

# Upper Conner Creek Existing Conditions



*RIG Design Team Meeting*



**Hoopa Valley Tribe Design Team**

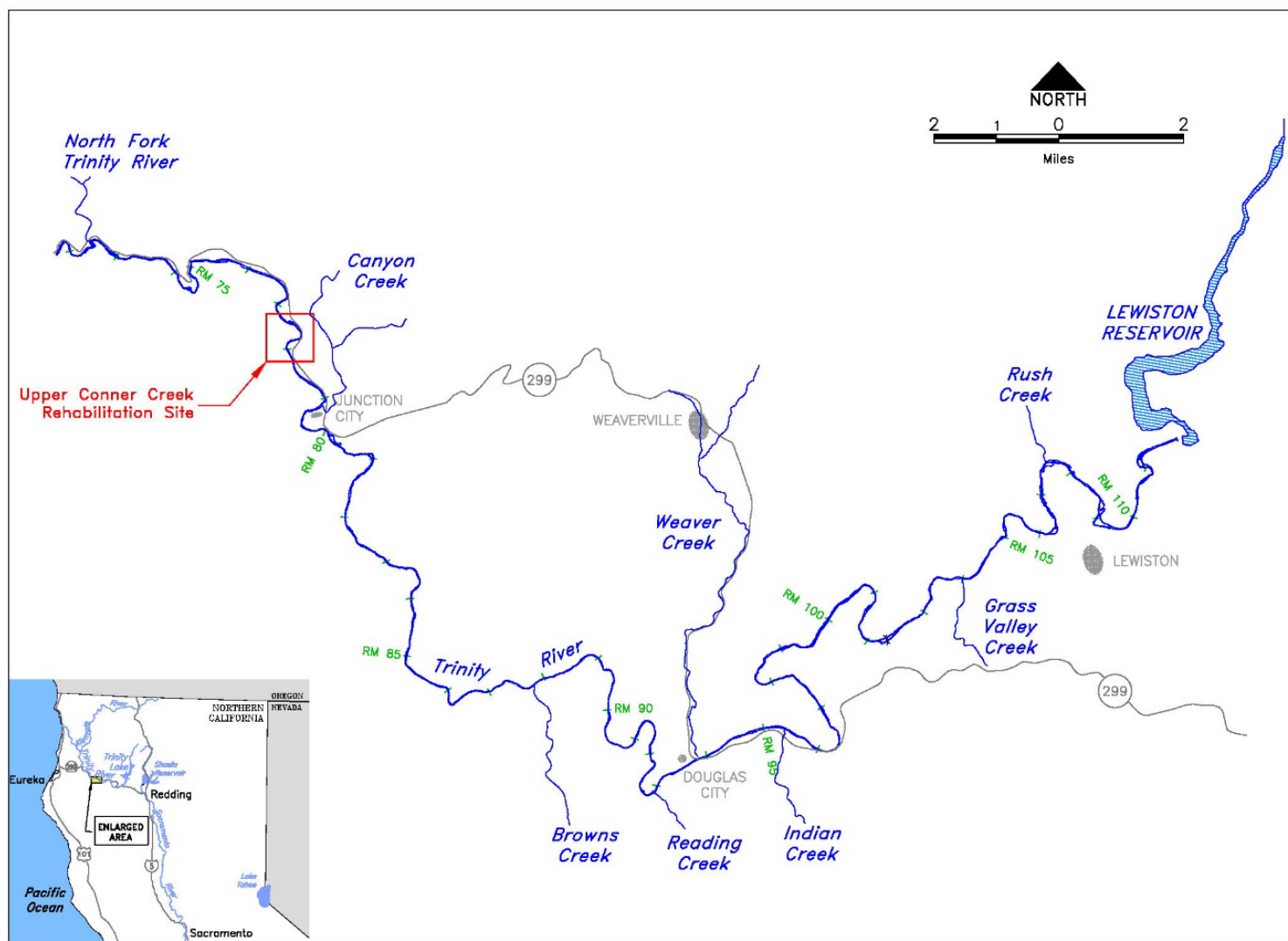


February 6, 2020

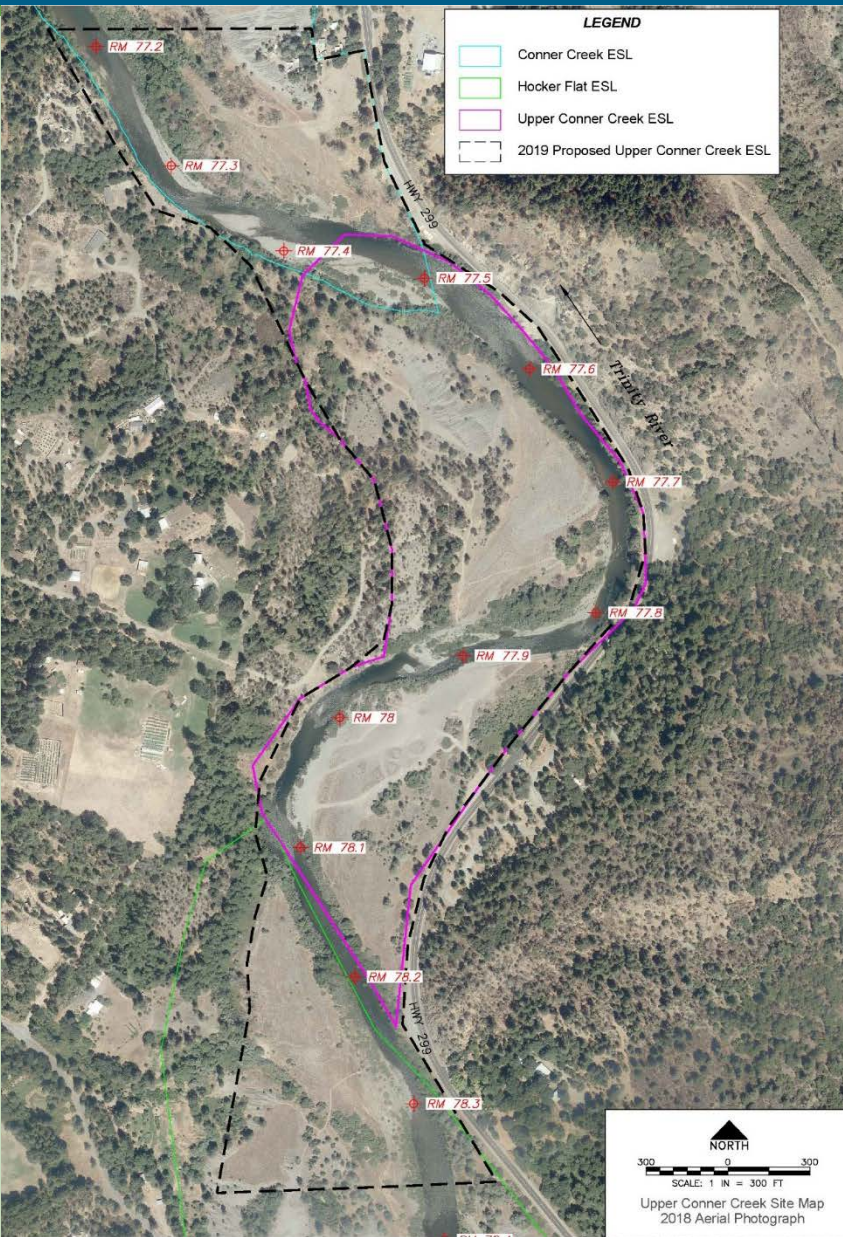
# Outline

- Site Location
- Current vs. Proposed ESL
- Land Ownership, Mining Claims, and Recreation
- Existing Infrastructure
- Geotechnical Investigation
- Current Geomorphic Conditions
- Hydrology
- Existing Conditions Hydraulic Model
- Existing Vegetation
- Fisheries
- Amphibians and Reptiles
- Next Steps

