

Recent Watershed Enhancement Projects Klickitat Subbasin



David Lindley
Columbia Gorge Science Conference
April 18, 2017



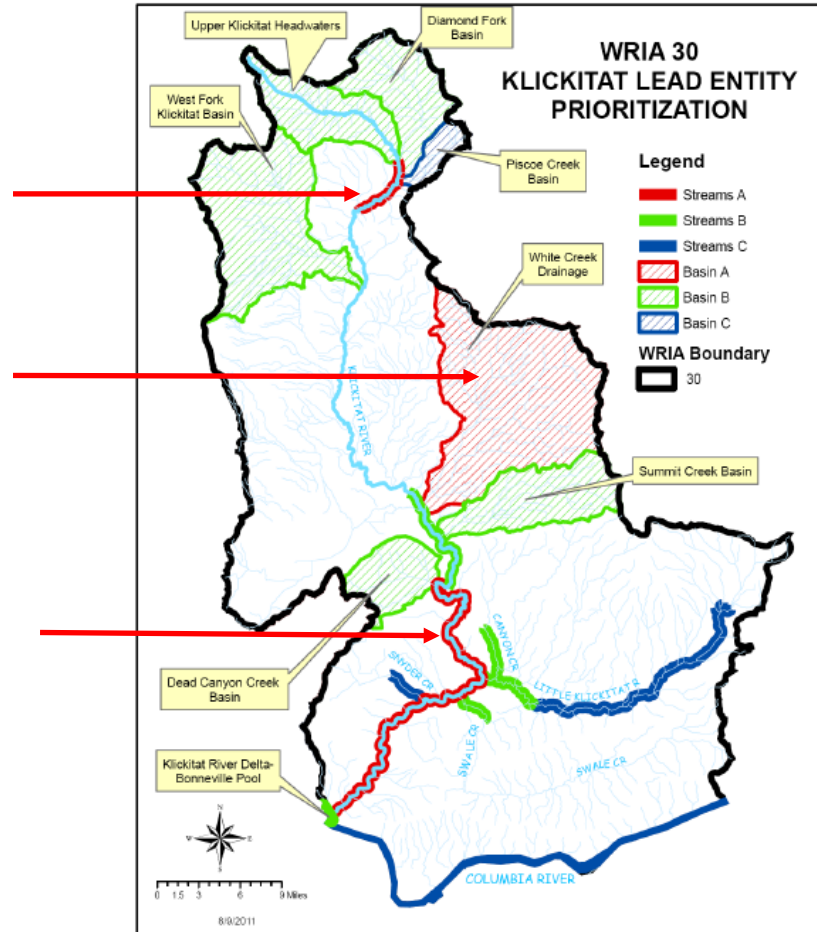
Link Project Actions to Priority Areas

Upper Klickitat Phase 3 & 4

Tepee Creek Phase 2

White Creek LWD (2017)

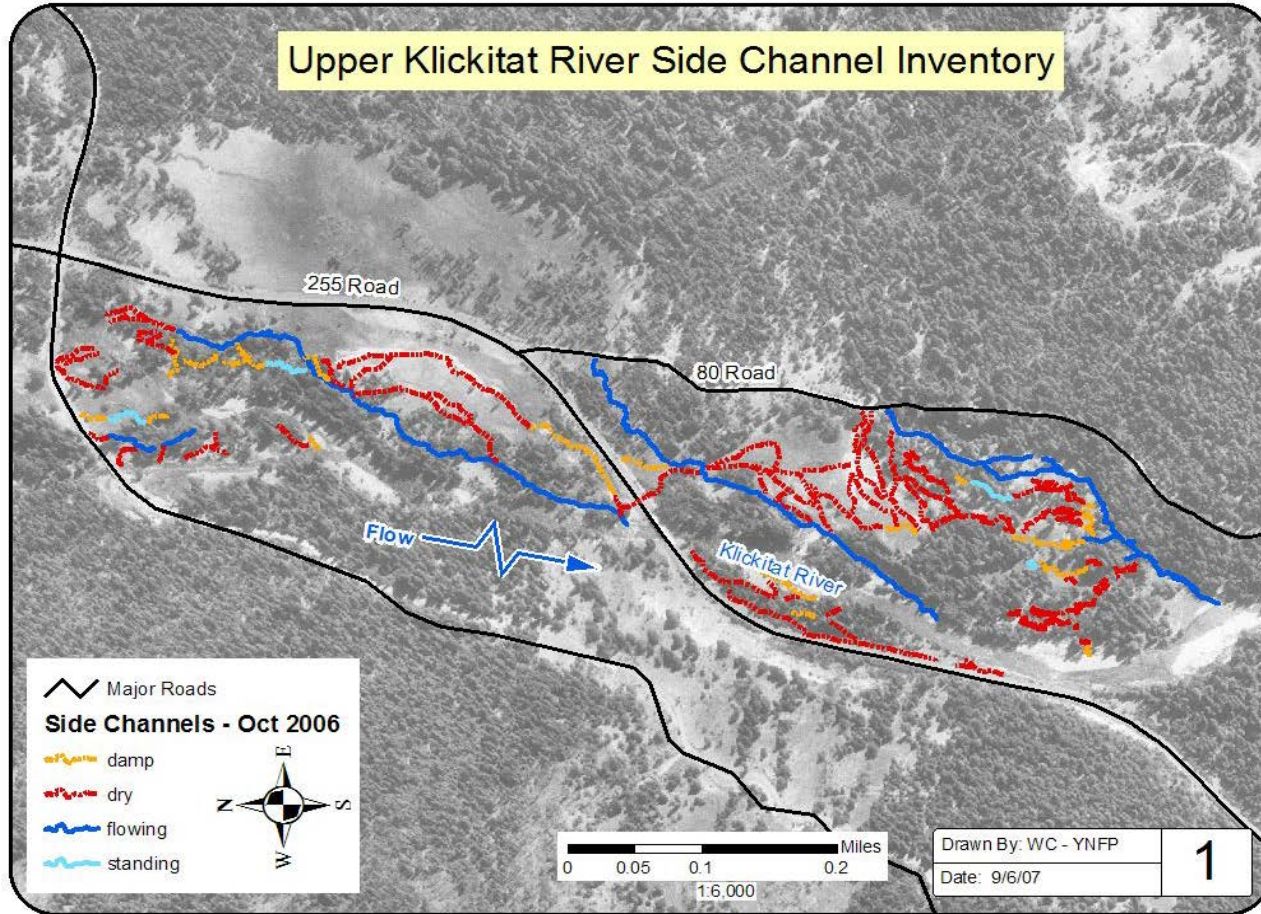
Haul Road Phase 6 (2017)



