

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



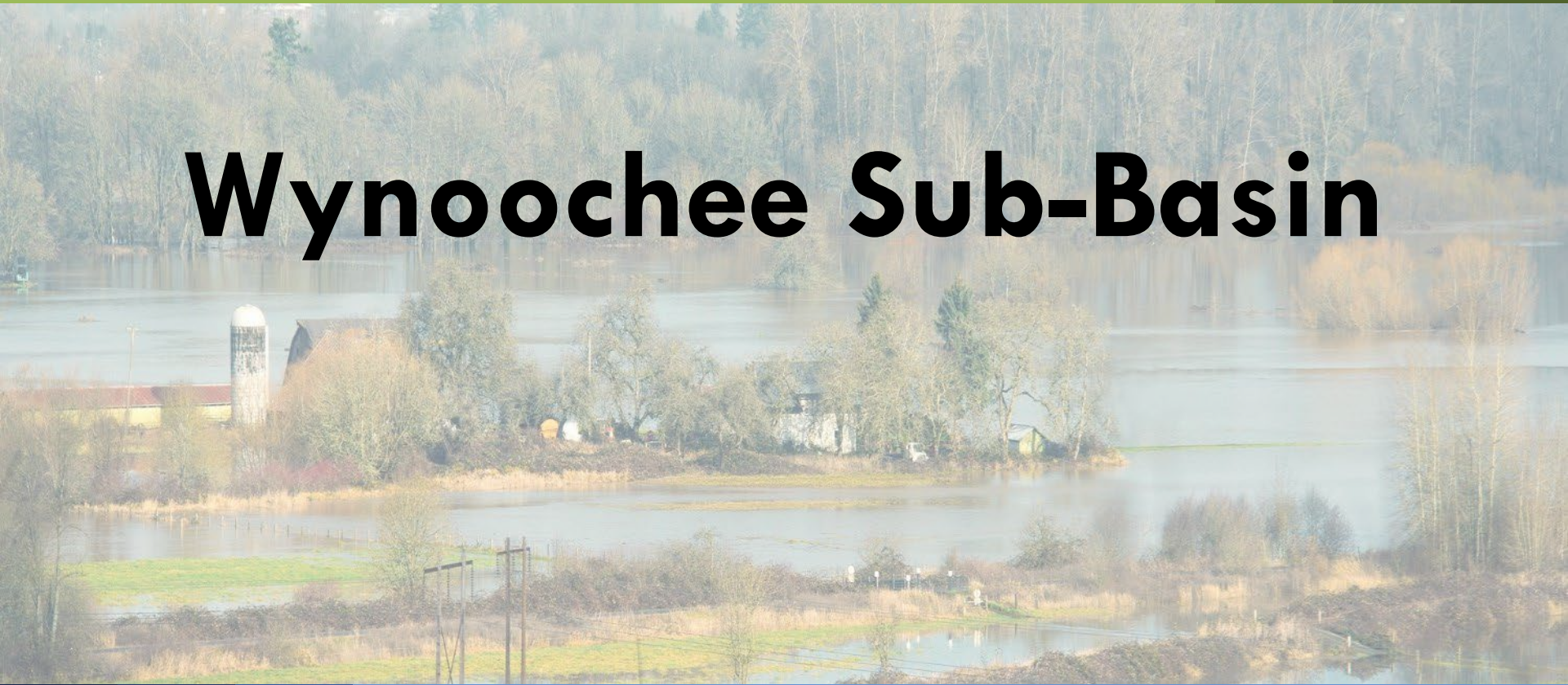
Flood fence revetment taken by Aldrich and DeVries 2017

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)

