

Wynoochee and Satsop Rivers Proposed Restoration Elements

Key Elements

- Land
 - ▶ Land acquisition
 - ▶ Conservation easements
 - ▶ Relocation options to accommodate target land use outside of erosion and flood risk areas
 - ▶ Provide land owners with land to offset recent losses to channel migration and avulsion



Satsop River (RM 8.5) 2017 aerial (Google Earth).

Key Elements

■ Structural Habitat Elements

- ▶ Engineered Log Jams (ELJs) within Channel and Floodplain to Create:
 - ▶ Channel stability
 - ▶ Flow deflection
 - ▶ Pools
 - ▶ Stable forested islands
 - ▶ Side channels

■ Temporary Habitat Enhancements – Limited Application

- ▶ Excavated side channels
- ▶ Constructed floodplain wetlands
 - ▶ Immediate habitat benefits
 - ▶ Restored process will ultimately be modified by dynamic river processes.



Engineered log jam on the Elwha River viewing downstream. Photo taken ~2018 by T. Abbe

Key Elements

- Structural Bank Protection Elements
 - ▶ Complex timber revetments to reduce channel migration rates.
 - ▶ Array of ELJ flow deflectors.
 - ▶ Flood fences/post arrays to trap debris and protect riparian revegetation.



Complex timber revetment on South Fork Nooksack. View is downstream. Photo taken ~2012 by T. Abbe



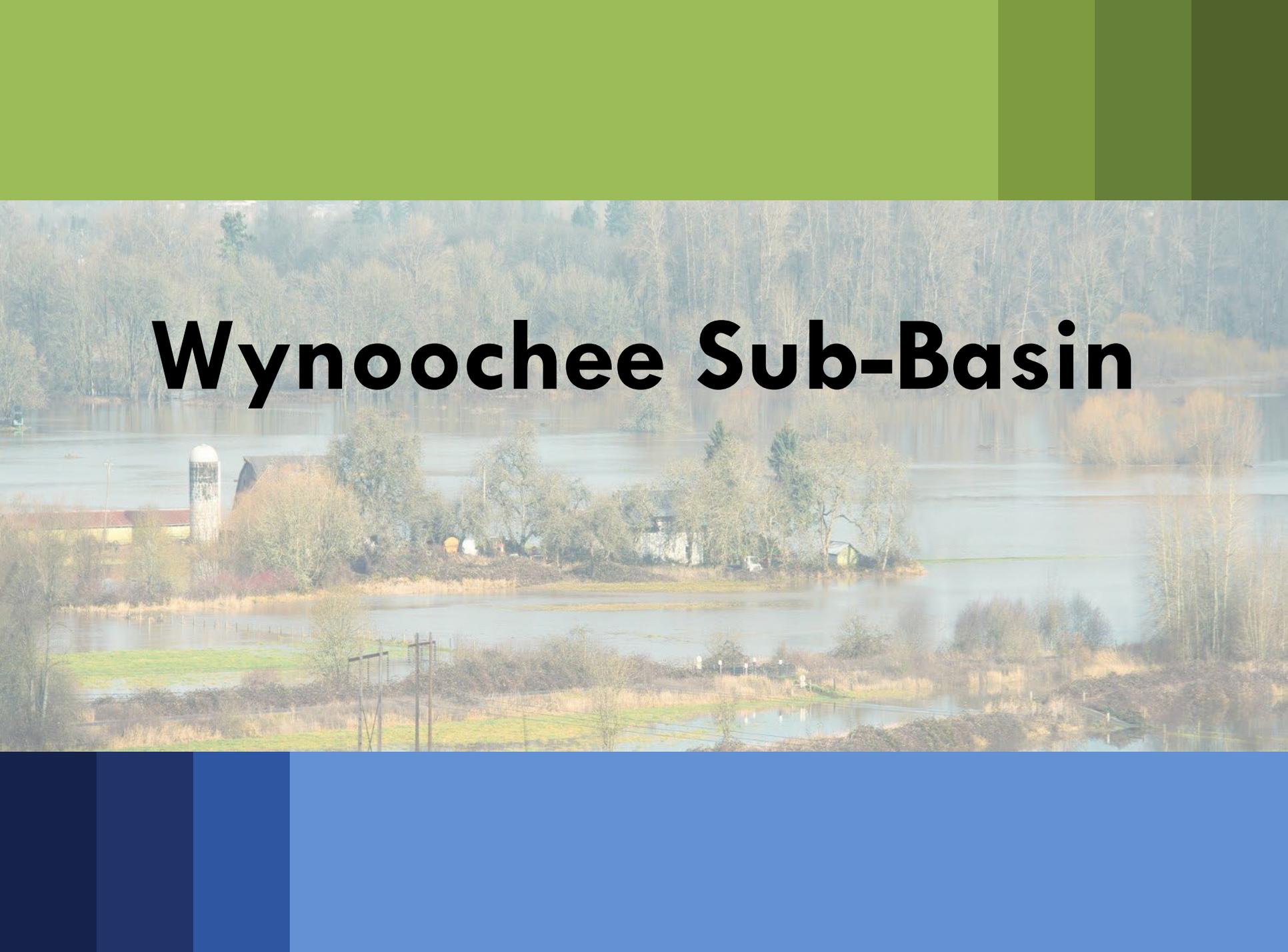
Flood fence revetment taken by Aldrich and DeVries 2017

