



Elizabeth Eastman, NPT

Tucannon PA 5-15 Assessment and Conceptual Design

Co-Management Model



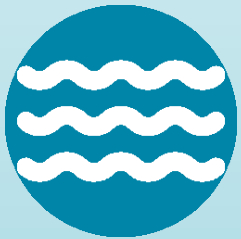
CTUIR River Vision



**Riparian
Vegetation**



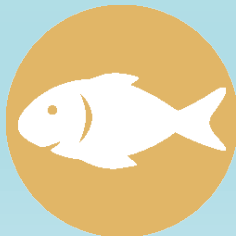
Connectivity



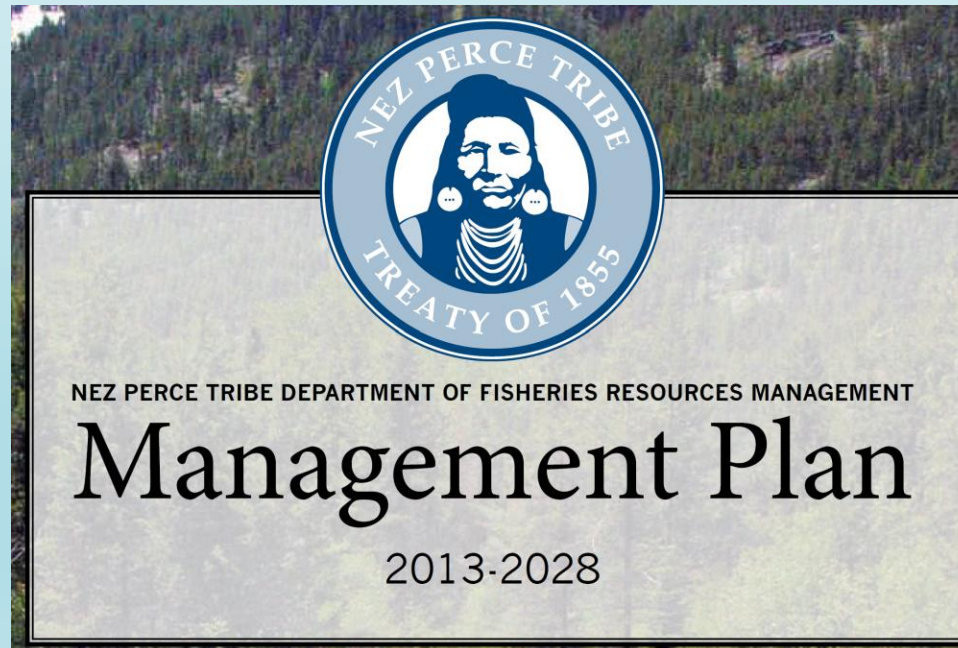
Hydrology



Geomorphology



**Aquatic
Biota**



W.T. Wooten Floodplain Management Plan (2014)

Washington Department of Fish and Wildlife

11/08/2012

Authored by the Wooten FMP Team; Update Dec. 2014

Wildlife Program: Bob Dice (Wildlife Complex Manager), Kari Dingman (Assistant Wildlife Area Manager).

Habitat Program: Mark Grandstaff (Assistant Habitat Program Manager), Dave Karl (Watershed Steward), Tom Schirm (Area

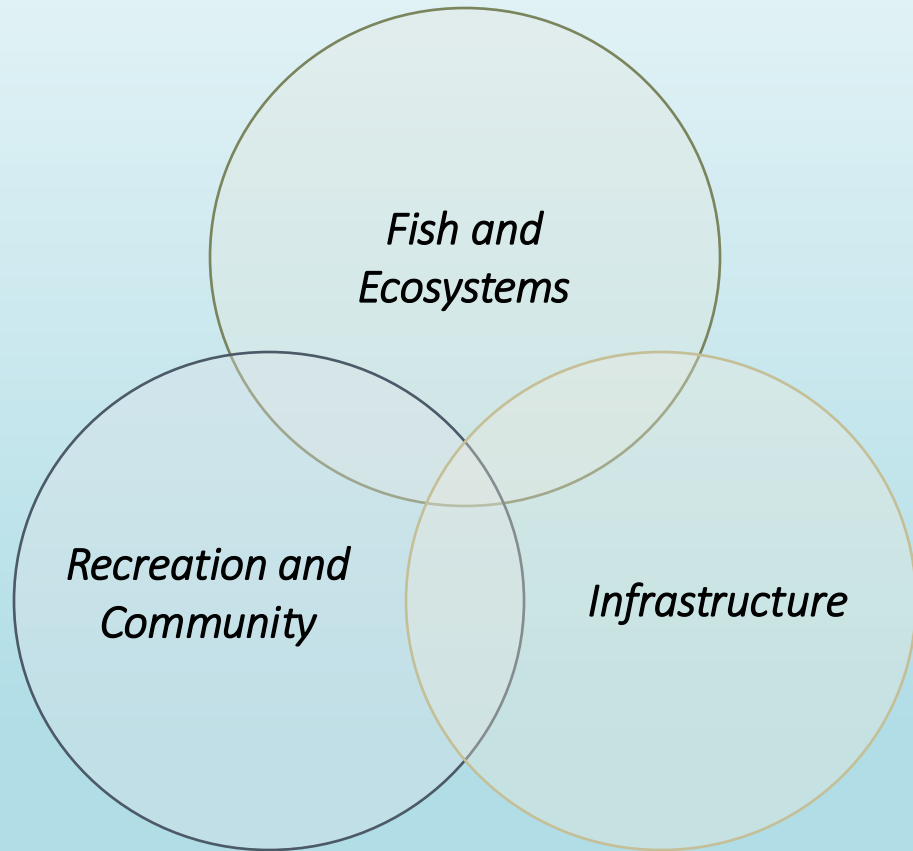
Habitat Biologist), Bruce Heimer (Environmental Engineer).

Fish Program: Doug Maxey (Tucannon Hatchery Manager), Glen Mendel (District Fish Biologist).

Edited by: Mark Wachtel (Regional Habitat Program Manager)