Protect, restore, or enhance identified priorities
2012-2016

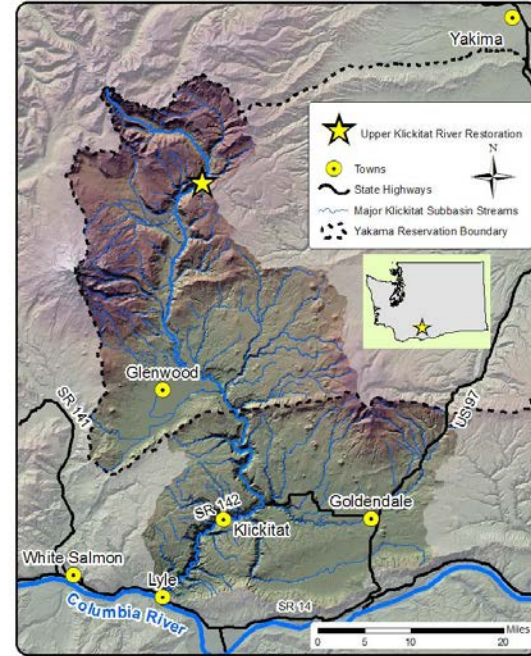


Upper Klickitat River – Phase 3

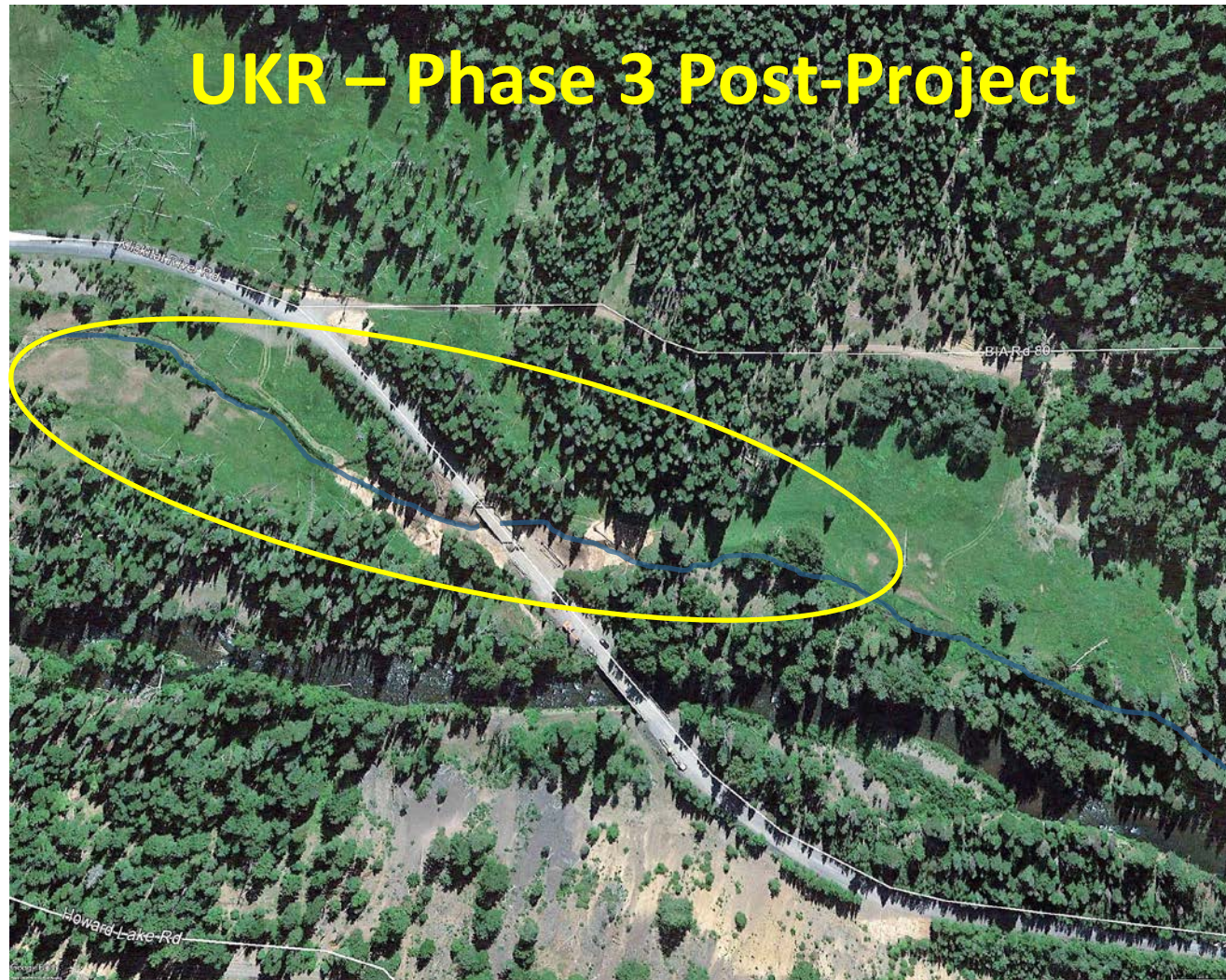


Upper Klickitat River – Phase 3

- Channel simplification
- Channel alignment deflected by road fill
- Limited side channel development and length