Key Elements

- Riparian Reforestation
 - ▶ Restart the large wood cycle through enhancing existing forests and planting new forests within the restoration corridor.
 - ▶ Reduce channel migration rates.
 - ▶ ELJs as hard points to allow forest maturation.
 - ▶ Silviculture to accelerate growth of late seral trees (e.g., Western Red Cedar, Sitka Spruce, Doug Fir, Bigleaf Maple, Black Cottonwood)

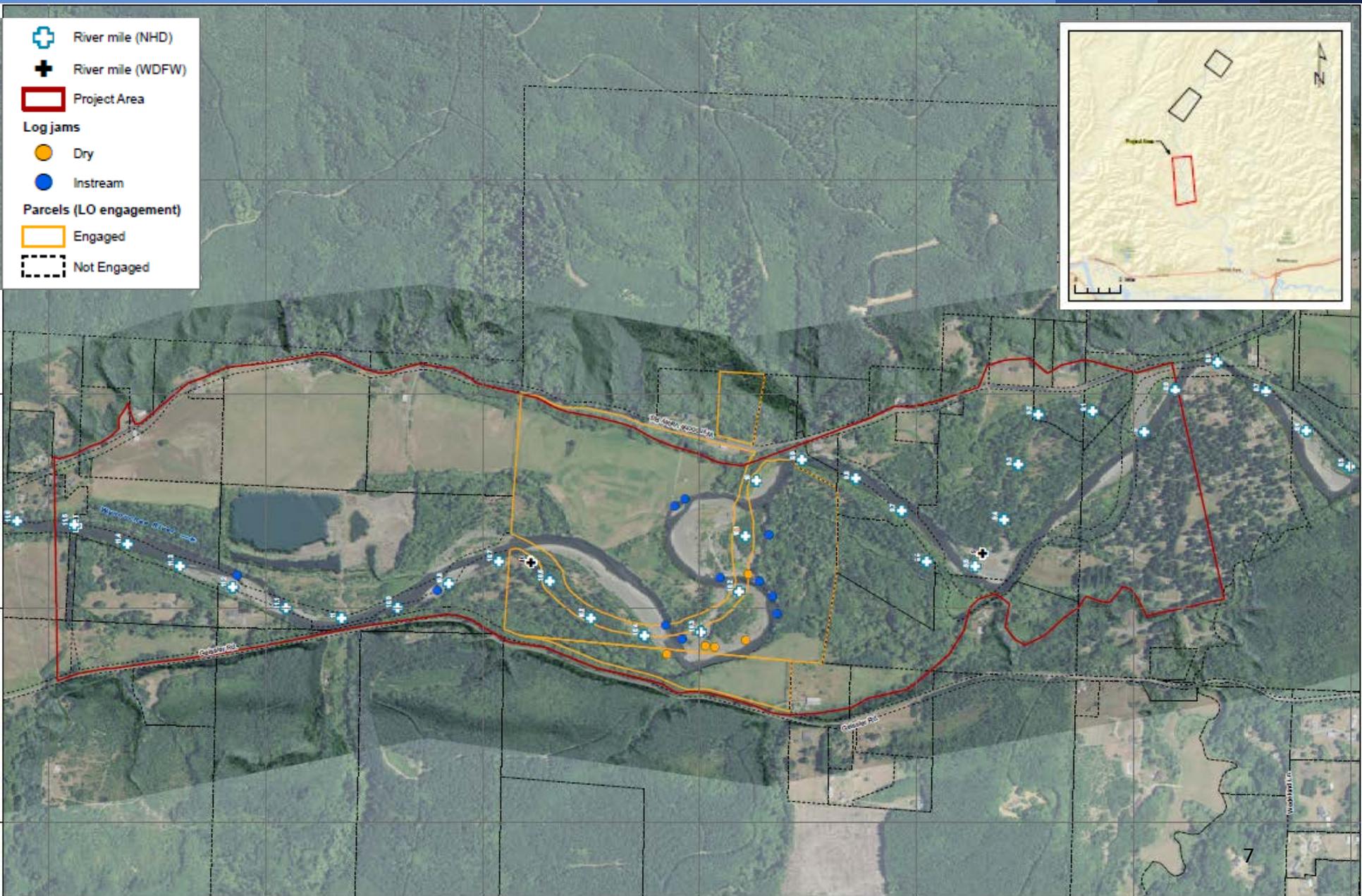
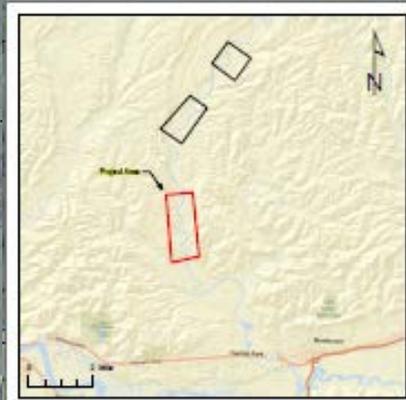