Comprehensive, Multi-Use Strategy



Urgency for spring Chinook recovery

Long-term investments

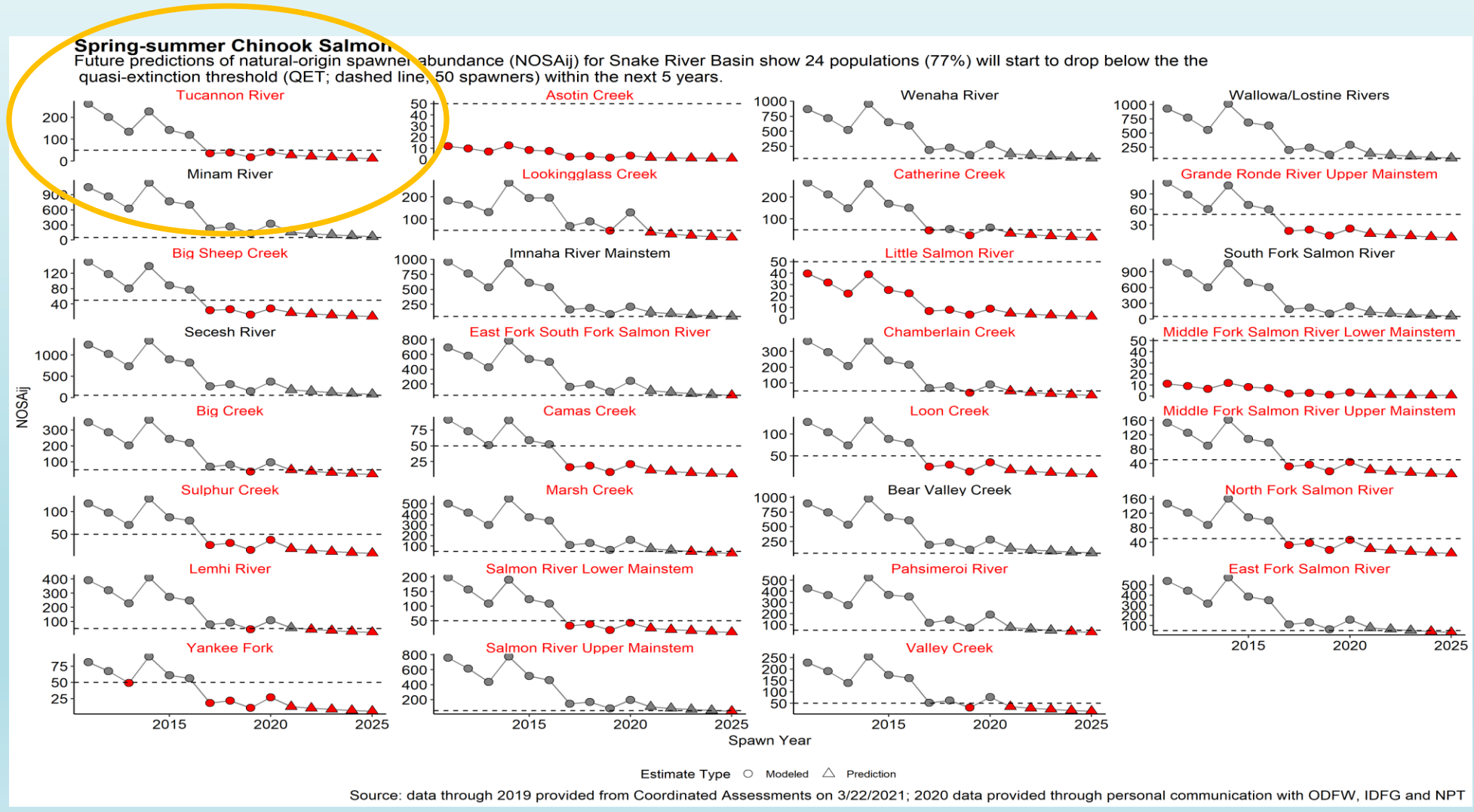
Needs to be sustainable for land managers
(WDFW)

Climate change

Community input is critical

Action Needed: Chinook Reaching Quasi-Extinction Status

Fewer than 50 wild pairs showing up





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Tucannon PA 5-15 Assessment and Conceptual Design

Reach-Scale Alternative

Background

Primary reasons for the Assessment and Conceptual Design project:

- **Lakes and Infrastructure Condition**
 - WA Department of Ecology Dam Safety Office regulates, conducted dam safety studies in 1997, 2001, and 2005. These studies concluded that all of the lake embankments (dams) and inlets/outlets were in need of continued maintenance, most needed significant repairs or replacement
 - Embankment dams average 70-years old, lifespan of infrastructure is 50-years. Costs for maintenance, repair and replacement are increasing
 - Typical deficiencies for the embankments/dams are: erosion, slopes too steep, top widths too narrow, leakage, failing and collapsing inlet and outlet structures, danger of overtopping and failure in large floods, and lack of emergency spillways
- **Threatened and Endangered Species Status**
- **Treaty Rights obligations**

Assessment and Conceptual Design

Assessment Components

- **Lakes and Infrastructure Condition**
- **Geomorphic Assessment and State of the Floodplain**
- **Floodplain Space and Connectivity related to stream power, channel resilience vs incision, and redd scour**
- **Vegetation**
- **Climate Change Impacts**
- **Focal Species Production and Habitat Suitability Assessment**

Assessment and Conceptual Design

Assessment Technical Outcomes

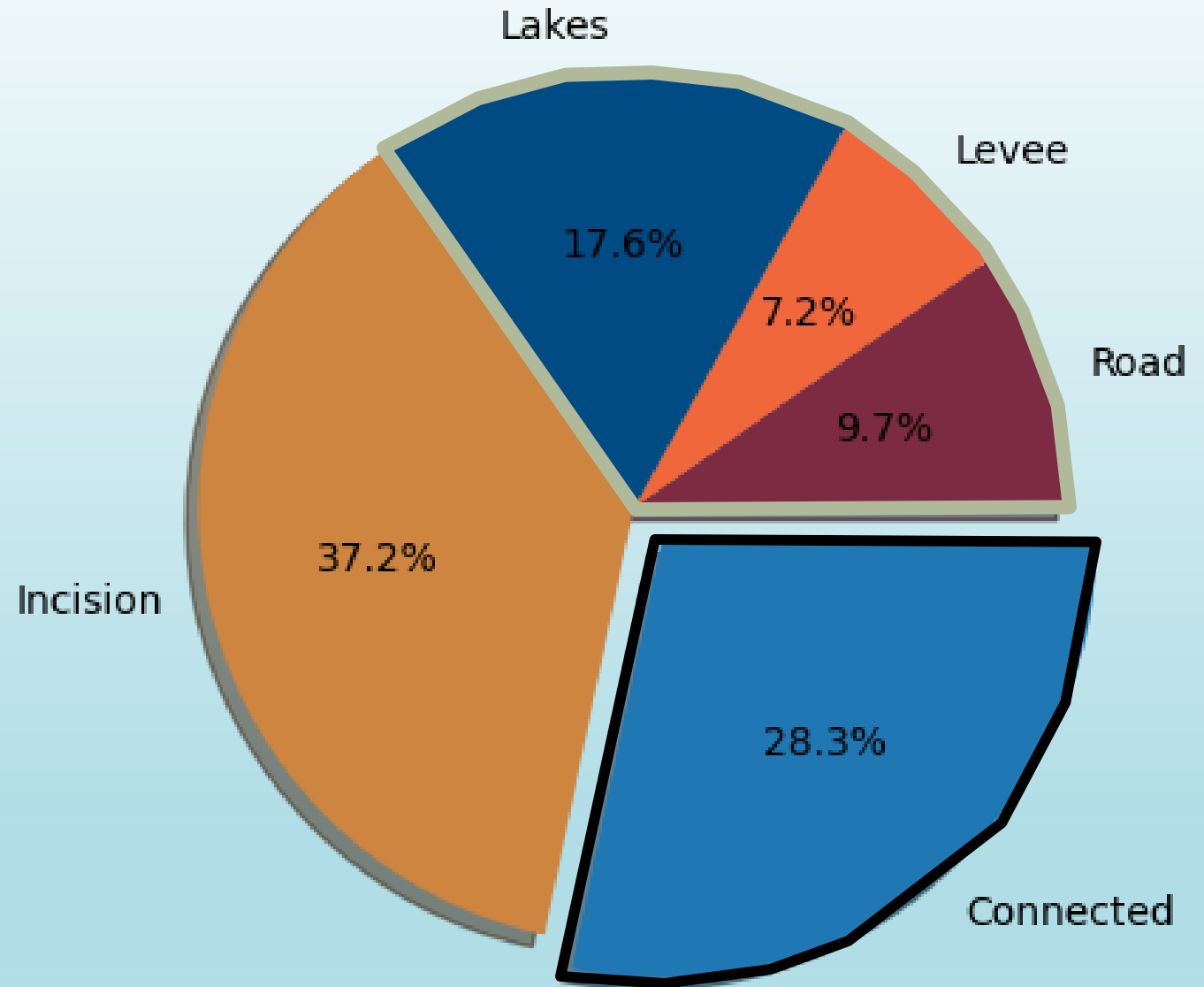
- **Lakes and infrastructure aging, Operation & Management/ Replacement costs increasing, some in need of replacement and/or major repair**
- **72% of floodplain disconnected by lateral confinement (infrastructure) and vertical incision (excess stream power)**
- **450-feet minimum target floodplain width to address confinement and infrastructure, and excess stream power**
- **Reduced riparian and floodplain vegetation complexity**
- **Reduced aquatic species function**
- **Climate warming trend/higher temperatures**
- **Decline in function and total wetland area**

