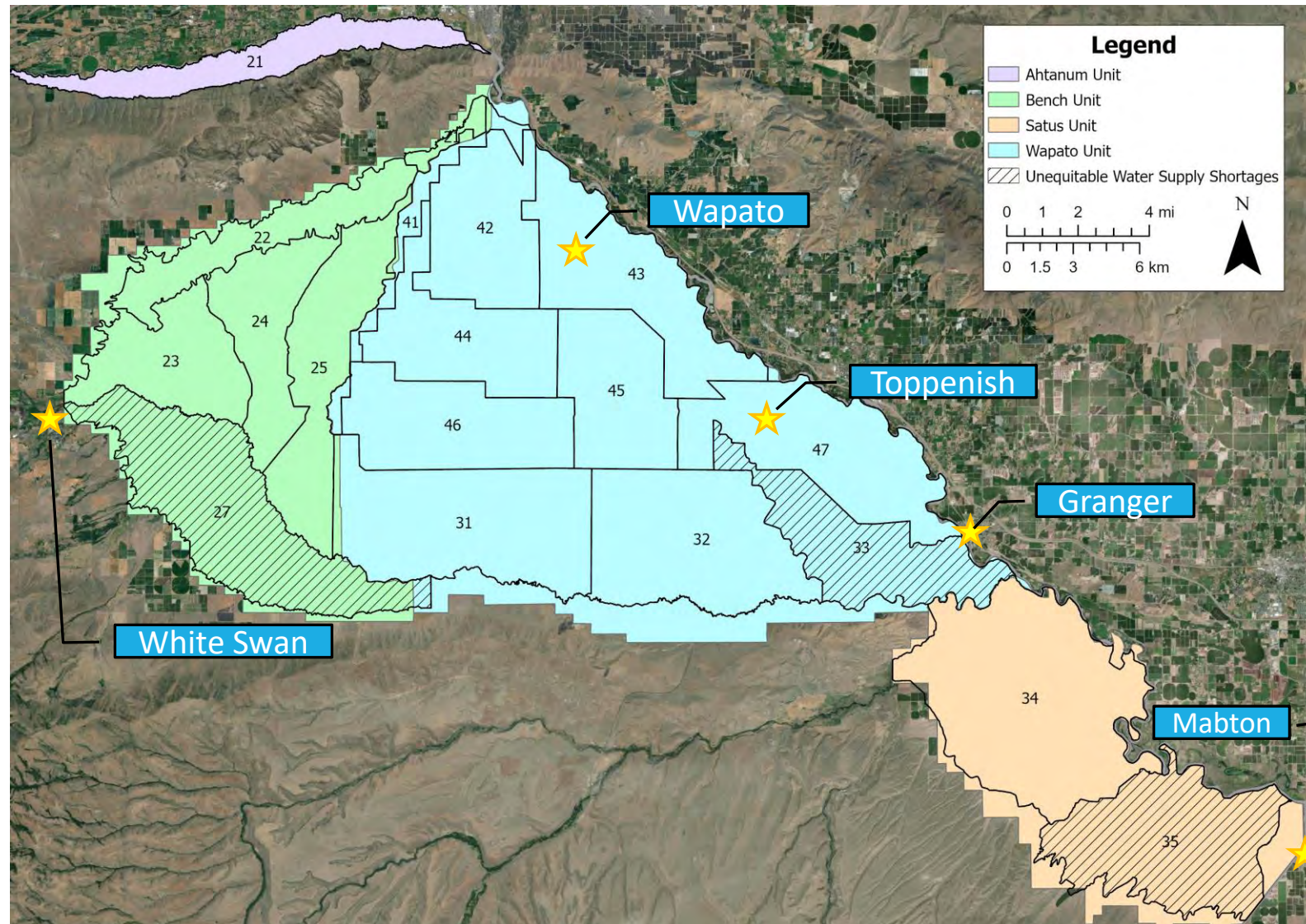
- Requires regular monitoring, most of which relies on manual measurements from ditch riders

WIP will adjust the diversion schedule to use most of the remaining storage during the first half of September.



# Areas of Perennial Shortage

Source – WIP Conservation Plan



# 2024 Drought Plan



IRRIGATION  
TRAINING &  
RESEARCH  
CENTER

## Wapato Irrigation Project *Drought Operations Plan Recommendations*



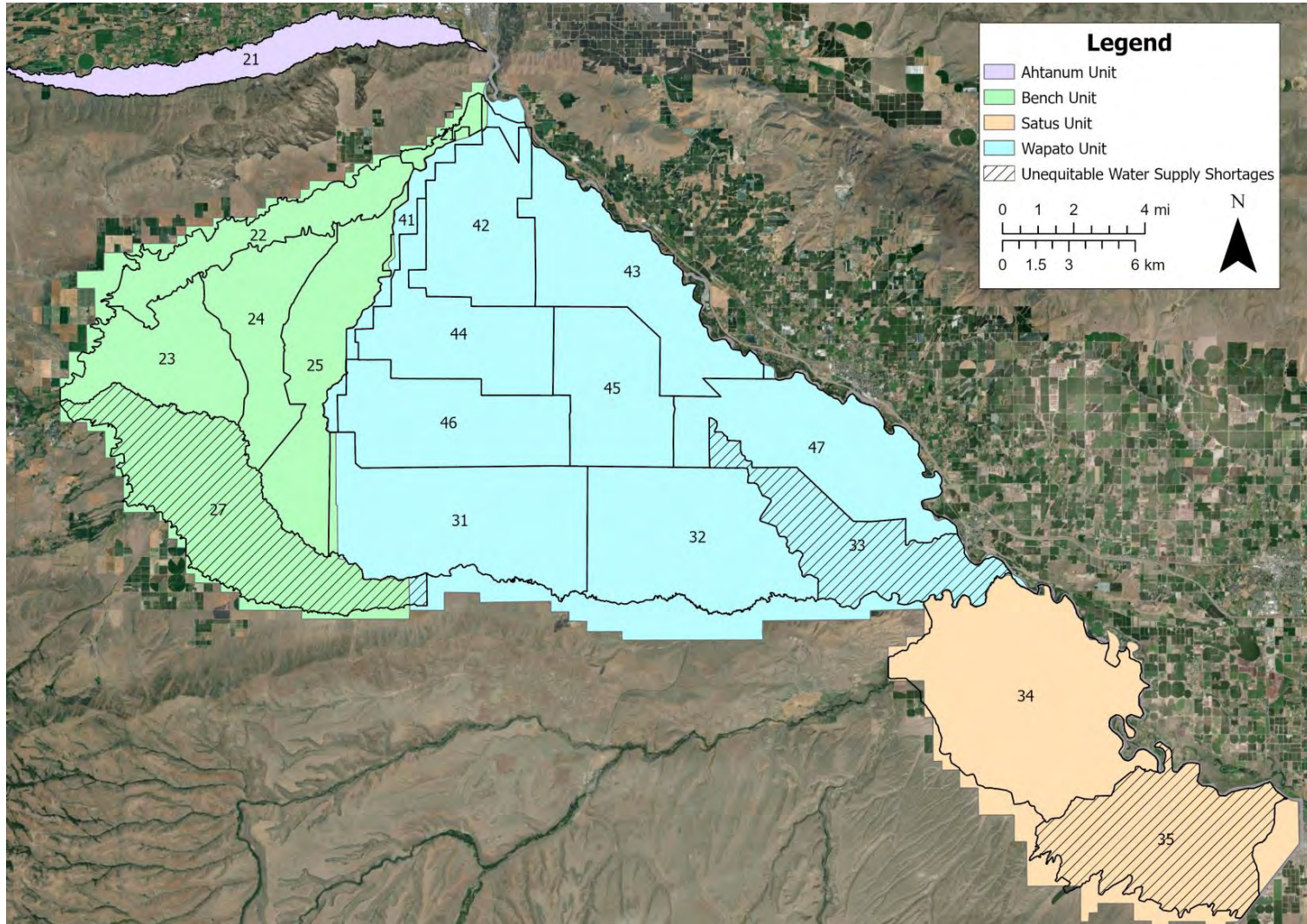
*Technical Report*

U.S. Bureau of Indian Affairs

February 2016

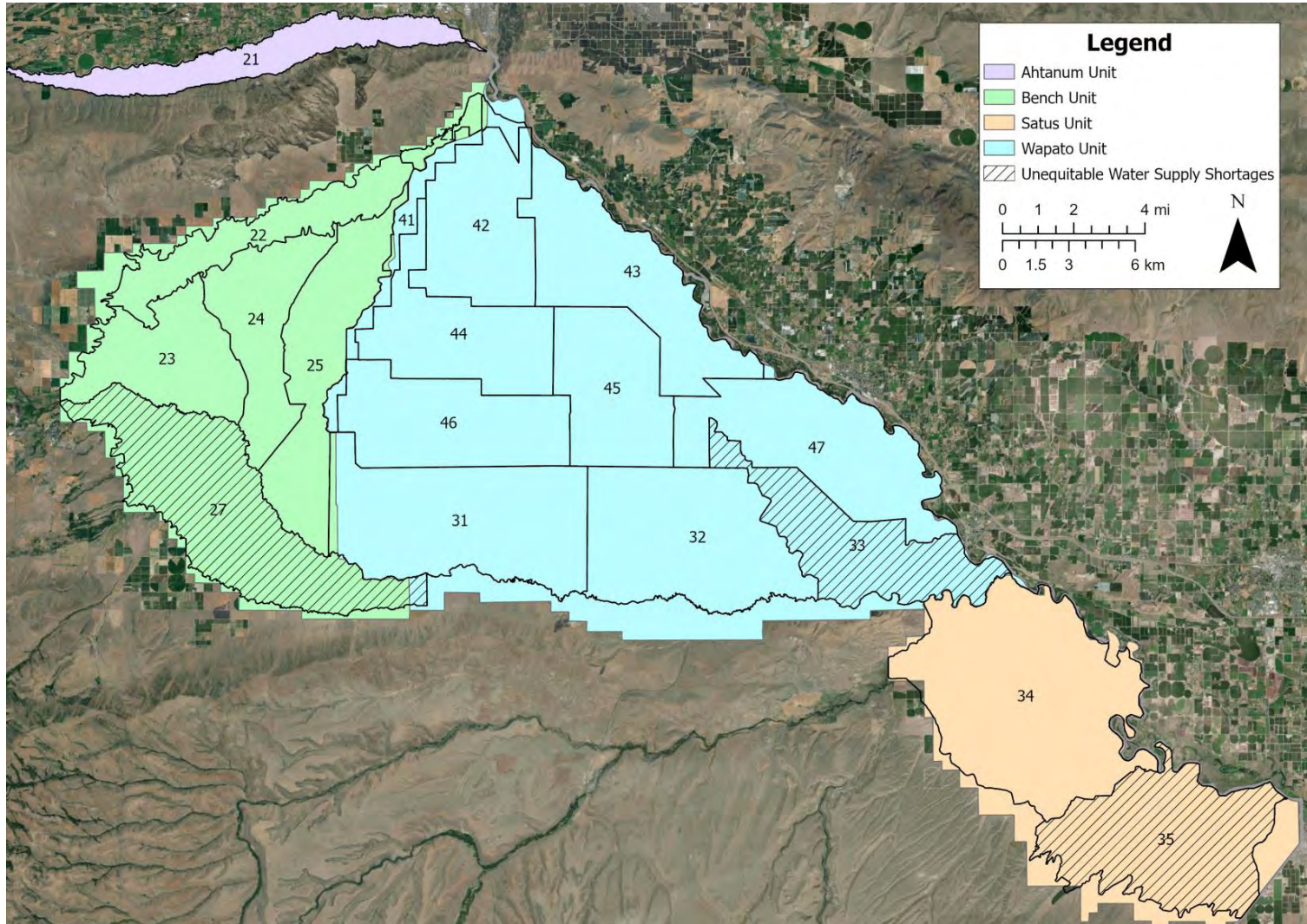
- Following the 2015 drought, BIA Division of Water and Power commissioned Cal-Poly Irrigation Training and Research Center (ITRC) to create the “*Wapato Irrigation Project Drought Operations Plan Recommendations*”
  - The plan assessed issues that arose in the 2015 water season and identified
    - Institutional Recommendations
    - Identification of key operational information
    - Operational strategies
    - Other recommendations including future infrastructural improvements

# 2024 Drought Plan



- 2016 ITRC Drought Plan: Salient Recommendations
  - Flow rate data is of high priority
  - Critical flow control to areas impacted under normal conditions
    - Use of “fast-track” Laterals to supply critical areas
  - Existing infrastructure limitations will only allow for rotational scheduling of deliveries
  - Irrigation System Operator (ISO) training and accountability

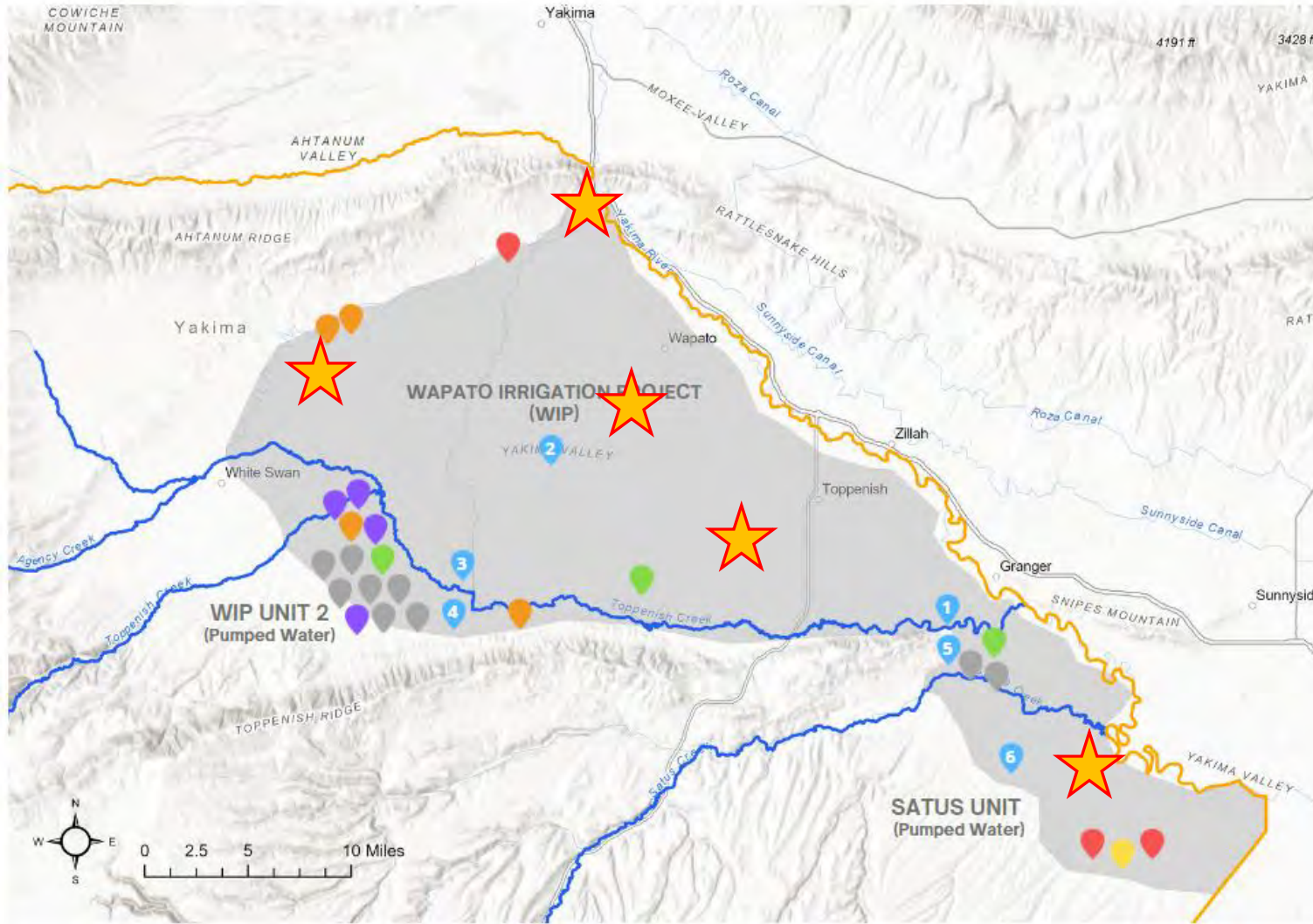
# 2024 Drought Plan



- Other Activities
  - Development of a drought relief well testing and repair plan
  - Water user engagement