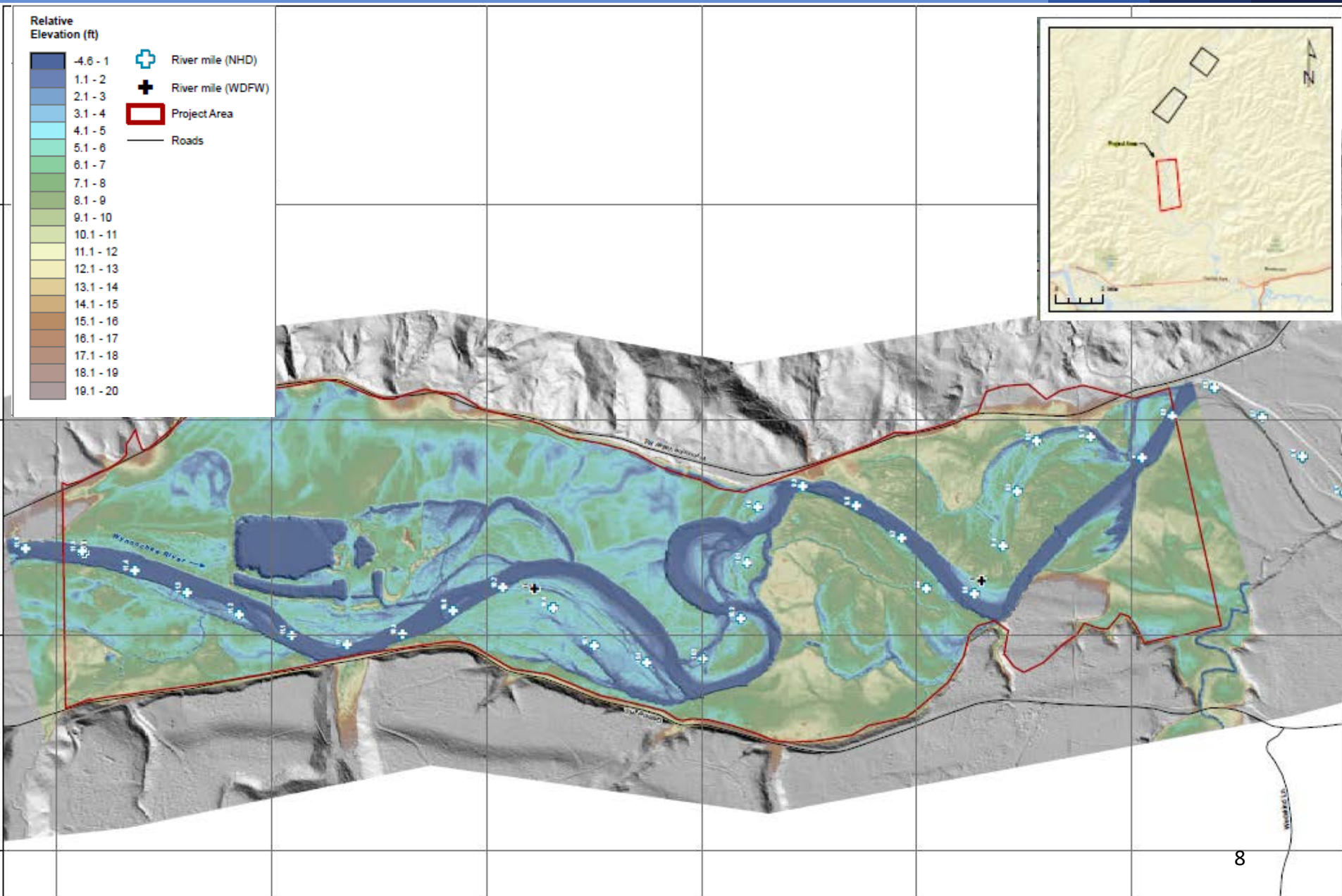


Wynoochee Sub-Basin