State of the Floodplain

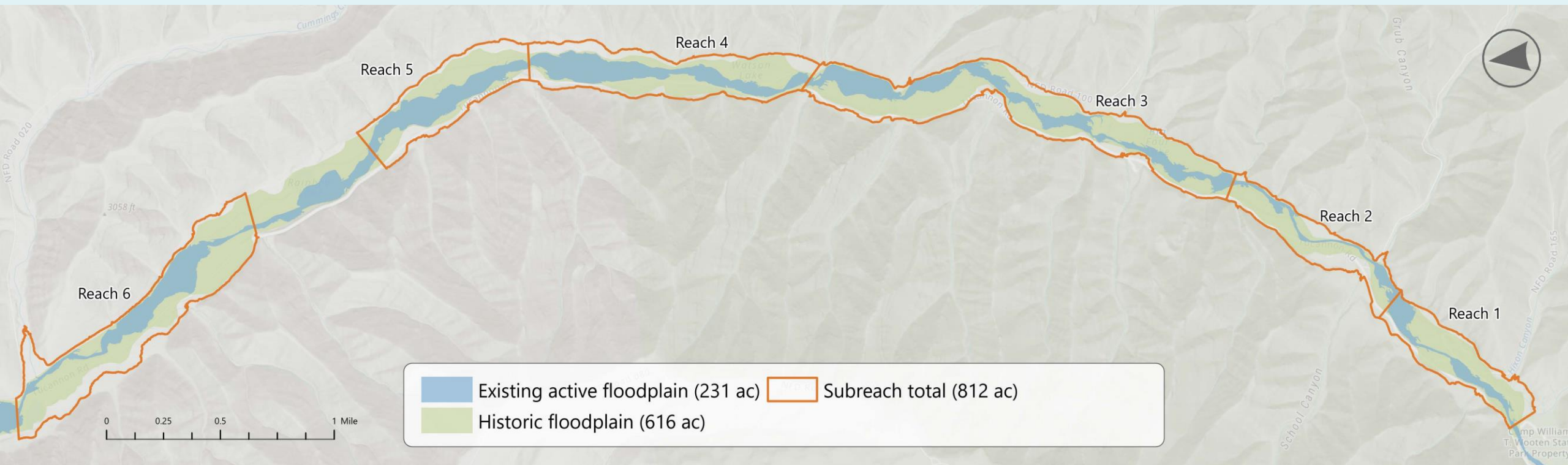
Floodplain is ~30% of its historical extent

Lakes, levees, and road infrastructure disconnect ~35% of historical floodplain

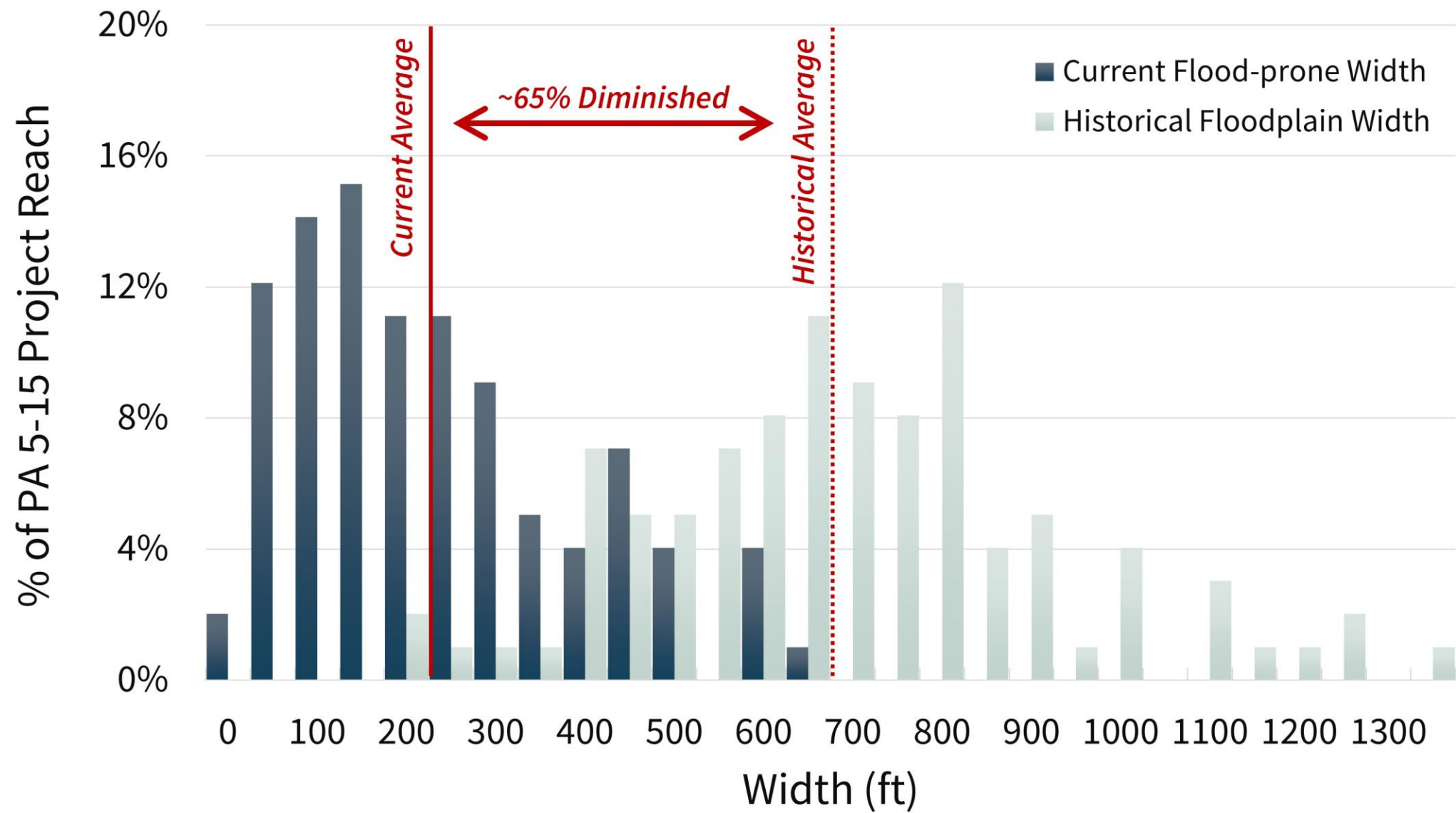
~37% of historical floodplain is vertically disconnected



