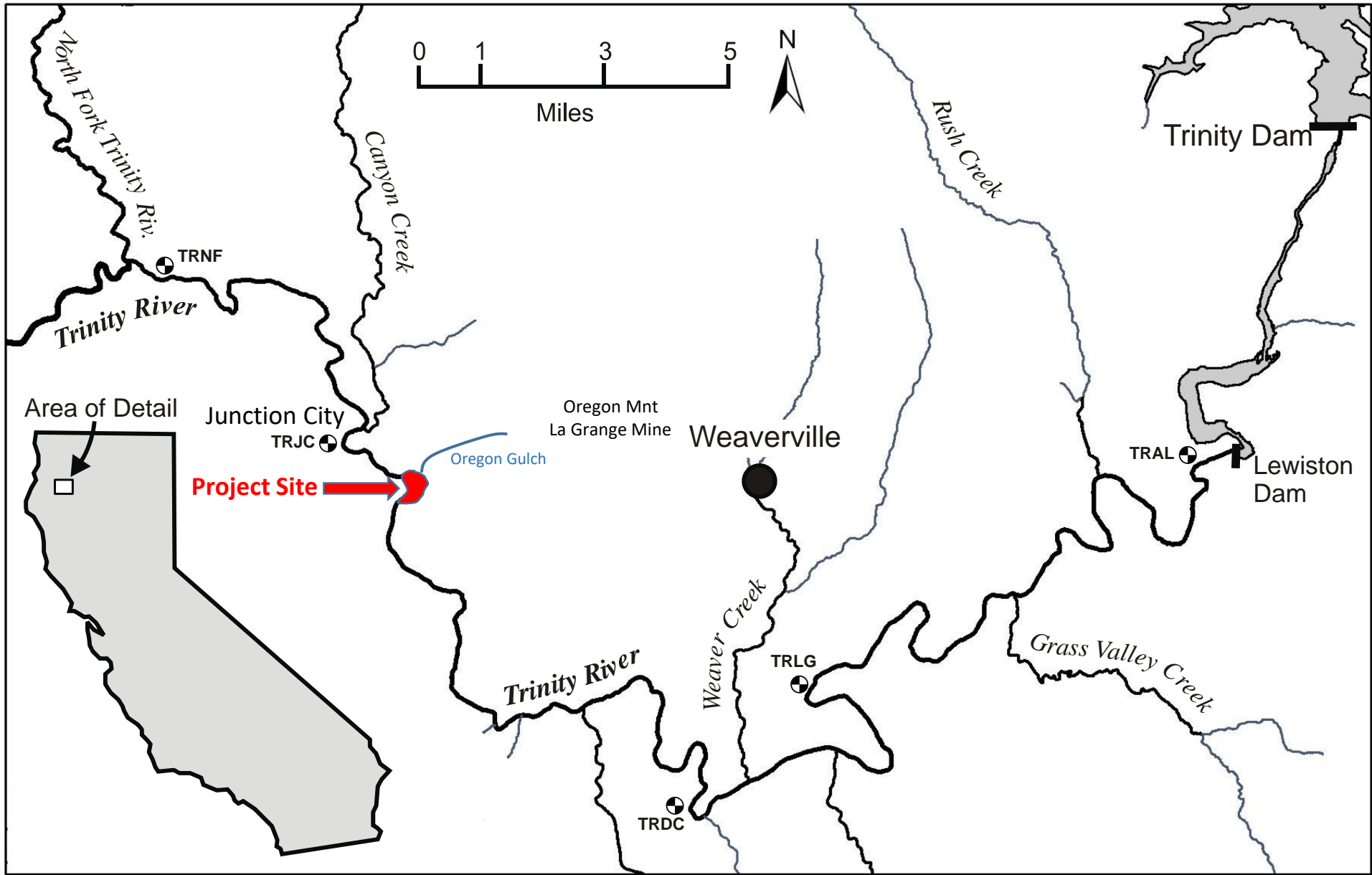




Oregon Gulch Valley Restoration



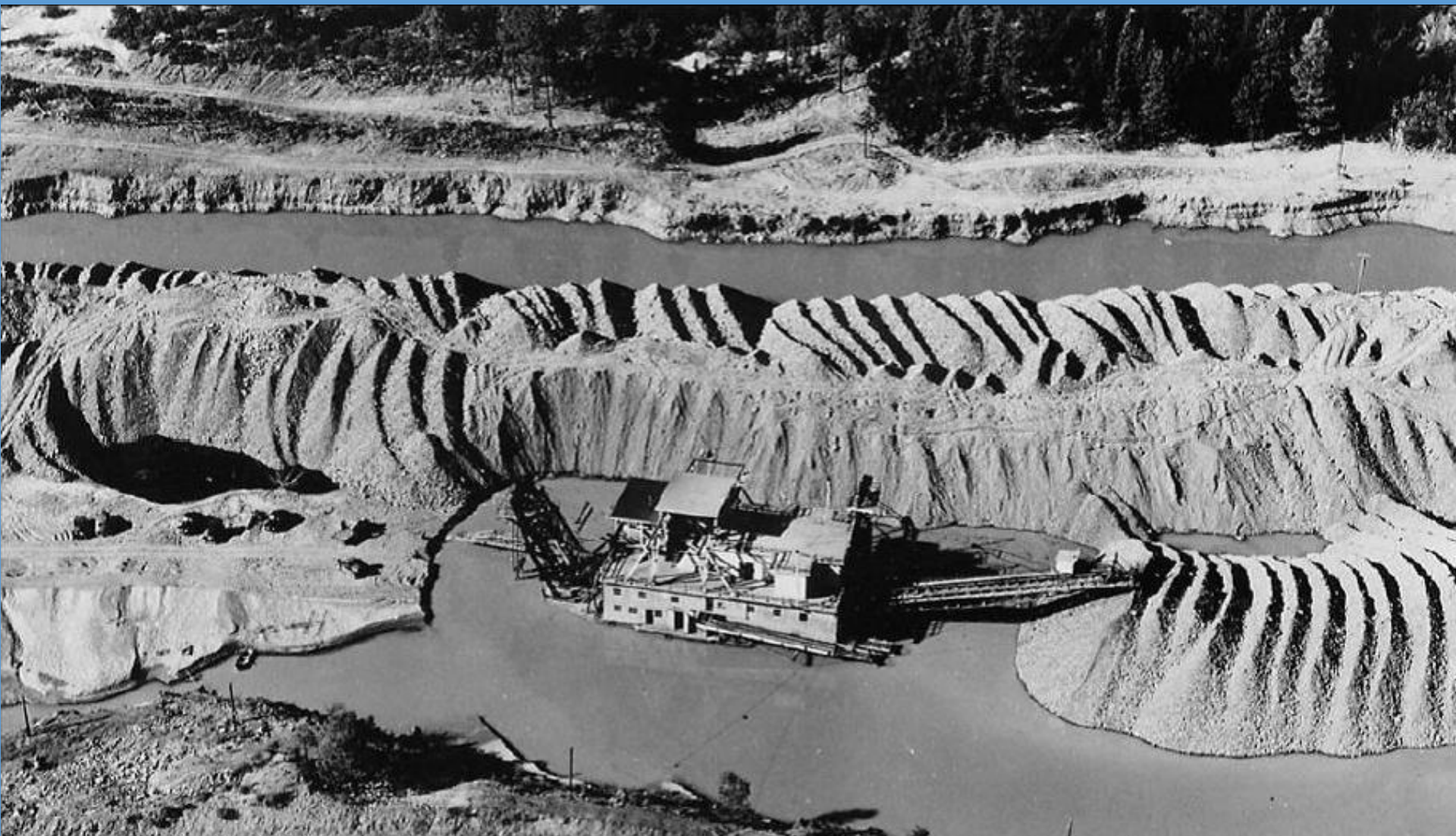
Yurok Tribe Fisheries Department, Trinity River Division
David Gaeuman*, D.J. Bandrowski, Aaron Martin, and Kyle De Julio