# Ongoing Conservation



## ★ 2024 Conservation Projects

- ★ Satus 2 Pump Canal – Long Crested Weir check structure replacement
- ★ Conversions: Earthen canal to Pressure pipe
  - ★ L2-200-53
  - ★ L4-491
  - ★ P967 (Partial, completion in 2025 construction season)
- ★ Control gate replacement at Wapato Main Diversion

# Conservation Work

L2-200-53



L4-400



Satus 2: LCW construction





# KID Conservation Efforts

Jason McShane, P.E.  
Assistant District Manager

YBIP Workgroup  
March 13, 2024





# Capital Improvement Plan

| Canal Lining

| Automated Control

| Recapture Reuse

| In Canal Storage

| Operational Reservoirs

| Central Storage Reservoir



## Canal Automation



Automation helps better manage the water

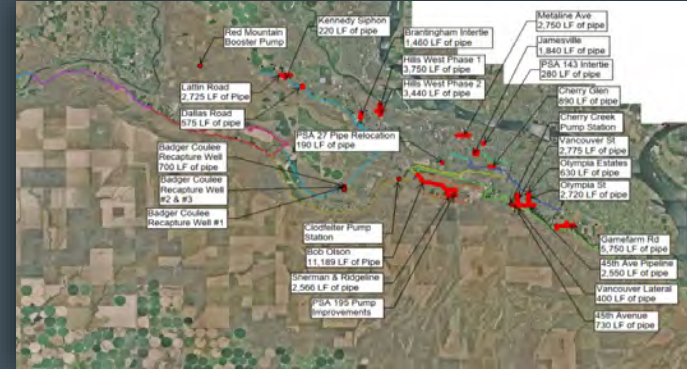
30 Automatic Control Gates Installed since 2009



## Capital Investment

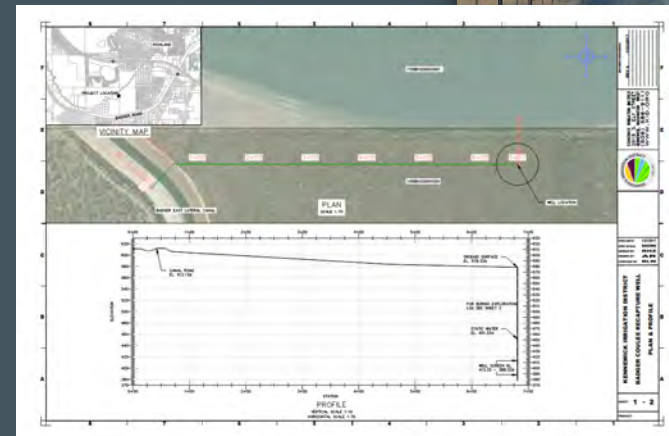


## Pipeline Replacement



~11 miles of new pipeline installation since 2011

## Recapture Wells





# KENNEWICK IRRIGATION DISTRICT



















# **KENNEWICK IRRIGATION DISTRICT**

## **Since 1980's**

- **Over 50 miles of canal lined or piped**

## **Since 2007**

- **Over 45 miles of canal lined or piped**
- **Primarily District resources and WaterSMART**
- **Over \$20 Million Invested**
- **More than 5,000 AF saved annually**



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# Drought Response in the Yakima Basin

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Heather Simmons & Kelsey Collins  
Washington Department of Ecology  
March 13, 2024



# Ecology Drought Planning in the Yakima Basin

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## Short-Term (2024)

- Emergency Drought Well Program
- Cost-Share for Mitigation
- Hiring two, one-year positions to assist with compliance work

## Long-Term

- Telemetered Meter Program
- USGS Groundwater Availability Pilot
- Long-Term Drought Plan with US Bureau of Reclamation and Yakama Nation





# Short-Term

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2024

# Emergency Drought Well Program

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Ecology will run the Emergency Drought Well Program in 2024 (if needed).

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Ecology will determine if existing and/or new emergency drought wells are completed in declining aquifers.

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All applicants must acquire mitigation to offset impacts to the Yakima River (started in 2023).

# Mitigation

## 2024

All water pumped from emergency drought wells must be mitigated.

### Cost Share

- Ecology providing 25% match for mitigation purchased from the Selah Moxee Irrigation District water bank to get users up to 75% normal supply.
- Applicants can purchase mitigation to get up to 100% of normal supply (from SMID or other banks) without cost-share.

### Shaping Mitigation

- Water banks must hold 20% of the mitigation used in 2024 instream for 5 years (starting in 2025) to account for lag time of impacts to the Yakima River.

# Long-Term

2024 and beyond



# Uncertainties regarding groundwater availability



Indications that groundwater levels in the Lower Yakima Basin are in sustained declines in many places.

Wanapum Aquifer  
Lower Saddle Mountains  
Aquifer



There are currently over 450 applications for new water uses in the Lower Yakima Basin.



Emergency Drought Wells – applications to construct new wells or to continue pumping existing wells will face increased denials in coming years.

# Telemetered Meters

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- Tracking what is pumped from aquifers with limited availability.
- Reconciling pumping with water bank accounting.



# Telemetered Metering Program

- NEW emergency drought wells are required to install telemetered meters.
- Encouraging installation of telemetered meters on existing wells.
- Partnering with Roza Irrigation District to incentivize the installation of these meters.
- All emergency drought wells will be required to install telemetered meters in the future.



Prepared in cooperation with the  
Bureau of Reclamation,  
Washington State Department of Ecology, and the  
Yakama Nation



## Numerical Simulation of Groundwater Flow for the Yakima River Basin Aquifer System, Washington



Scientific Investigations Report 2011-5155

# USGS Pilot

- USGS updating model to conduct estimates of groundwater availability in two test locations.
- USGS is completing budgeting and scoping in March.
- If the tests are successful, we hope to replicate throughout the Yakima Basin.



# Yakima Basin Drought Planning

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- Yakama Nation, USBR, and Ecology met in January to discuss:
  - Actions in 2024 to address drought.
  - Plans to meet early in the year when drought may occur.
  - Develop long-term plan to replace the 1999 MOU.





Questions?

# Lower Kittitas Reach Restoration

Arden Thomas, Kittitas County

Wendy Christensen, Reclamation

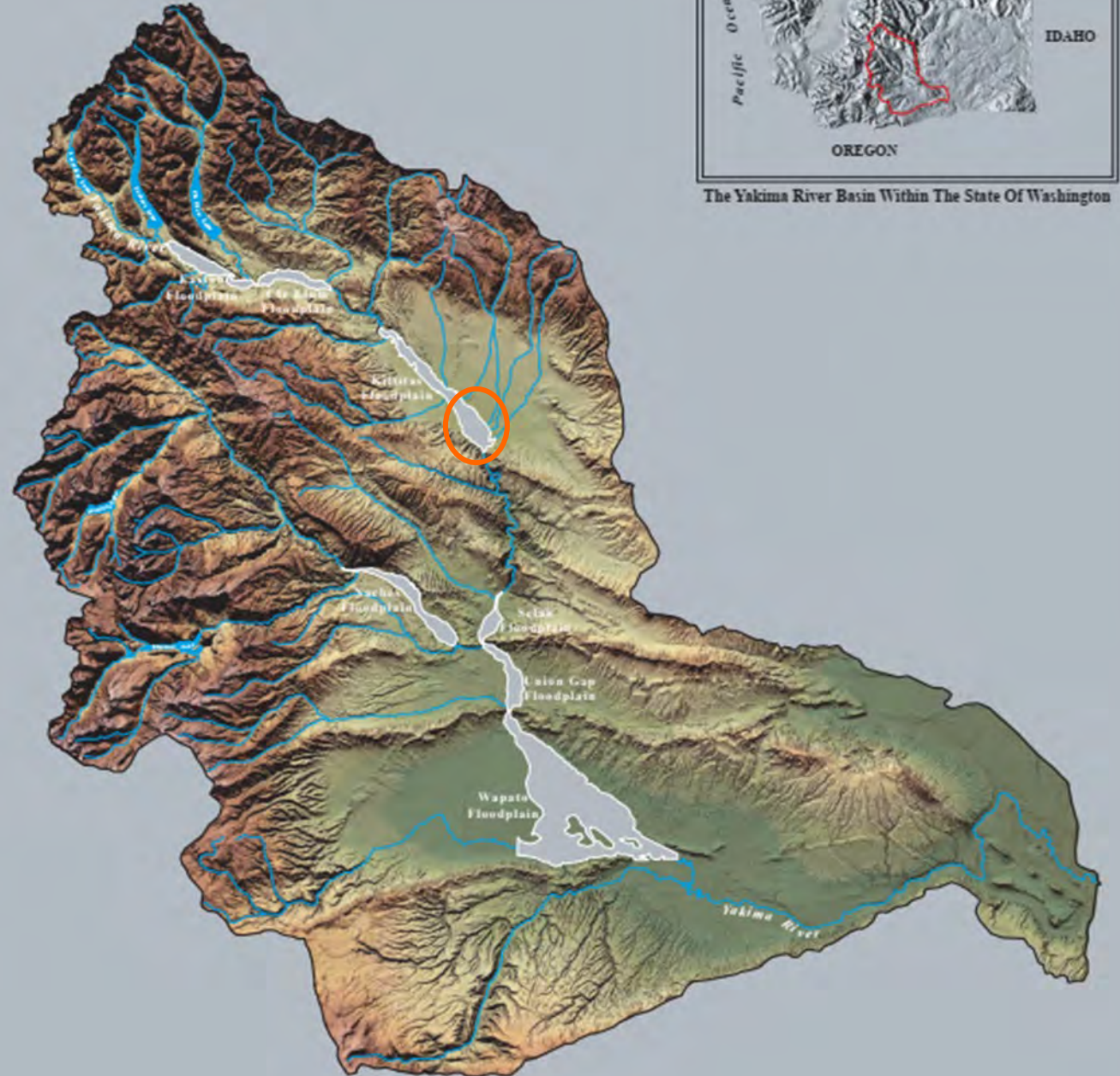
Chris Sheridan, Bureau of Land Management

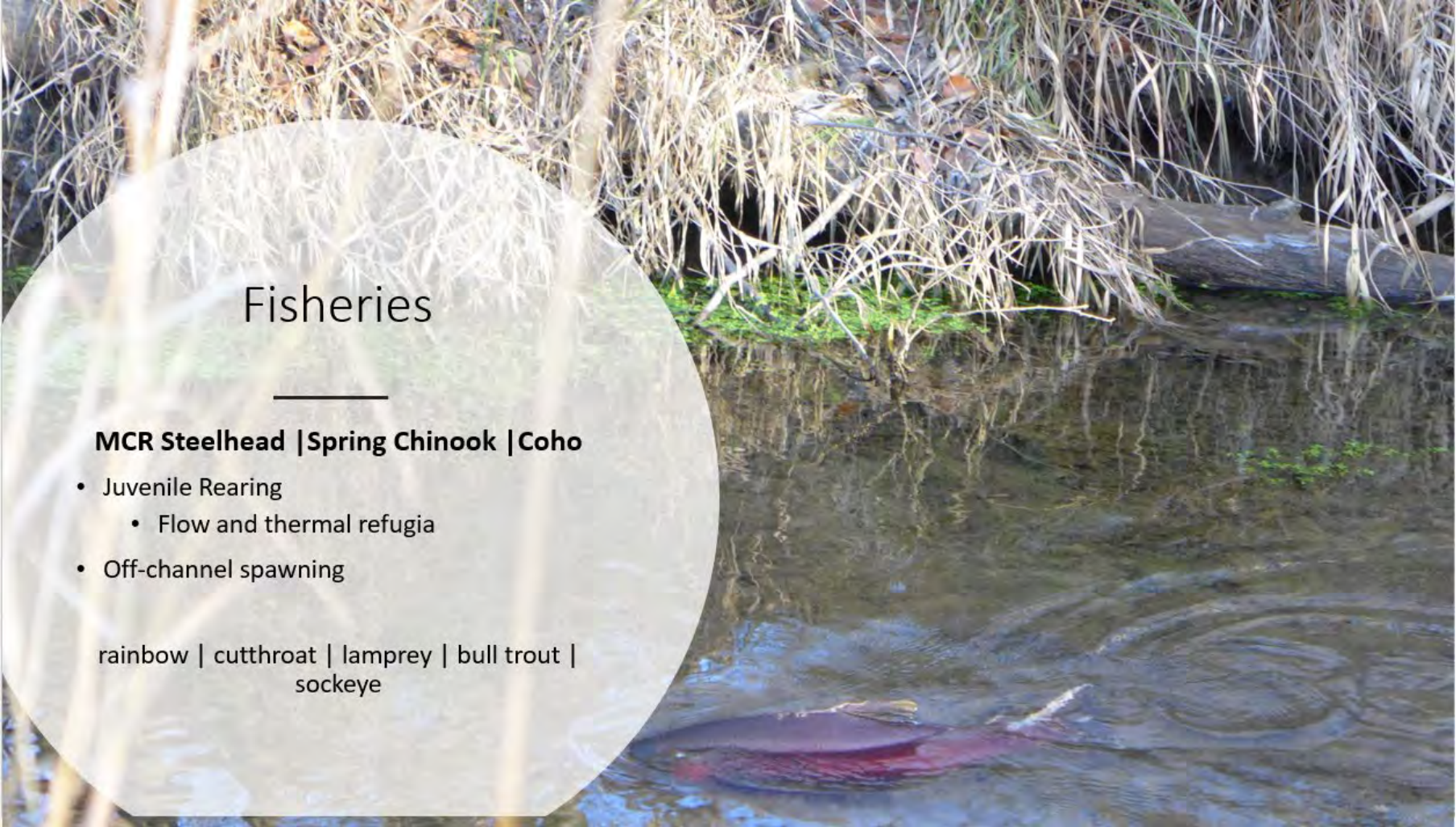


# Basin Context

2001 Reaches Project:  
Identification of Priority  
Alluvial Floodplain Reaches

*Pearls on a String*





## Fisheries

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### **MCR Steelhead | Spring Chinook | Coho**