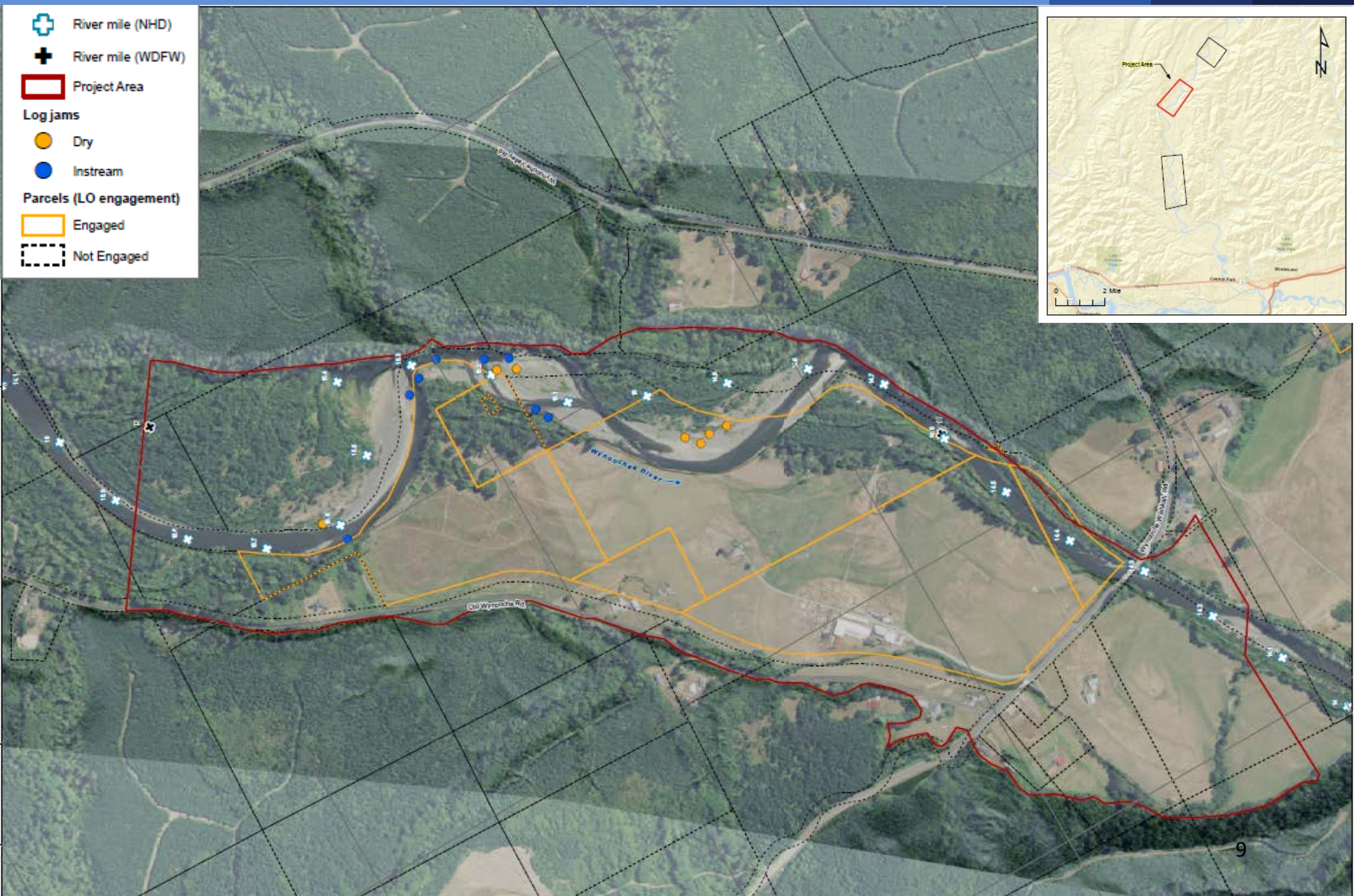
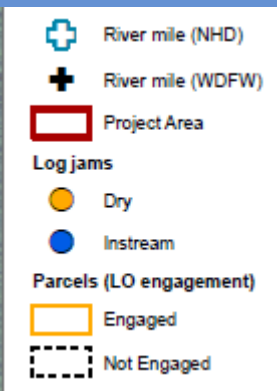