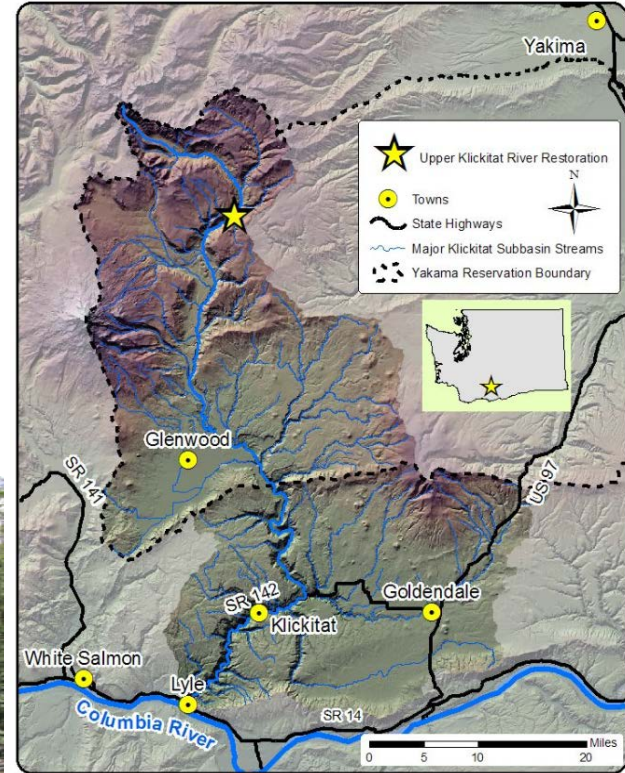
UKR – Phase 3 Post-Project





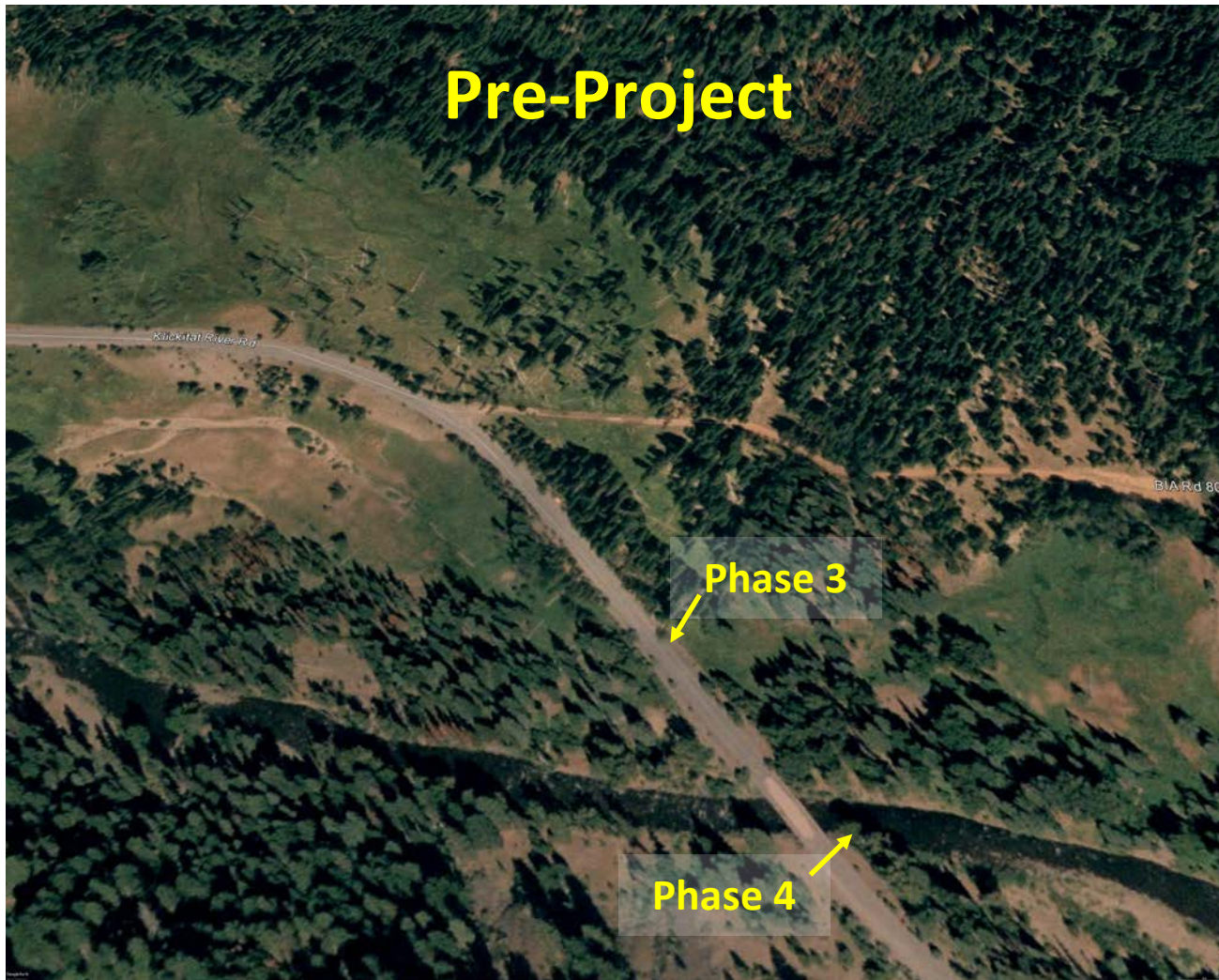
Upper Klickitat River – Phase 4

- Channel and habitat simplification
- Channel confined to facilitate road x-ing
- Floodplain isolation



WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Salmon Recovery
Funding Board

Pre-Project



Phase 3

Phase 4

A photograph of a river flowing through a dense forest. The river is the central focus, with water splashing and creating white foam. The banks are lined with tall, green trees. A semi-transparent white box is overlaid on the image, containing text. On the right side of the image, there is a vertical bar with a blue-to-green gradient.