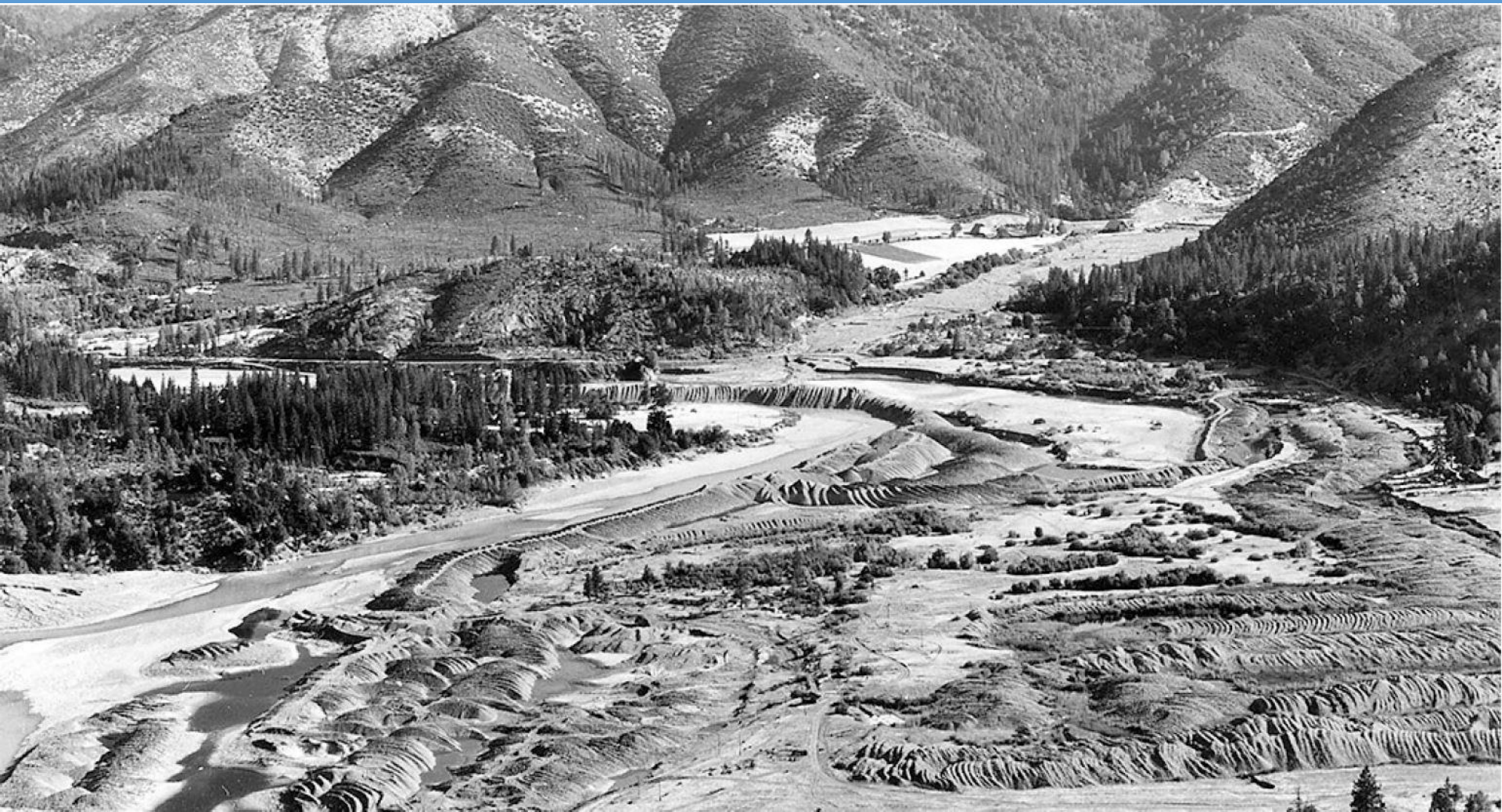




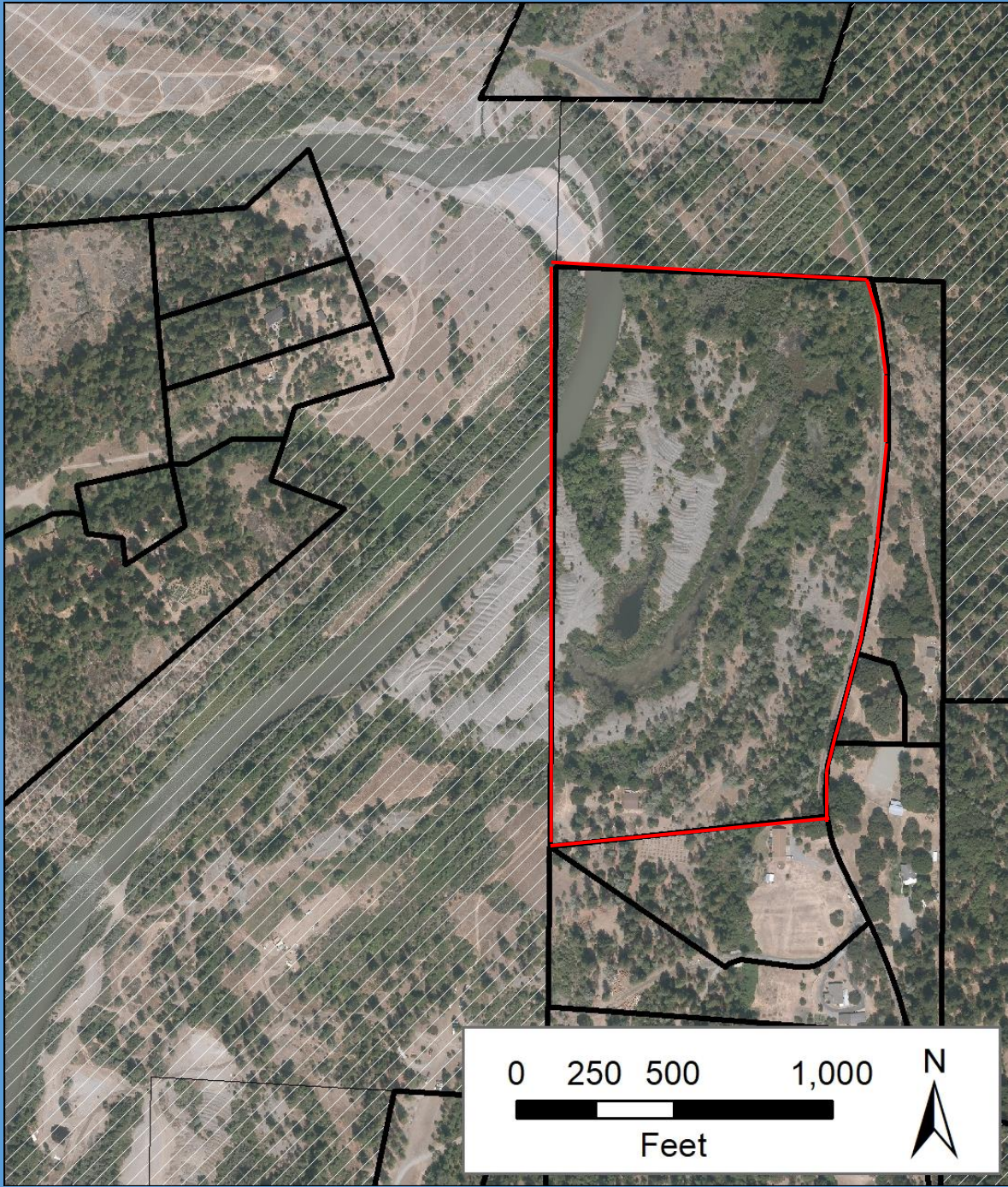


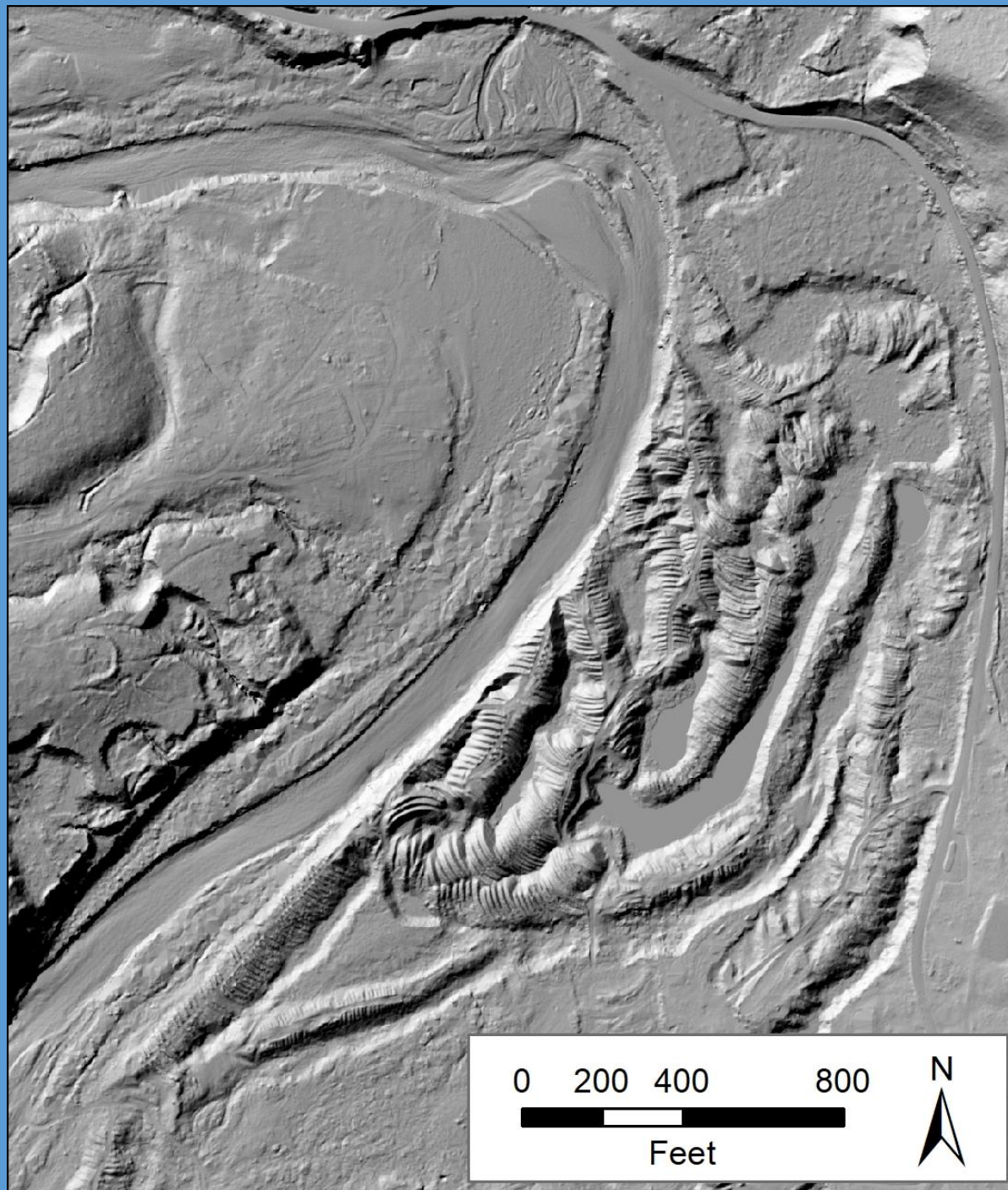
DREDGER, NEAR WEAVERVILLE, CALIF.