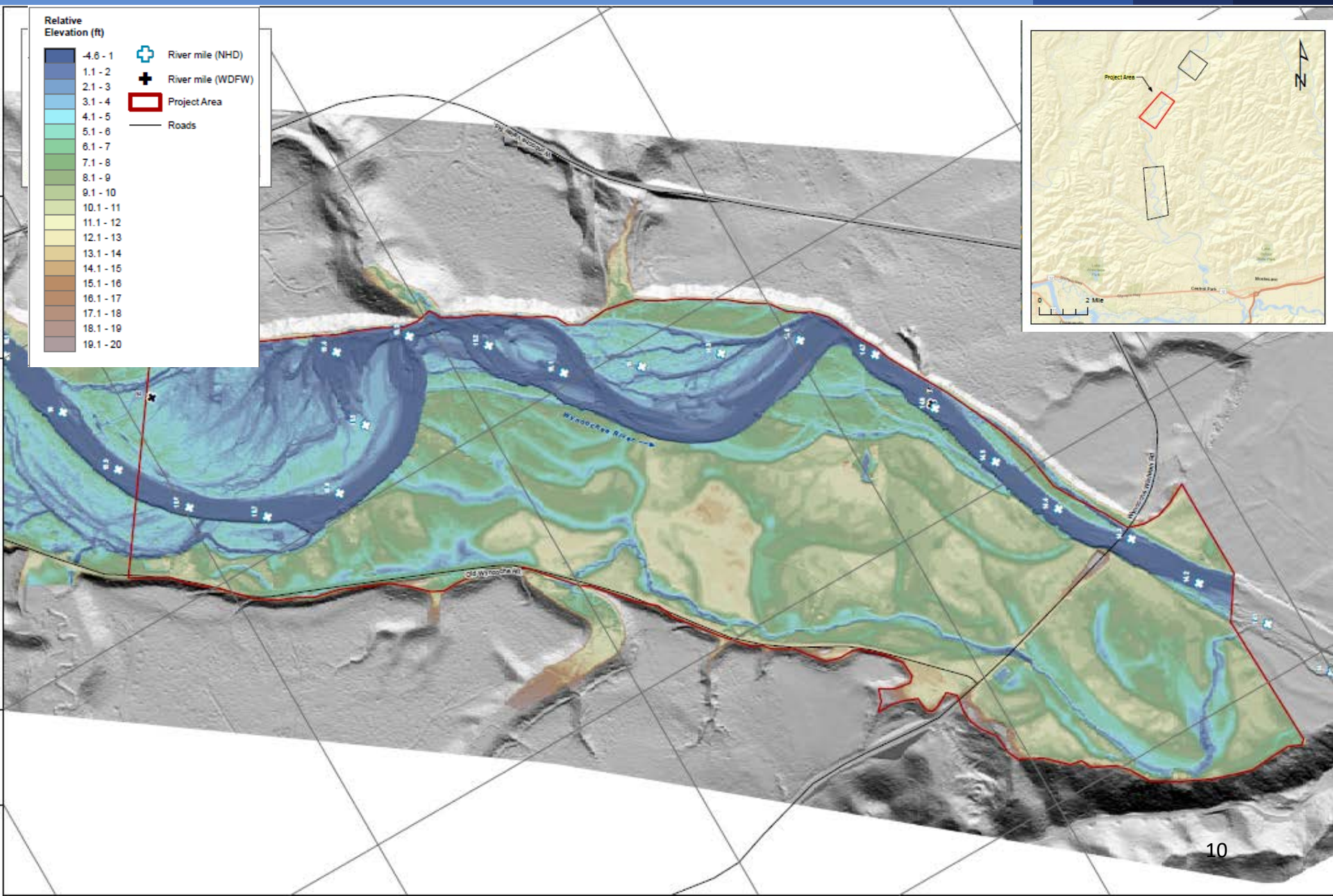
Wynoochee RM 8.5-11



Wynoochee RM 13.5 – 15.0