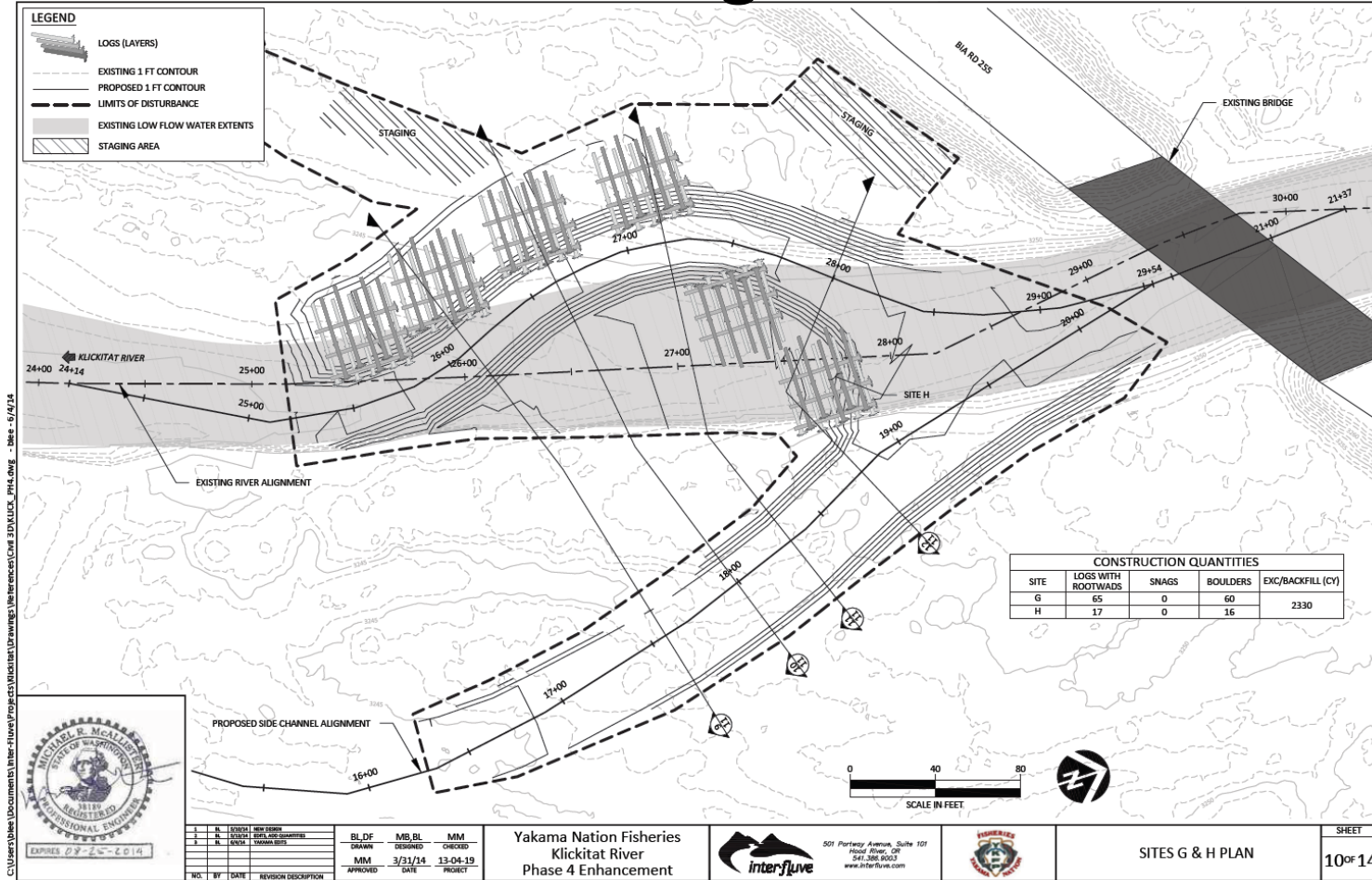
Goal

- Improve instream habitat, reverse channel incision, and increase overbank flow frequency

Approach

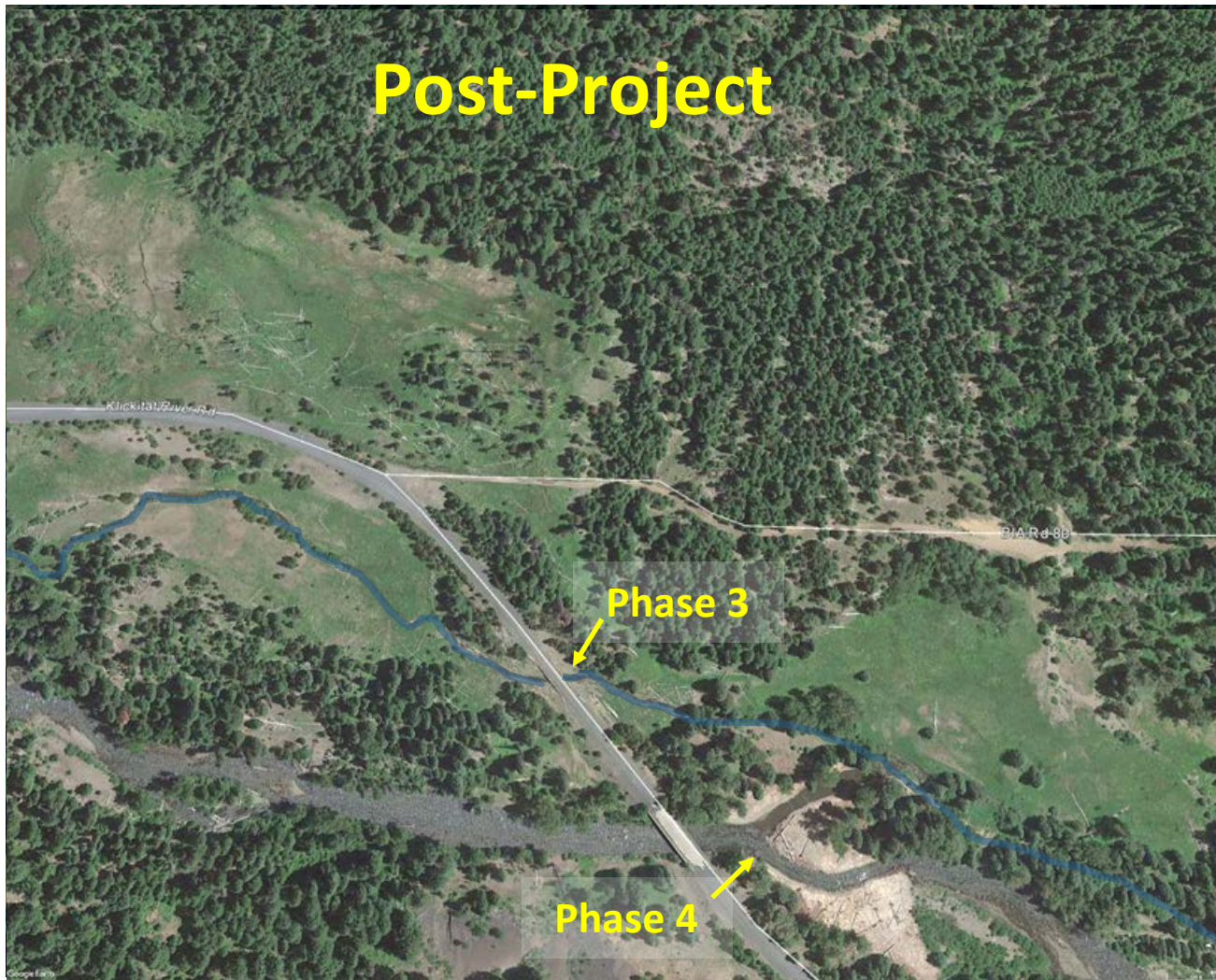
- Split flow from a single thread into two channels
 - baseflow through right (west) channel
 - spring flows in left (east) channel
- Log jams
 - installed along right channel margin and at flow splits
 - provide habitat, bank stability, and backwater effects

Design



C:\Users\jshelton\Documents\Inter-fluv\Projects\Klickitat\Drawings\Interfluv\Klickitat\Drawings\Interfluv\Klickitat_PHA.dwg - sheet - 6/1/14