Wynoochee Sub-Basin

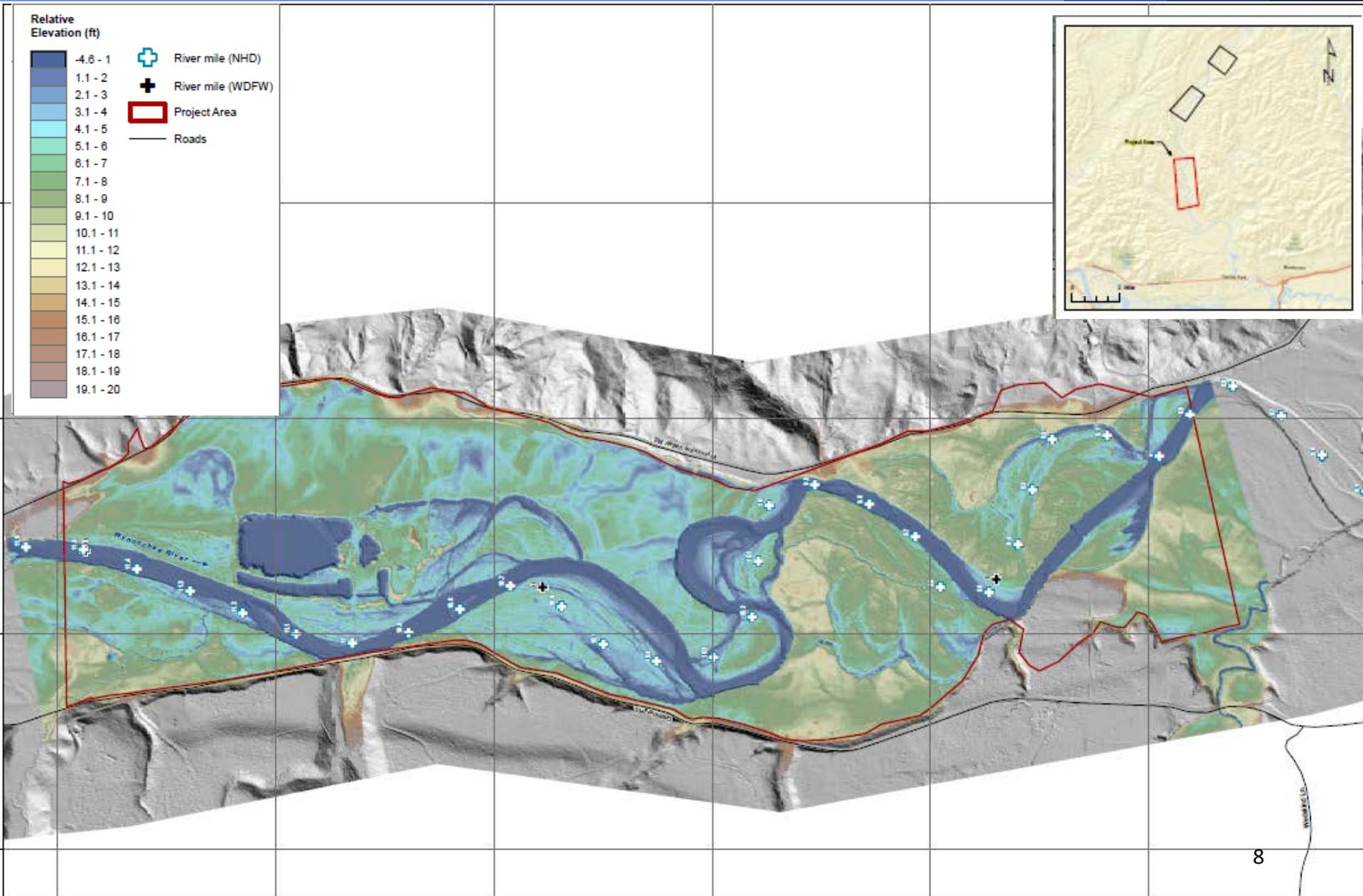
A landscape photograph showing a flooded area. In the foreground, there is a grassy field with a fence. In the middle ground, a large body of water (likely a reservoir or flooded area) surrounds a small island or peninsula. On this island, there is a large barn with a red roof and a tall, white, cylindrical silo. The background consists of a dense forest of trees, some of which are bare, suggesting a late autumn or winter setting. The sky is overcast. The image is framed by a green bar at the top and a blue bar at the bottom.