Existing compared to Historic Floodplain



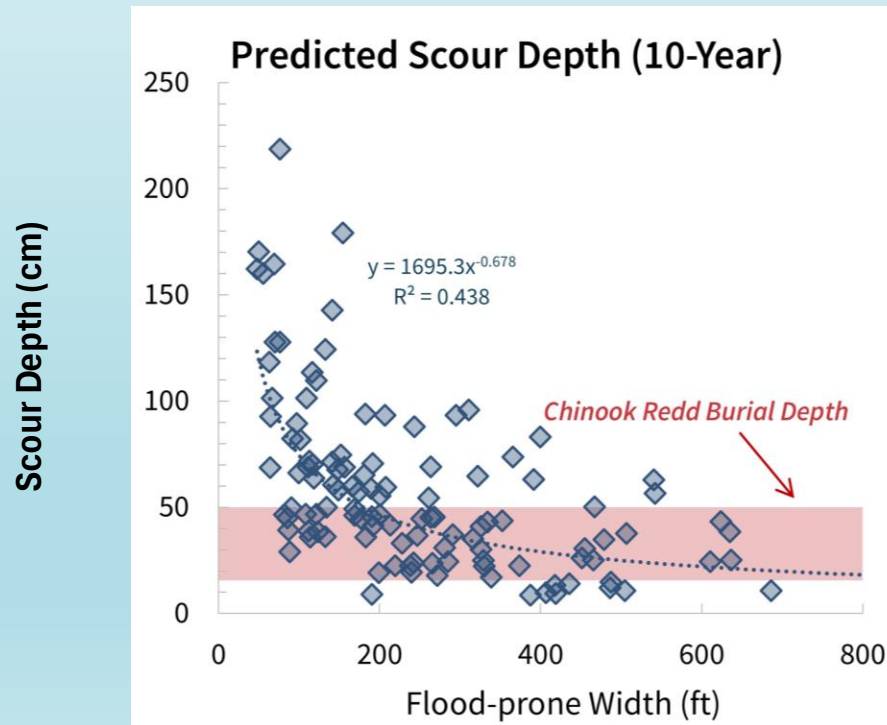
Historical v. Present Day Widths (Narrowing = Disconnection)



Space as a Unifying Framework

Quantified benefits of space:

- Increased ecosystem resilience
- Direct benefits for life history bottlenecks (redd scour)
- Reduced stream power
- Increased infrastructure resilience
- Reduced flood risk



Road wash-out in March 2026 flood near Camp Wooten

Potential Consequence of Stream Power = Increased Redd Scour

Chinook Egg Burial Depth
15-50 cm (~0.5-1.5 ft)
[Paul DeVries, 1997]

Barry Hecht 1982
measure scour
depths from 0.43-
1.47 feet

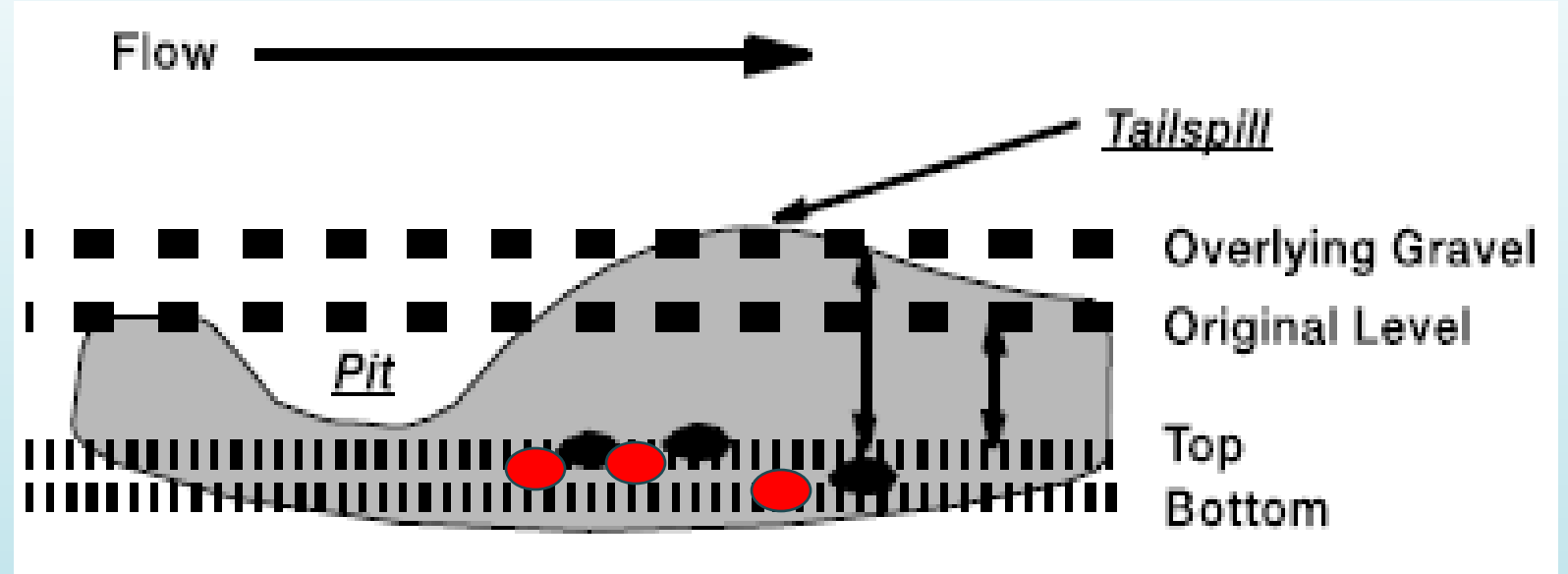


Table 6.1. Summary of Bed Configuration
Tucannon River Bed-Monitor
(Summary of Tables G-1

Code ^{a/}	Name	Number of Sections	Net Mean Scour(-) or Fill(+) at Site ^{b/} (feet)	Maximum Net Point Scour (feet)
H	Camp Wooten	10	-0.02	-0.43
A	Hatchery Bridge	6	+0.01	-1.01
G	Marengo	6	-0.06	-1.15
B	Krouse Ranch	8	+0.11	-1.45
J	Helley Fletcher	6	-0.18	-1.47

^{a/}Site designation, figure 1.)