Post-Project



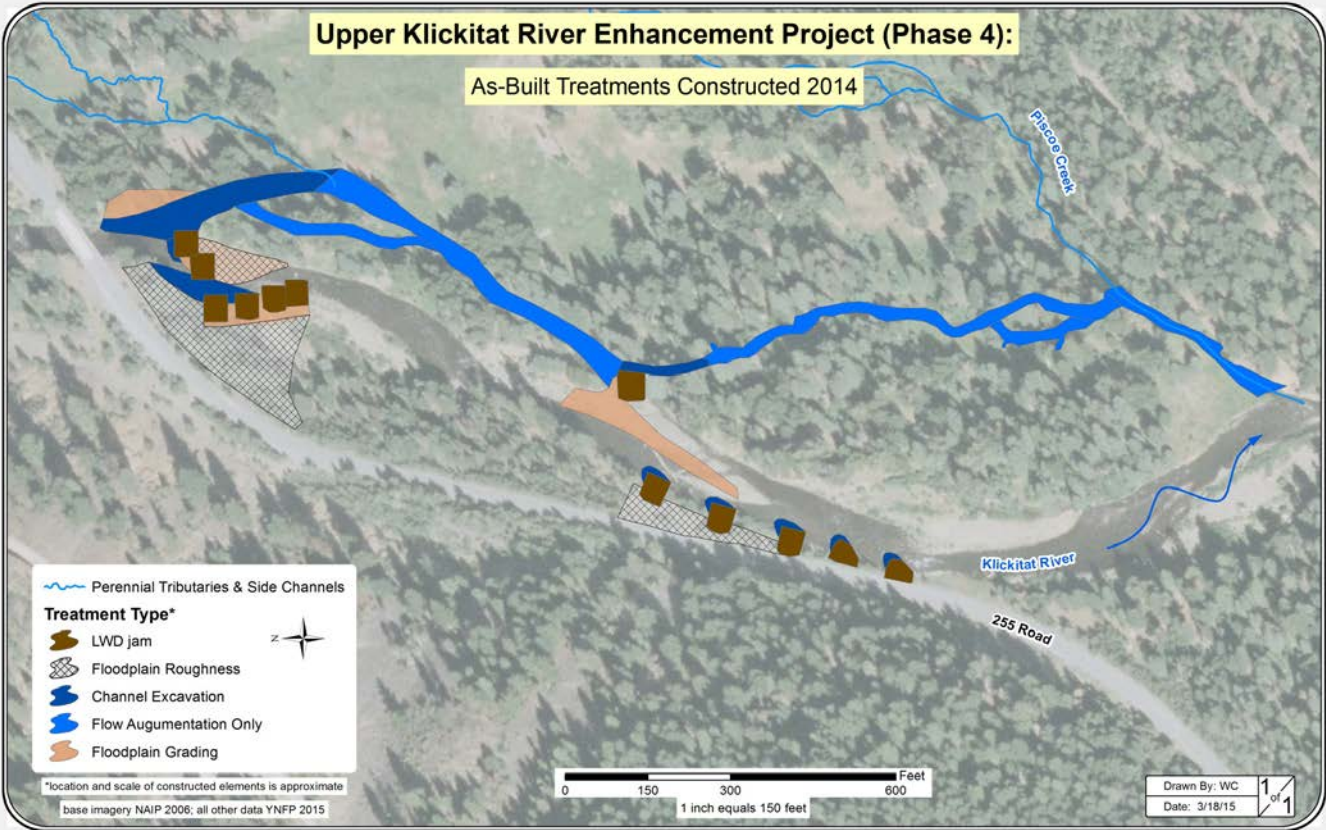
Results

Before

After



As-built

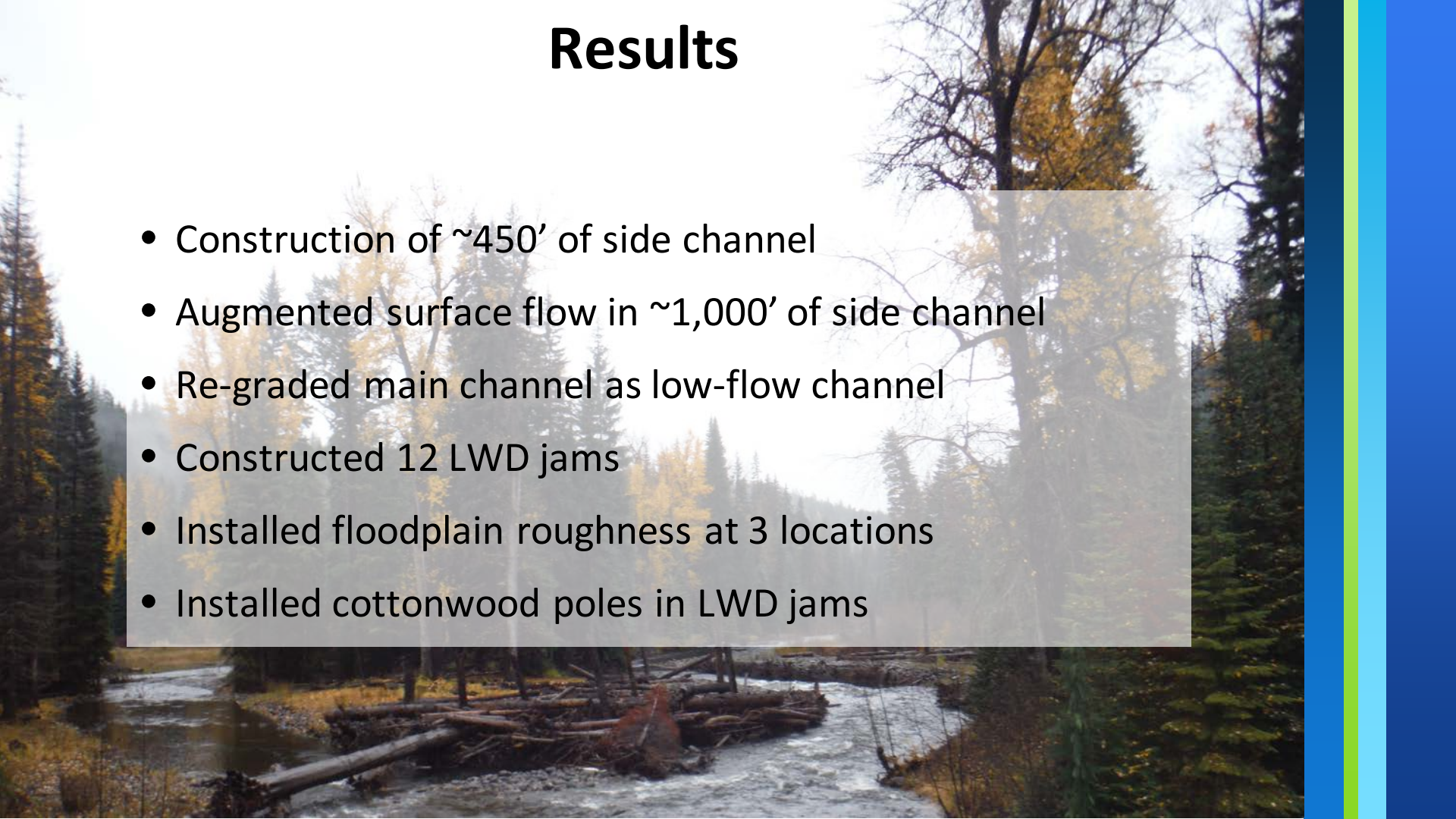


Results



Results

- Construction of ~450' of side channel
- Augmented surface flow in ~1,000' of side channel
- Re-graded main channel as low-flow channel
- Constructed 12 LWD jams
- Installed floodplain roughness at 3 locations
- Installed cottonwood poles in LWD jams