Wynoochee RM 8.5-11

-  River mile (NHD)
-  River mile (WDFW)
-  Project Area
- Log jams**
-  Dry
-  Instream
- Parcels (LO engagement)**
-  Engaged
-  Not Engaged

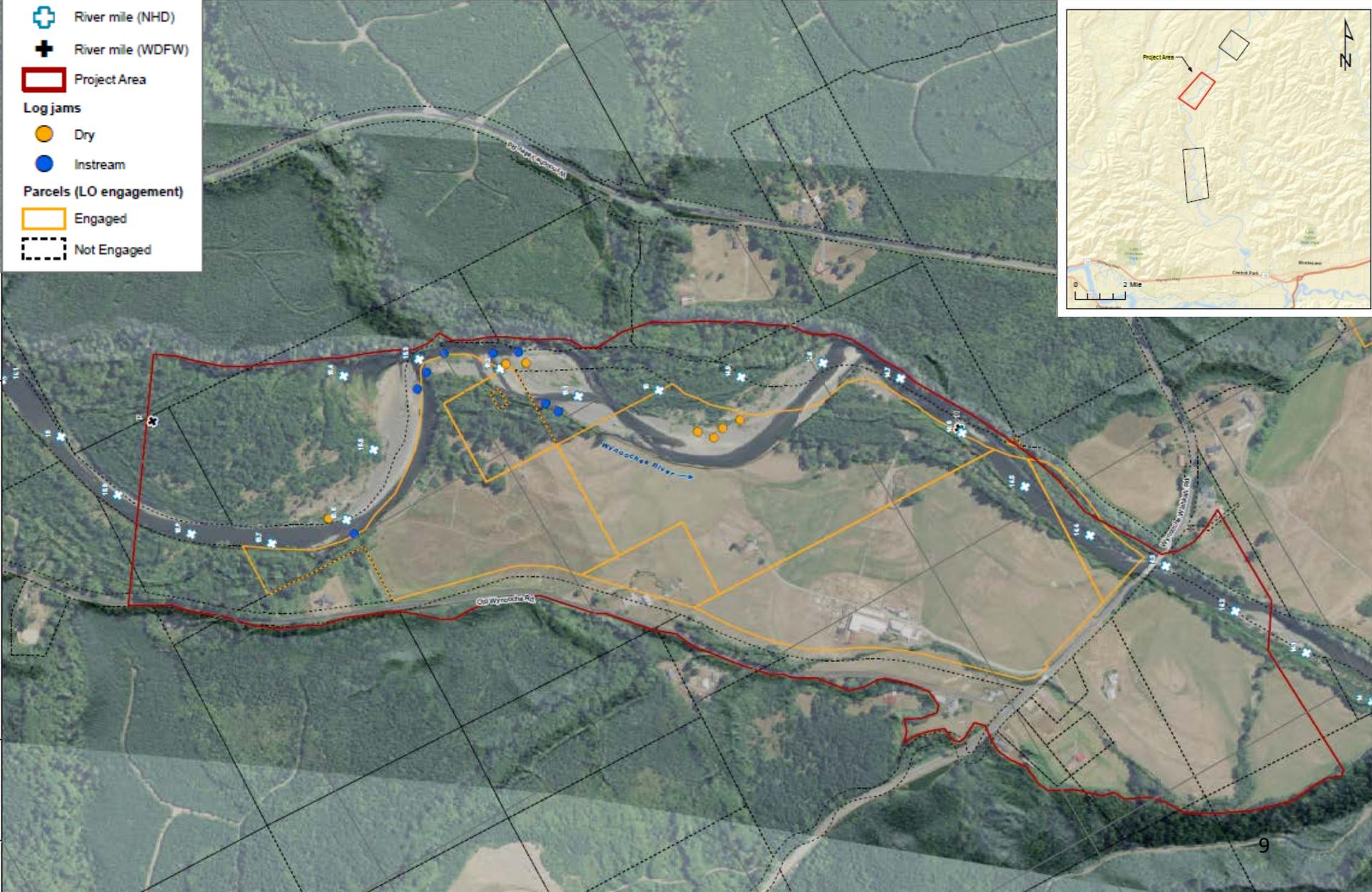
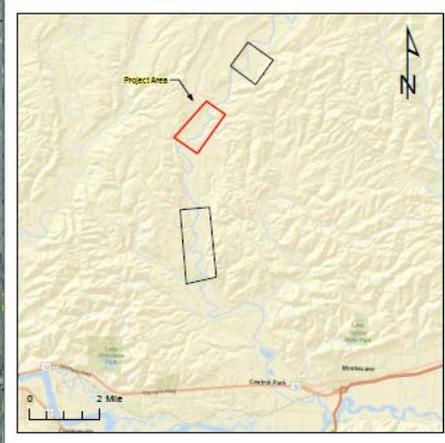