- Juvenile Rearing
  - Flow and thermal refugia
- Off-channel spawning

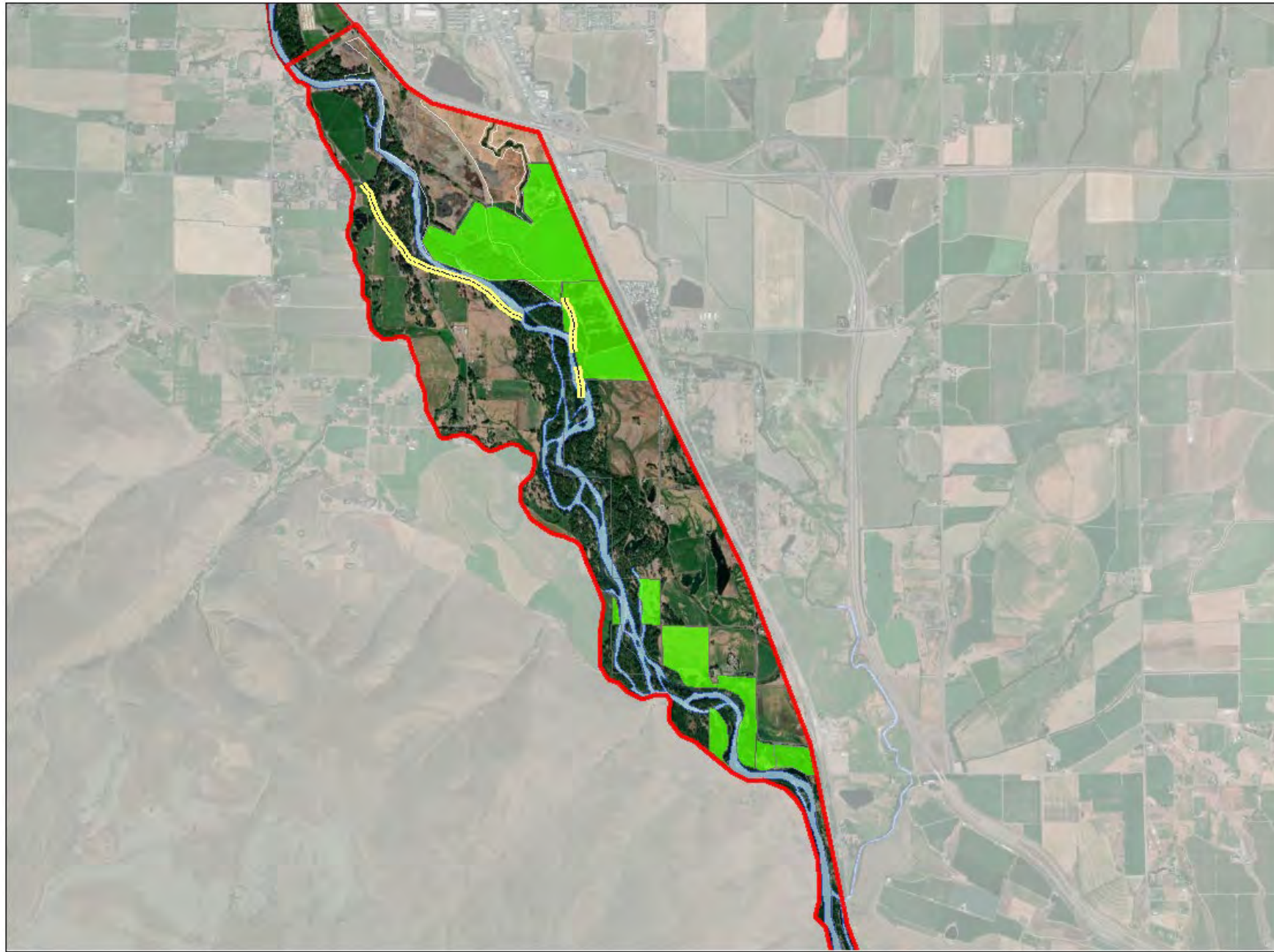
rainbow | cutthroat | lamprey | bull trout |  
sockeye