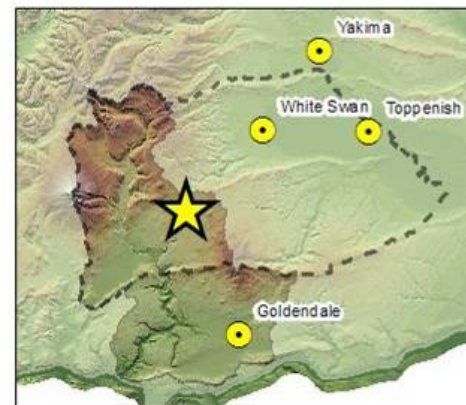
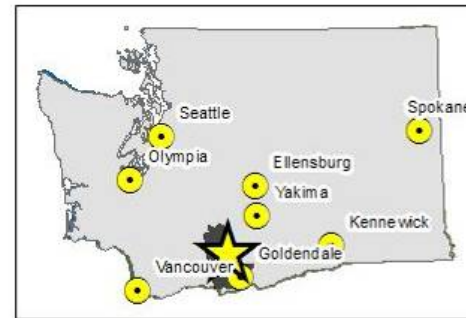


Tepee Creek – Phase 2

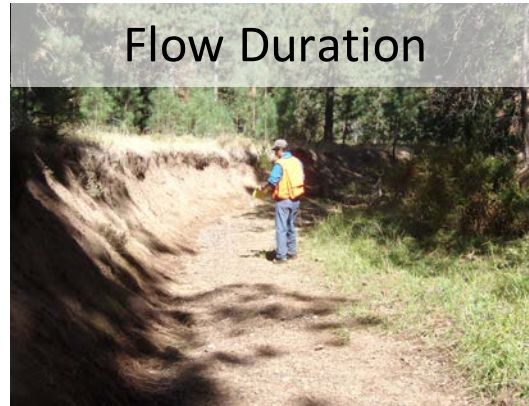
Project goals :

- Restore overbank flow to \leq 2-year recurrence
- Increase floodplain storage
- Reduce active channel hydraulic severity
- Enhance rearing conditions
- Reduce conifer encroachment into meadow
- Restore suitability of valley bottom for medicinal and traditional food plants

0.8 mile long reach (RM 4.5 – 5.3)