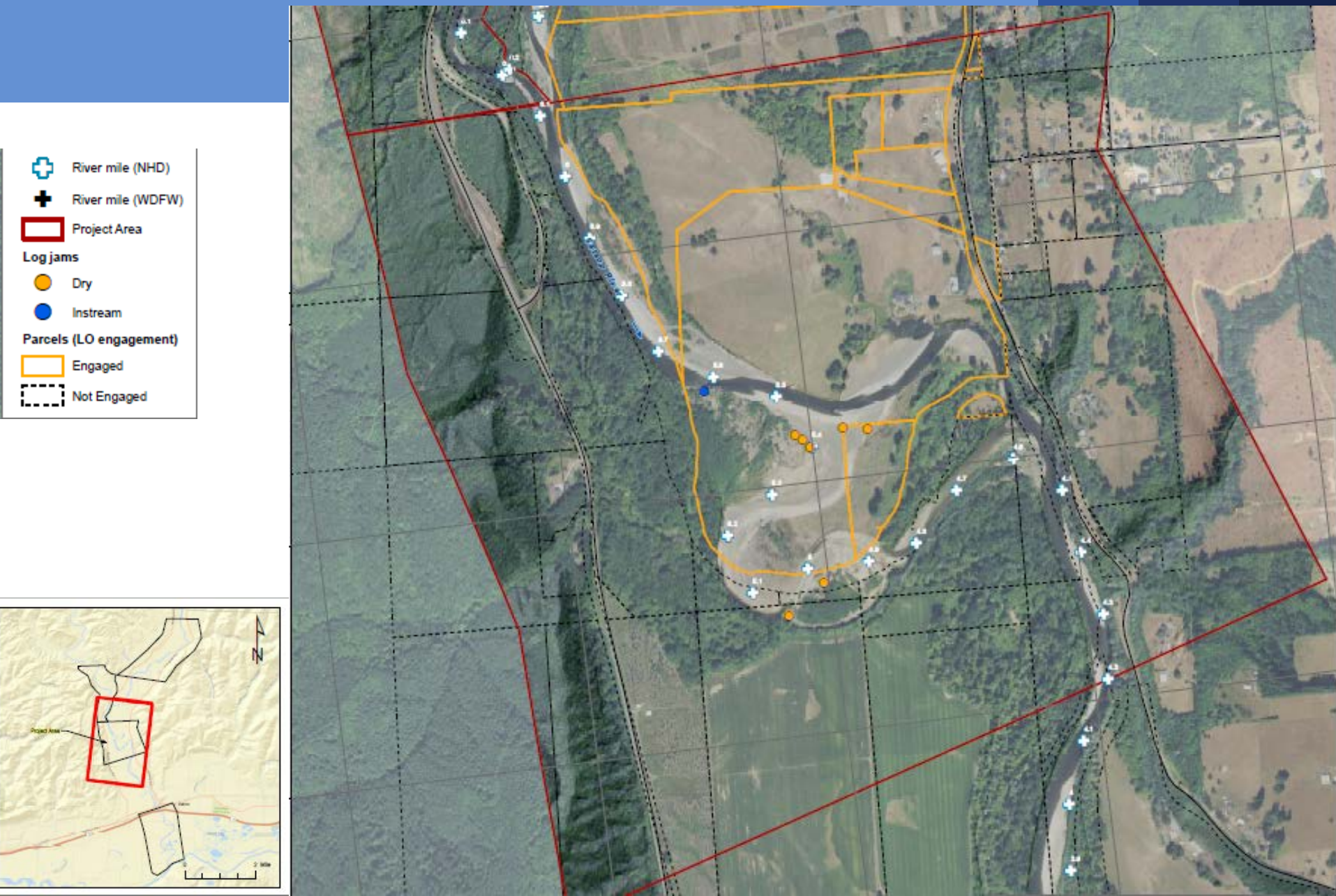
Wynoochee RM 13.5 – 15.0



Satsop Sub-Basin