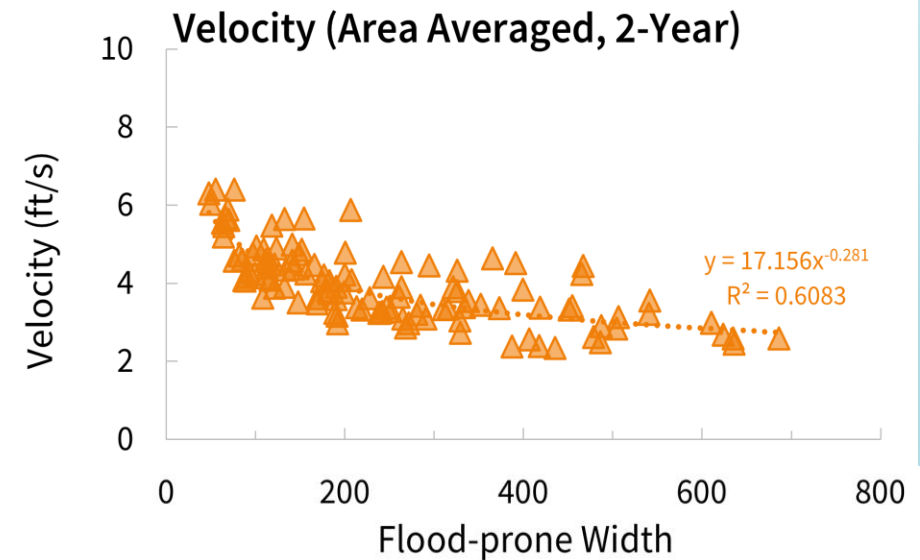
^{b/}Difference in mean bed elevation, spring and fall surveys.

Assumed bulk density of 120 lbs/ft³.

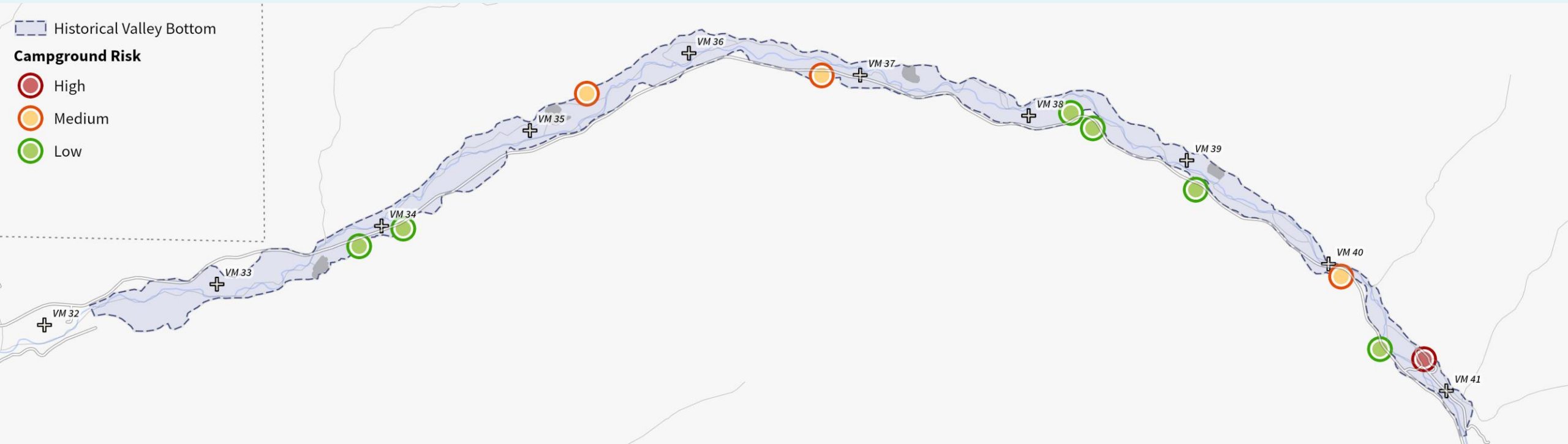
Flood Risk Benefits

Quantified benefits of space:

- Increased ecosystem resilience
- Direct benefits for life history bottlenecks (redd scour)
- Reduced stream power
- Increased infrastructure resilience
- Reduced flood risk



Recreational Risk during Flood Events



March 2026 Flooding



Community Benefits

Recreation drives tourism and visitation to Columbia County

Upgraded lakes provide long-term recreational value

Increased flood attenuation and floodplain water storage benefits downstream irrigators and producers

Floodplain restoration improves habitat for salmon and other First Foods essential to Tribal Communities and Treaty Rights



Road Damage between Camp Wooten and USFS Tucannon Campground

Vision for the Future

- ***The Reach-Scale Preferred Alternative** is based on our understanding of the Upper Tucannon River ecosystem, and considers the range of **Project Goals and Objectives** including restoration of watershed function to support **Tribal Treaty Rights, Chinook salmon and Steelhead trout, and recreational use.***
- *The Reach-Scale Preferred Alternative was developed as a coordinated effort of Co-Manager Leadership and the Project Core/Technical Team.*
- *Development included **Recreation Values**; the five **River Vision Touchstone** categories: Hydrology, Geomorphology, Connectivity, Riparian Vegetation, and Aquatic Biota; combined with Chinook Salmon **Limiting Factors.***

Recreation Values

Fishing Opportunity

- *Fishable lake shoreline (linear feet)*
- *Lake fishable area (acres)*
- *Duration of fishing availability*
- *River fishing - recovery of salmon and steelhead fishery*