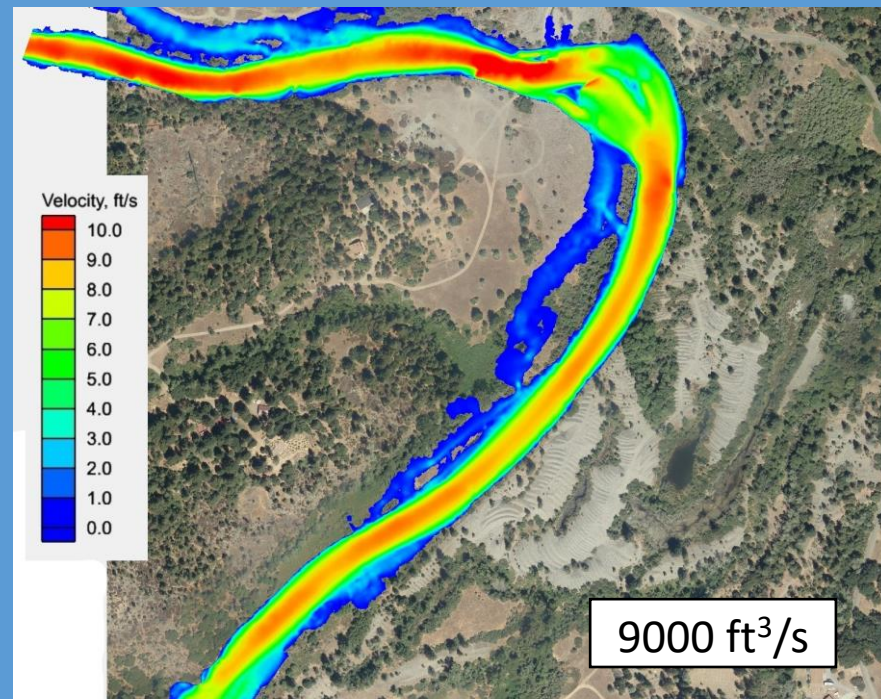
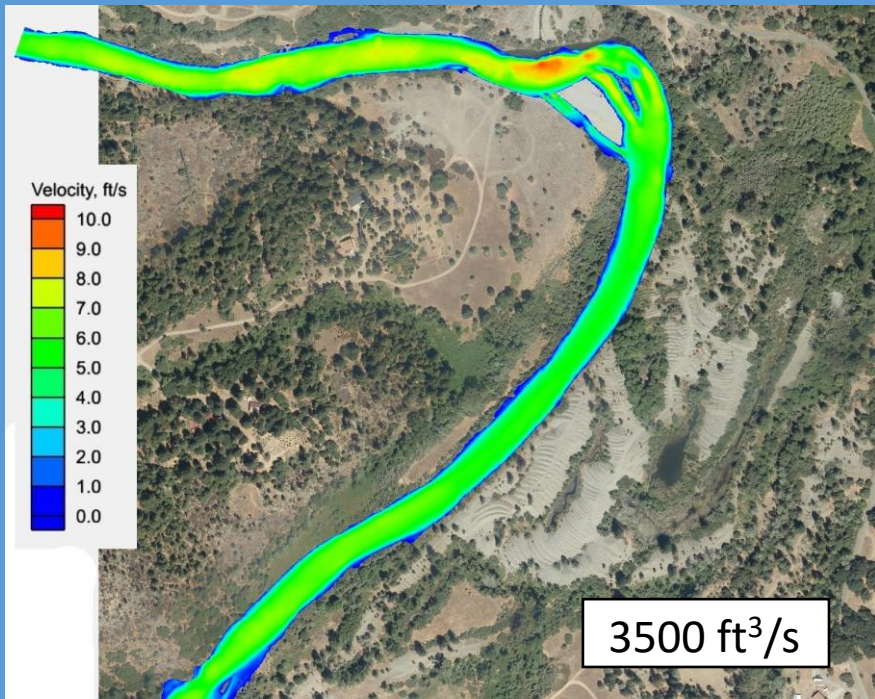
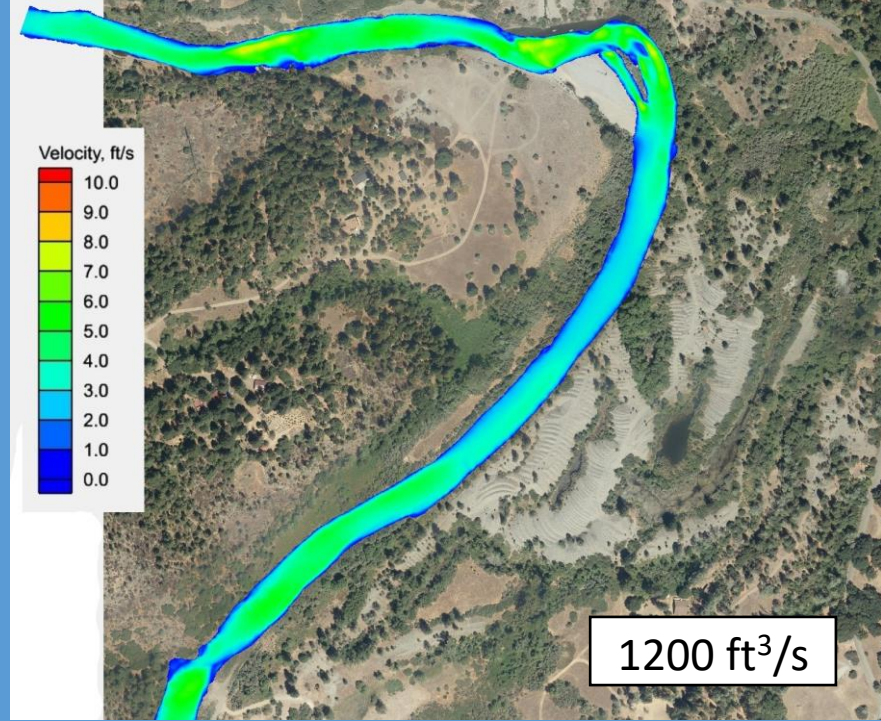
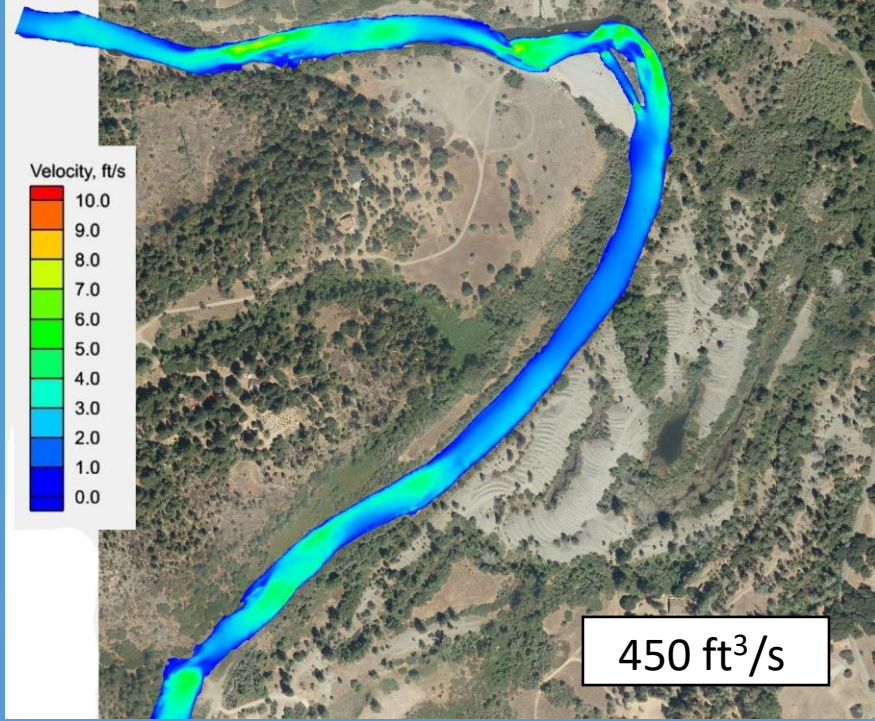
J. R. EASTMAN "B-1278"