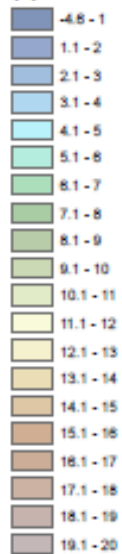


Satsop RM 4.5 – 6.5

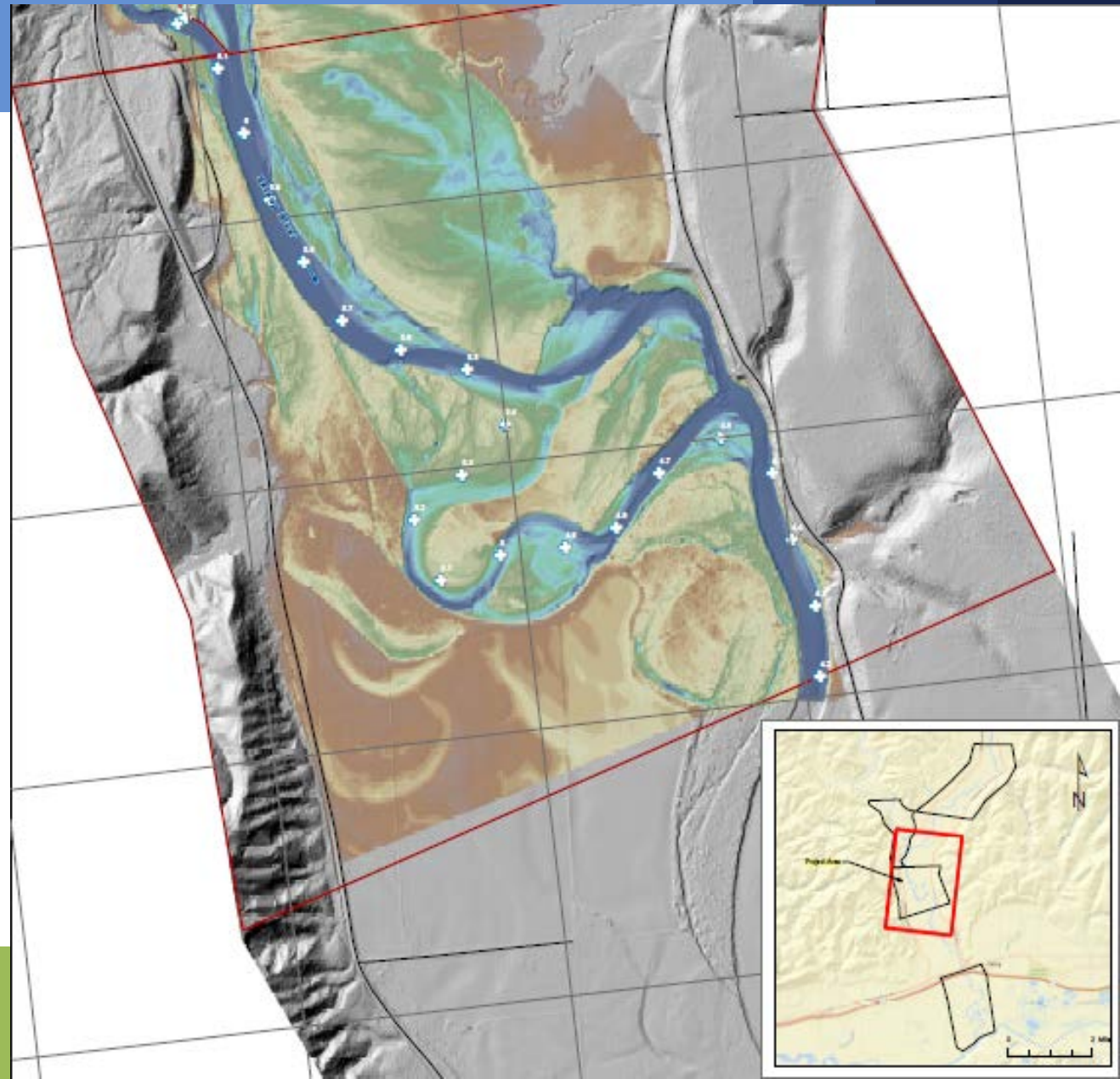