Wynoochee RM 8.5-11

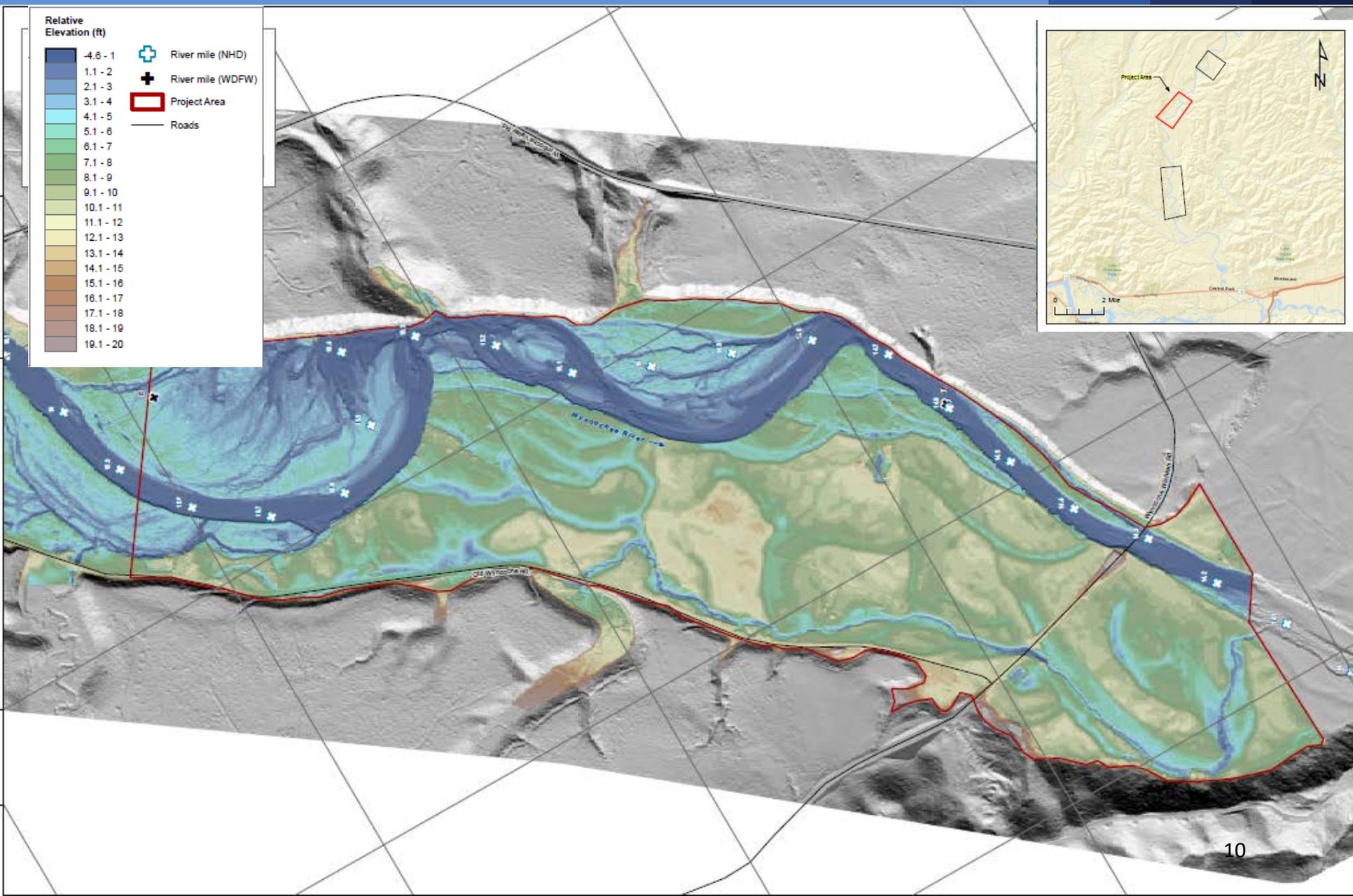


Wynoochee RM 13.5 – 15.0

-  River mile (NHD)
-  River mile (WDFW)
-  Project Area
- Log jams**
-  Dry
-  Instream
- Parcels (LO engagement)**
-  Engaged
-  Not Engaged