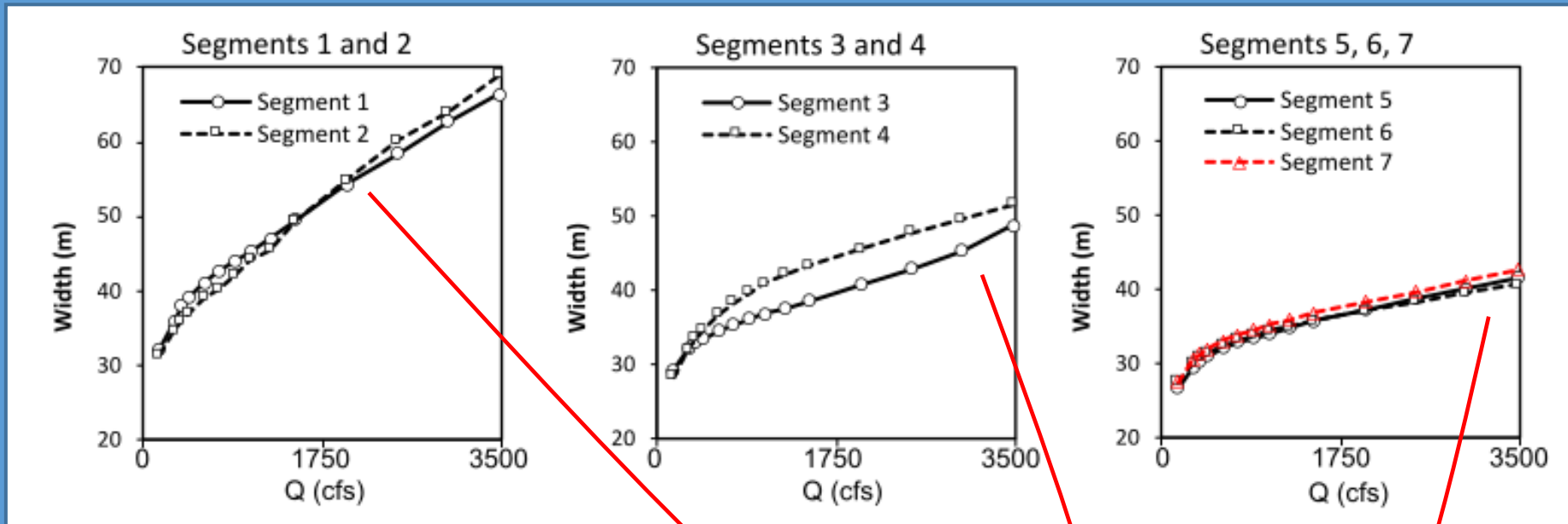




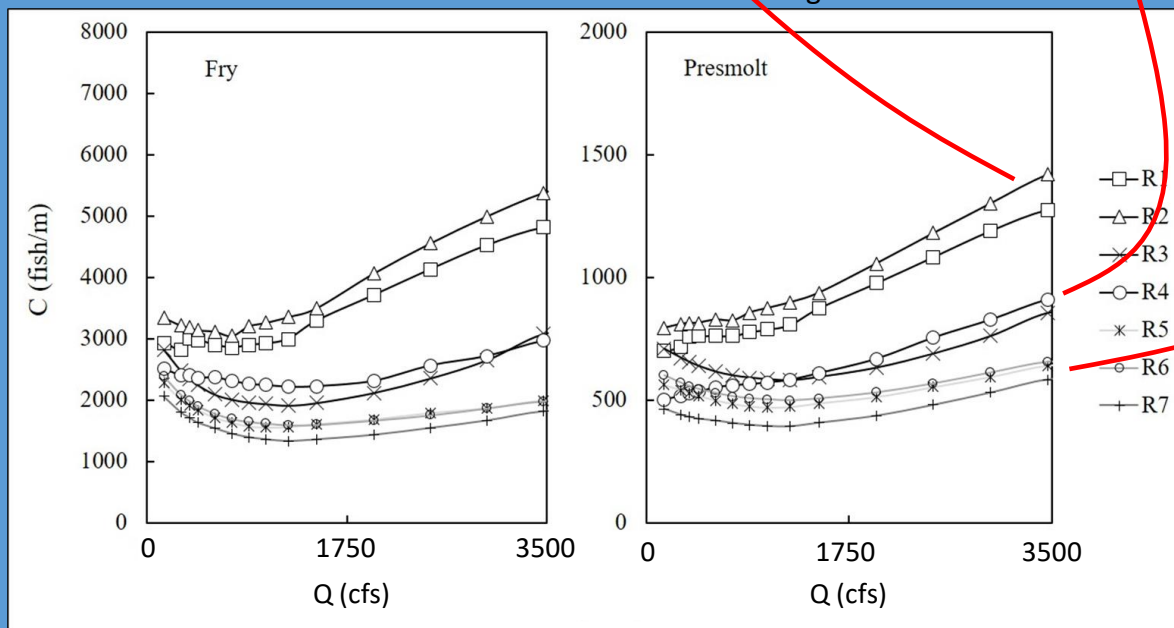




Inundated Width



Fish Capacity (fry and presmolt)



Segments 1 and 2

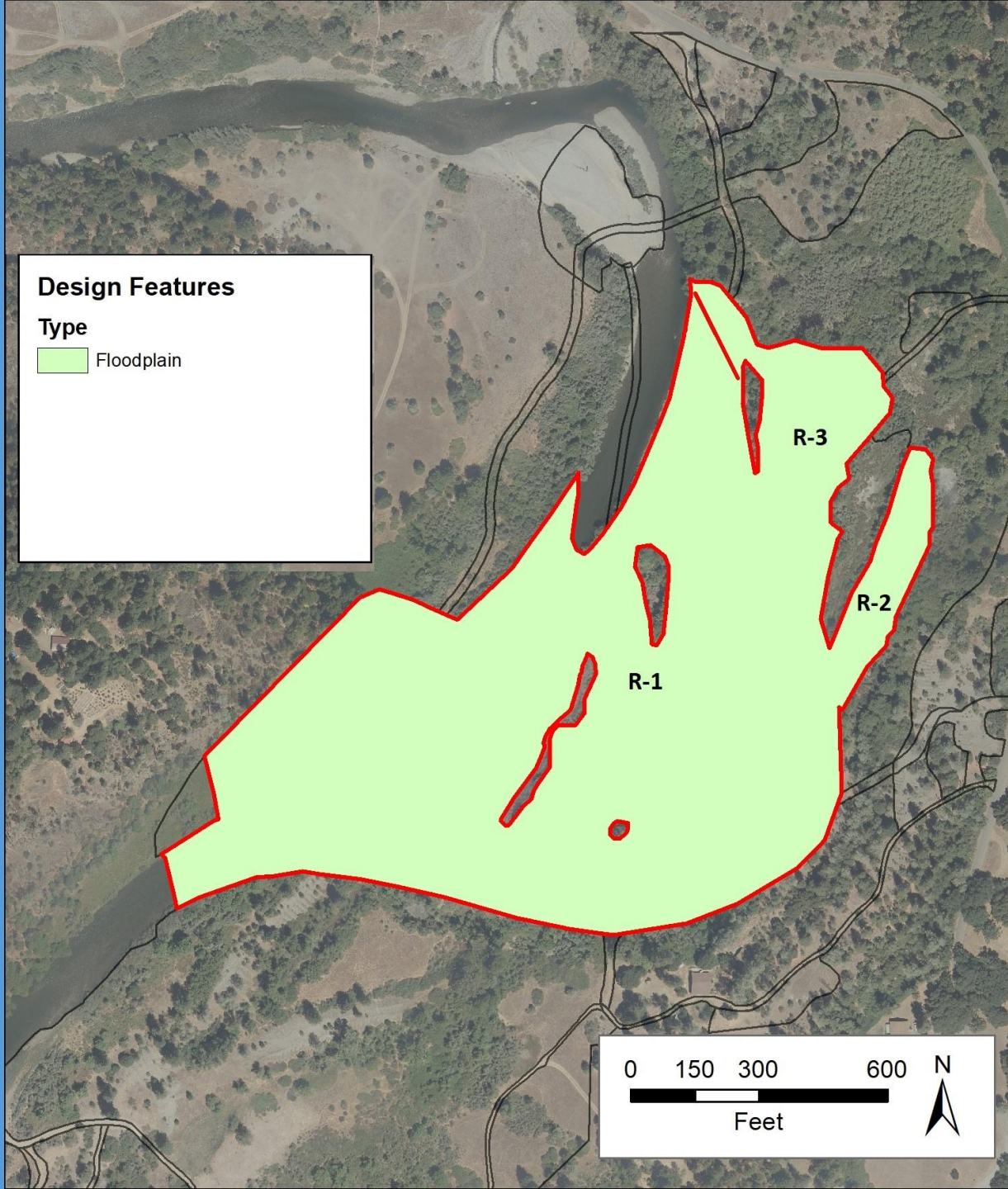
Segments 3 and 4

Segments 5, 6, and 7

Overall Project Objectives

Remove 16 acres of tailings piles from the valley bottom to:

- Greatly increase the extent and frequency of floodplain inundation – get the water out of the ditch!
- Reduce flow velocities and increase wetted cover (critical for juvenile salmon rearing habitat)
- Increase riparian biomass, trophic production, and overall ecosystem function
- Promote fluvial process and geomorphic change (deposition, avulsion, etc.)