Tepee Creek Pre-Project Conditions



Incised Channel



Fish Stranding/Mortality

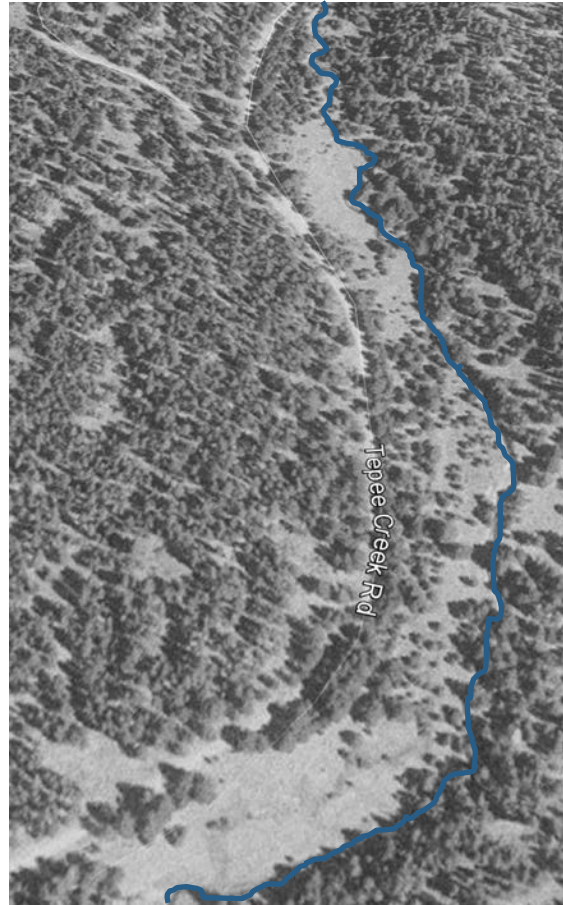


Tepee Creek – Phase 2

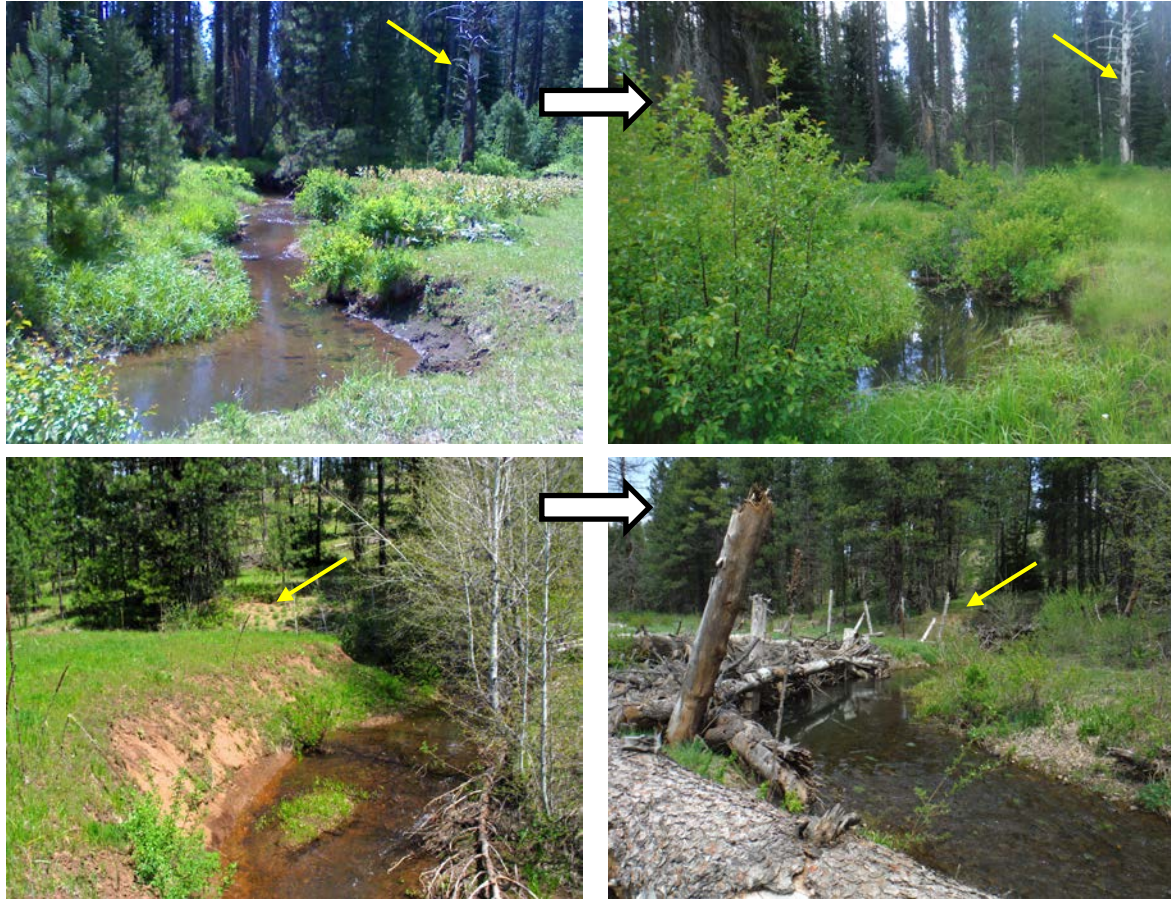
1996

2013

2016



Tepee Creek – Phase 2



Tepee Creek – Phase 2

Before

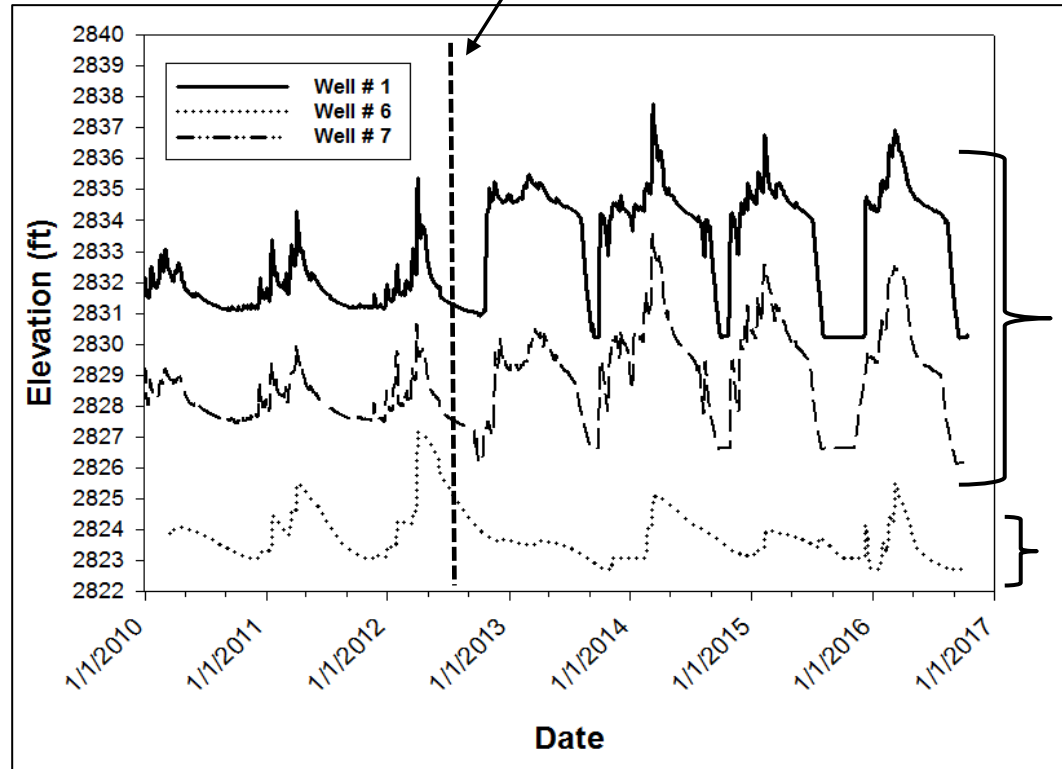


After



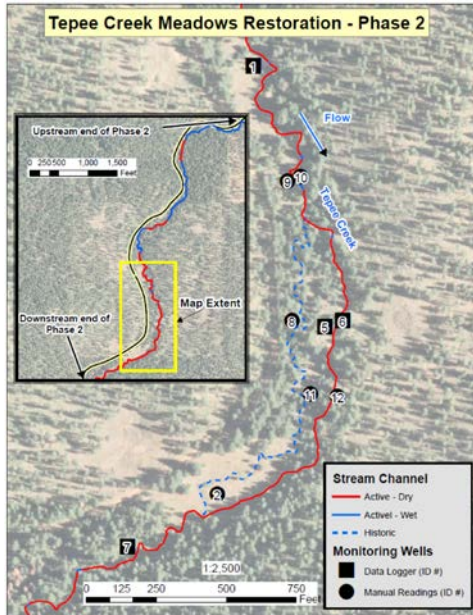
Tepee Creek – Phase 2

Project Completion



Treatment

Control



Protect, restore, or enhance identified priorities
2017 Implementation

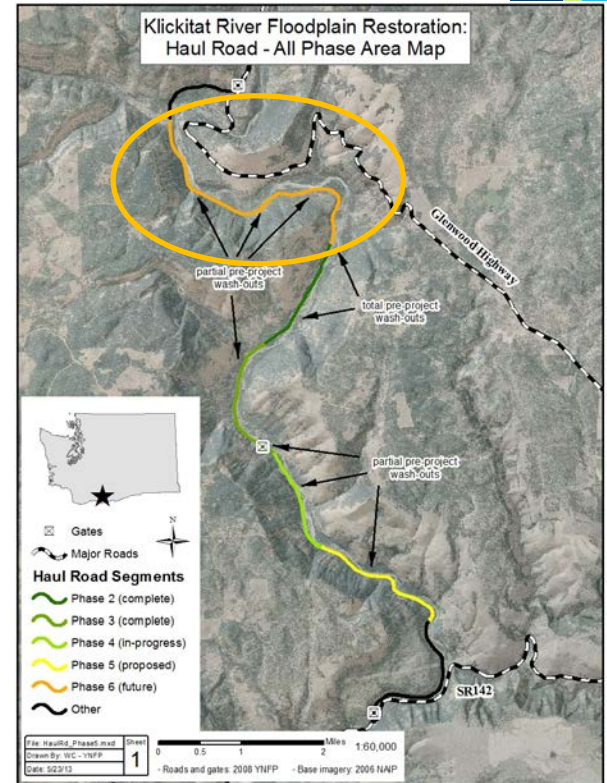


Haul Road – Phase 6

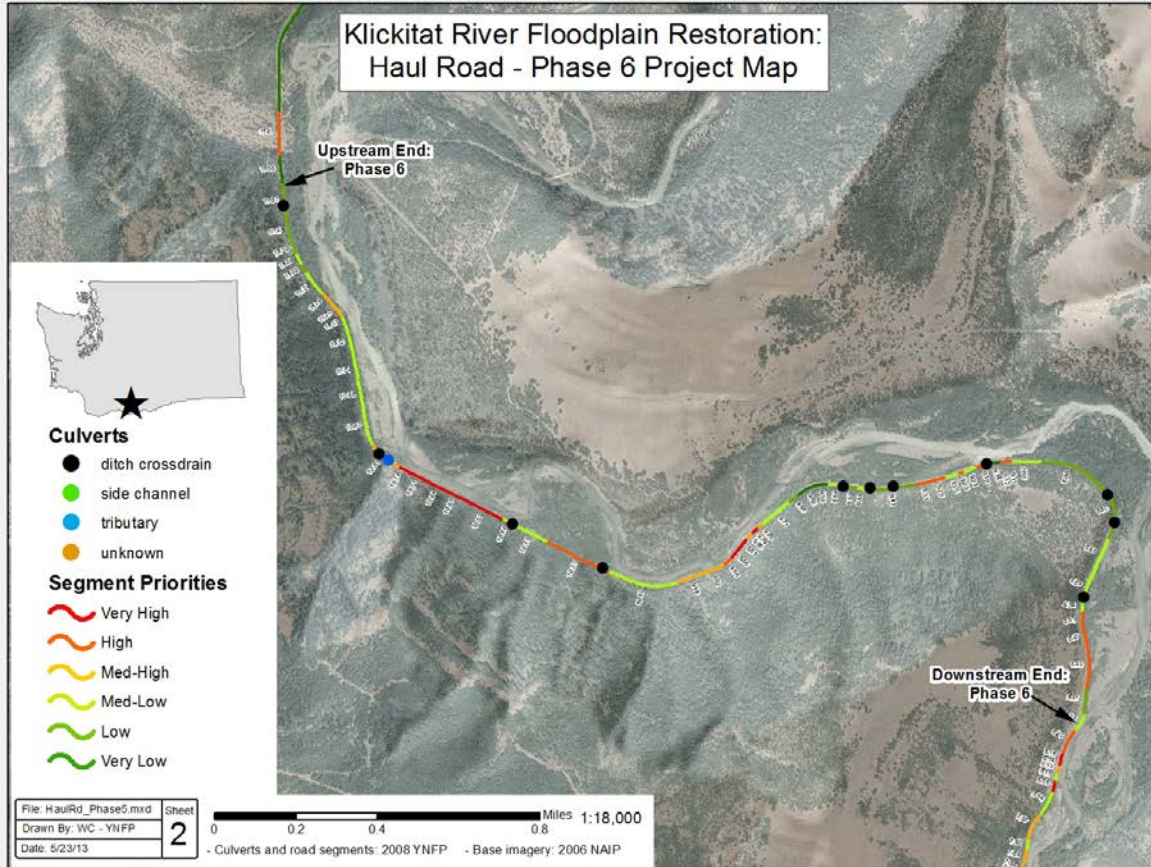
Goal: Restore connectivity of riverine, floodplain, and hillslope processes (RM 27-31).

Limiting Habitat Features addressed:

- Increase habitat complexity
- Restore floodplain connectivity
- Increase pool frequency and quality
- Improve riparian conditions and LWD recruitment
- Restore channel migration zone boundaries
- Reconnect tributary alluvial inputs (sediment)
- Reconnect colluvial pathways (sediment and LWD)