## Habitat Limiting Factors

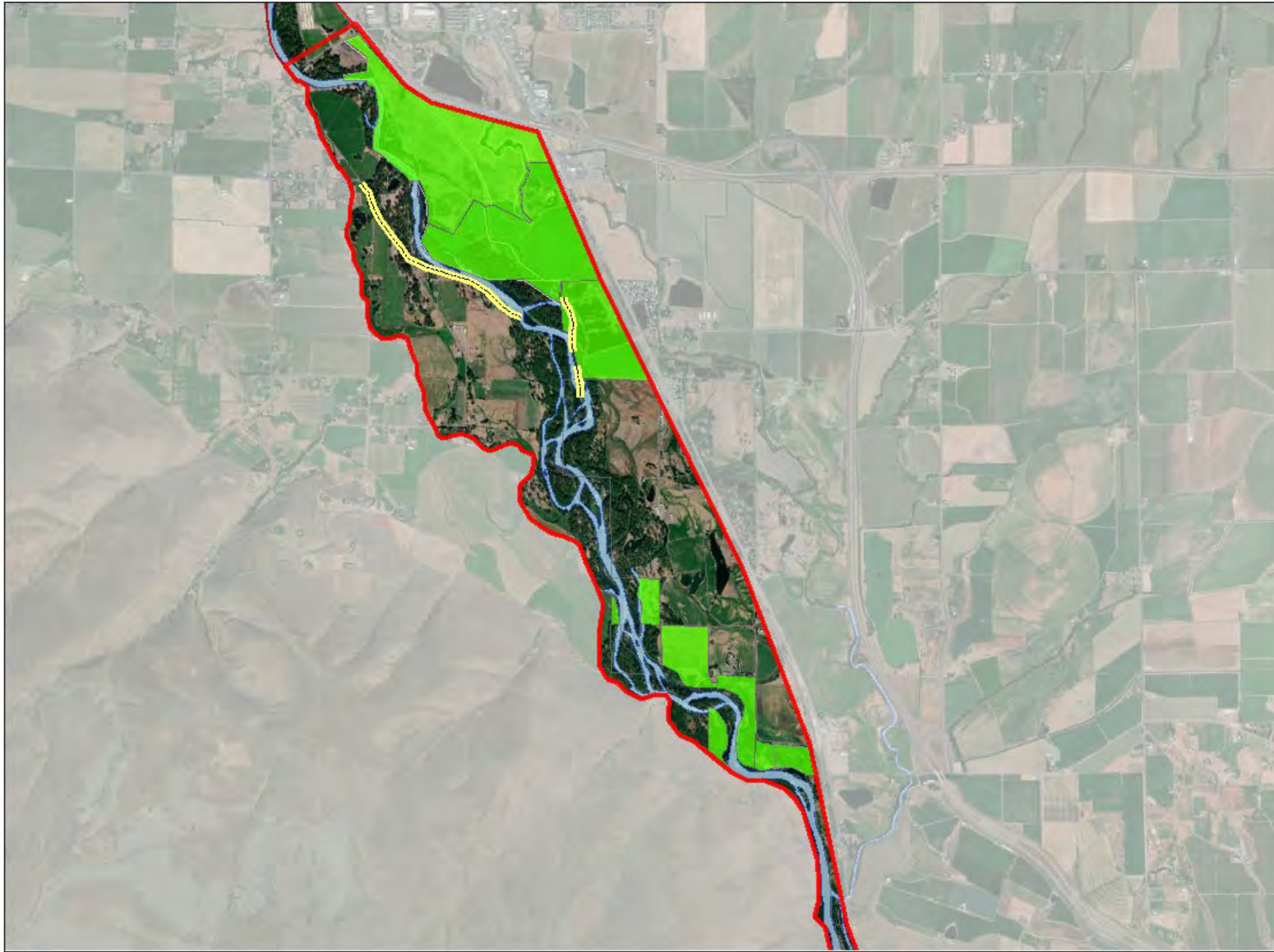
Floodplain and Off-Channel Habitat

Access to Side Channel and Pond Habitat

Riparian Restoration



# Path to Opportunity

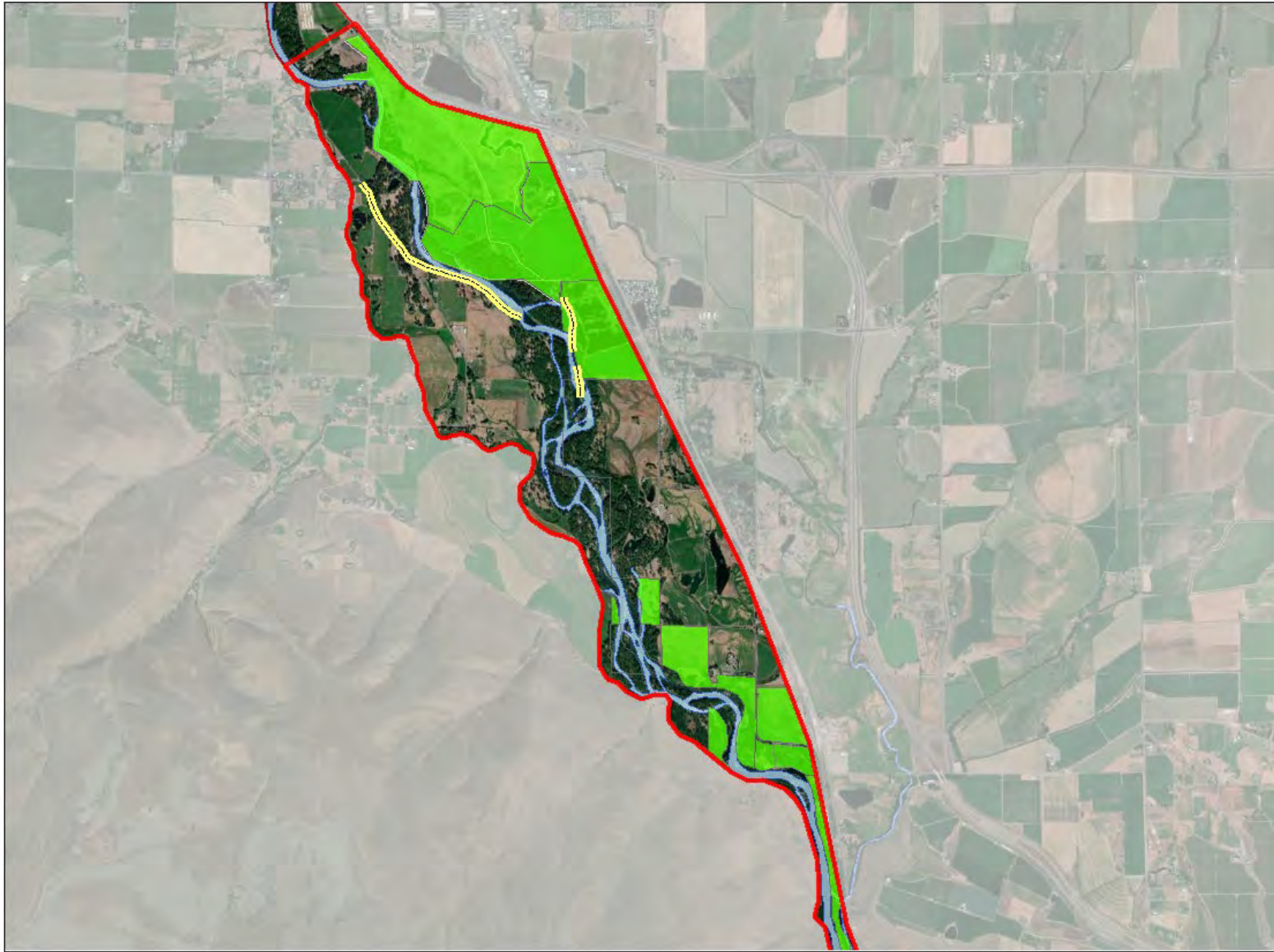


# Path to Opportunity

2003

280 Acres





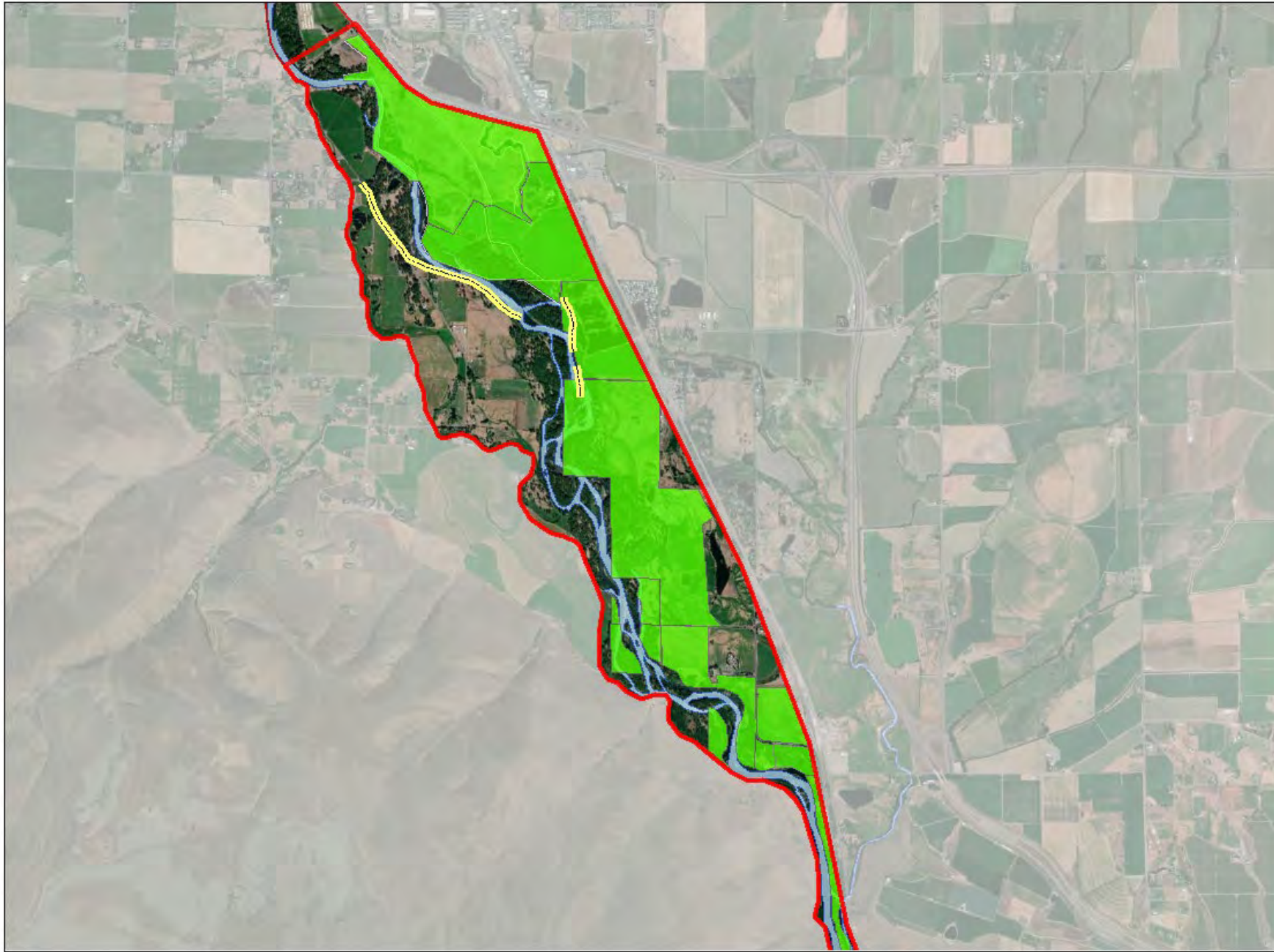
# Path to Opportunity

2017

83 Acres





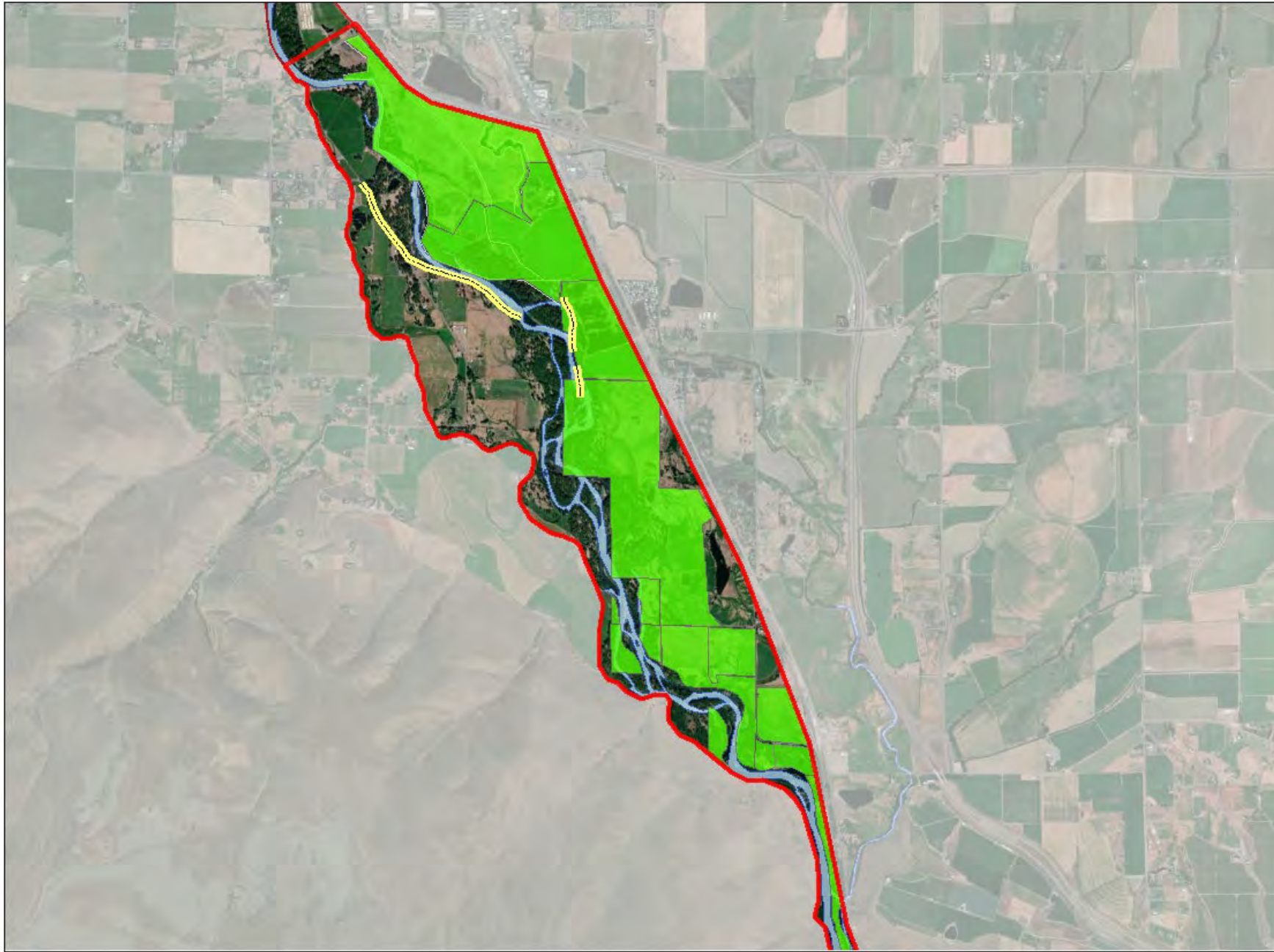


# Path to Opportunity

2019-2021

386 Acres





# Path to Opportunity

2023

39 Acres



# Collective Action

## Reach Scale

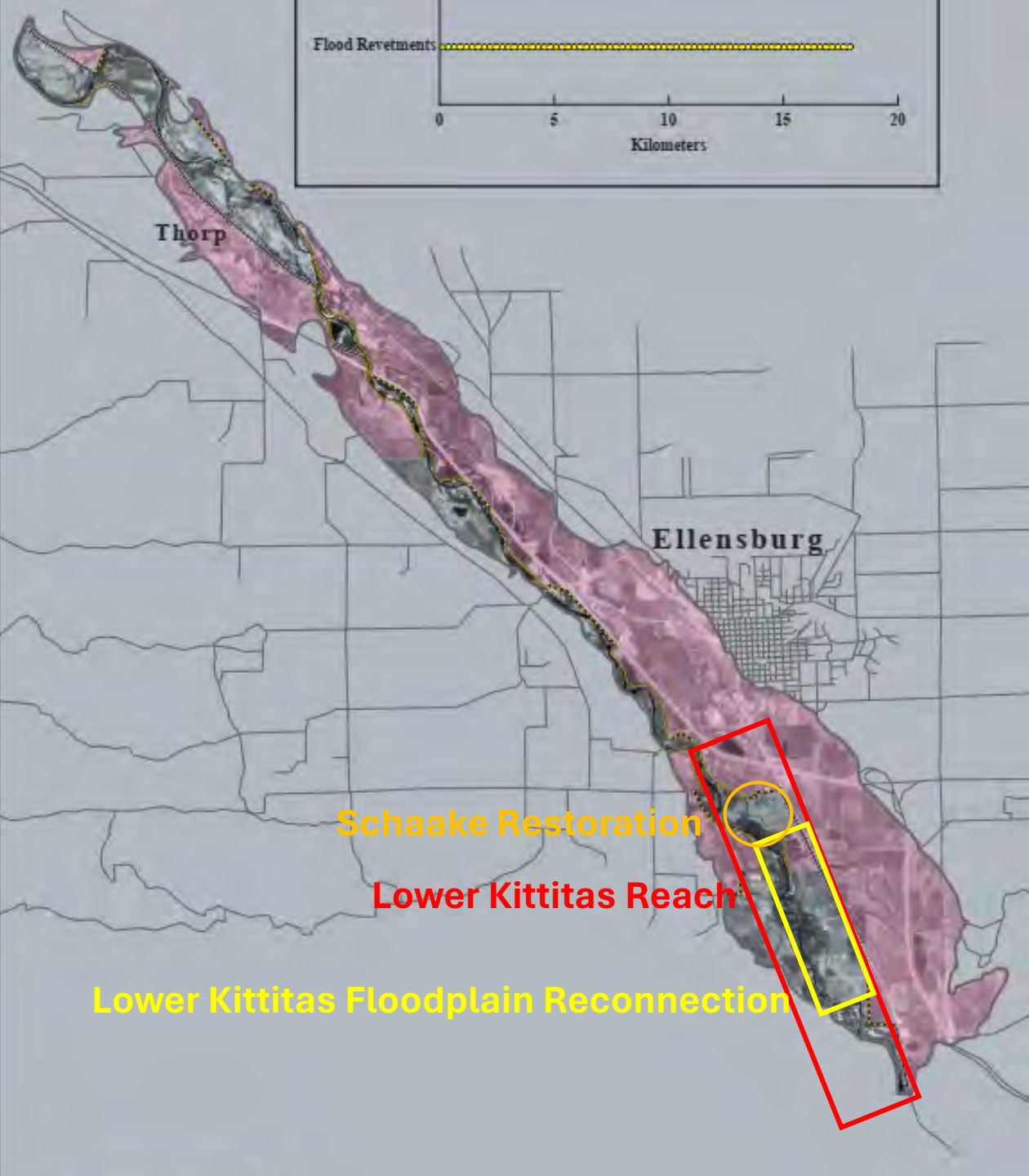
- 6 miles, over 1,200 acres in public ownership

## Project Scale

- Schaake Restoration Project



- Lower Kittitas Floodplain Reconnection



YAKIMA RIVER

Schaake Project Area

Approximate Project Area

5.98 River-miles  
4.59 Straight-line miles  
Sinuosity of 1.3

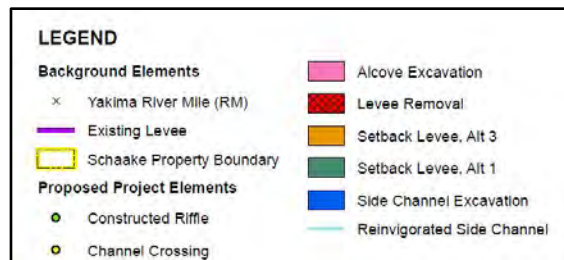
# Linking Efforts Across Properties, Partners, and Time



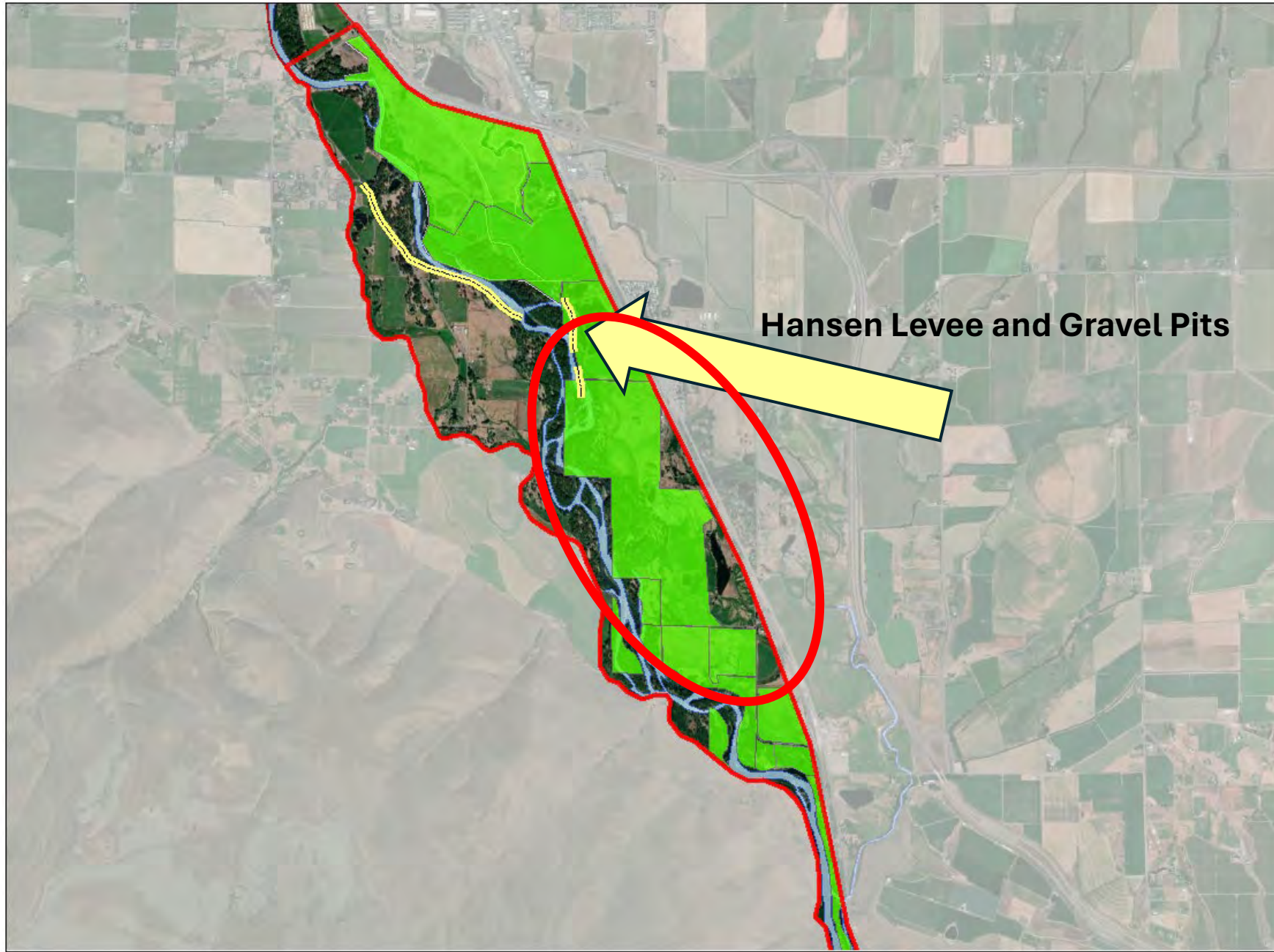
# Schaake Habitat Improvement Project



- Funding – \$12M Reclamation
- Schedule
  - Construction complete October 2021
  - Revegetation – ongoing (5 years complete)
  - Monitoring – ongoing
  - Land Exchange (75 acres) – complete October 2023
  - 341 acre-feet surface water right
  - 280 acres acquired in 2003
  - 205 acres of floodplain restoration with land exchange
  - Approximately 2-mile reach of Yakima River
  - Tjossem Ditch decommissioning in process by Trout Unlimited