Design Features

Type

 Floodplain

R-3

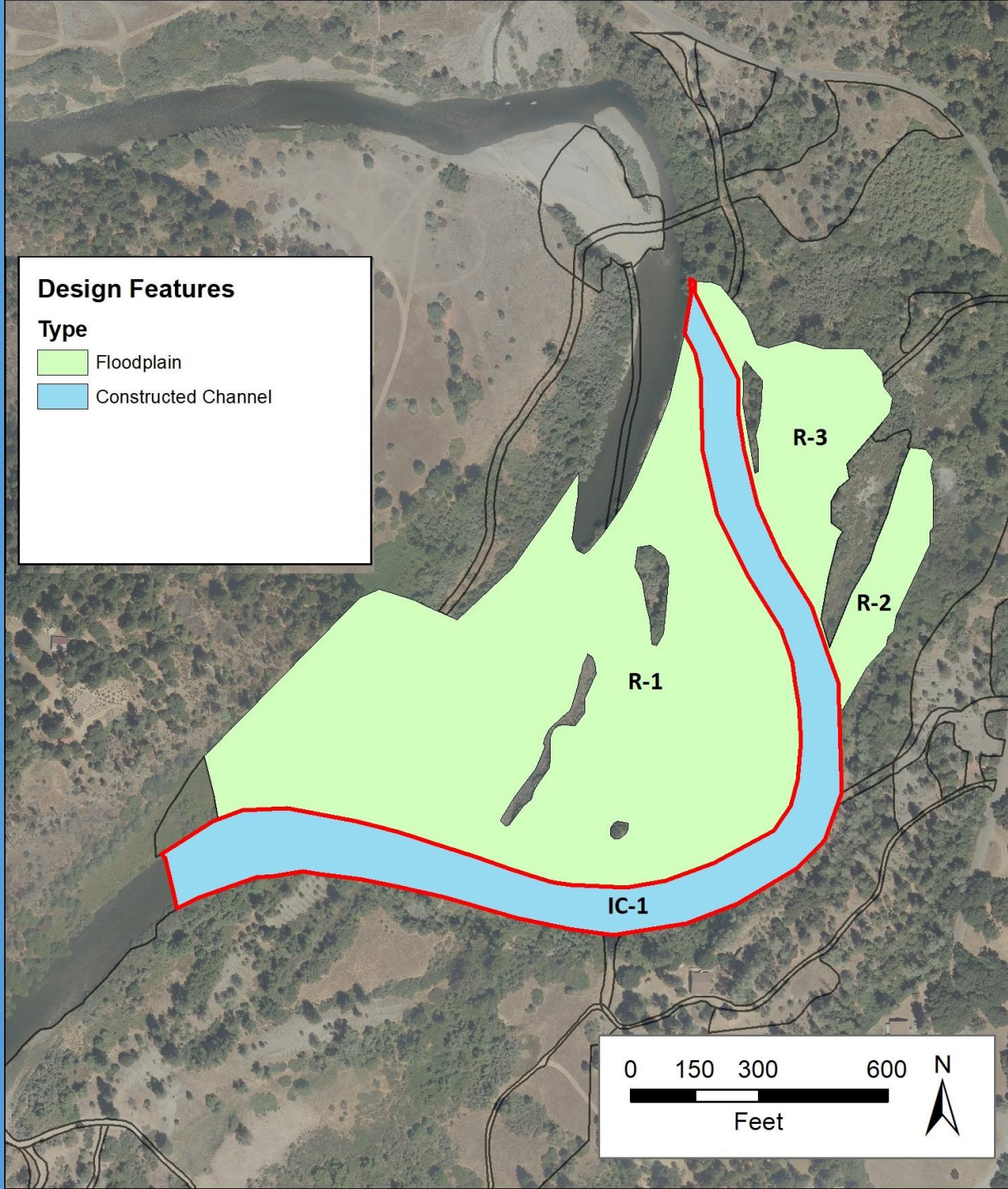
R-2

R-1

0 150 300 600

Feet





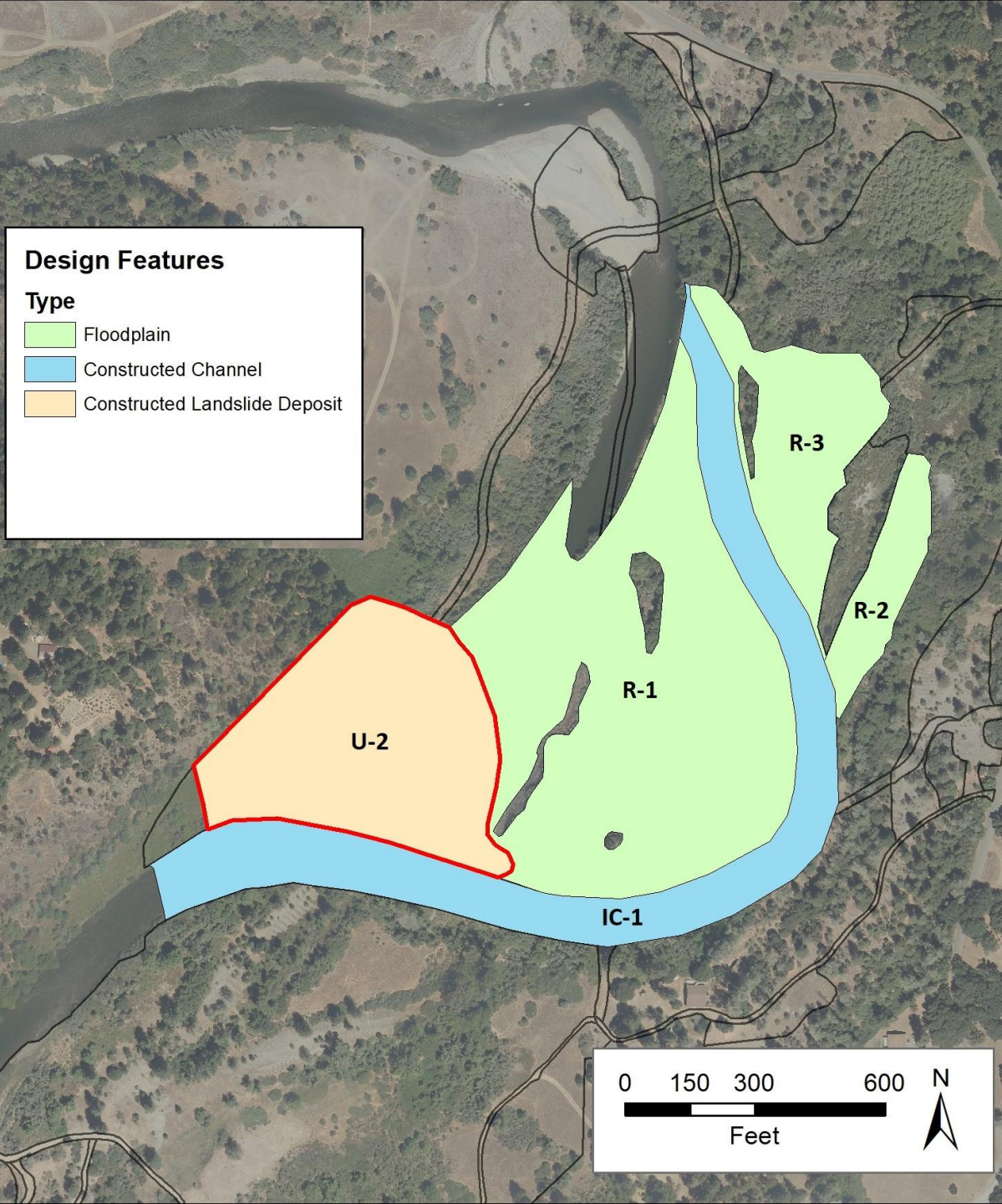
Design Features

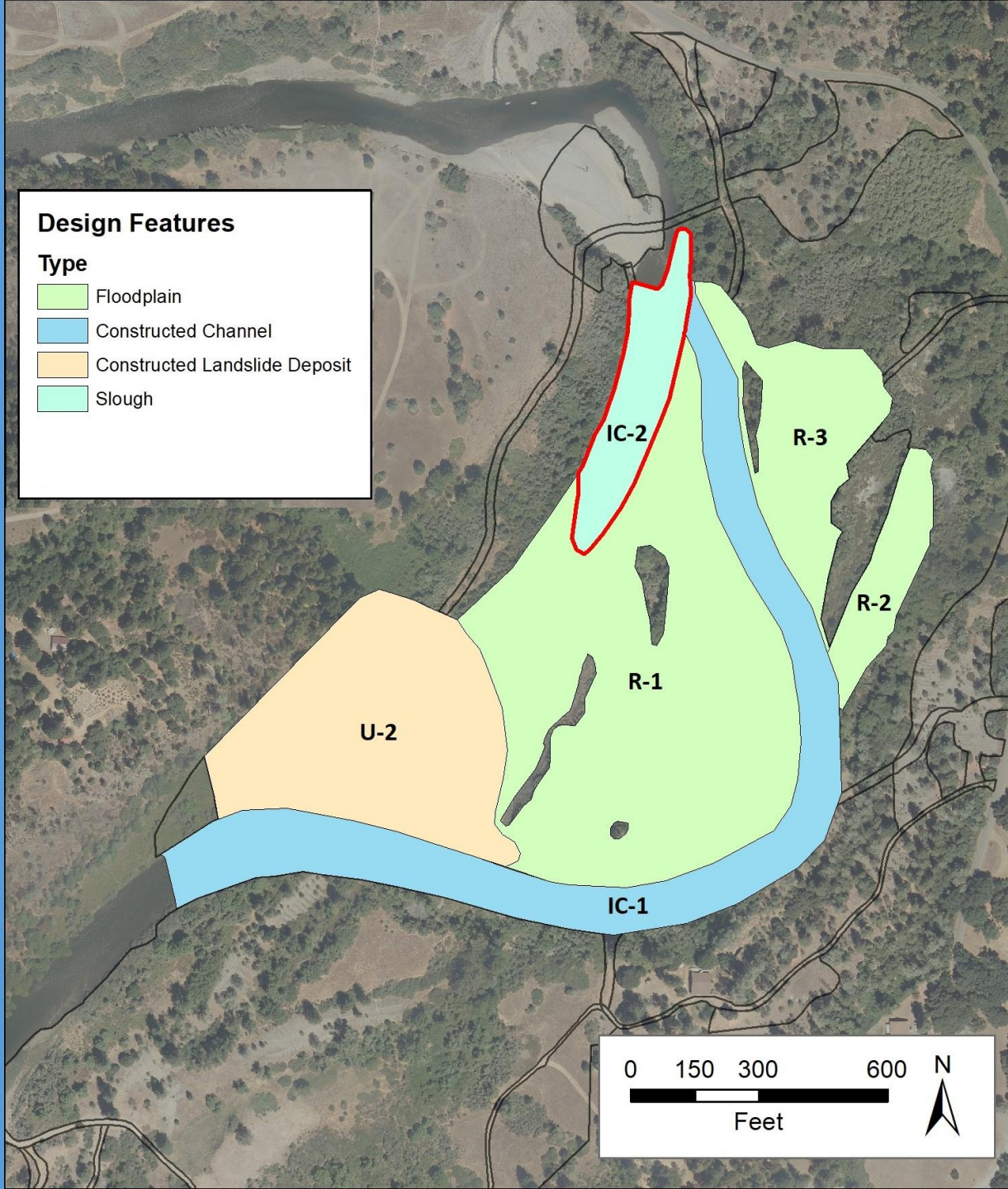
Type

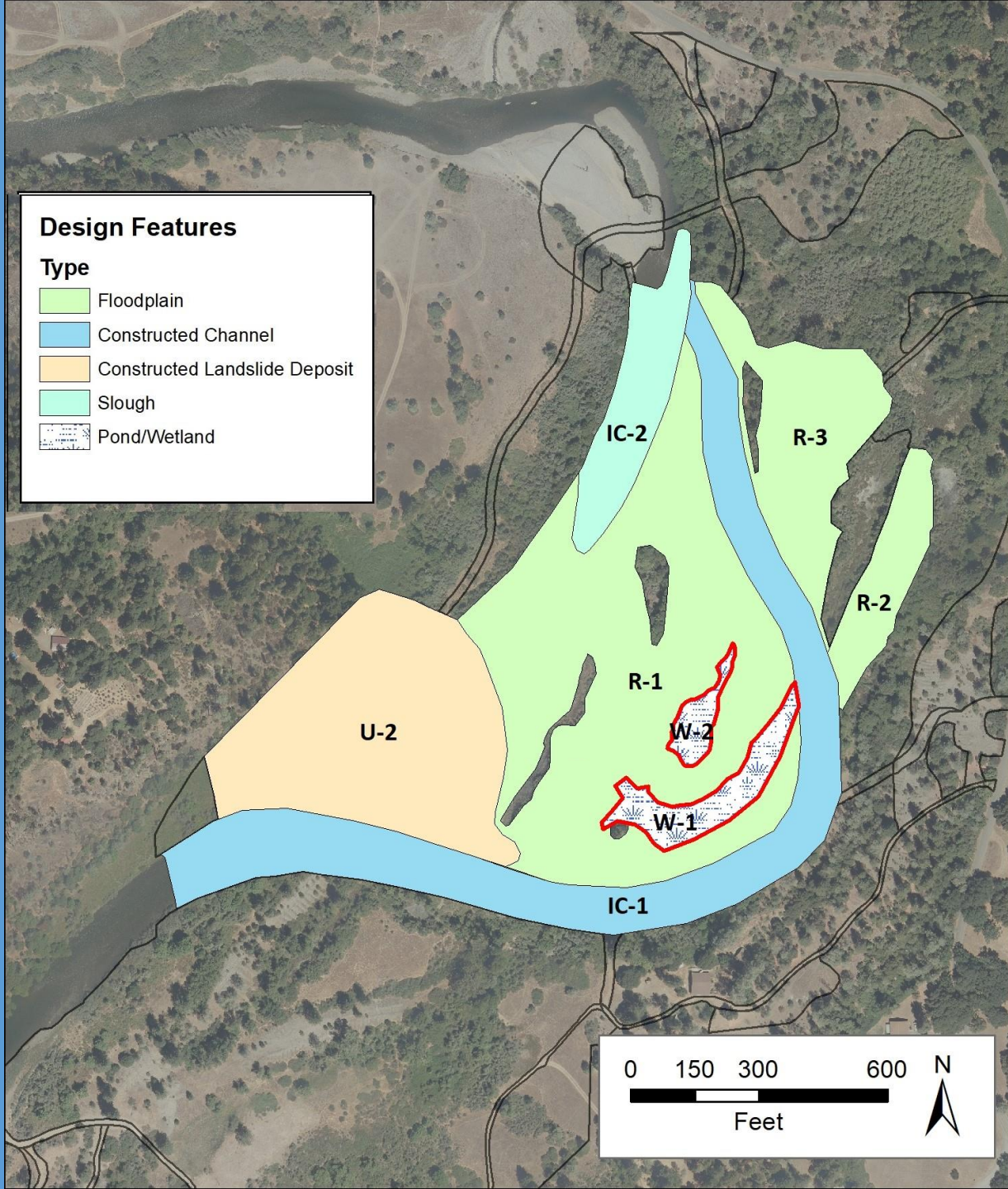
- Floodplain
- Constructed Channel

0 150 300 600 N

Feet



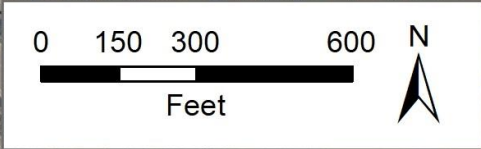




Design Features

Type

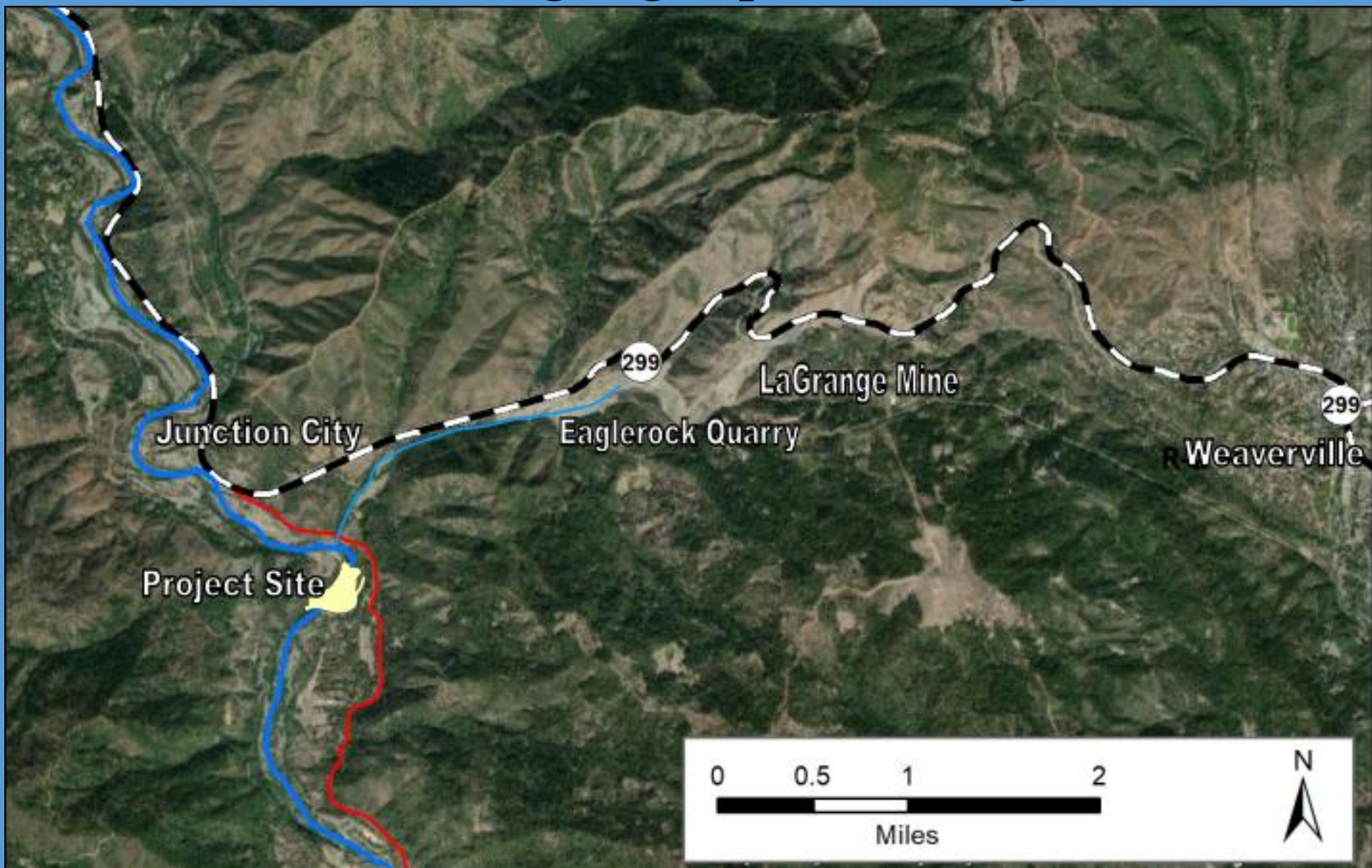
- Floodplain
- Constructed Channel
- Constructed Landslide Deposit
- Slough
- Pond/Wetland



