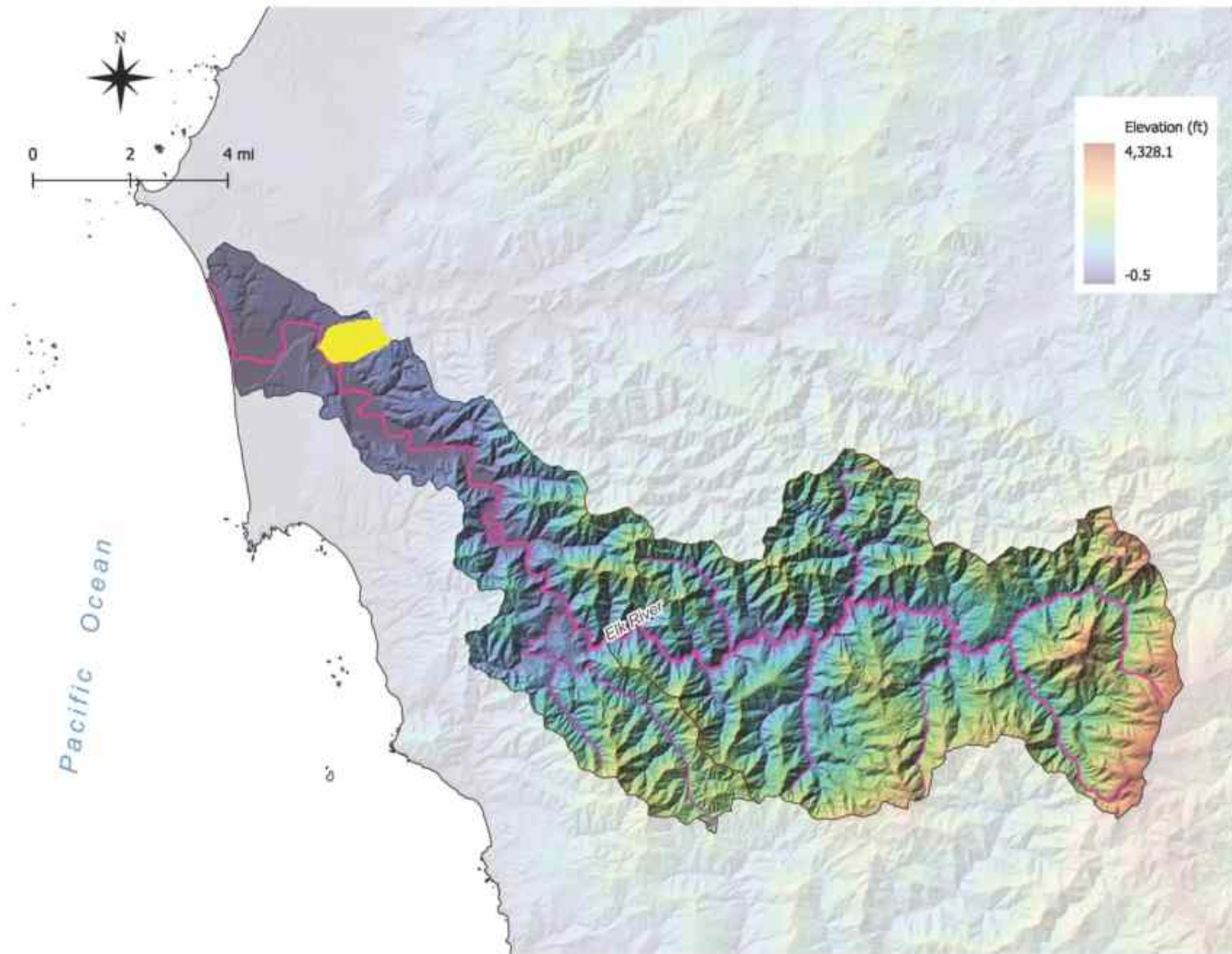




**Kermit Creek: Restoring
salmonid habitat on
“working lands” on the
Southern Oregon Coast**

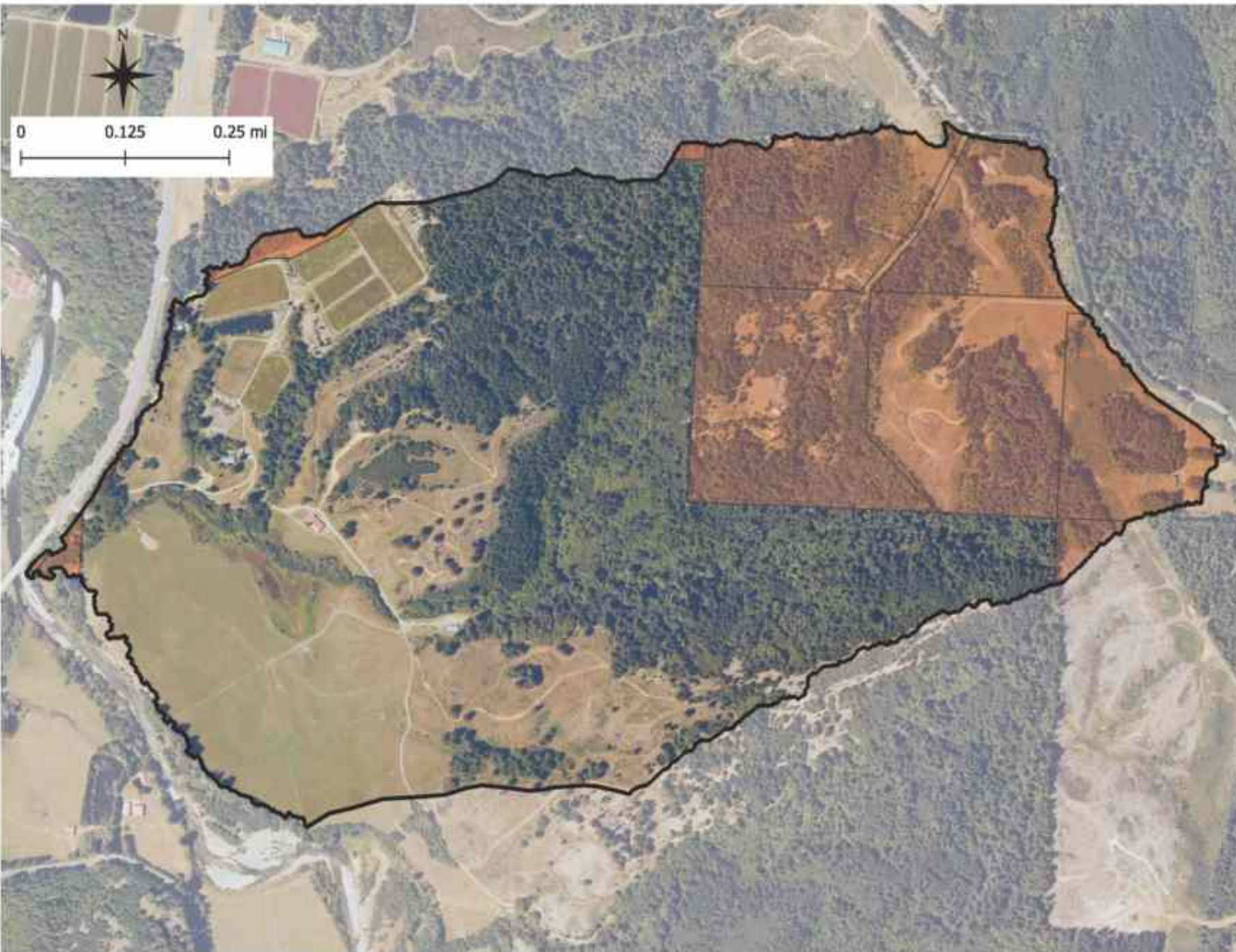
Elk River Watershed

- 58,678 acres (92 sq mi)
- 78% Federal Ownership (USFS)
- Coastal Lowlands and Siskiyou Mountains (Klamath Mountain Geologic Province)
- Relatively steep streams and small valleys; small estuary
- River mouth migrates
- Southern Oregon – Northern California ESU
- Limiting Factors – salmonid rearing; water temperature