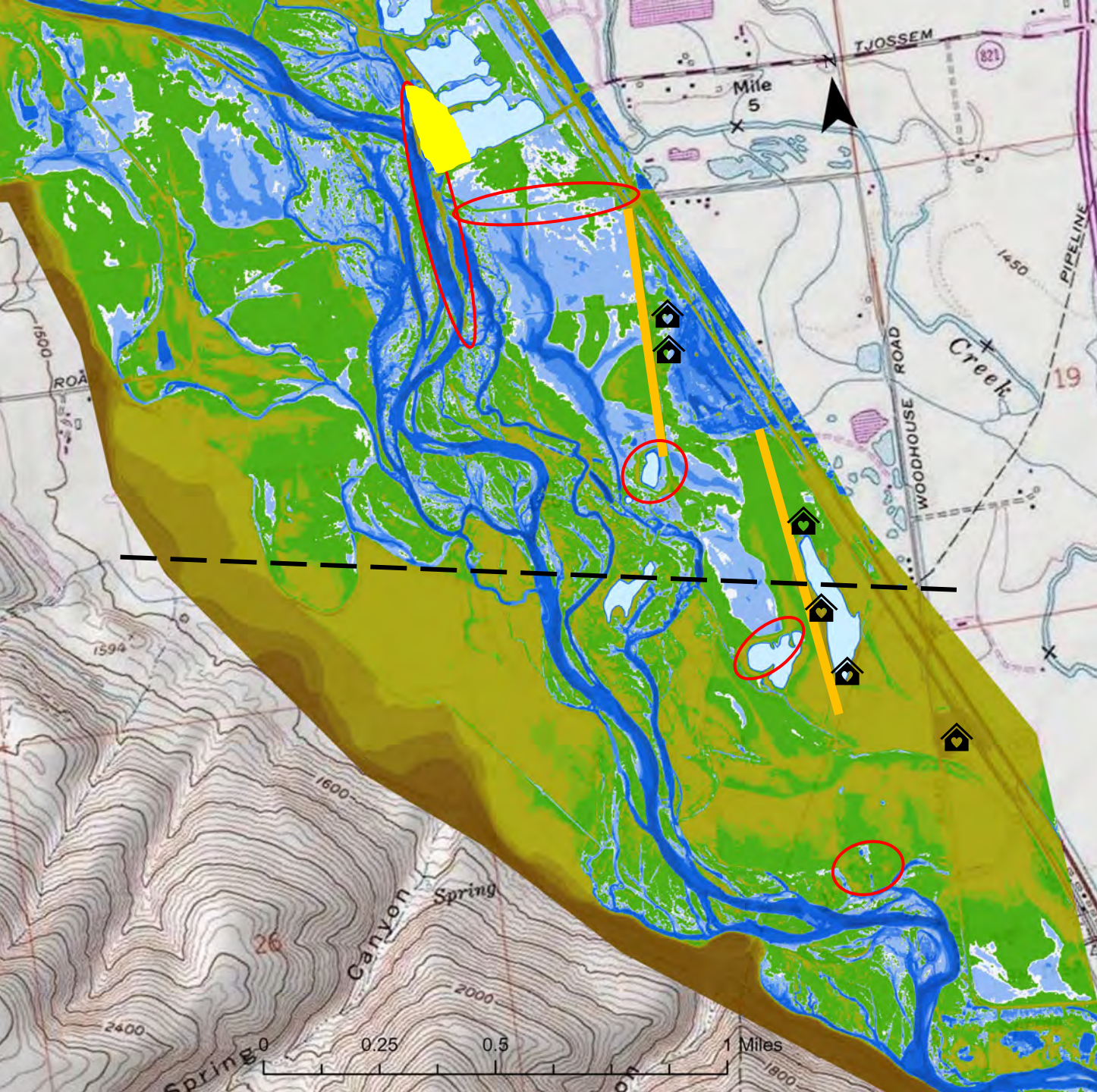
Hansen Levee and Gravel Pits





# Lower Kittitas Floodplain Restoration





# Floodplain Engagement Potential



-  - below bankfull discharge
-  - at bankfull
-  - within 18" of bankfull water surface
-  - higher than 18"

# Riparian Restoration Approach

- Riparian regeneration requirements inform design
- Sequencing
- Innovative revegetation techniques

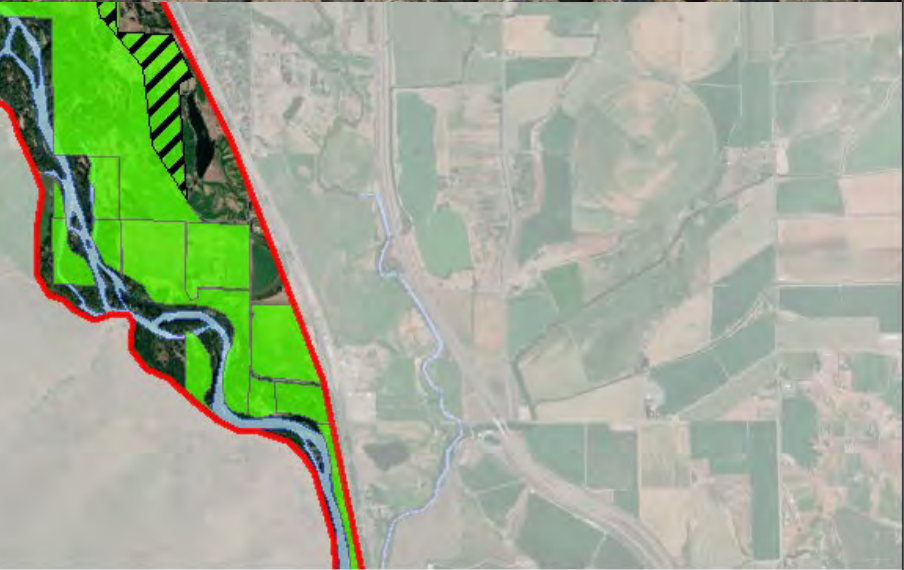
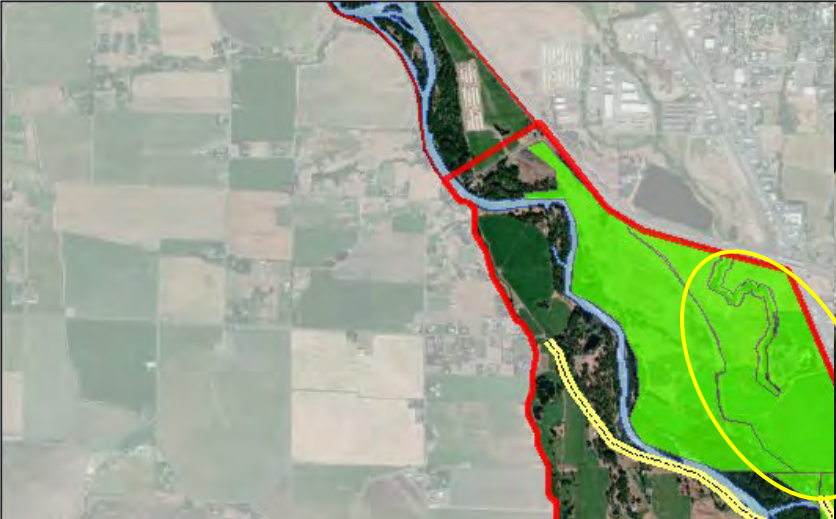


# Riparian Restoration Approach (cont.)

- Reforestation integrated into designs
- Sequencing
- Innovative techniques
  - Planting



# Agricultural Benefits





# Recreation Benefits

# Future Opportunity

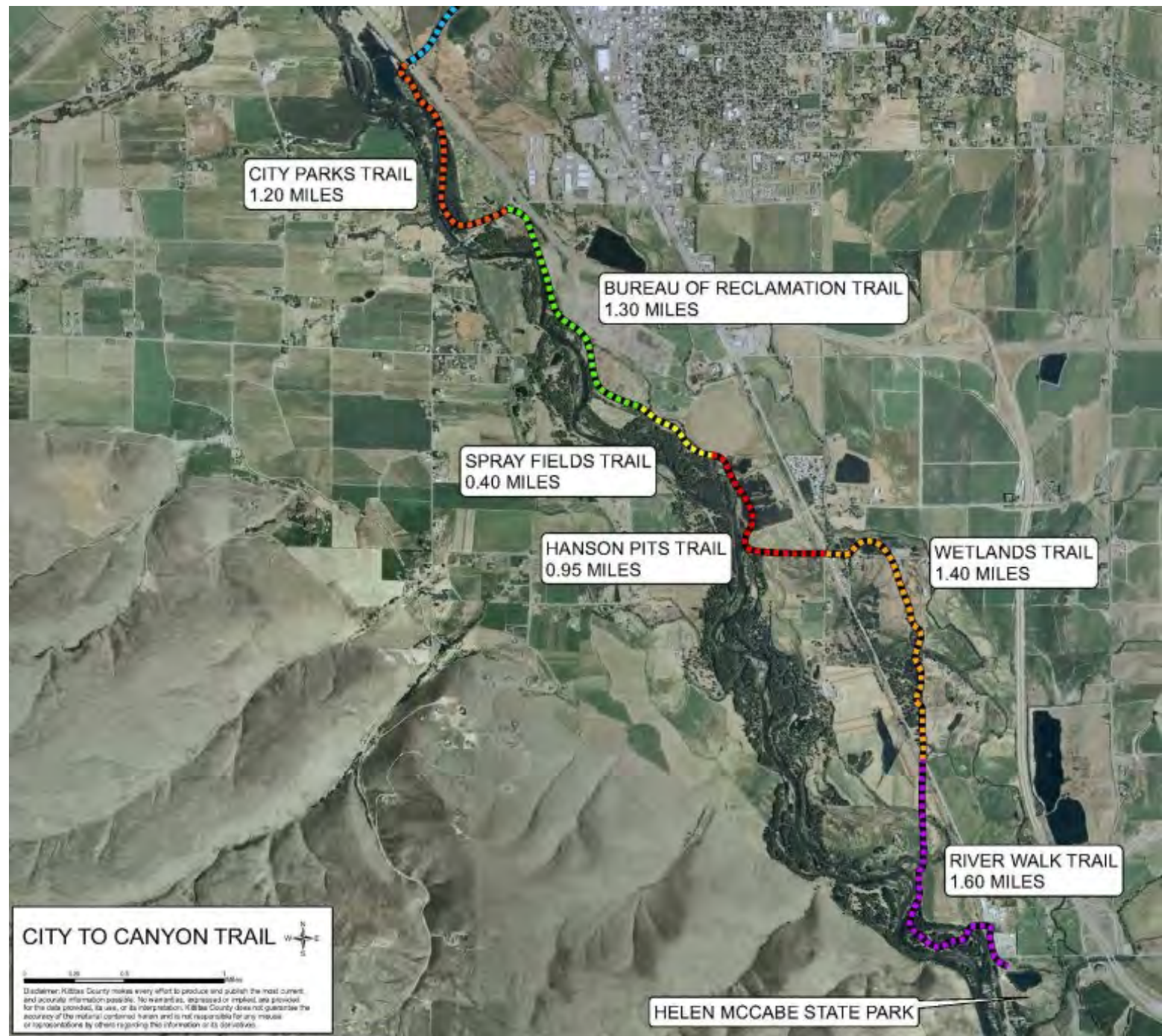
## A Concept Plan for City-to-Canyon Trails

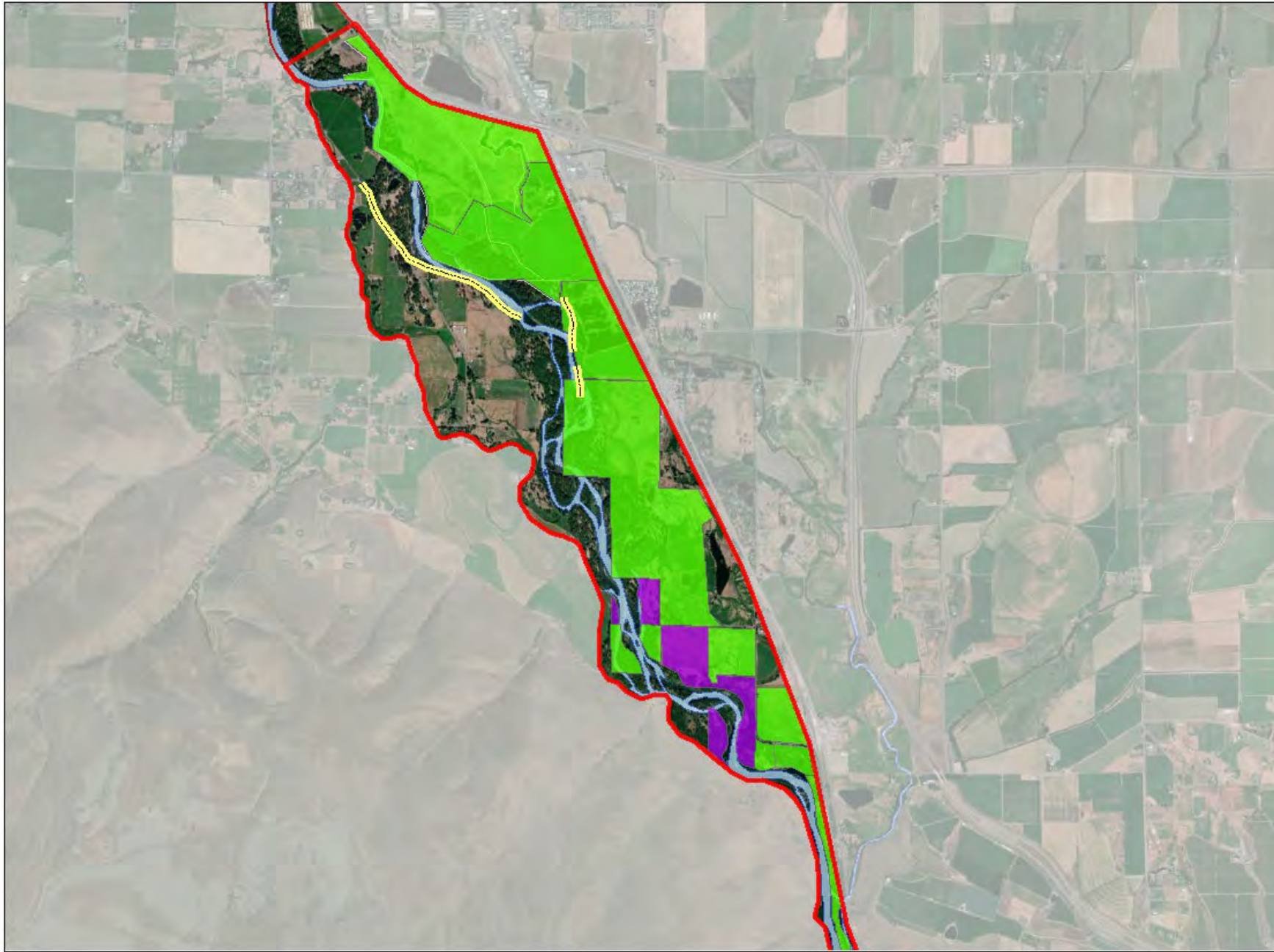
A ten mile trail corridor along the scenic Yakima River connecting local and regional trails and parks



City-to-Canyon Trails Committee

with technical assistance from  
National Park Service Rivers & Trails Program





# **BLM Lands and Restoration**



Questions?