Geologic materials quantities by feature. Volumes in cubic yard; wood in number of pieces 30+ ft long.

Feature	Cut	Fill (PR)	Fill (CGC)	Fill (CSB)	Fines	Large Wood
R-1	233,070	2,070	4,140			120
R-2	32,640					20
R-3	68,880					40
R-4				150		10
U-2		21,010	5,200	12,350	2,390	55
IC-1	181,890					75
IC-2		1,260	3,790			35
IC-3				225		16
IC-4				275		13
W-1						60
W-2						20
U-1 Spoils Area		143,000				
Totals	516,480	24,340	13,130	13,000	2,390	464

Where are we going to put all that gravel?



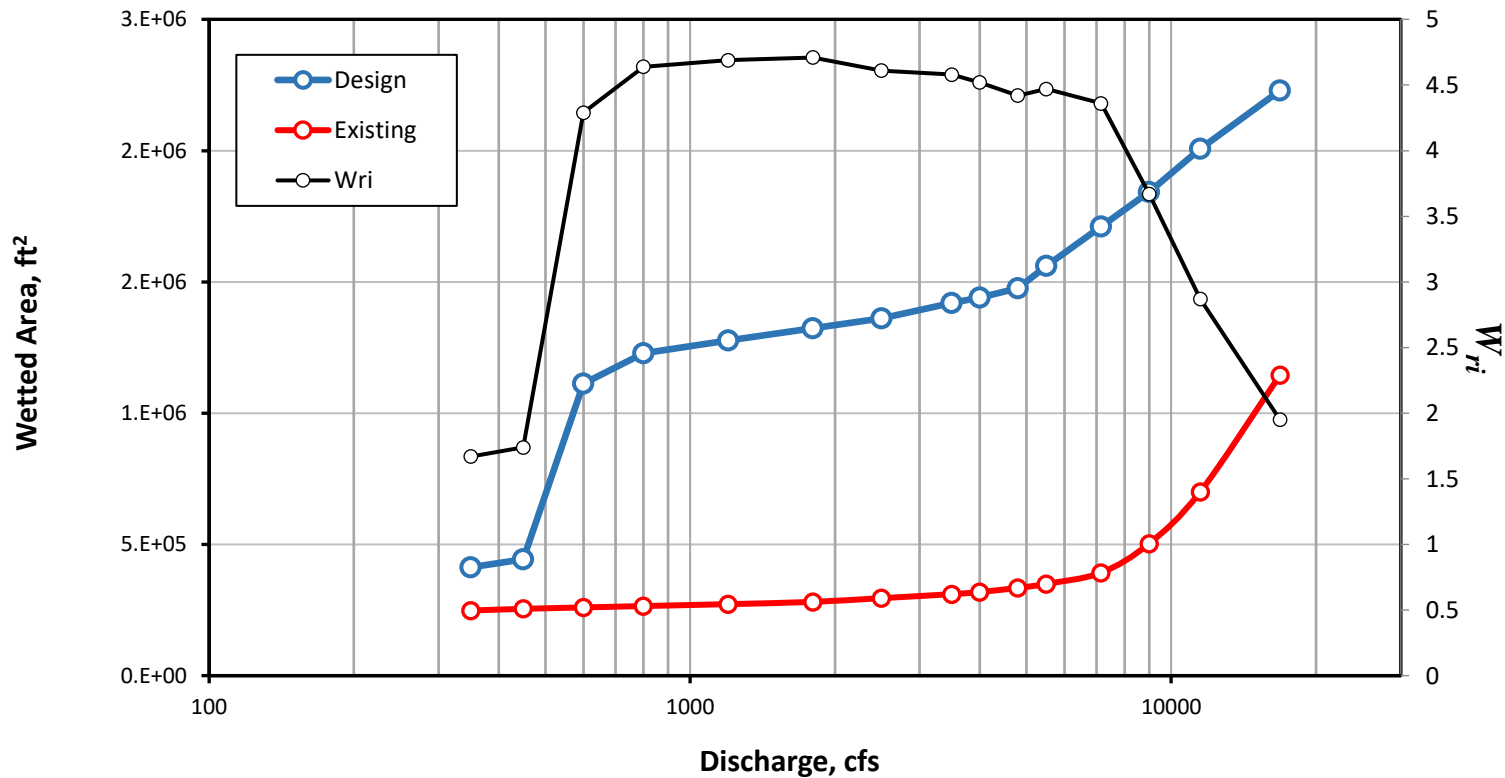
Between 320,000 and 500,000 yd³ to Eagle Rock