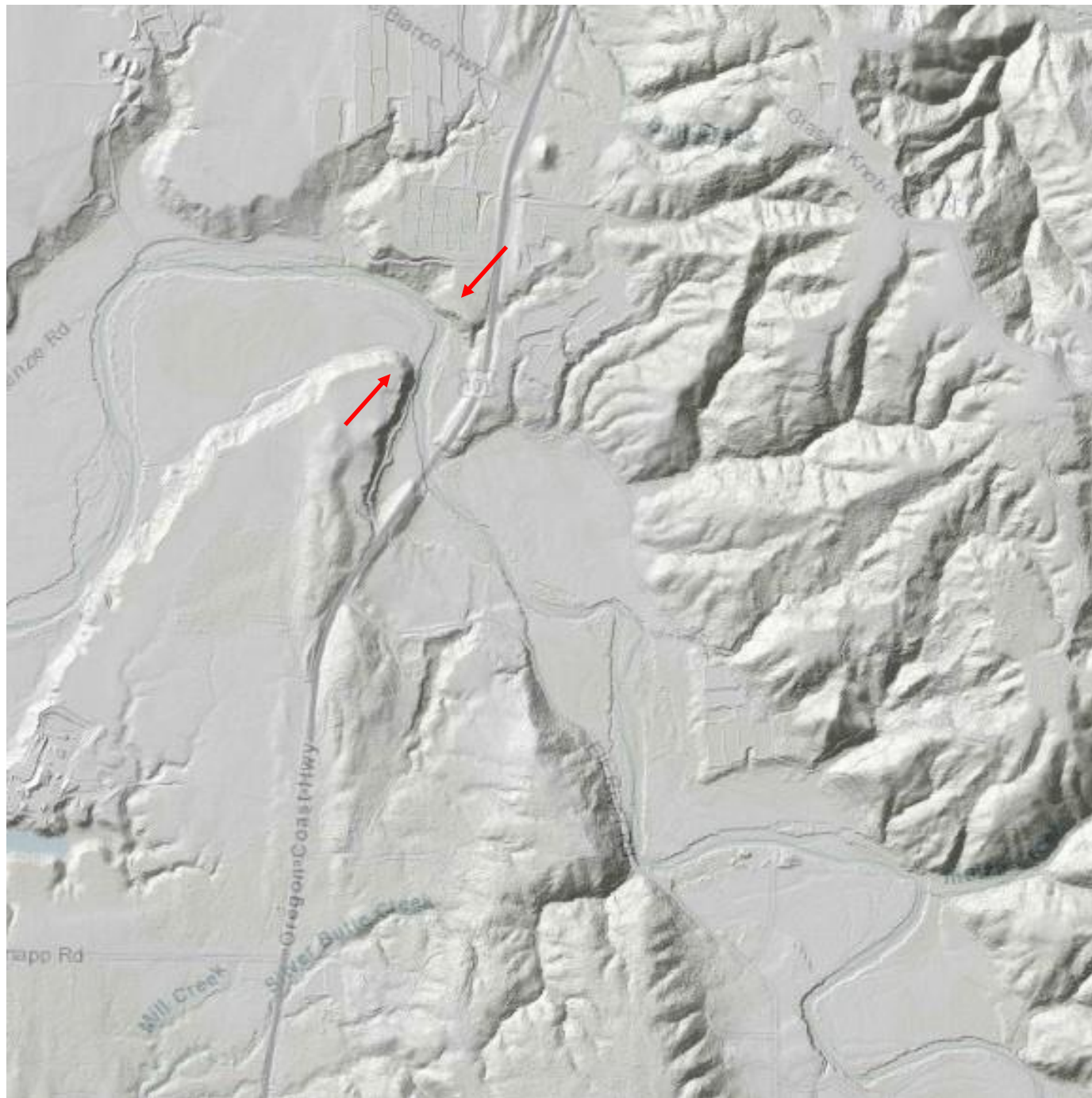
Kermit Creek Subwatershed

- 495 acres
- Privately owned
- ~4.5 river miles from the Pacific Ocean; 1.7 miles upstream of head of tide
- Weiner Ranch (344 acres – 70% of subwatershed)
 - Cranberries
 - Timber
 - Cattle
 - Conservation
 - Residential
- ~2.2 miles of fish habitat
- Coho, steelhead, cutthroat, and lamprey