Wynoochee RM 13.5 – 15.0

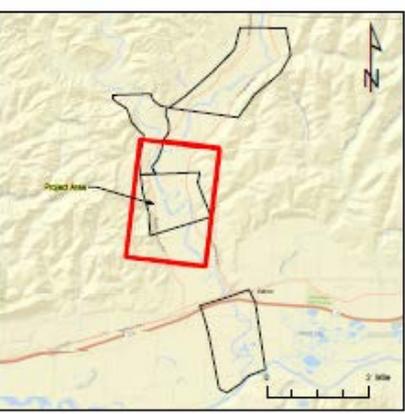


Satsop Sub-Basin

A landscape photograph showing a flooded area. In the foreground, there is a grassy field with a fence. In the middle ground, a large body of water (likely a reservoir or flooded field) is visible. On the left side of the water, there is a barn and a tall silo. The background is a dense forest of trees, some of which are bare, suggesting a late autumn or winter setting. The sky is overcast. The image is framed by a green bar at the top and a blue bar at the bottom.

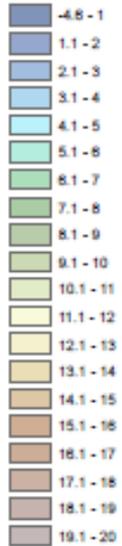
Satsop RM 4.5 – 6.5

-  River mile (NHD)
-  River mile (WDFW)
-  Project Area
- Log jams
 -  Dry
 -  Instream
- Parcels (LO engagement)
 -  Engaged
 -  Not Engaged