Eagle Rock



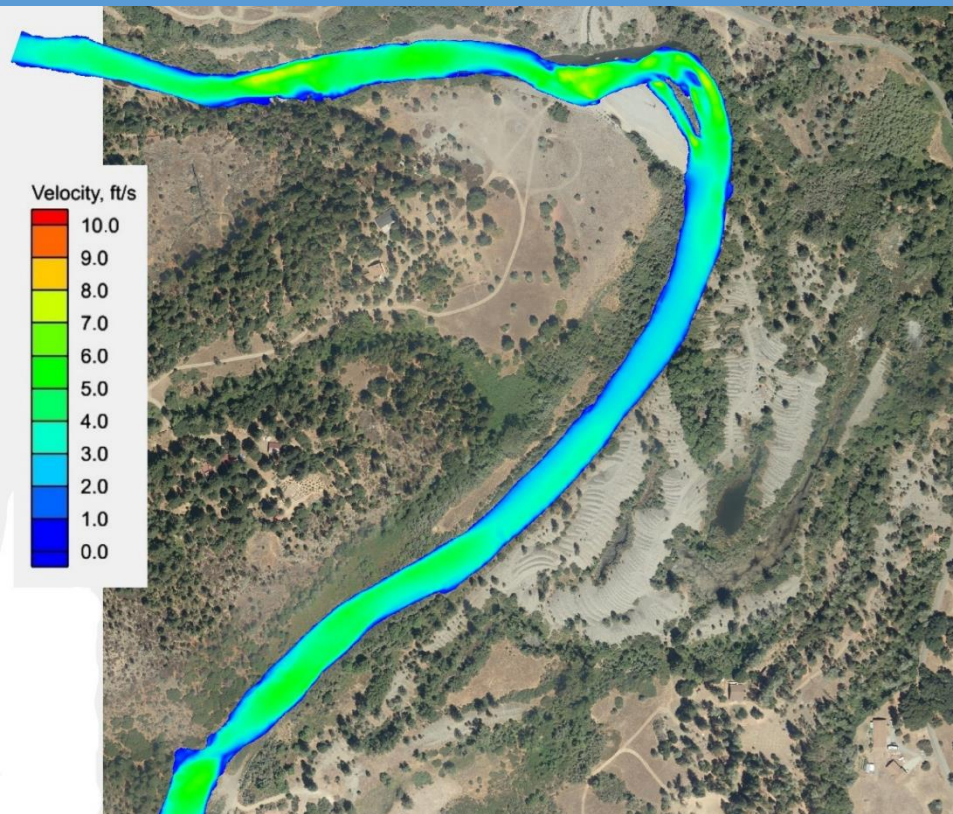
Design Performance

Wetted area increases by factor of 4.5 over wide range of frequent flows

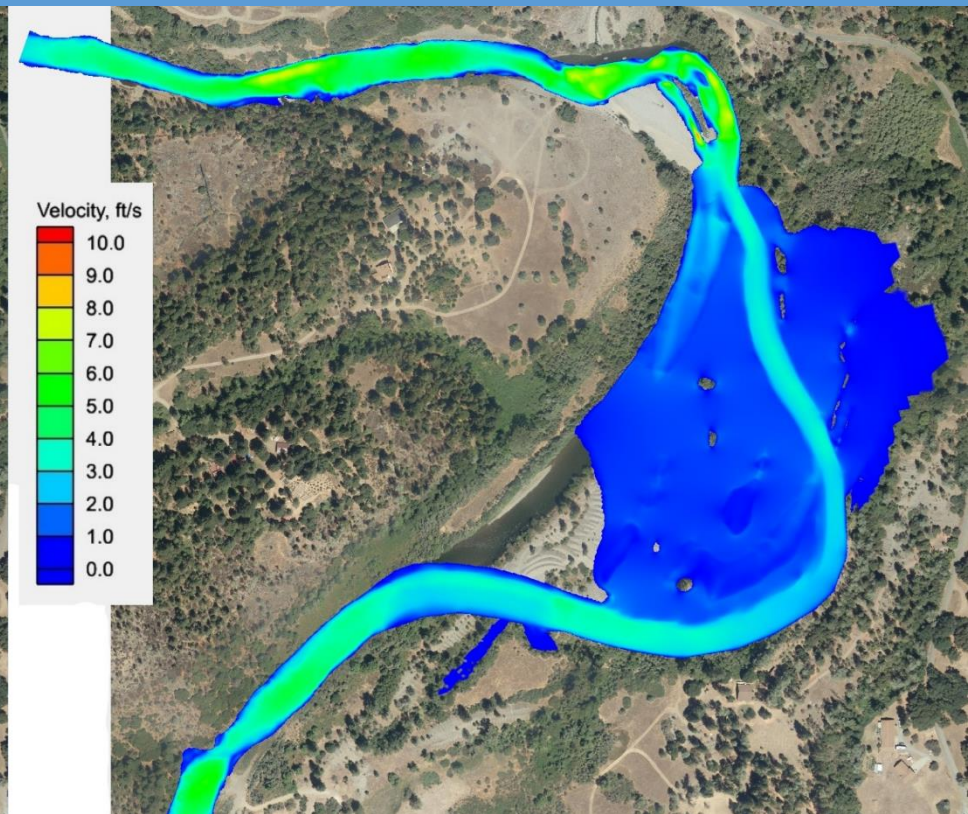


$$W_{ri} = \text{wetted area existing} / \text{wetted area design}$$

Modeled Inundation Extents and Flow Velocity 1,200 cfs

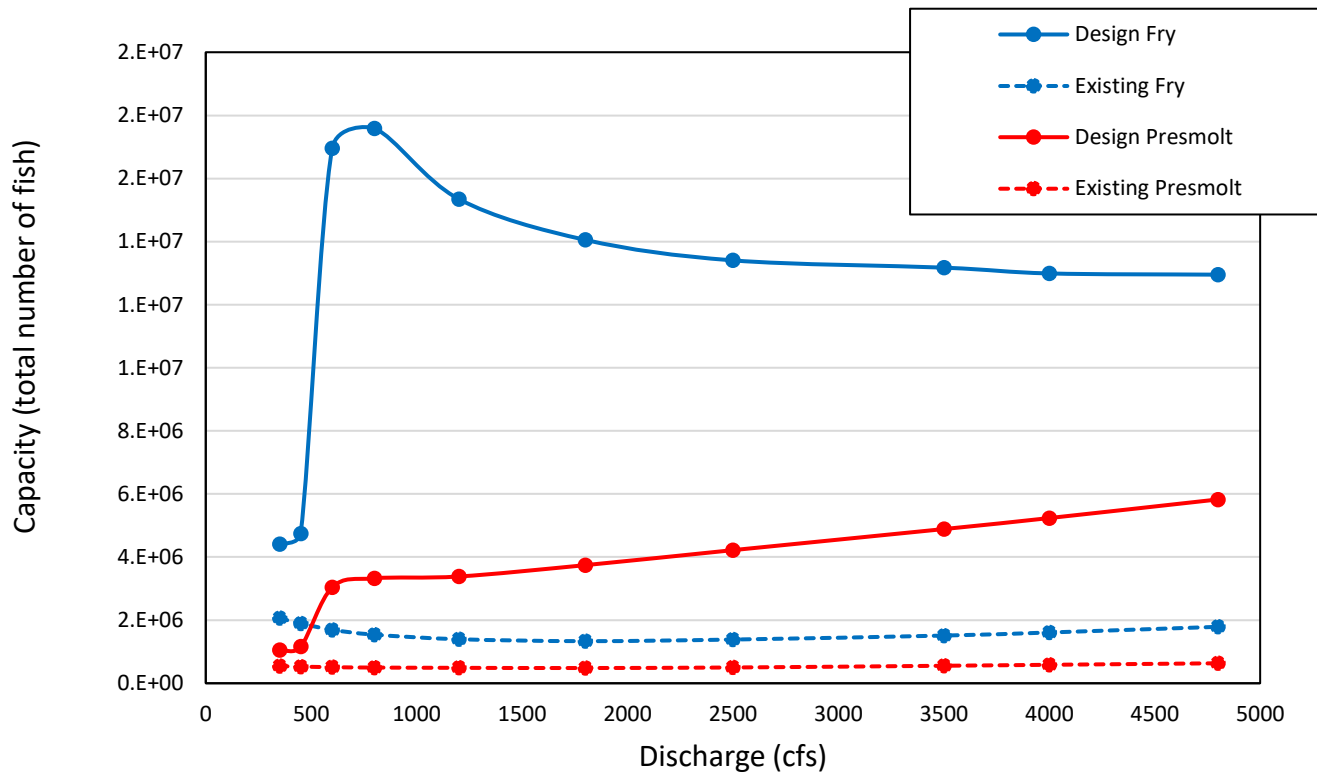


Existing Conditions



Design Conditions

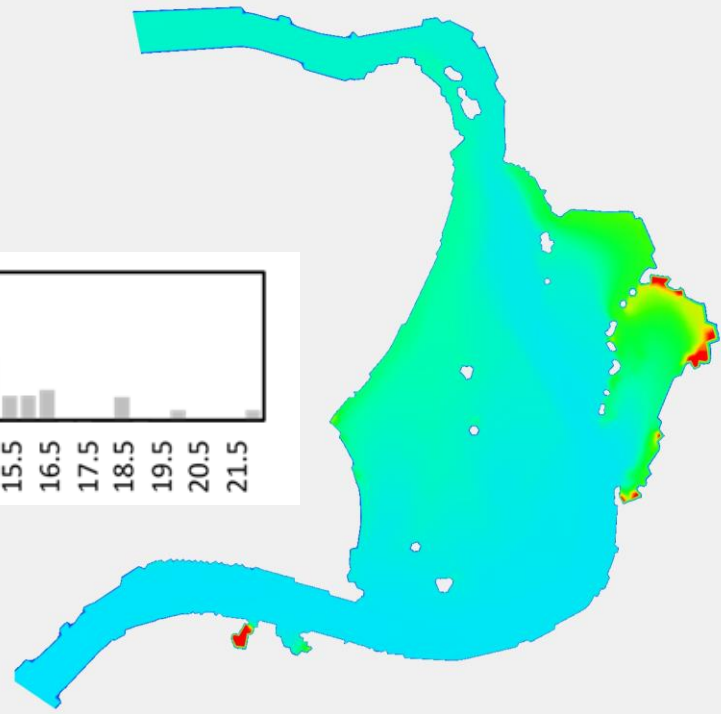
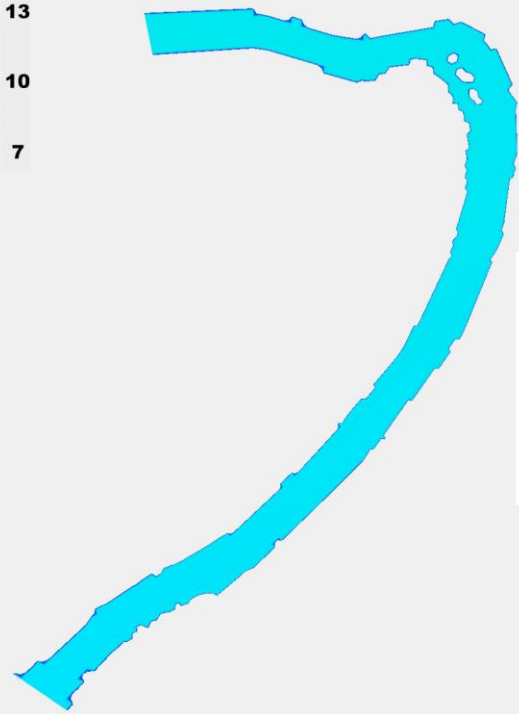
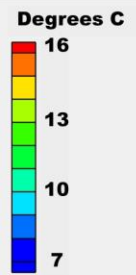
Fish Capacity



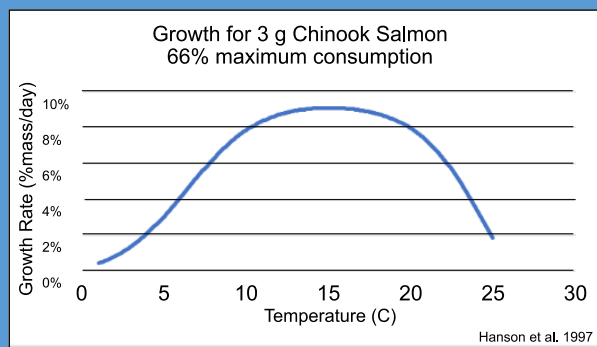
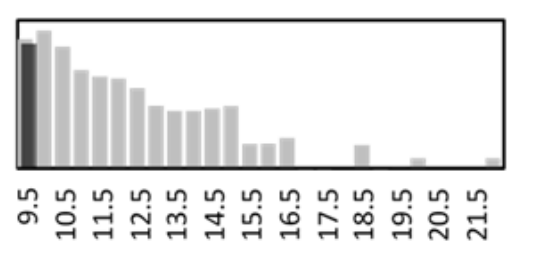
Discharge	Existing Fry	Discharge	Design Fry	Design Presmolt	% Increase Fry	% Increase Presmolt
300	2,066,426	350	4,415,513	1,052,714	114	94
450	1,898,467	450	4,740,872	1,159,337	150	119
600	1,696,684	510,465	16,959,808	3,041,313	900	496
800	1,542,588	498,925	17,590,396	3,327,916	1,040	567
1,200	1,397,962	490,081	15,350,484	3,384,612	998	591
1,800	1,337,247	484,635	14,054,960	3,744,610	951	673