Experiential quality

- *Spacing between lakes*
- *Parking*

Campgrounds

- *Amenities*
- *Proximity to lakes*

Other

- *Trails*
- *Access*

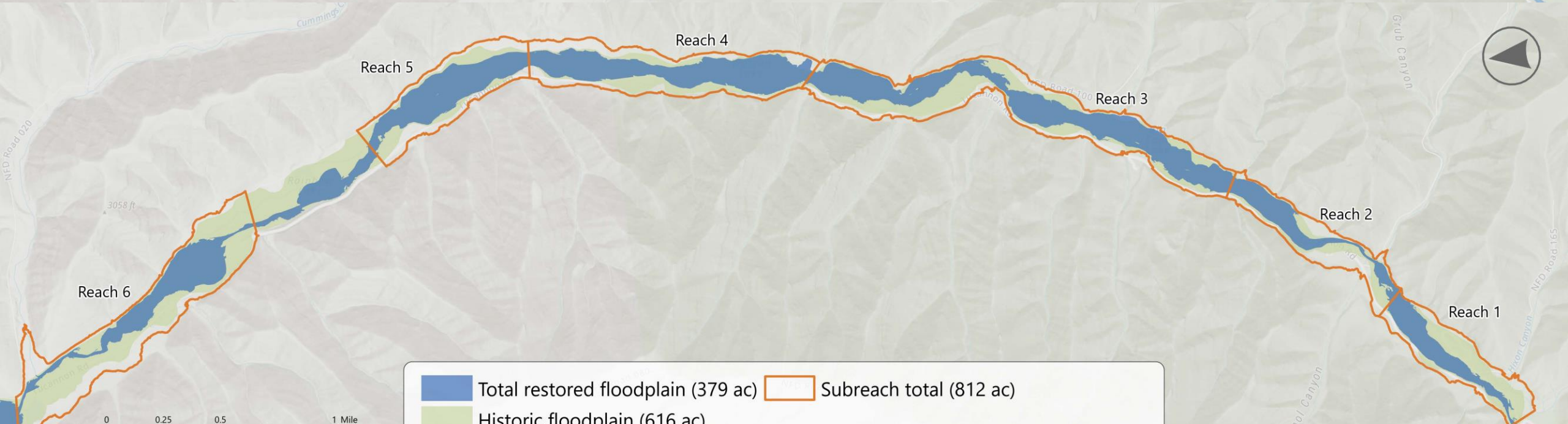
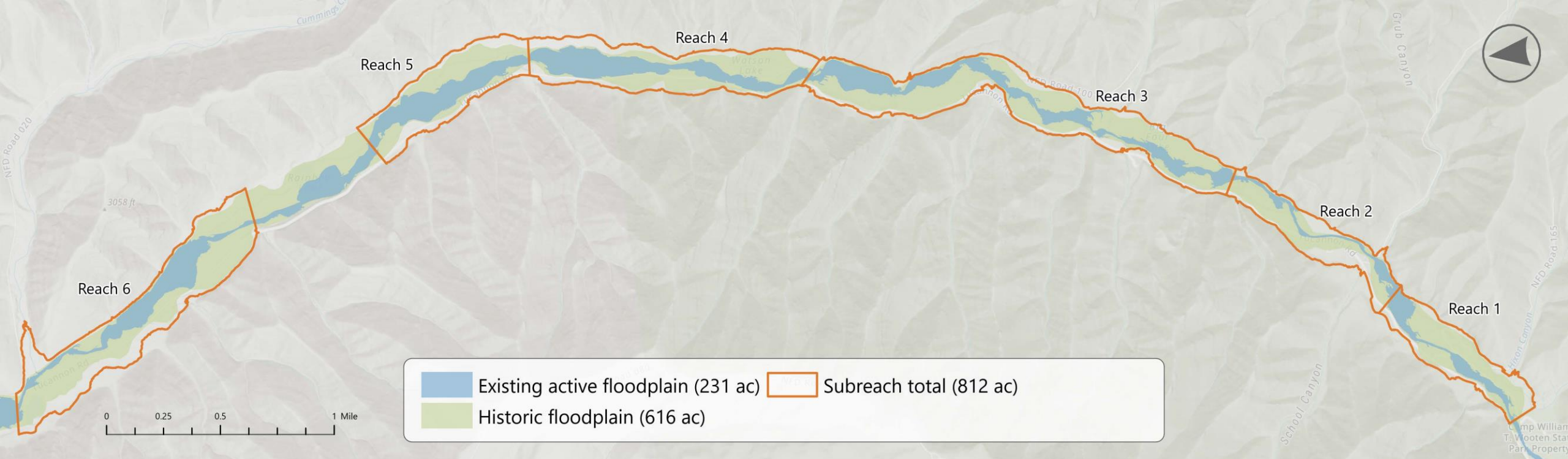
Includes:

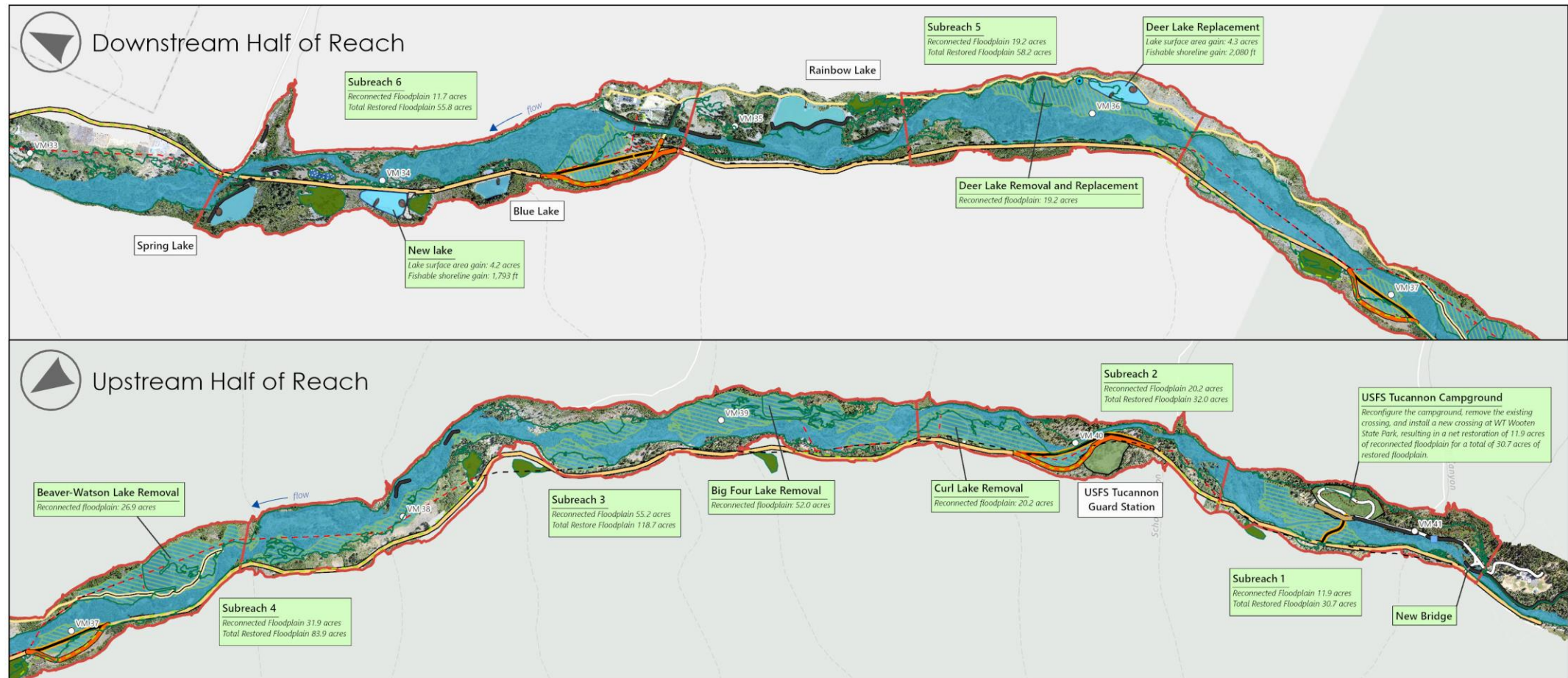
- New lake between Spring and Blue Lakes
- Reconfigure and move Deer Lake upstream on alternate water source
- Removal of Beaver and Watson Lakes
- Removal of Big Four Lake Remnants
- Removal of Curl Lake in coordination with USFWS
- Reconfigure USFS Tucannon Campground
- Road segment setbacks to increase floodplain connectivity
- Powerline relocation to road alignment

Preferred Alternative

SUBREACH/ACTION	EXISTING FISHABLE SHORELINE (ft)	PROPOSED FISHABLE SHORELINE (ft)	EXISTING LAKE AREA (ac)	PROPOSED LAKE AREA (ac)	FLOODPLAIN AREA RESTORED (ac)
1 - Tucannon Campground	NA	NA	NA	NA	30.7
2- Curl Lake	1112.0	0.0	2.0	0.0	32.0
3 - Big Four	0.0	0.0	0.0	0.0	118.7
4 - Beaver-Watson	1642.0	0.0	4.2	0.0	83.9
5 - Deer Lake	605.0	2080.0	2.3	4.3	58.2
6 - New Lake	0.0	1793.0	0.0	4.2	55.8
Total	3359.0	3873.0	8.5	8.5	379.3

380 acres of Floodplain Restored
Includes 148 acres of Reconnected Floodplain Gained
514 feet of Fishable Shoreline Gained
0 acres of Lake Surface Area lost.