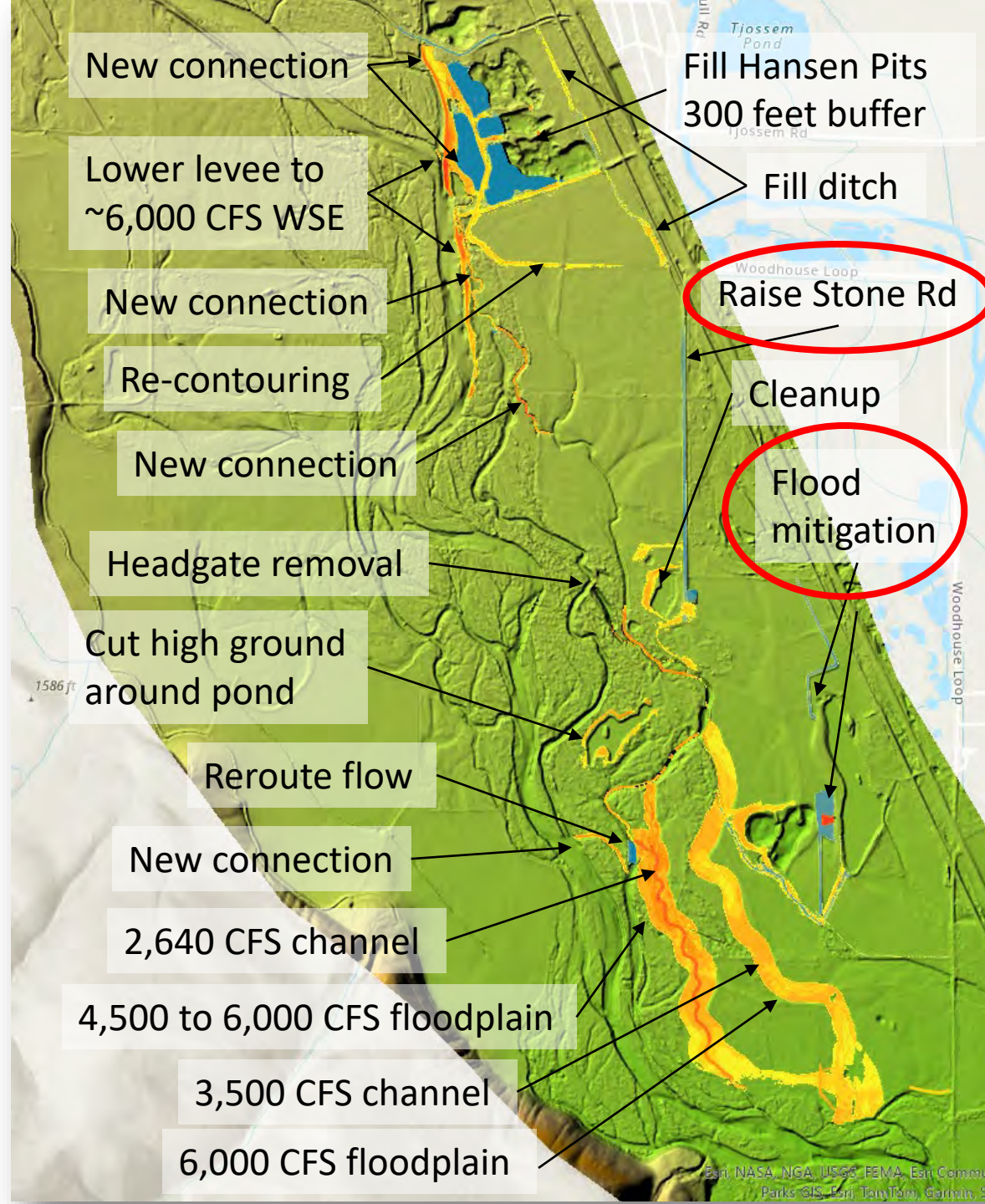






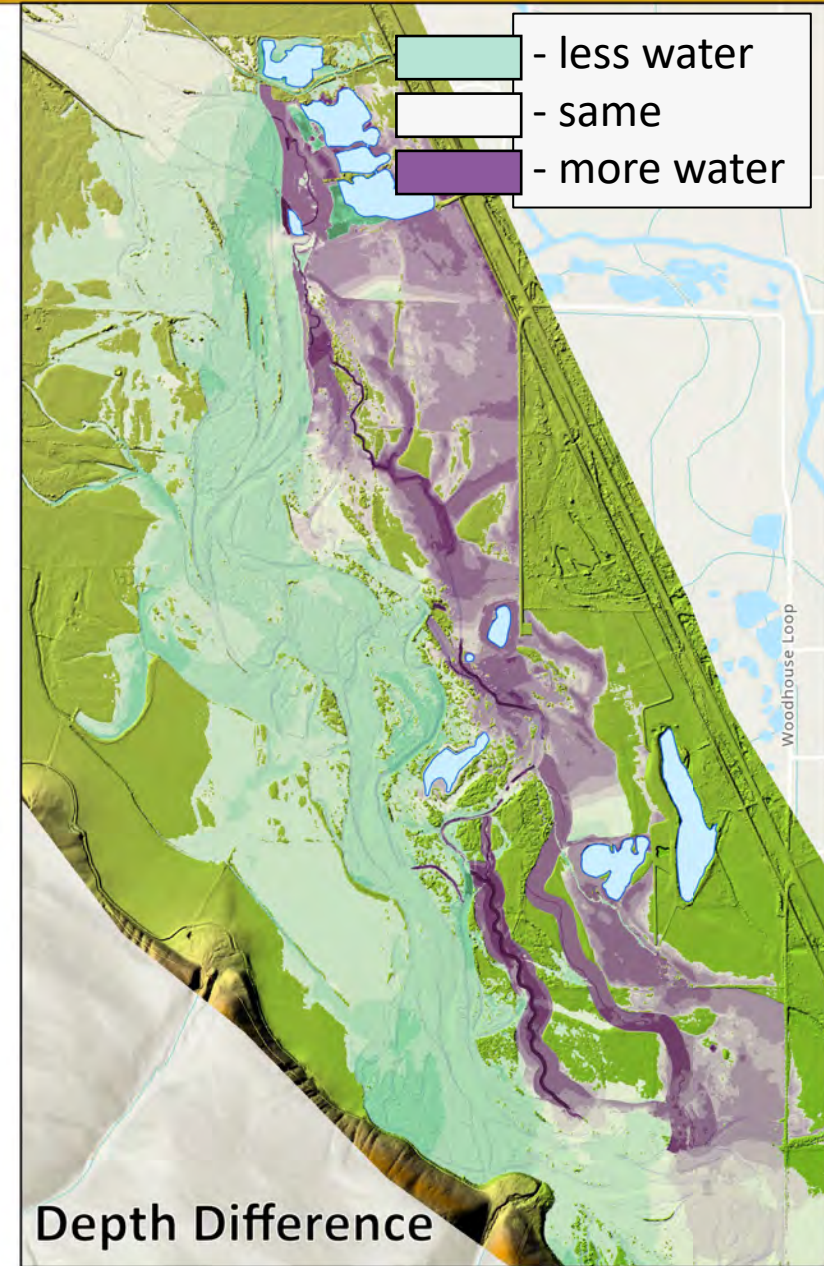
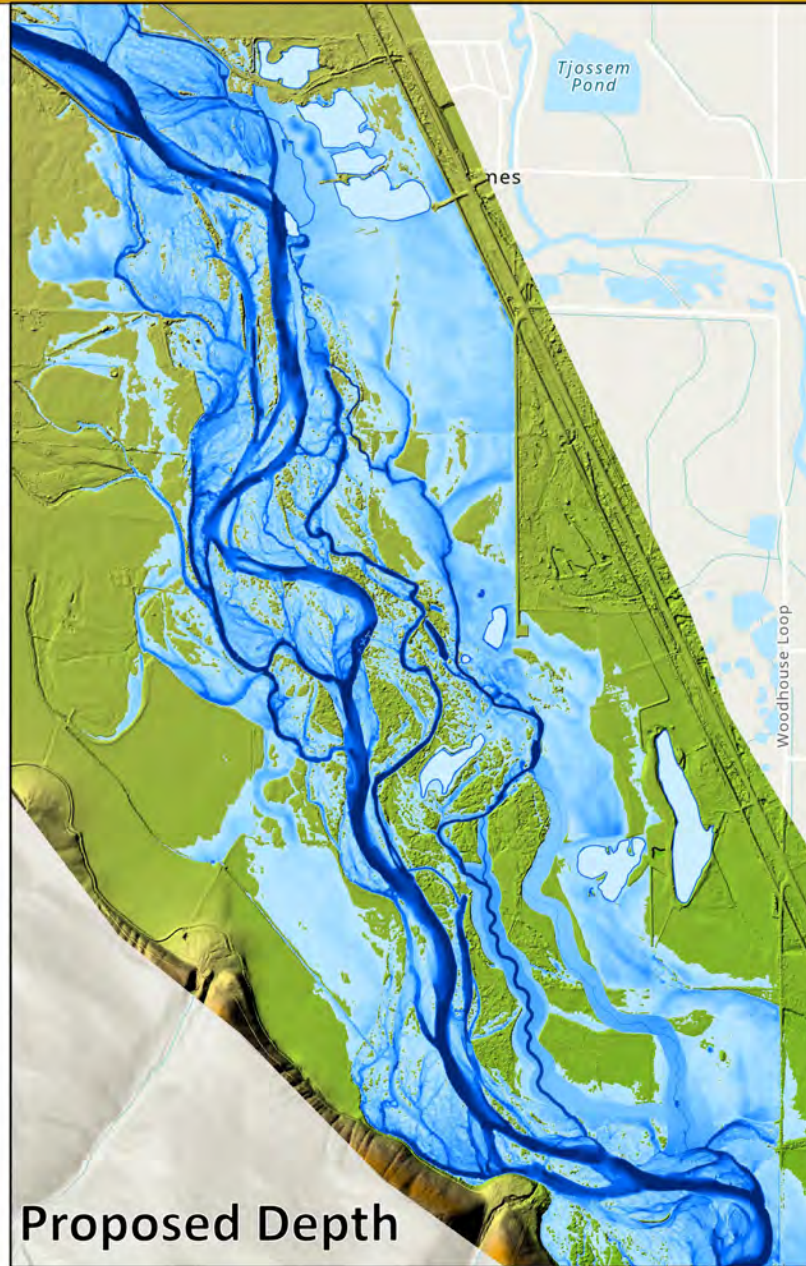
# Preferred Alternative