2,500	1,387,653	501,426	13,404,804	4,219,898	866	742
3,500	1,513,884	555,522	13,174,571	4,887,795	770	780
4,000	1,611,942	585,747	12,990,963	5,236,235	706	794
4,800	1,791,810	633,893	12,951,779	5,825,820	623	819

Modeled Thermal Diversity

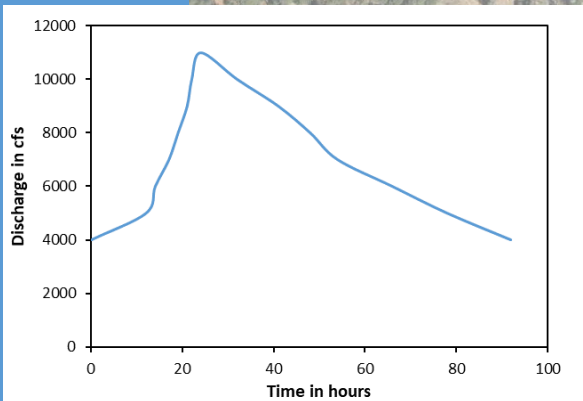
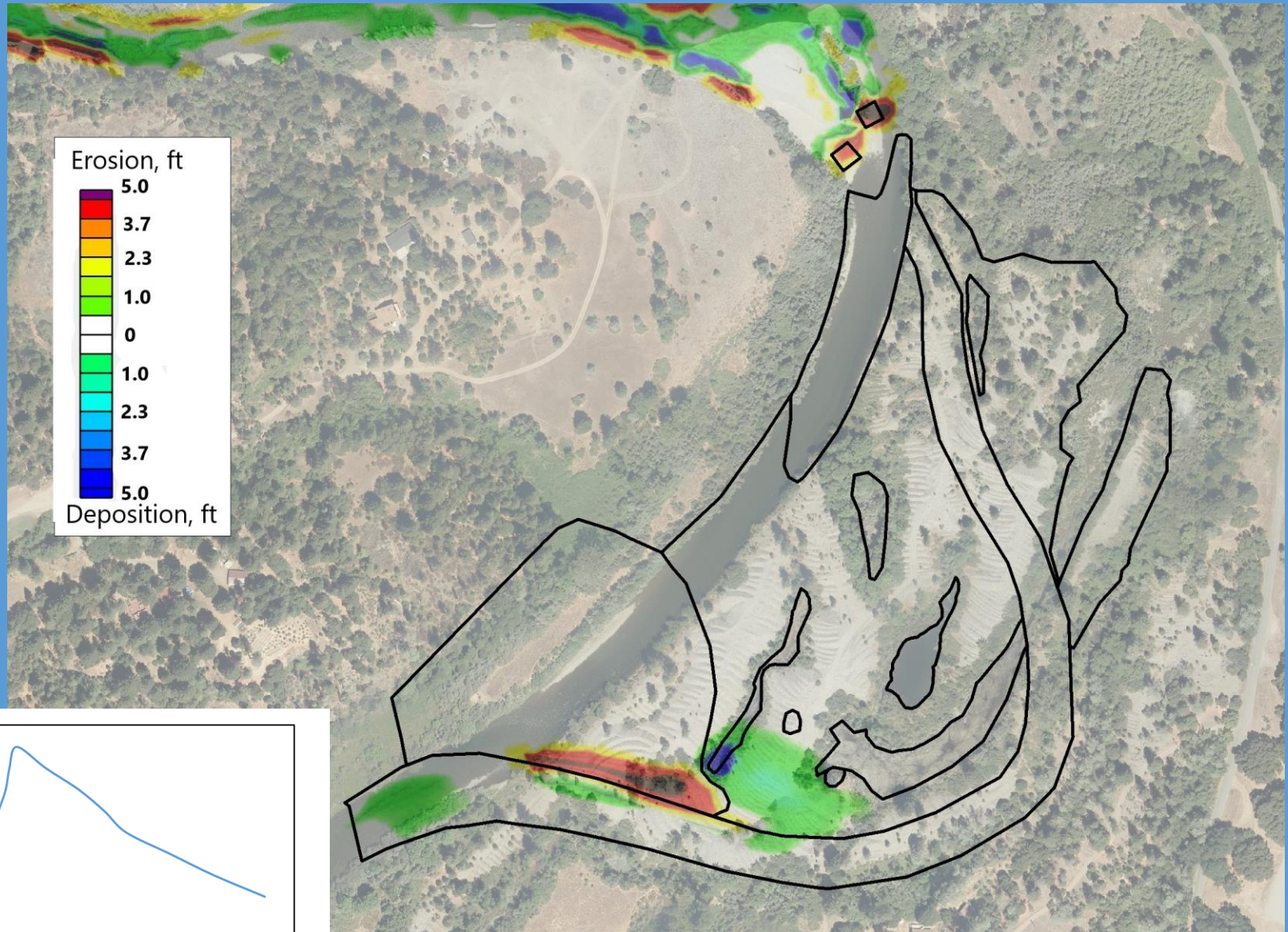
April 13, 2019 hydrology and meteorology, 1400 cfs



Existing
Design



Morphodynamic Model Prediction



Oregon Gulch Summary

- **Remove 16 acres of tailings piles from the valley bottom.**
- **About 500,000 yd³ of excavation.**
- **Increase inundated width at this site by a factor of 4.5 over a wide range of frequent flows.**
- **Hundreds to > 1000% increase in juvenile salmon rearing habitat over a wide range of frequent flows.**
- **50+% increase in area of seasonally inundated aquatic and riparian habitat over entire 40-mile TRRP restoration domain.**
- **Projected future evolution includes local deposition and scour, potential for avulsions and development of complex multi-thread channel.**