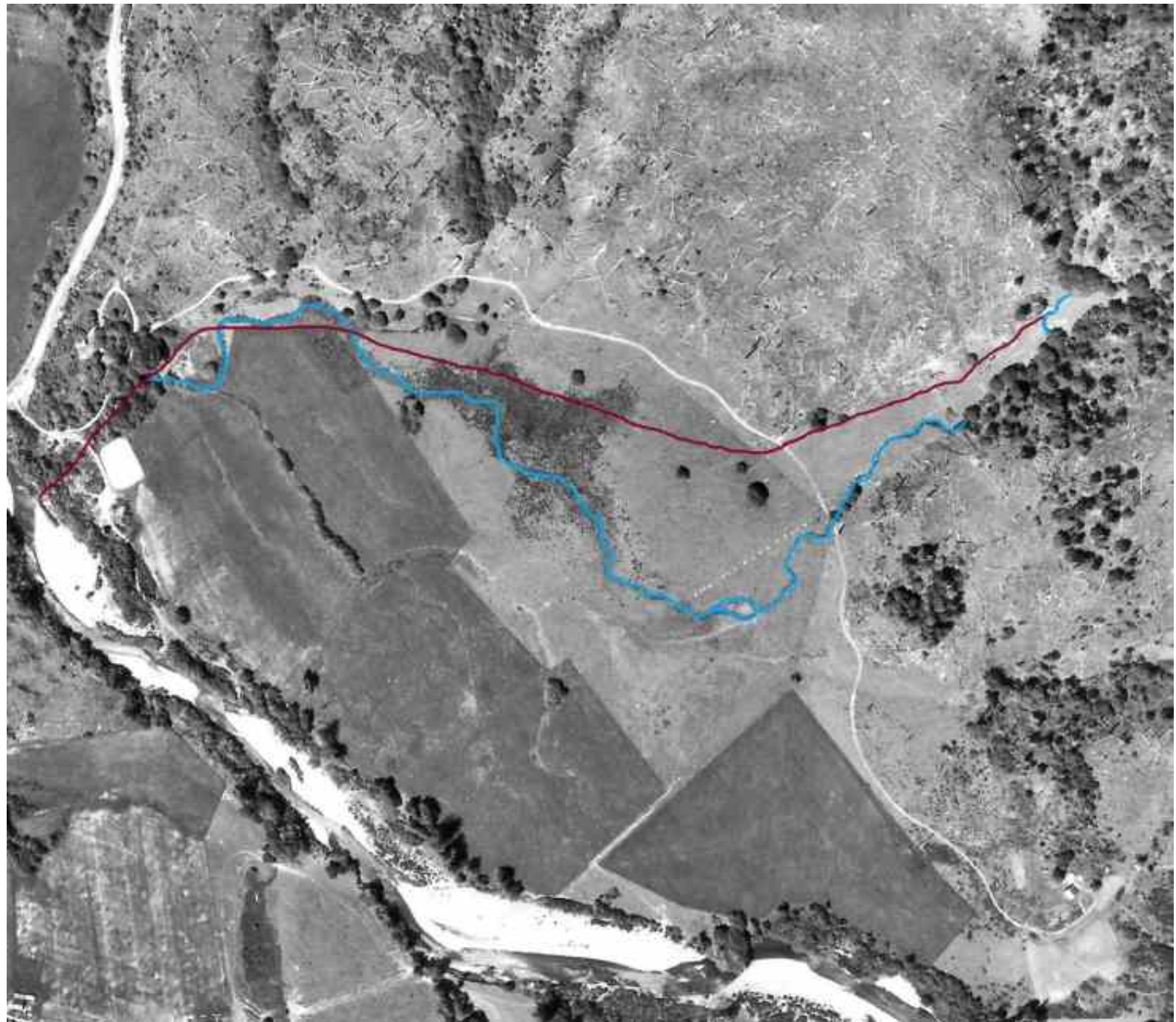
Geology and Geomorphology

- Kermit Creek forms in an uplifted marine terrace
 - Deep, narrow ravines, relatively low gradient streams
 - Prone to landslides and debris flows -- bedload
 - Relatively low stream density
 - High infiltration rates – minimal surface water but good perennial flow in the stream network
 - Alluvial fan at mouth of stream valley
 - Flows ~0.6 miles across Elk River floodplain through riverine oxbow – controlled by beaver dams
-
- Elk River valley constricts downstream of Kermit
 - Valley is ~30% wider than upriver
 - Broad historic meanders – orphaned oxbows
 - Possibly braided channel pre-settlement
 - Floodplain active at ~10-year flood event