ACTION	EXISTING FISABLE SHORELINE (ft)	PROPOSED FISABLE SHORELINE (ft)	EXISTING LAKE AREA (ac)	PROPOSED LAKE AREA (ac)	FLOODPLAIN AREA GAINED (ac)	TOTAL FLOODPLAIN RESTORED (ac)	DESCRIPTION
Big Four Lake reach Restoration	NA	NA	NA	NA	NA	118.7	Remove lakes and associated infrastructure.
Beaver-Watson Lakes removal	1,642	0	4.2	0.0	26.9	83.9	Remove lakes and associated infrastructure.
Curl Lake removal	1,112	0	2.0	0.0	20.2	32.0	Remove lake and associated infrastructure. Lower Tucannon adult collection weir to be installed prior to lake removal.
Deer Lake removal and construct a replacement lake	605	2,080	2.3	4.3	19.2	58.2	Remove Deer Lake and associated infrastructure. Create a new 4.3-acre lake upstream and install groundwater well to supply lake.
New lake (near VM 34)	NA	1,793	NA	4.2	NA	55.8	Construct a 4.2-acre lake in the area between Blue and Spring Lakes.
Road and powerline setback	NA	NA	NA	NA	17.5	NA	Setback road and powerlines at three locations within the project area to increase floodplain connectivity by 17.5 acres.
Tucannon Campground	NA	NA	NA	NA	11.9	30.7	Reconfigure the campground, eliminate the existing access crossing, and install a new bridge near WT Wooten State Park.
Totals	3,359	3,873	9	9	96	379	Achieve a net gain of 514 feet of fishable shoreline, with no loss of lake area, and reconnect 96 acres of disconnected floodplain with a total of 379 acres of restored floodplain. Floodplain and channel processes and functions will be restored across all reclaimed floodplain areas.

Tucannon PA 5-15 Preferred Alternative

Remove Big Four, Beaver-Watson, Curl, and Deer Lakes; construct two new lakes; relocate roads and powerlines at three locations; and reconfigure Tucannon Campground with a new bridge near Camp Wooten

Existing Conditions

- Reach
- Lake
- Approximate 100 yr (4,160 cfs)
- WDFW campground
- USFS campground
- Floodplain channel
- Levee
- Road
- Service road
- Existing OHP
- Valley mile (2017)

Actions

- Restored floodplain
- Reconnected floodplain
- New lake
- Polishing wetland
- Bridge
- Parking
- Fishing access area
- Camp access road
- Road removal
- Road setback
- Service road removal
- New alignment
- New levee
- Proposed OHP
- OHP removal
- Groundwater well
- New relief culvert

0 750 1,500 3,000 Feet





0 225 450 900 Feet



Existing Conditions

- ▬ Reach
- ▬ Approximate OHW
- ▬ Approximate 100 yr (4,160 cfs)
- ▬ WDFW campground

- ▬ Levee
- ▬ Road
- ▬ Service road
- Valley mile (2017)

Actions

- ▬ Restored floodplain
- ▬ Reconnected floodplain
- ▬ New lake
- ▬ Polishing wetland
- ▬ Parking
- ▬ Fishing access area
- ▬ Road removal
- ▬ Road setback
- ▬ Proposed OHP
- ▬ OHP removal

Tucannon PA 5-15

Sub-reach 6: VM 33.5 - VM 34.7





0 150 300 600 Feet



Existing Conditions

- ▬ Reach
- ▬ Approximate OHW
- ▬ Approximate 100 yr (4,160 cfs)
- ▬ WDFW campground

▬ Levee

▬ Road

▬ Service road

○ Valley mile (2017)

Actions

- ▬ Restored floodplain
- ▬ Reconnected floodplain
- ▬ New lake
- ▬ Fishing access area