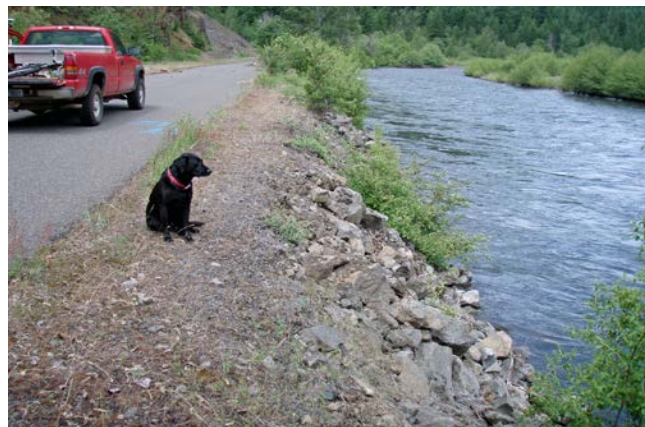
Haul Road – Phase 6



Haul Road – Phase 6

Treat 3.3 miles of floodplain road:

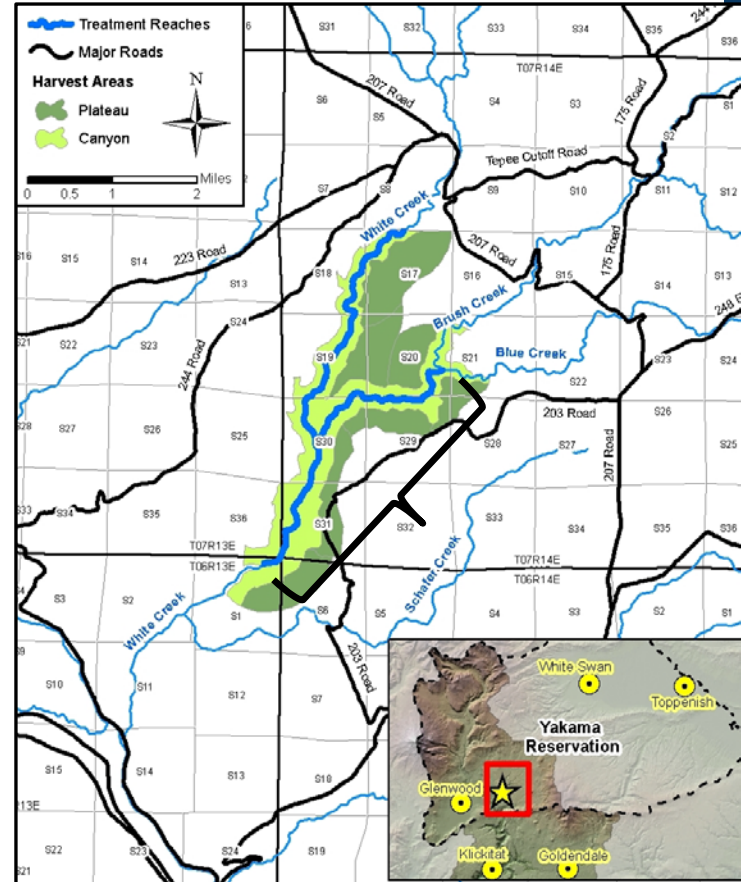
- 1.1 miles of active channel contact
- 0.5 miles of backwater channel contact
- 855 ft of floodplain reconnection
- Removal of 12 culverts:
 - 11 cross-drains
 - 1 Type 'N' tributary
- Control invasive and establish native plants



* In-water work July 1 – August 31, 2017

White Ck LWD Project

- **Channel and habitat simplification**
 - Plane bed morphology
 - Low pool and LWD frequency
 - Armored substrate and poor habitat
 - Fish stranding



Project Approach

Treat habitat features identified with potential for desirable response

- Localized bed scour
 - Increased pool depth
 - Sediment sorting
- Increase in reach-based roughness

Implementation Approach

- Harvest LWD in a centralized location to treatment sites
- Stage LWD in distributed landings near canyon rim
- Transport LWD from landings and place via helicopter

Fall 2017



Questions



Photo Courtesy Columbia Land Trust