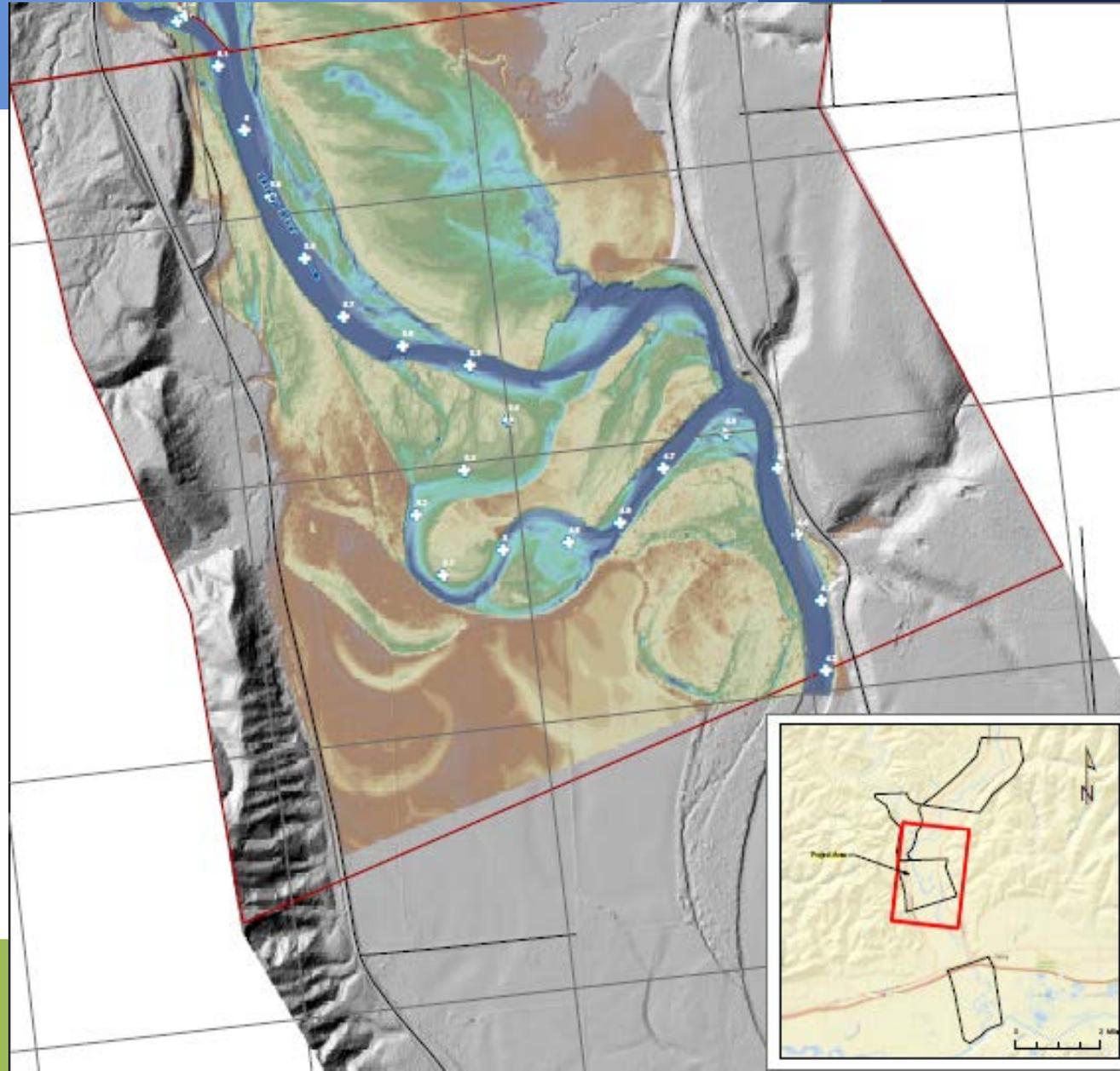


Satsop RM 4.5 – 6.5

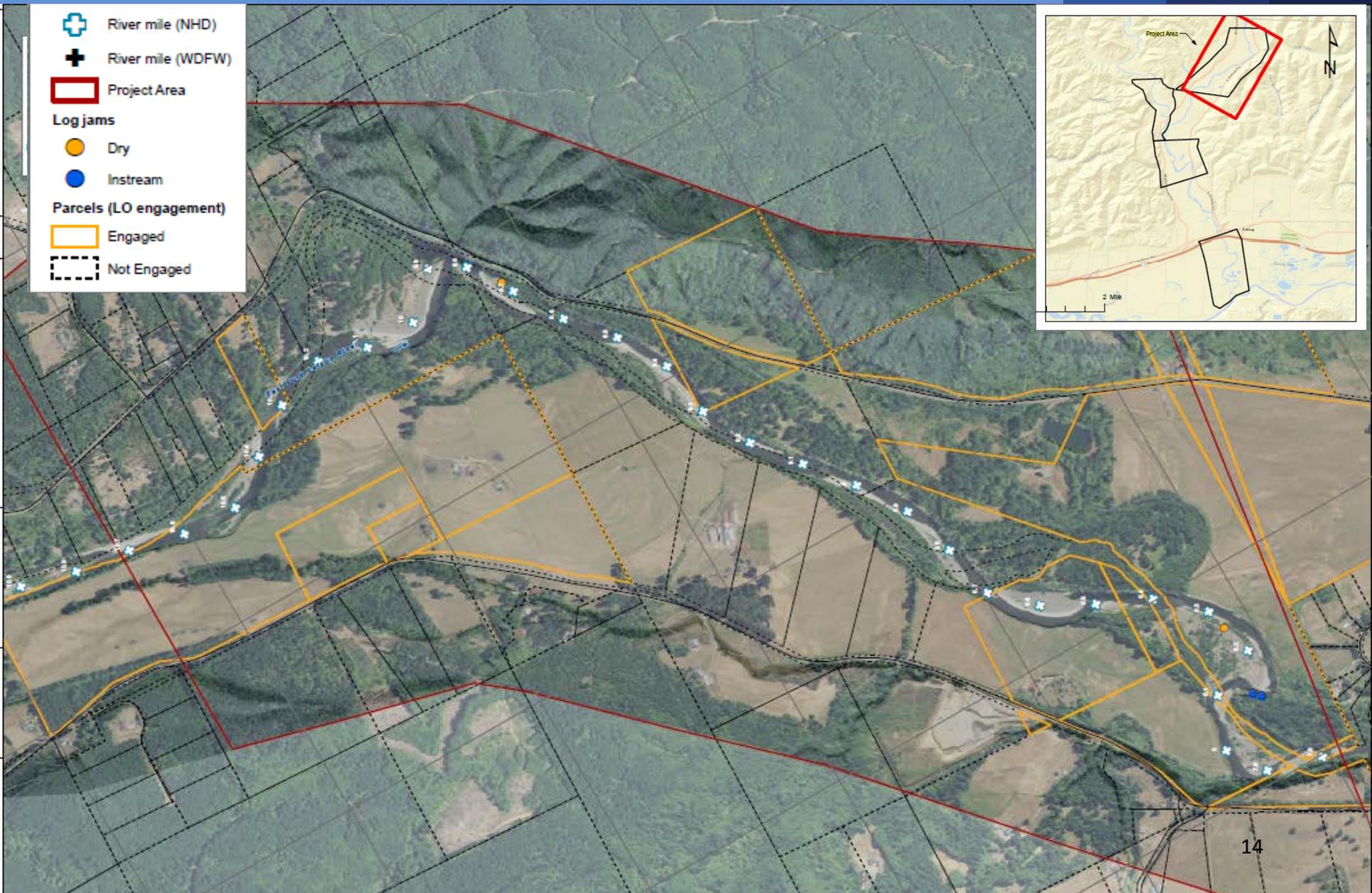
Relative Elevation (ft)