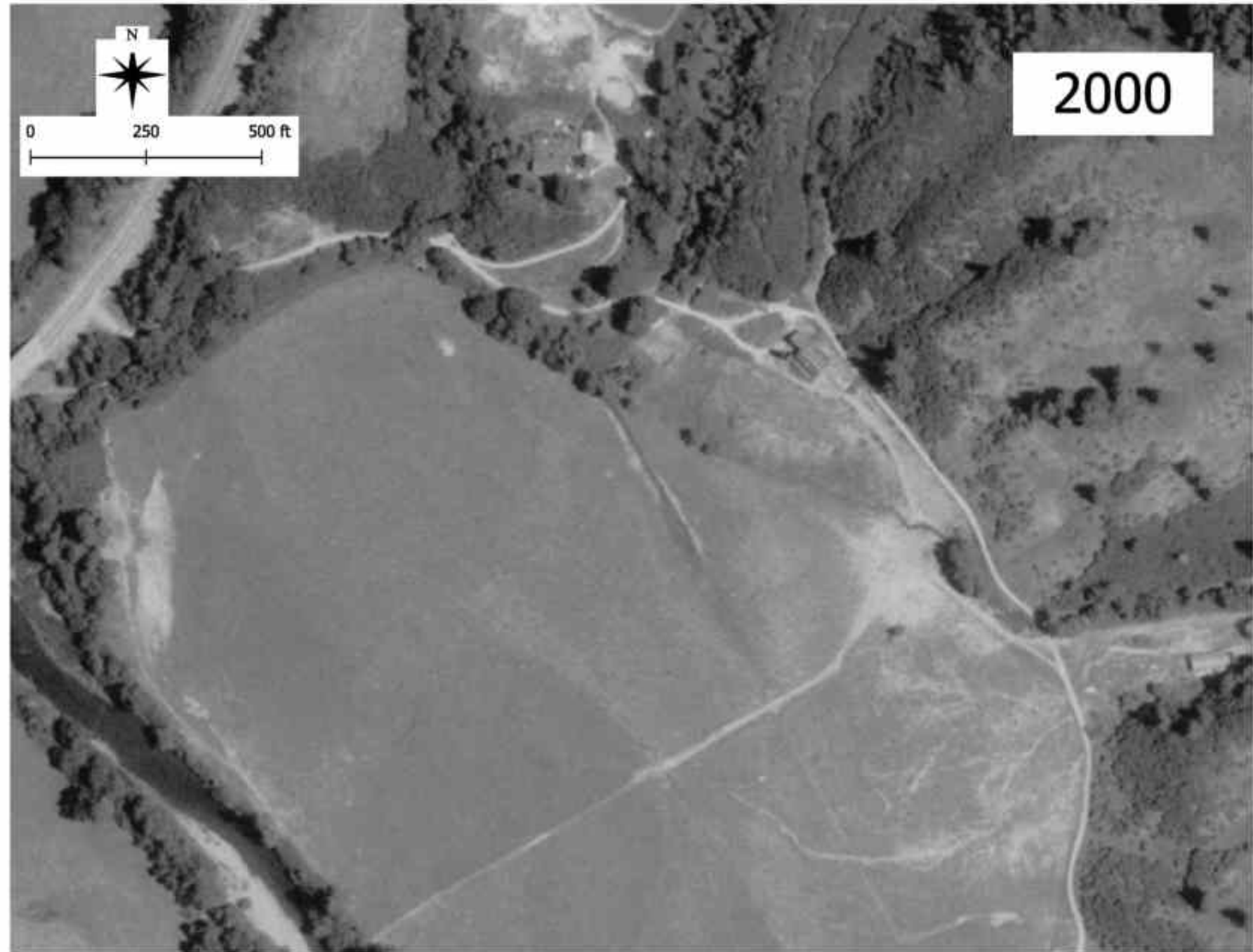
Land Use Pre-Contact through 1960

- Ancestral lands of the Native American Qua-To-Mah group of the Tututni peoples
- Villages ranging from a few to several houses – where access to resources
- No known sites on Weiner Ranch
- Port Orford founded in 1851
- Euro-American settlement of Elk River valley circa 1860 to early 1900s
- Land cleared for livestock (dairy cows and sheep) – timber often felled and left
- Port Orford cedar prized wood – other timber species after WWII
- 1939 aerial photograph
 - Bottomland in pasture, hills being cleared
 - Kermit Creek still in natural alignment
- Kermit ditched mid-20th century
- Most of watershed logged by 1960