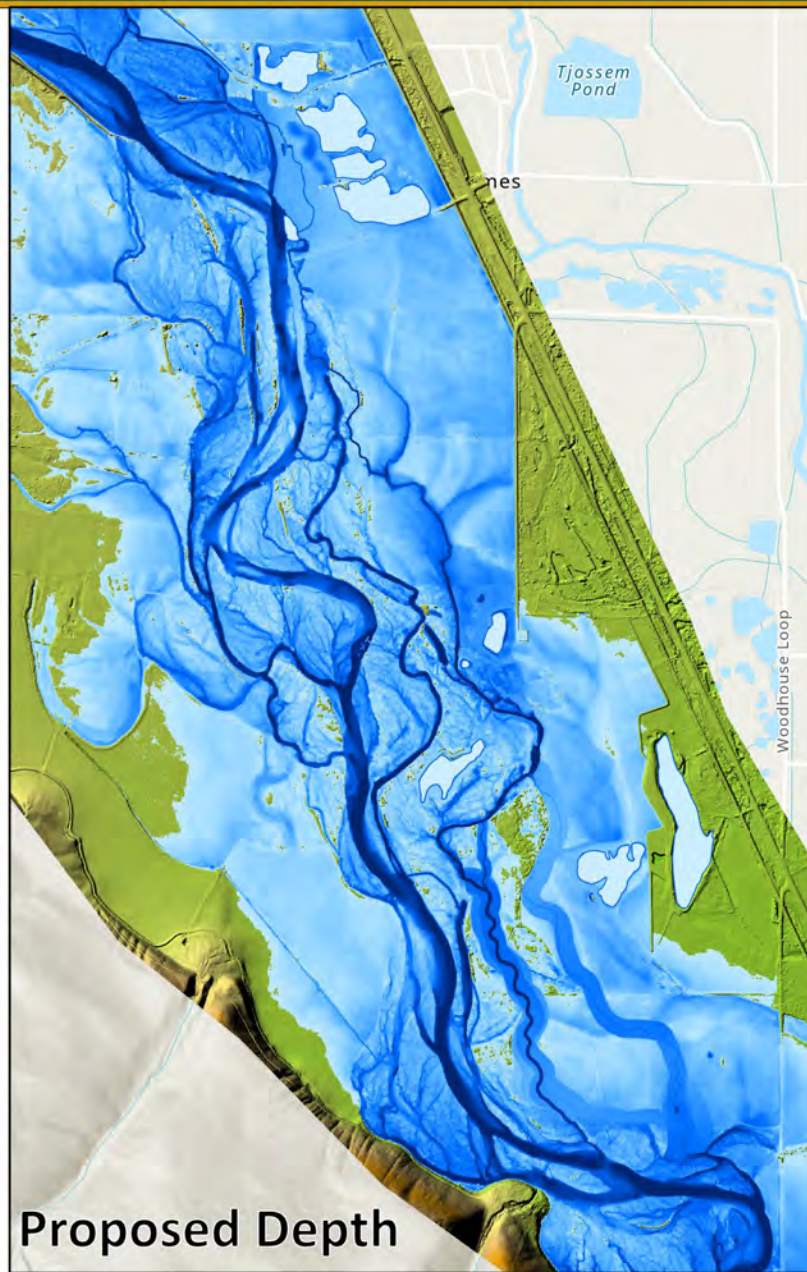
-  - Cut (Excavation)
-  - Fill

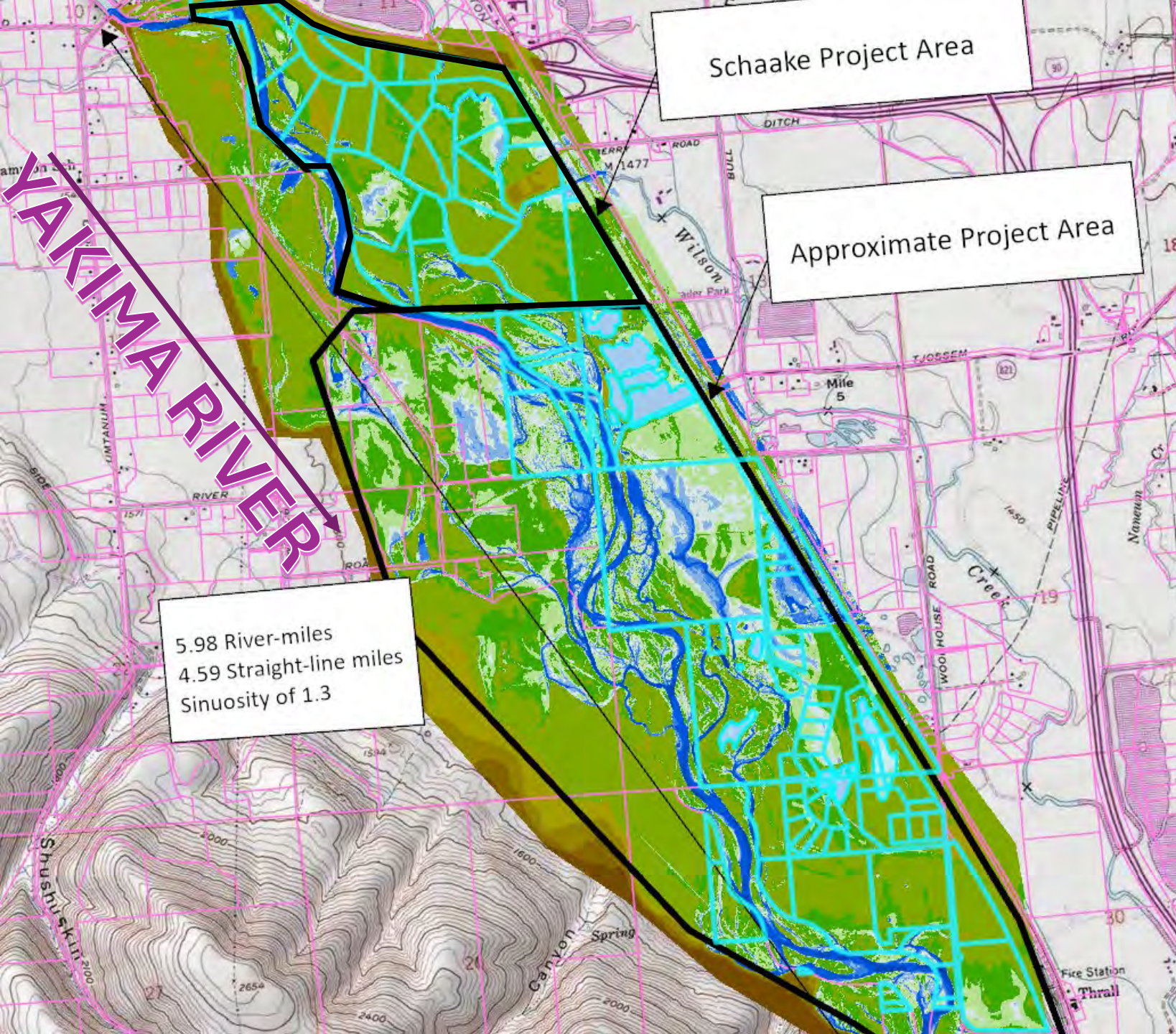












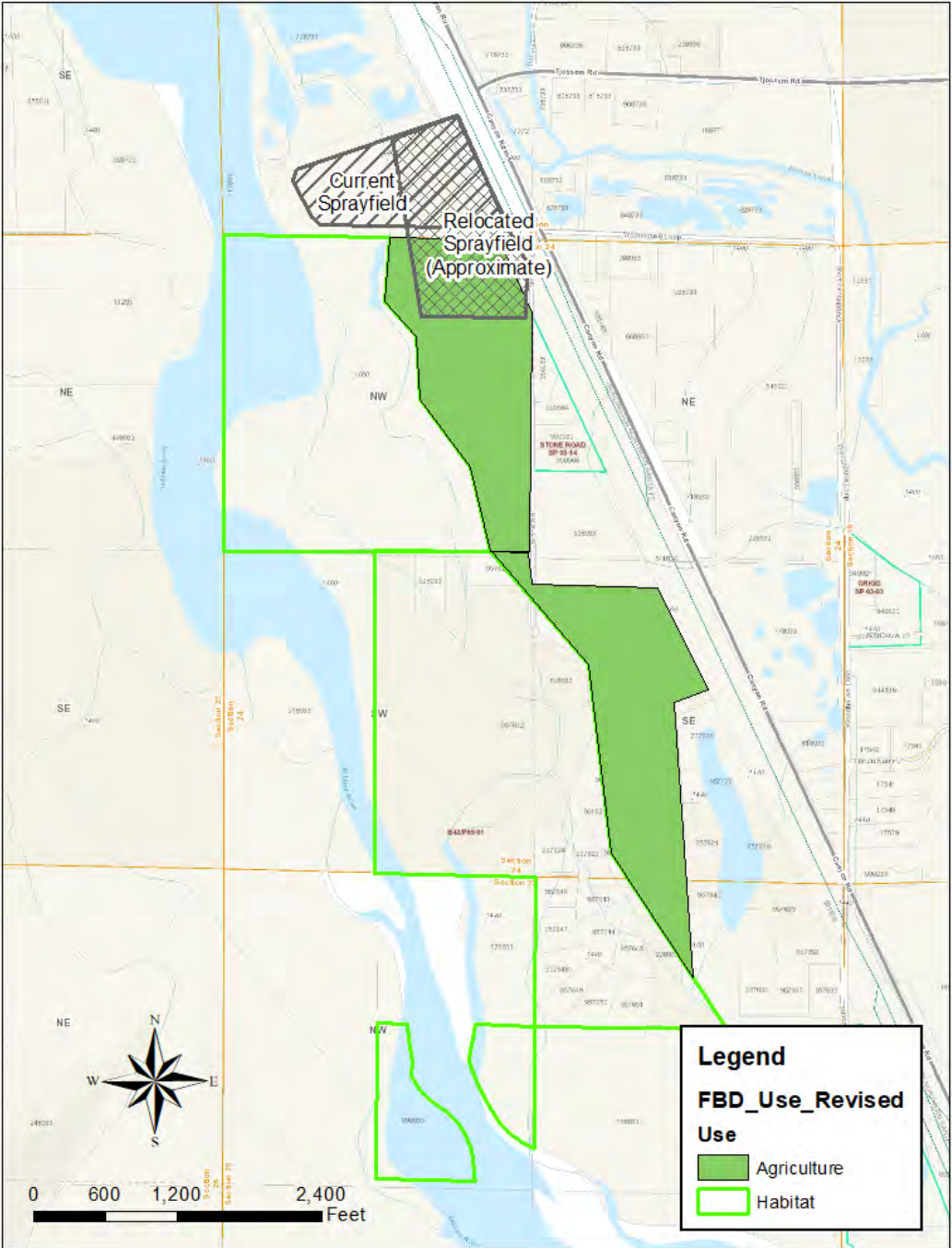
# Flood Reduction Benefits

- Decreased Reliance on Flood Levees
- Project Area: 5 homes, 35 parcels, commercial RV park
- Reach: 98 tax lots!

# Broader Ecosystem Benefits





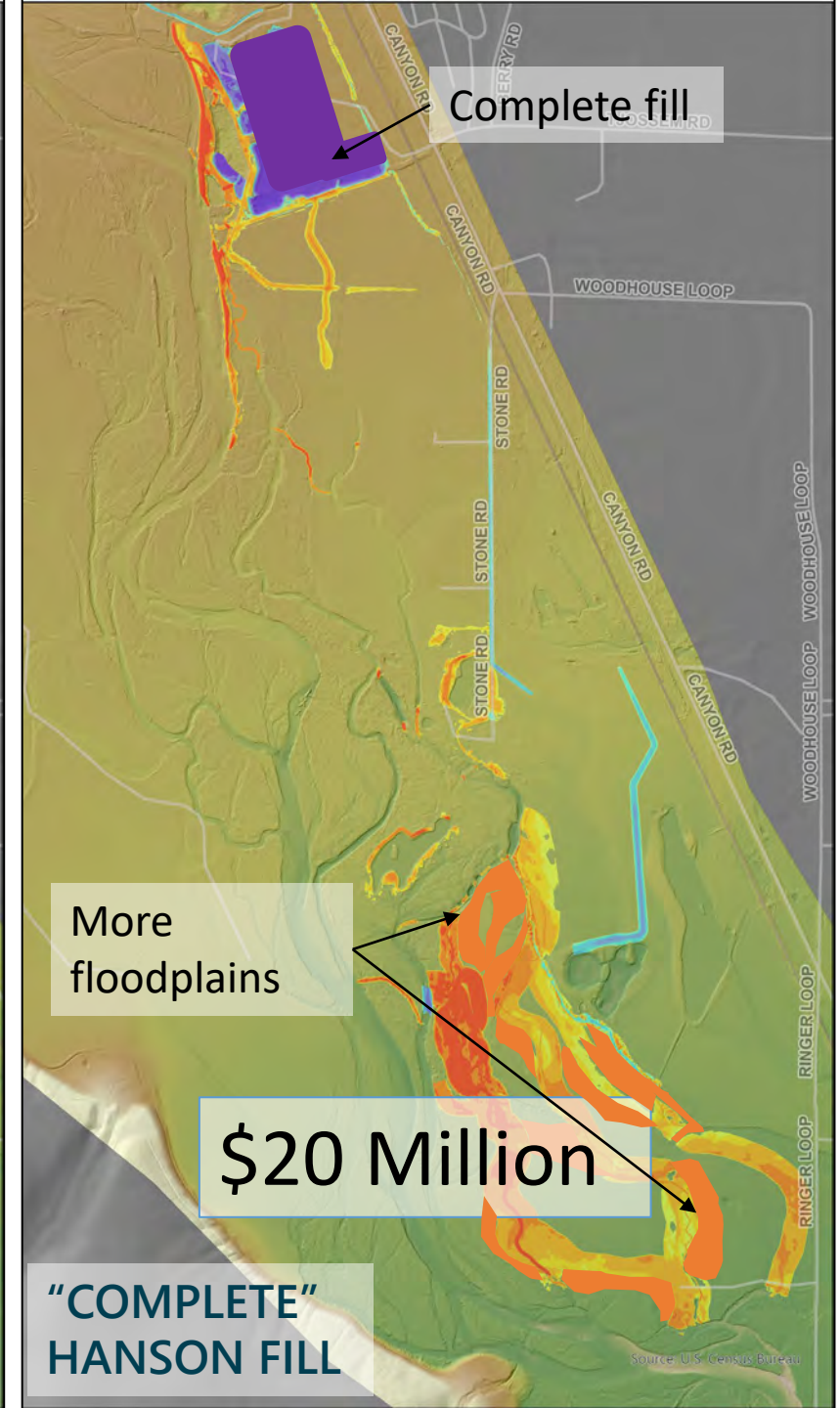
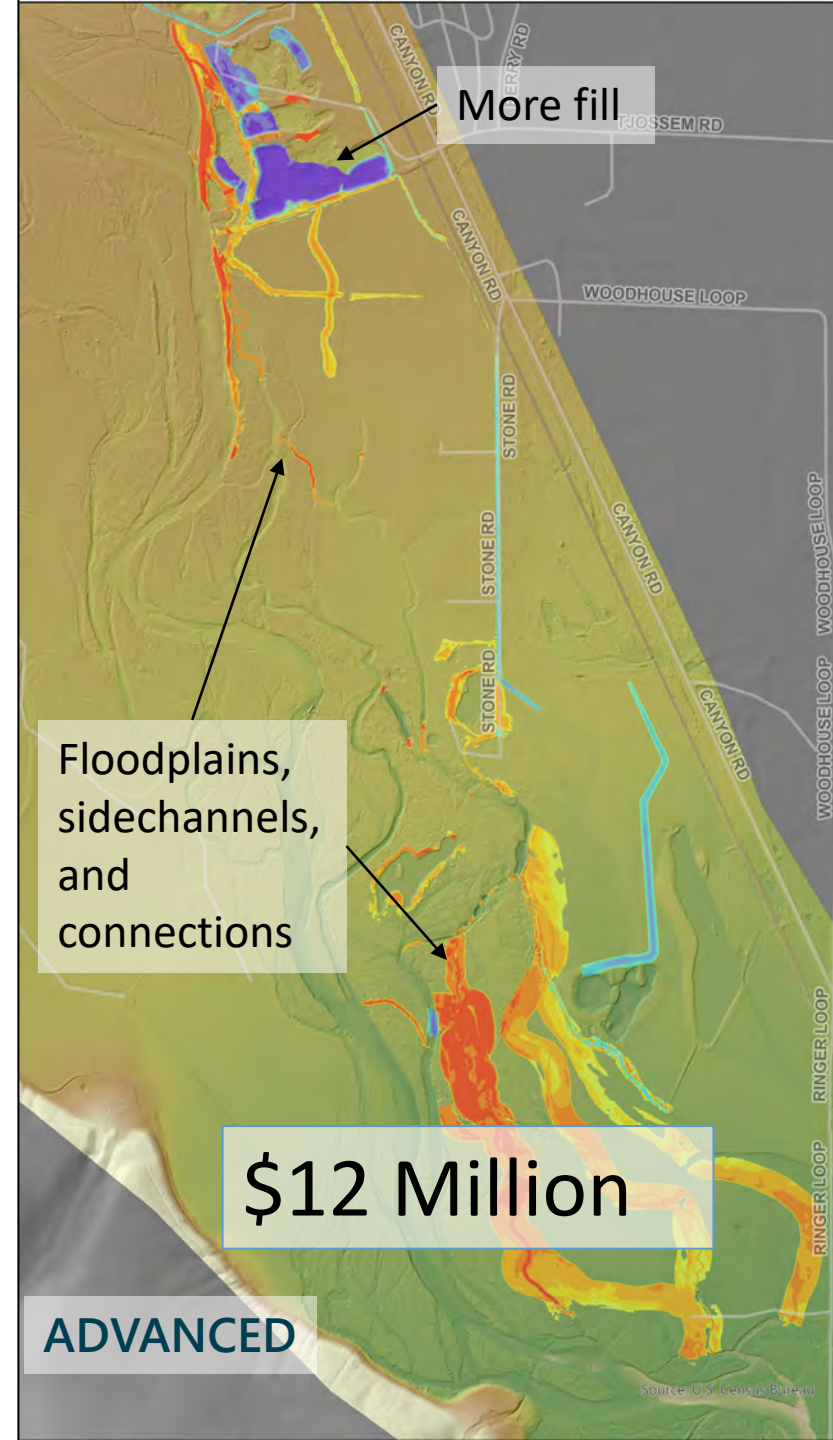
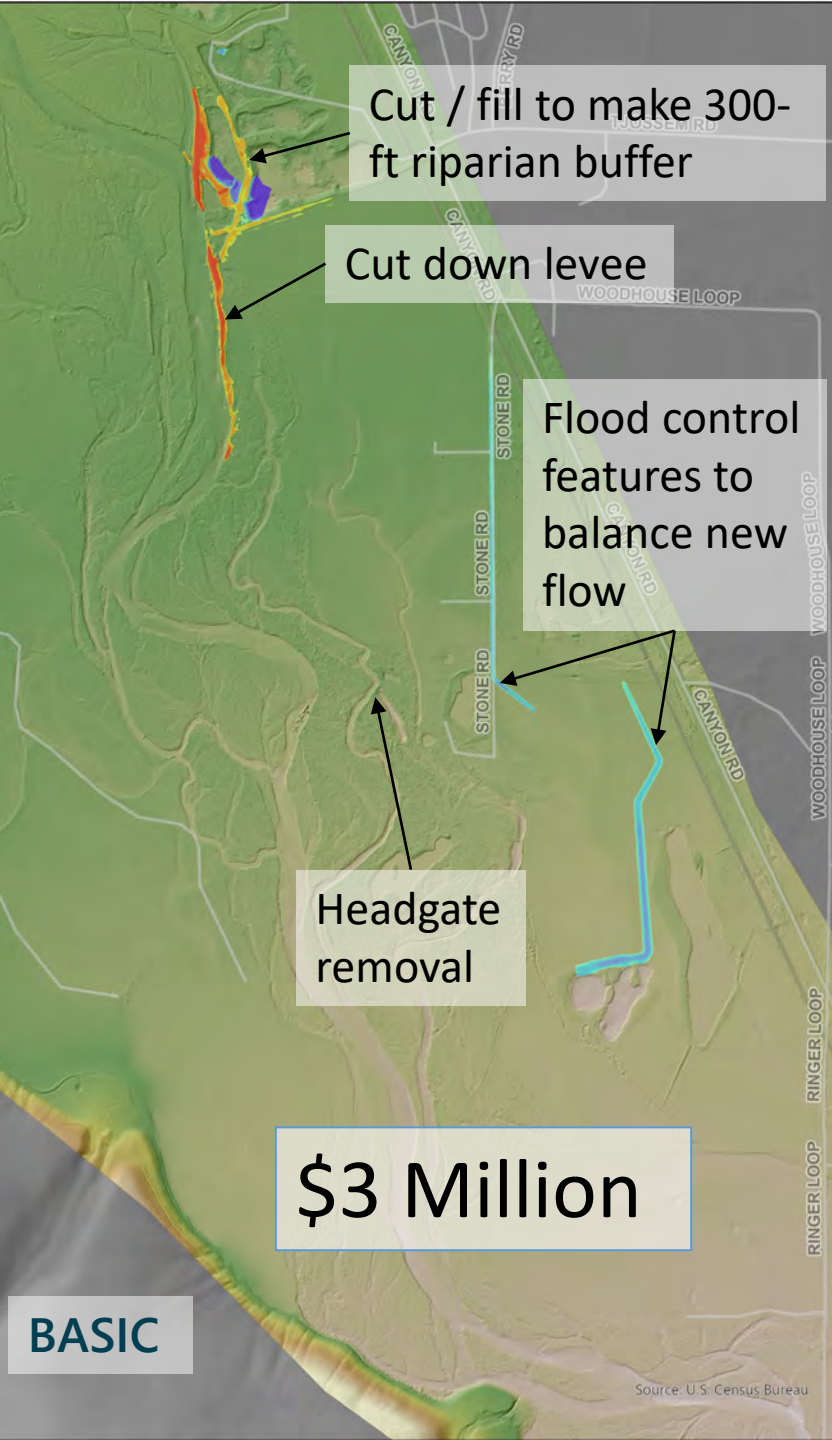