Satsop RM 4.5 – 6.5

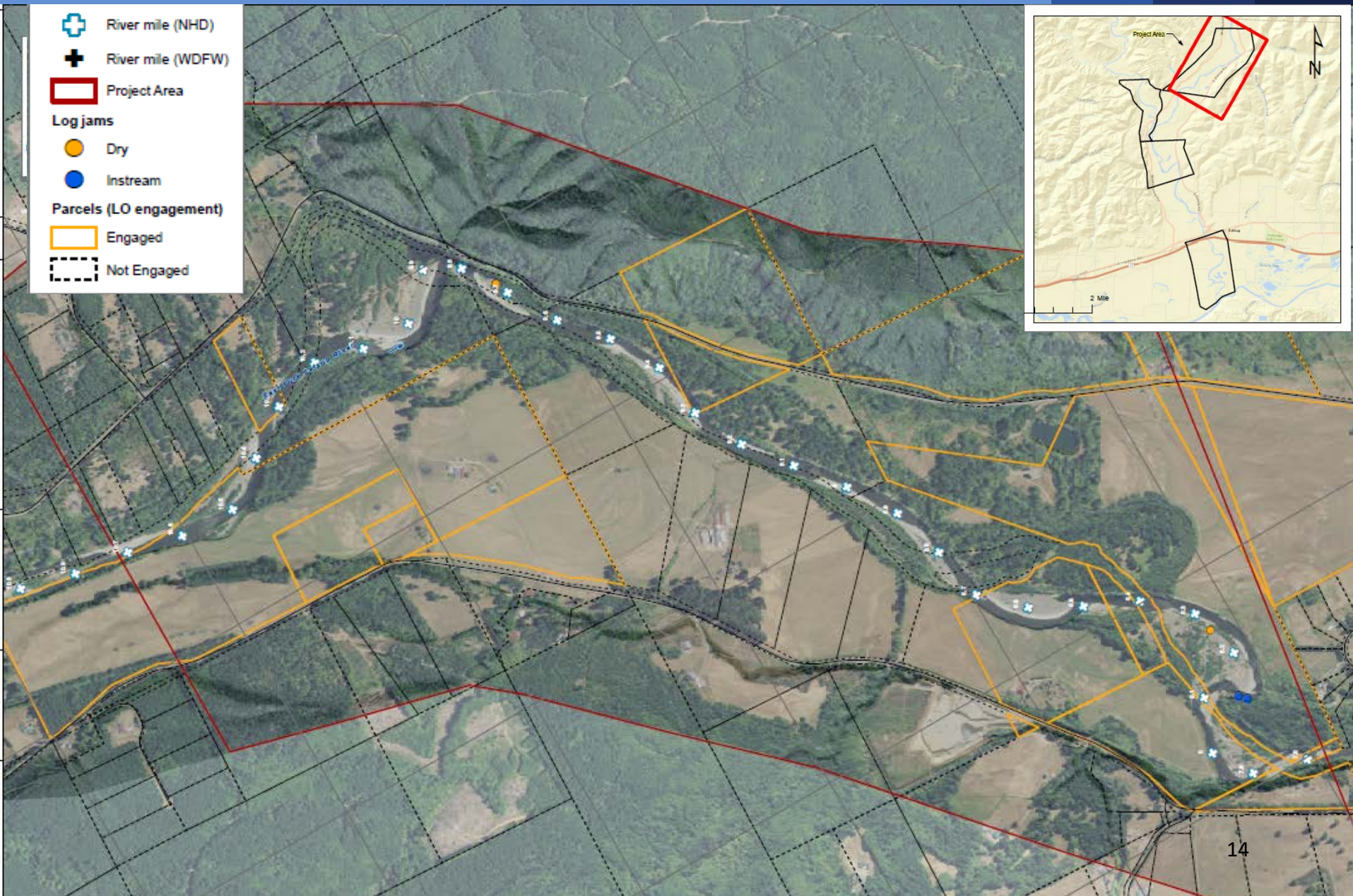
Relative Elevation (ft)