Land Use 1960-2000

- Natural reforestation of steep slopes
- Upper benches and gentle hillslopes in pasture
- Gorse introduced
- Bottomland in pasture – ditches maintained
- Sheep Ranch through 1990 – coyote predation (~800 lambs annually) ruined the operation
- 1990s – second round of logging; cranberry bogs; leased bottomland for cattle; gorse colonization
- Property sold to the Weiner Family in 2002



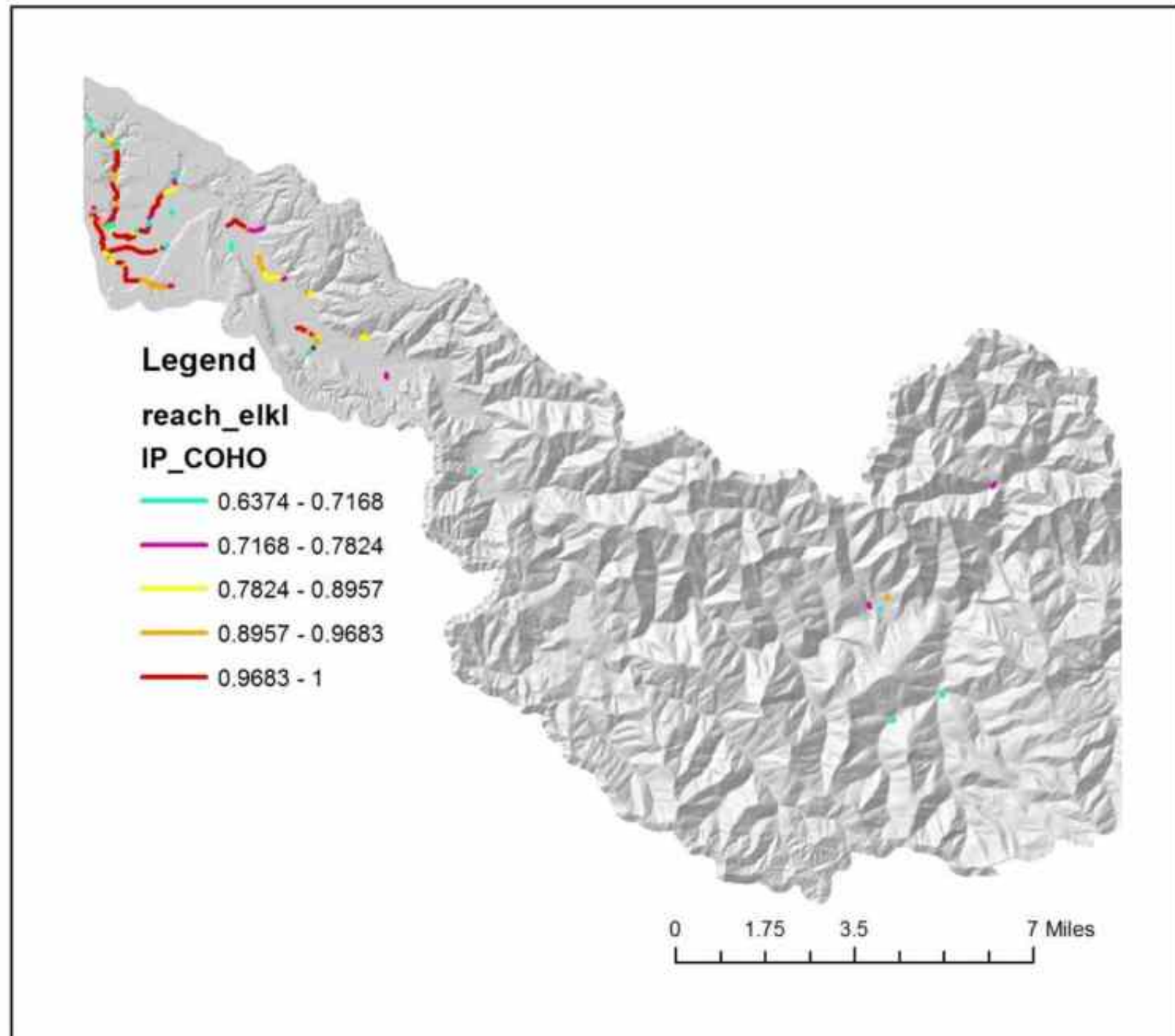


Kermit Creek Restoration Timeline

- 2008 – Weiner Family enrolled 40 acres (~1 mile of Elk River and ~0.6 miles of Kermit Creek) into CREP, including oxbow wetland
 - fencing and planting, off-stream livestock water; no changes to the ditched Kermit channel
- 2014 – CREP plantings overwhelmed by invasives – 50% failure rate
 - LO requests assistance from Curry Watersheds Partnership
- 2014 – 2018
 - CWP clears/treats invasives; maintains and interplants seedlings
 - Willow colonize ditched Kermit channel – cause diversions
 - LO starts to clear gorse in the uplands
- 2015 – 2018: “Elk River Strategic Action Plan for Coho Salmon Recovery” developed by a local technical team led by the Wild Salmon Center and OR Dept. of Fish and Wildlife