▬ Proposed OHP

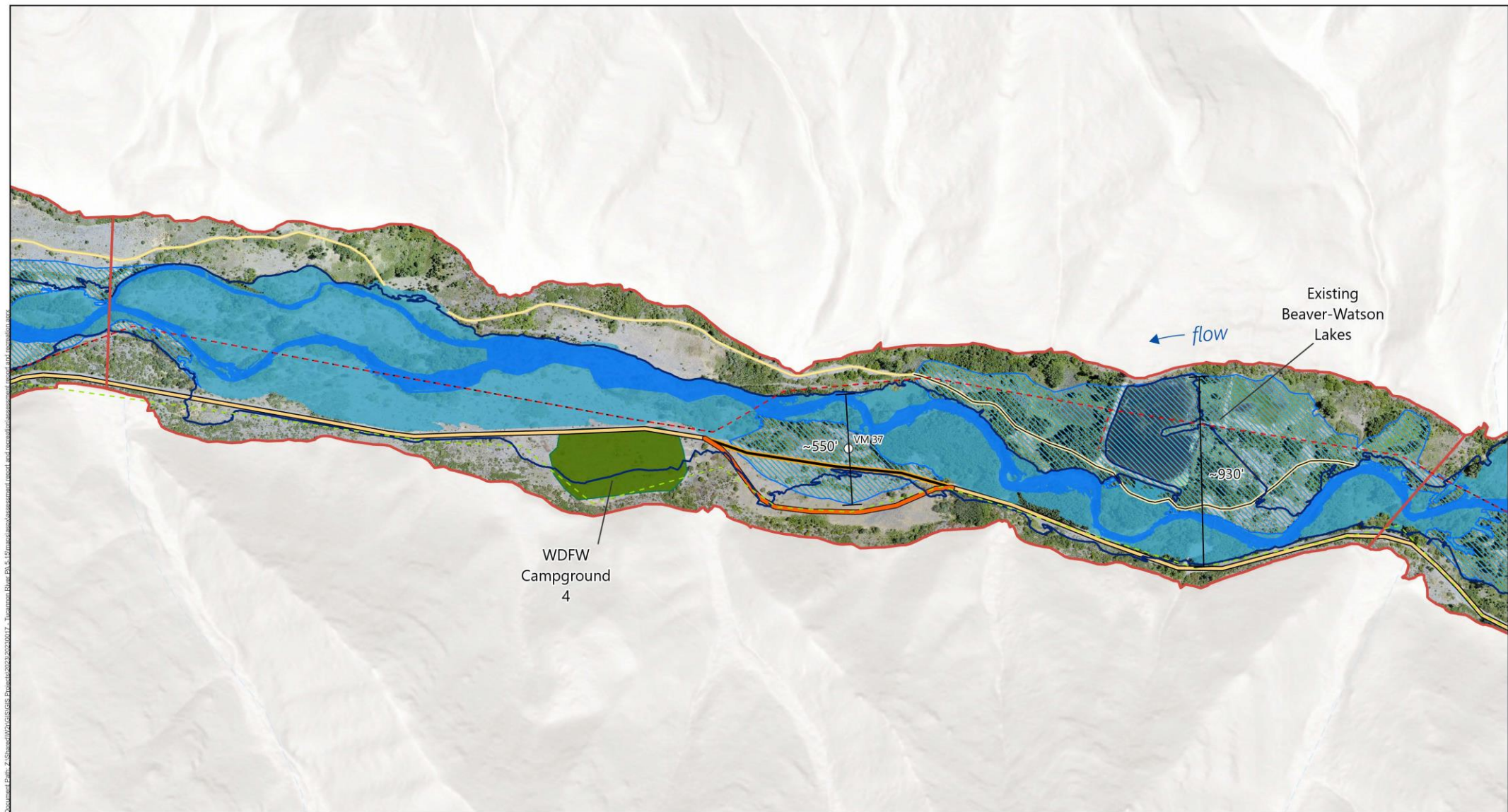
▬ OHP removal

● Groundwater well

Tucannon PA 5-15

Sub-reach 5: VM 35.5 - VM 36.6





0 200 400 800 Feet



Existing Conditions

- Reach
- Approximate OHW
- Approximate 100 yr (4,160 cfs)
- WDFW campground
- Road
- Service road
- Valley mile (2017)

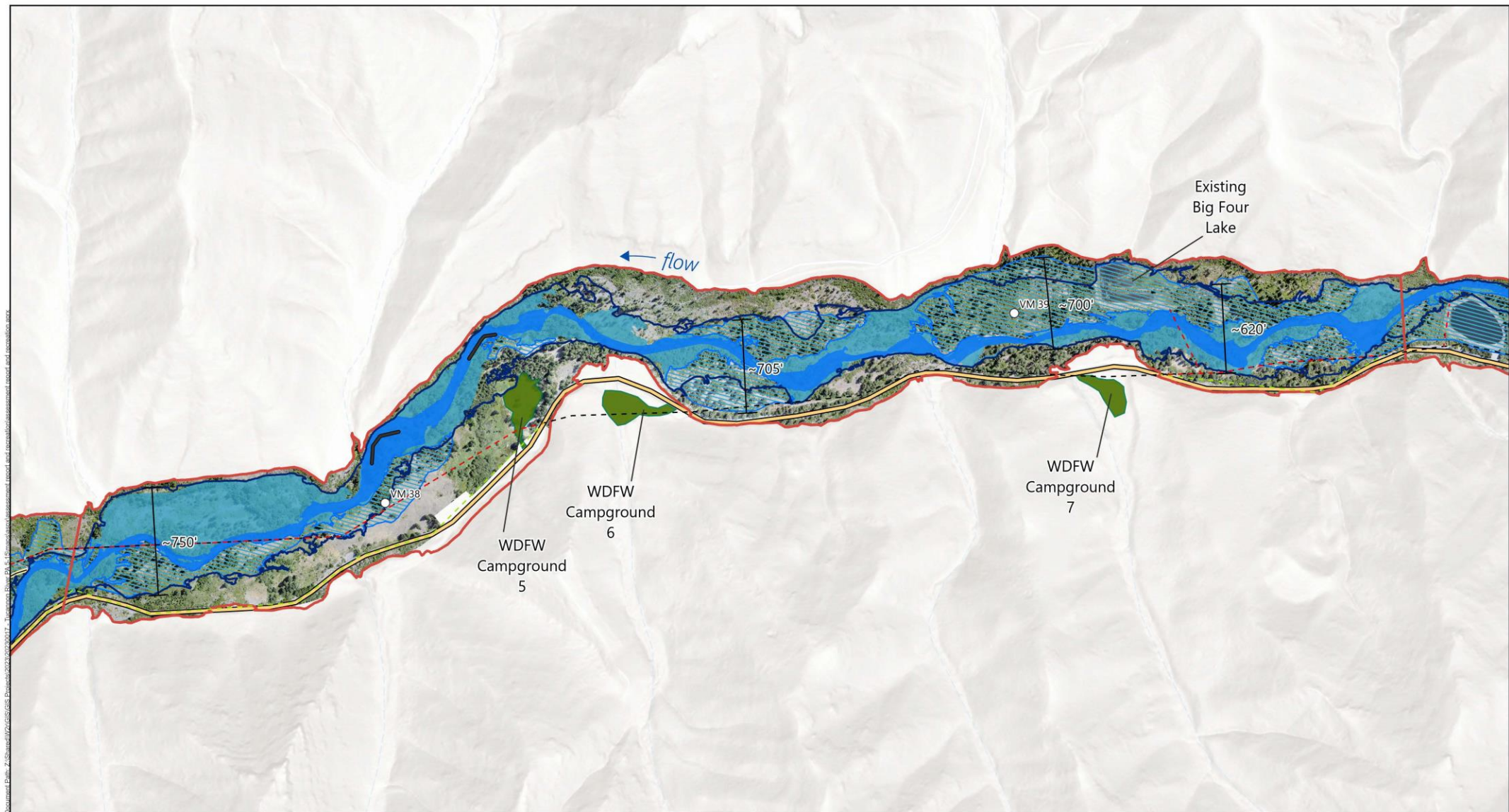
Actions

- Restored floodplain
- Reconnected floodplain
- Road removal
- Road setback
- Service road removal
- Proposed OHP
- OHP removal

Tucannon PA 5-15

Sub-reach 4: VM 36.6 - VM 37.6





0 250 500 1,000 Feet



Existing Conditions

- ▬ Reach
- ▬ Approximate OHW
- ▬ Approximate 100 yr (4,160 cfs)
- WDFW campground
- ▬ Levee
- ▬ Road
- ▬ Service road
- Valley mile (2017)

Actions

- Restored floodplain
- ▨ Reconnected floodplain
- ▬ Service road removal
- ▬ Proposed OHP
- - - OHP removal

Tucannon PA 5-15

Sub-reach 3: VM 37.6 - VM 39.6





0 125 250 500 Feet



Existing Conditions

- ▬ Reach
- ▬ Approximate OHW
- ▬ Approximate 100 yr (4,160 cfs)
- USFS campground
- ▬ Road
- Valley mile (2017)

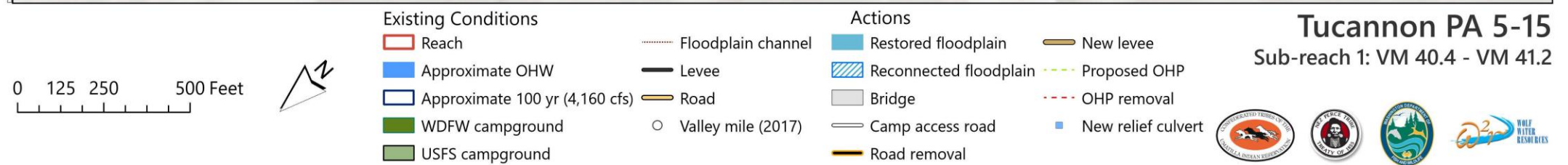
Actions

- Restored floodplain
- ▨ Reconnected floodplain
- ▬ Road removal
- ▬ Road setback
- ▬ Proposed OHP
- - - OHP removal

Tucannon PA 5-15

Sub-reach 2: VM 39.6 - VM 40.4





Check Out The Project Webpage



<https://tucannonriver.org/tucannon-pa5-15-assessment/>