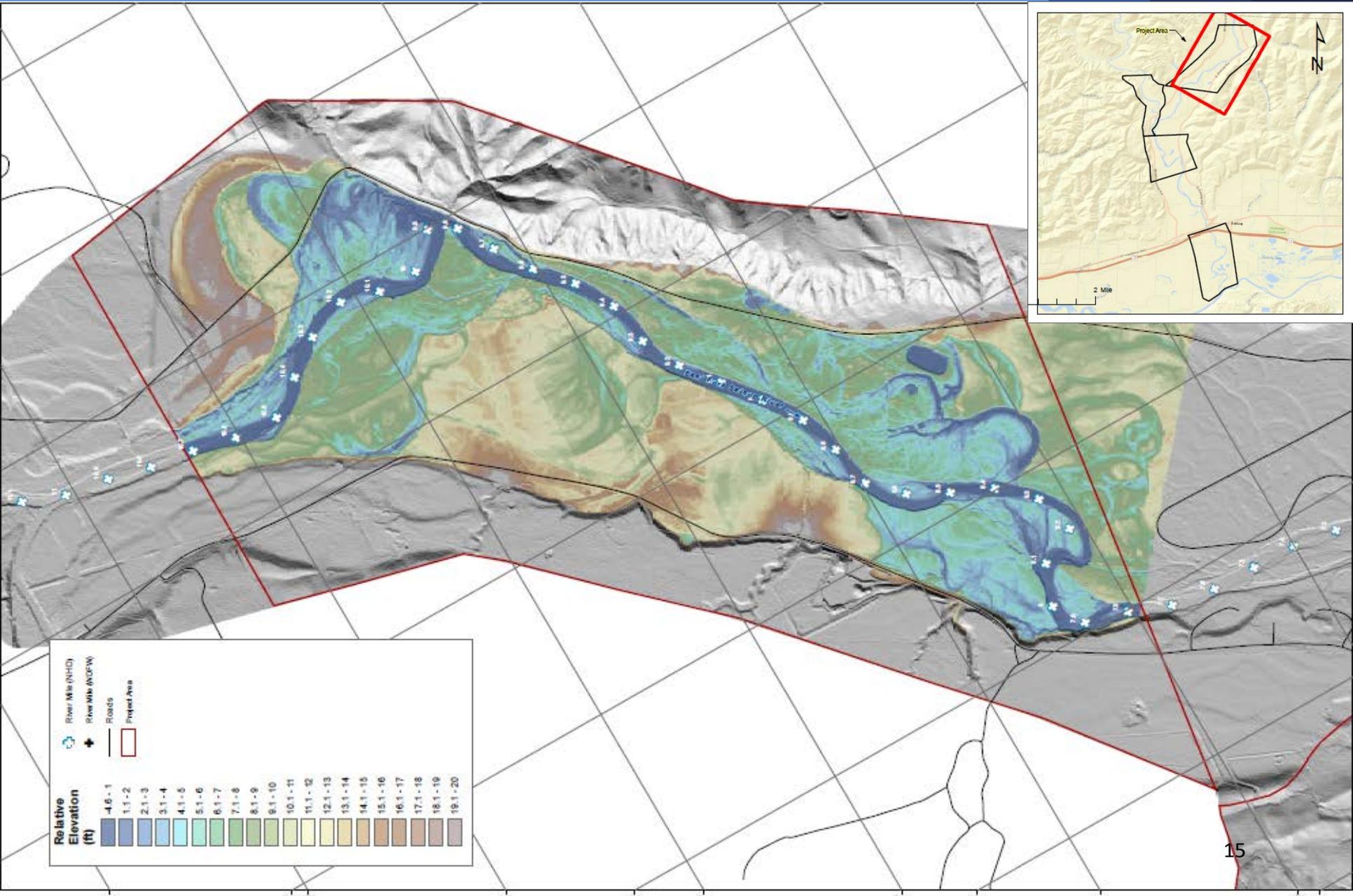
- River Mile (NRD)
- River Mile (WDFW)
- Project Area
- Roads



Satsop Lower East Fork RM 8.0 -10.5



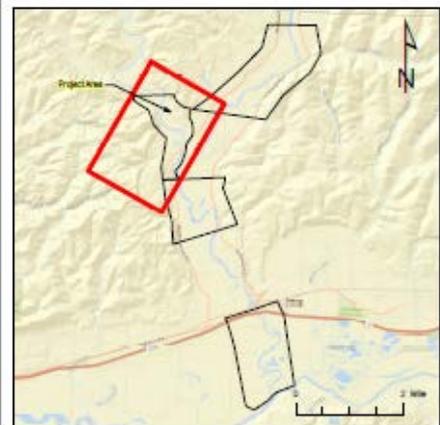
Satsop Lower East Fork RM 8.0 -10.5



Satsop Lower West Fork RM 0.0 – 2.0



- River mile (NHD)
- River mile (WDFW)
- Project Area
- Log jams**
 - Dry
 - Instream
- Parcels (LO engagement)**
 - Engaged
 - Not Engaged



Satsop Lower West Fork RM 0.0 – 2.0