Elk River Coho SAP

- Elk River 1 of 3 independent SONC populations in Oregon – watershed with best chance of recovery
- Most spawning primarily occurs in upper watershed
- Nearly all winter rearing occurs in lower watershed – mostly in tributaries
- Principal limiting factors to coho salmon (1) winter rearing habitat and (2) summer water temperature
- Kermit Creek is High IP habitat
- Restoration funding secured 2018-2020



Kermit Creek in 2020

- Riparian revegetation trending upward
- Depositional area developing at base of alluvial fan
- Stream channel simplified US of wetland
- Wetland dominated by reed canary grass
- Stream diverting through pasture
- BPA road impeding fish passage & bedload



Kermit Wetland

- Broad and shallow; become isolated ponds in spring
- Dominated by reed canary grass; minimal CREP seedling survival
- Ditched Kermit Creek channel dammed by beaver; braiding into wetland and north into floodplain



Kermit Creek Diversion

- Ditched stream channel no longer “maintained” and colonized by willow
- Channel filled with bedload, diverted from stream corridor because it was “perched”
- Potentially strand fish; entrain sediment and nutrients; dewater downstream channel; ruin livestock pasture



Bonneville Power Administration (BPA) Road Crossing

- Impeded fish passage and bedload movement
- Culvert frequently plugged, causing Kermit Creek to divert through pasture



Kermit Creek Restoration Project Design (2018)

Attributes

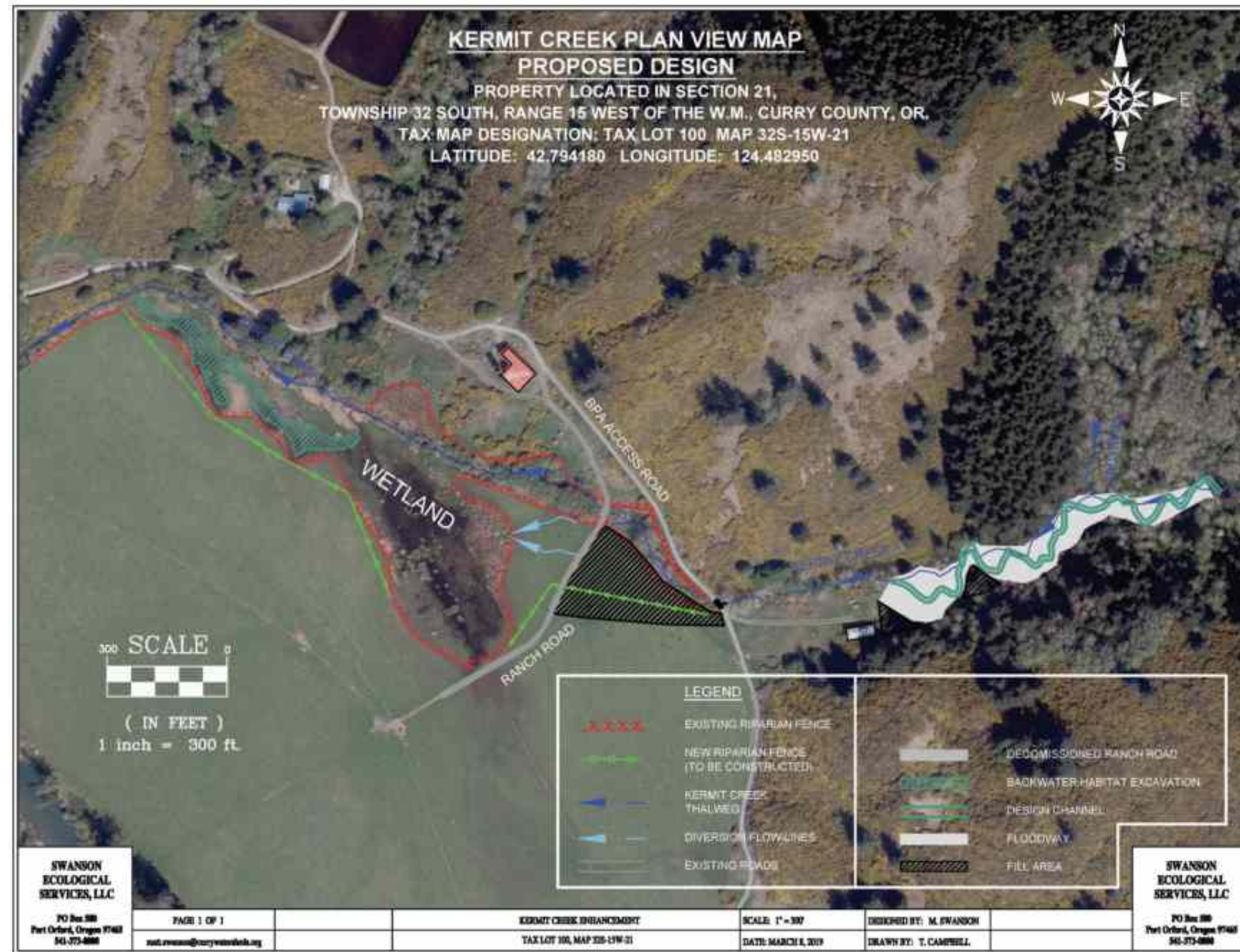
- Weiner Family was already committed to conservation
- Revegetation of the ditched Kermit Creek channel was on an upward trajectory
- “Passive Restoration” (i.e., beaver, willow colonization, bedload deposition) was converting the ditched stream channel along the wetland into a braided system with increasingly complex habitat