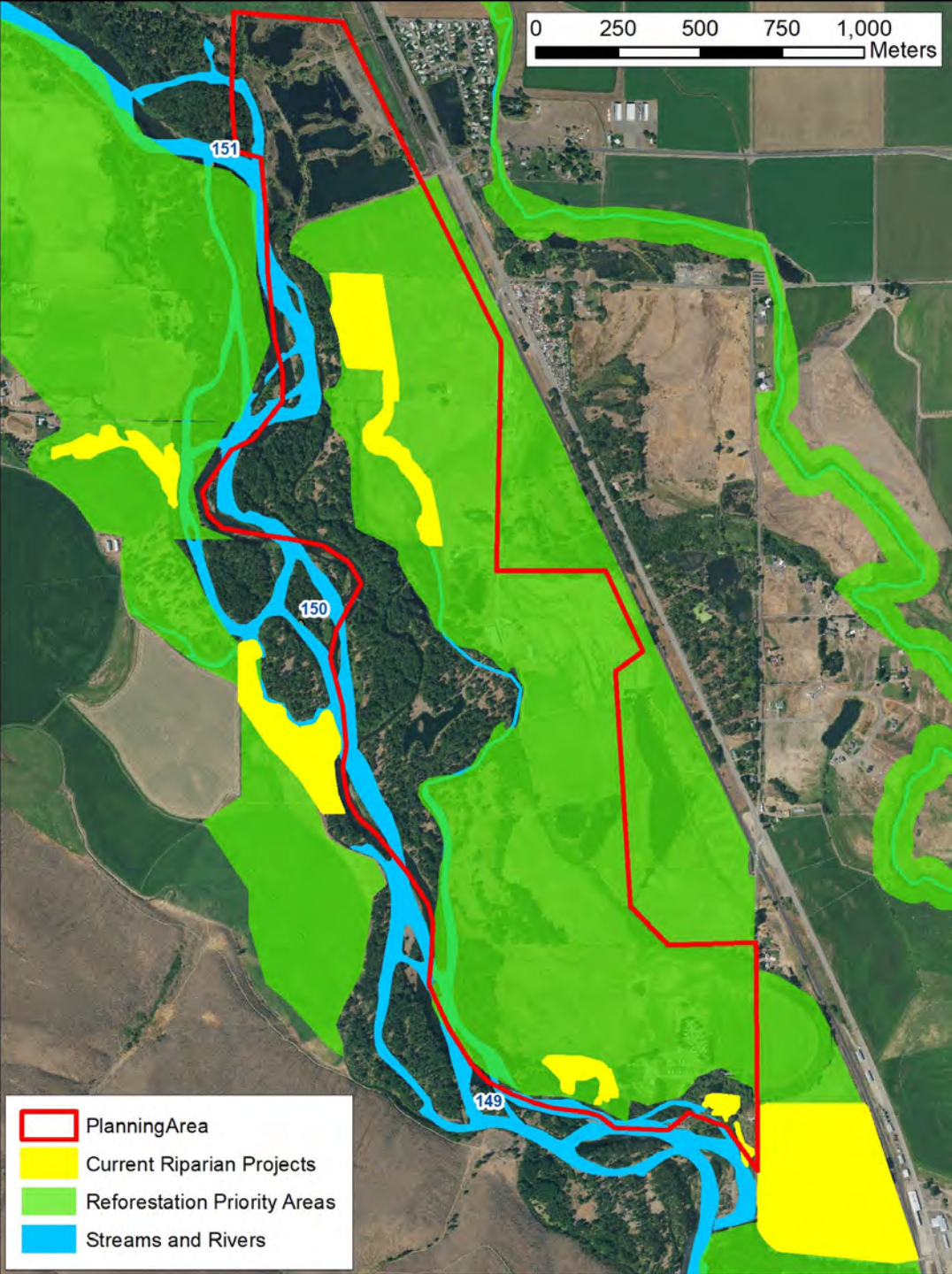
# Uplift Metrics

- Removal of ...
  - 2,083 - feet of former PL-8499 levee at Hansen Pits
  - 1,422 - feet of berm from Hansen Pits down to the head of the “fishhook sidechannel”
  - 874 - feet of berm at the RV park
  - 1,185 - feet of berm at “football pond”
  - 1,751 -feet of road berm around the “camel pond”
- 11,693-feet of new sidechannel
- Acres of new floodplain (by design!) ...

Event / Discharge	Existing Floodplain (Acres)	Proposed Floodplain (Acres)	Added Floodplain (Acres)	Added Wetted Area (Acres)
Bankfull / 6,000 cfs	129.6	139.0	9.4	11.8
2-year / 7,170 cfs	238.9	276.5	37.7	40.0
10-year / 14,000 cfs	793.3	873.9	80.5	82.9
100-year / 32,300 cfs	1,634.4	1,434.5	(199.9)	(197.5)





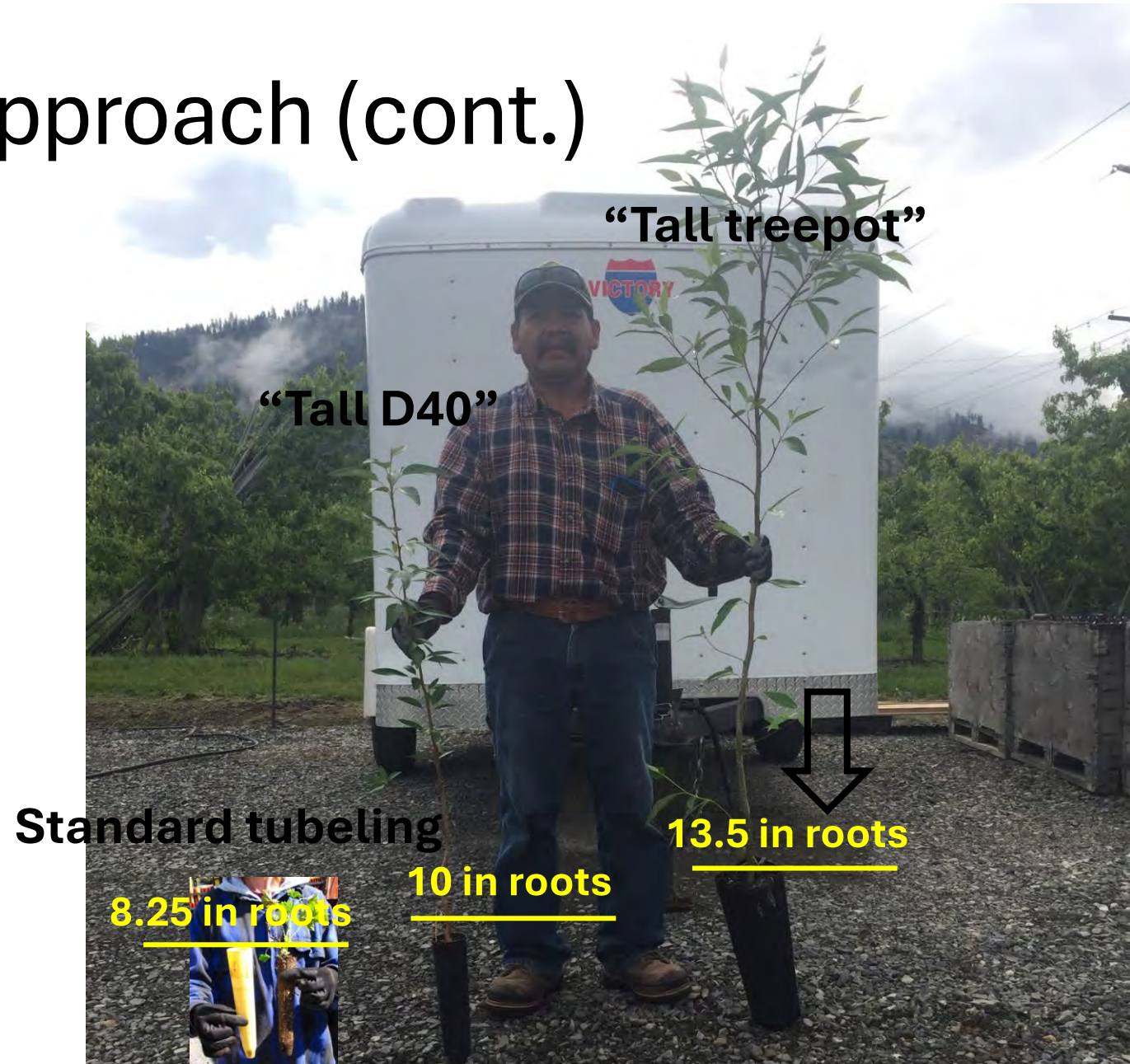


# High Value for Riparian Forest Management

- Project area represents highest value potential riparian forest in 30 mile reach
- 76.4 acres restored or underway since 2018

# Riparian Restoration Approach (cont.)

- Reforestation integrated into designs
- Sequencing
- Innovative techniques
  - Planting



# Technical Studies

## CORRIDOR PLAN

YAKIMA RIVER  
JEFFRIES LEVEE TO YAKIMA CANYON  
HABITAT ENHANCEMENT AND  
FLOOD RISK MANAGEMENT PLAN

Prepared for  
Kittitas County Flood Control Zone District

Prepared by  
Watershed Science & Engineering, Inc.  
and  
Herrera Environmental Consultants, Inc.



## Hydraulic Modeling: Schaake Restoration – Final Design

Schaake Floodplain Restoration  
Yakima River Basin Water Enhancement Project




U.S. Department of the Interior  
Bureau of Reclamation  
Technical Service Center  
Denver, Colorado

January 2019

## HANSEN PITS CHANNEL MIGRATION AND AVULSION RISK ASSESSMENT

Prepared for:  
Kittitas County Department of Public Works  
411 N Ruby ST, Suite 1  
Ellensburg, WA 98926



Prepared by:  
 **WATERSHED**  
SCIENCE & ENGINEERING  
506 2<sup>nd</sup> Ave, Suite 2700  
Seattle, WA 98104  
206-521-3000



April 9, 2021