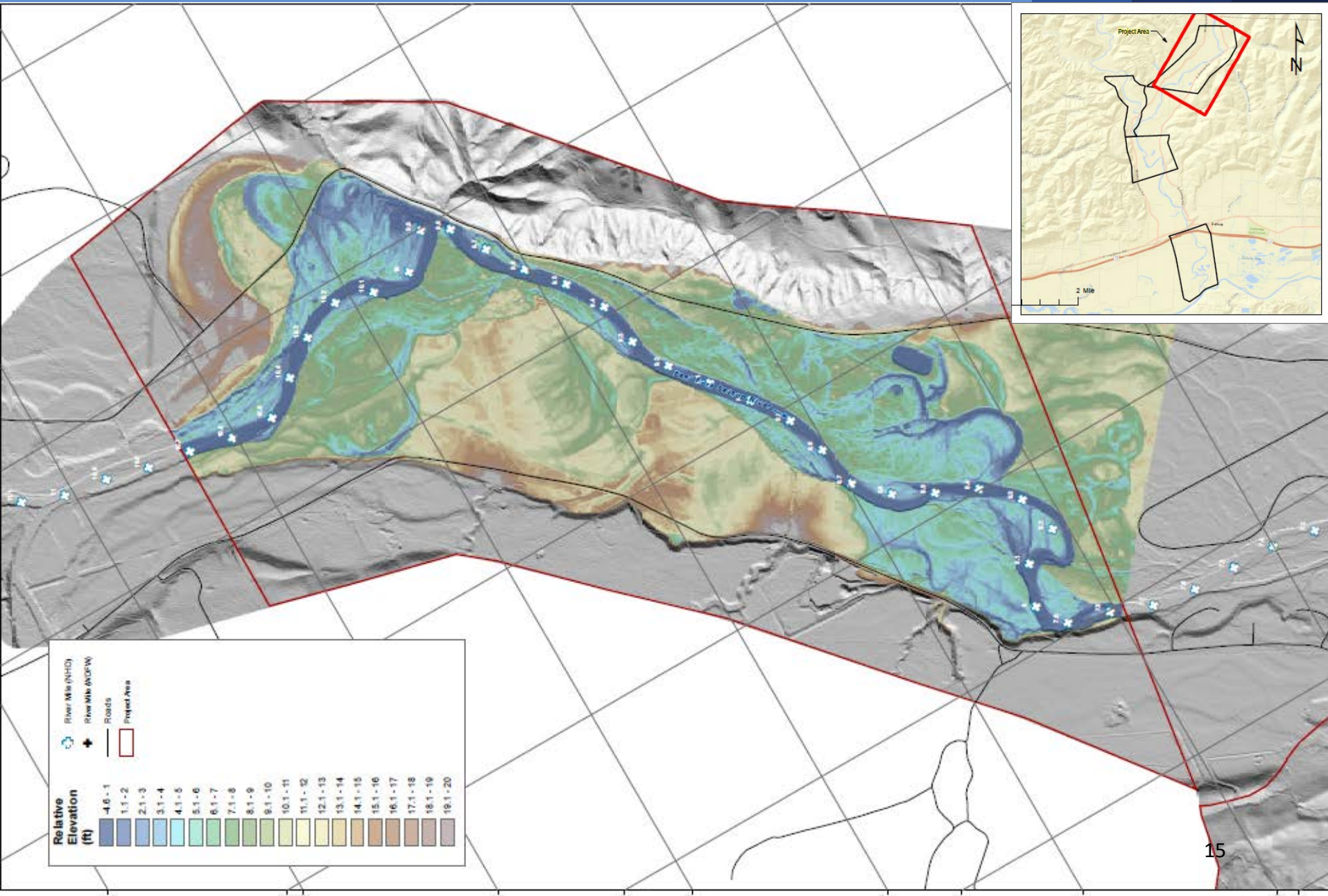
- River Mile (NRD)
- River Mile (NDPW)
- Project Area
- Roads



Satsop Lower East Fork RM 8.0 -10.5



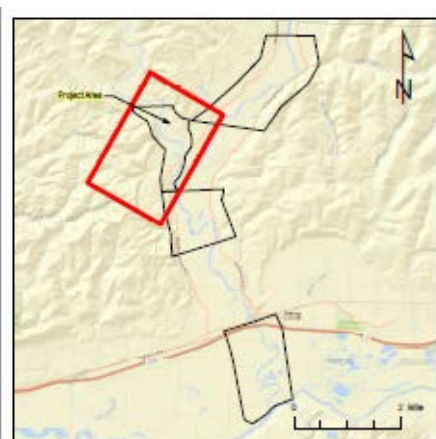
Satsop Lower East Fork RM 8.0 -10.5



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