Limiting Factors

- The property is a working ranch – need to preserve bottomland pasture (already took ~15% out of production)
- Enrolling the ditched Kermit Creek channel in CREP essentially locked in the alignment of the stream corridor
 - That alignment was not sustainable along the high side of the alluvial fan
 - Decision to fence and plant the alluvial fan reach was a technical failure – who is responsible
- Kermit wetland discontinuous -- too shallow and simplified -- dominated by reed canary grass
- Success of the CREP plantings along Kermit Creek meant channel reconstruction would cause a loss of habitat complexity and impair water quality for 5-10 years

Design Elements

- (1) Contain Kermit Creek in a complex stream corridor downstream of BPA road
- (2) Facilitate depositional processes and channel braiding (alluvial fan)
- (3) Preserve existing CREP habitat and enhance winter rearing habitat in the wetland
- (4) Minimize pasture loss
- (5) Address fish passage and bedload movement at BPA road crossing
- (6) Improve spawning habitat in Kermit Creek valley

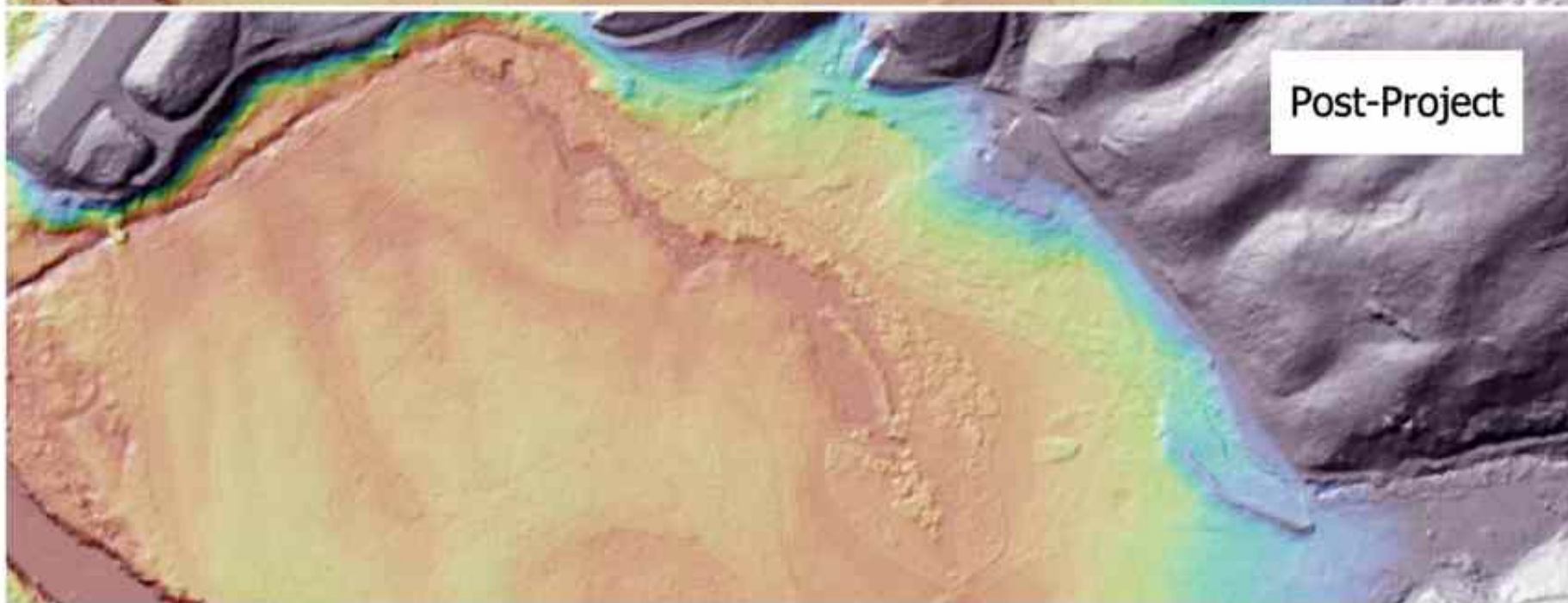
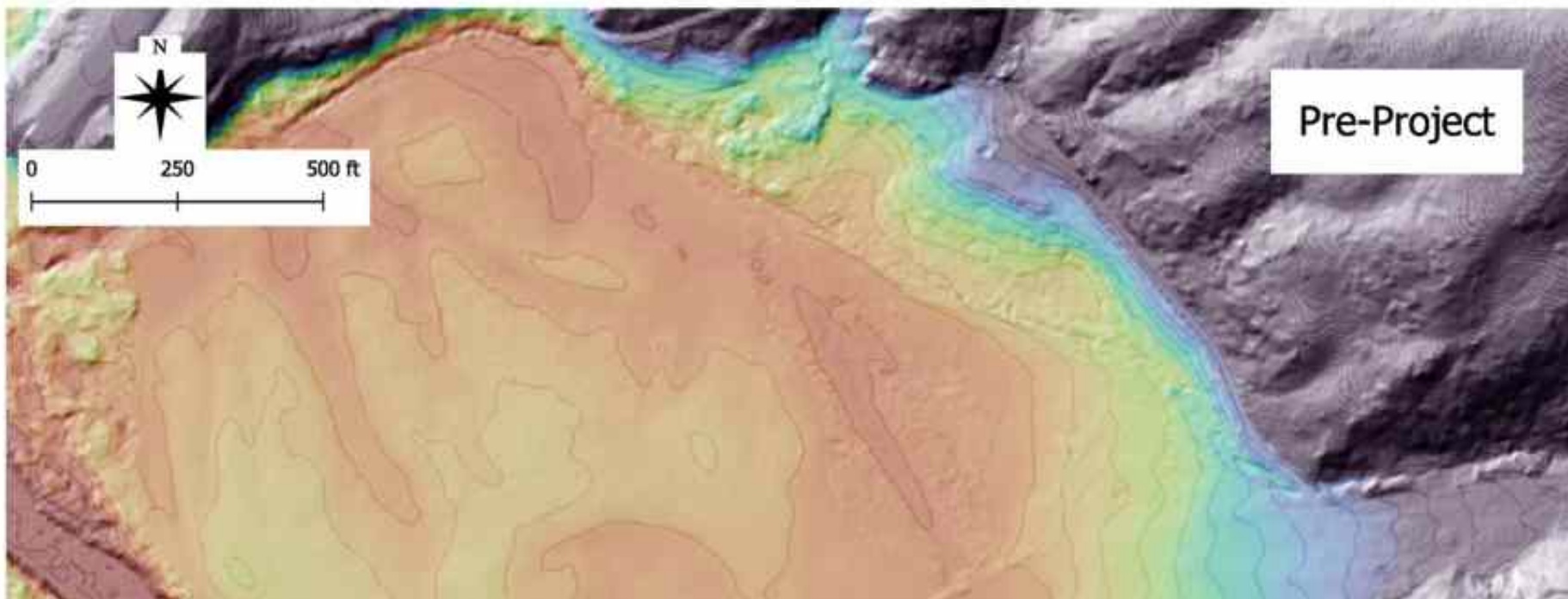






















Project Results

Successes

- Built a “ridge” landform using excavation spoils from the wetland and terrace deposits from upland borrow pit
 - Created an inset floodplain along Kermit Creek while preventing diversions
 - Facilitating development of an alluvial fan at the head of the wetland
 - Continuing to utilize the CREP habitat while new project areas are revegetated
- Created ~1.1 acres of open water rearing habitat and enhanced ~9.7 acres of inundated edge habitat in the wetland
- Kermit Creek riparian corridor adequately stocked with free-to-grow seedlings
 - Planted ~11,285 trees and shrubs (Kermit riparian corridor DS of BPA road)
 - Treating gorse, Himalayan blackberry, and English ivy
- Wetland hydrology fluctuates seasonally as designed and integrates beaver dams without extensive pasture flooding
- Bridge installation on BPA road restored fish passage to 0.8 miles of habitat and bedload movement
- Project site experienced an ~25-year flood event in March 2025 without failure – sustained overland river flow

Shortcomings

- No monitoring data to evaluate the project effects on fisheries, wildlife, or water quality
- Wetland revegetation only partially successful
 - Reed canary grass recolonized ~30% of the wetland, particularly the shallow shelves that were constructed
 - Disease and pests are threatening key woody species: Oregon ash, Port Orford cedar, red osier dogwood
 - Riparian fence is too close in some areas to grow a sufficient riparian tree-shrub buffer
- Phase II implementation delayed due to funding

Restoration Is Ongoing and Watershed Wide

- Upland Gorse Conversion – increase “working lands” productivity and reduce wildfire risk
 - 60 acres to pasture – facilitate future wetland restoration on the bottomland
 - 140 acres to forest – includes entire Kermit Creek stream network
 - 60 acres of cranberry bogs, residential, roads, barns, powerlines, etc.
 - Log structures downstream of BPA road to start habitat restoration in Kermit Creek and activate inset floodplain
- Sediment Abatement – decommission orphaned crossings and surface and improve drainage on resource roads
- Kermit Creek Phase II Restoration
 - ~1 acres of wetland recontouring to enhance rearing habitat
 - Expand riparian buffer around Kermit wetland
 - Convert reed canary grass in Kermit wetland to native plants and trees and shrubs
 - Log structures in built stream corridor and alluvial fan to restore stream processes
 - Restore channel meanders, inset floodplain, and log structures in Kermit Creek valley
- Pasture Management – infrastructure and technical assistance for intensive rotational grazing
- Monitoring – coho winter rearing, water quality, fish and wildlife use broadly



Project Partners and Funders

- Wild Salmon Center (NOAA subaward)
- Weiner Family
- Bandon Dunes Charitable Foundation (formerly Wild Rivers Coast Alliance)
- Oregon Watershed Enhancement Board
- Oregon Department of Agriculture
- Oregon Department of Forestry
- Natural Resources Conservation Service
- US Forest Service
- Conservation Reserve Enhancement Program (FSA and OWEB)
- Bonneville Power Administration