# Site Location

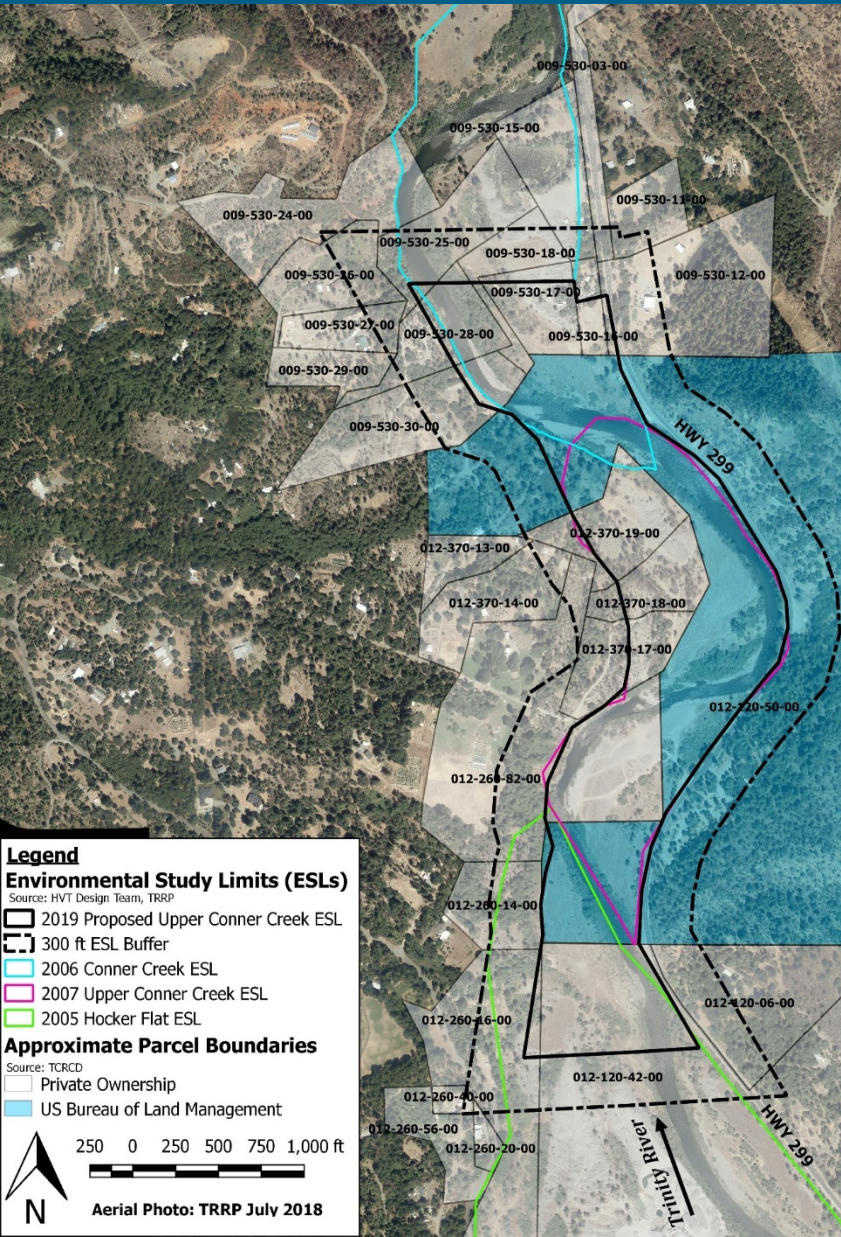


# Current vs Proposed ESL



- We propose that the 2007 Upper Conner Creek ESL be expanded to include portions of the Conner Creek and Hocker Flat ESLs.
- These portions of the Hocker Flat and Conner Creek ESLs comprise of high floodplain surfaces that do not support riparian vegetation or interact with contemporary flows.
- Future changes to the ESL are expected to accommodate site access along the left bank.

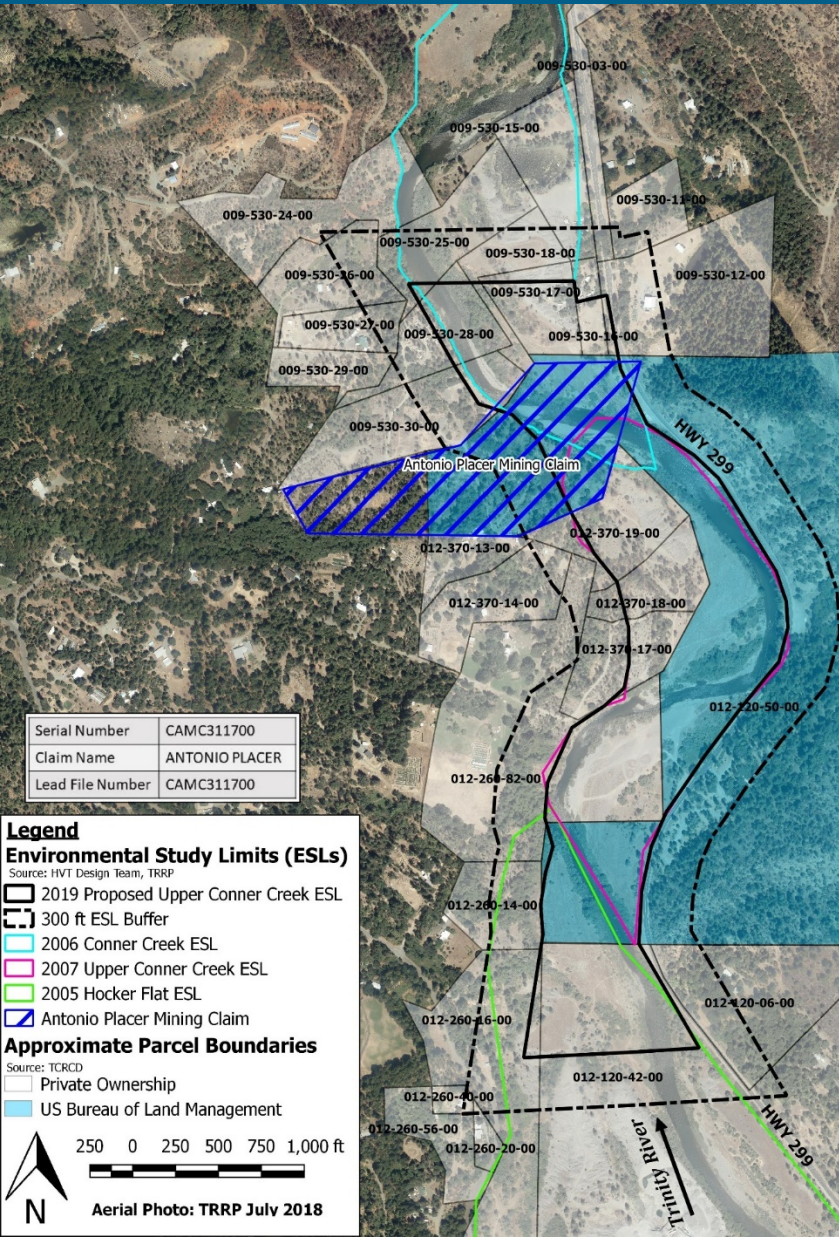
# Land Ownership



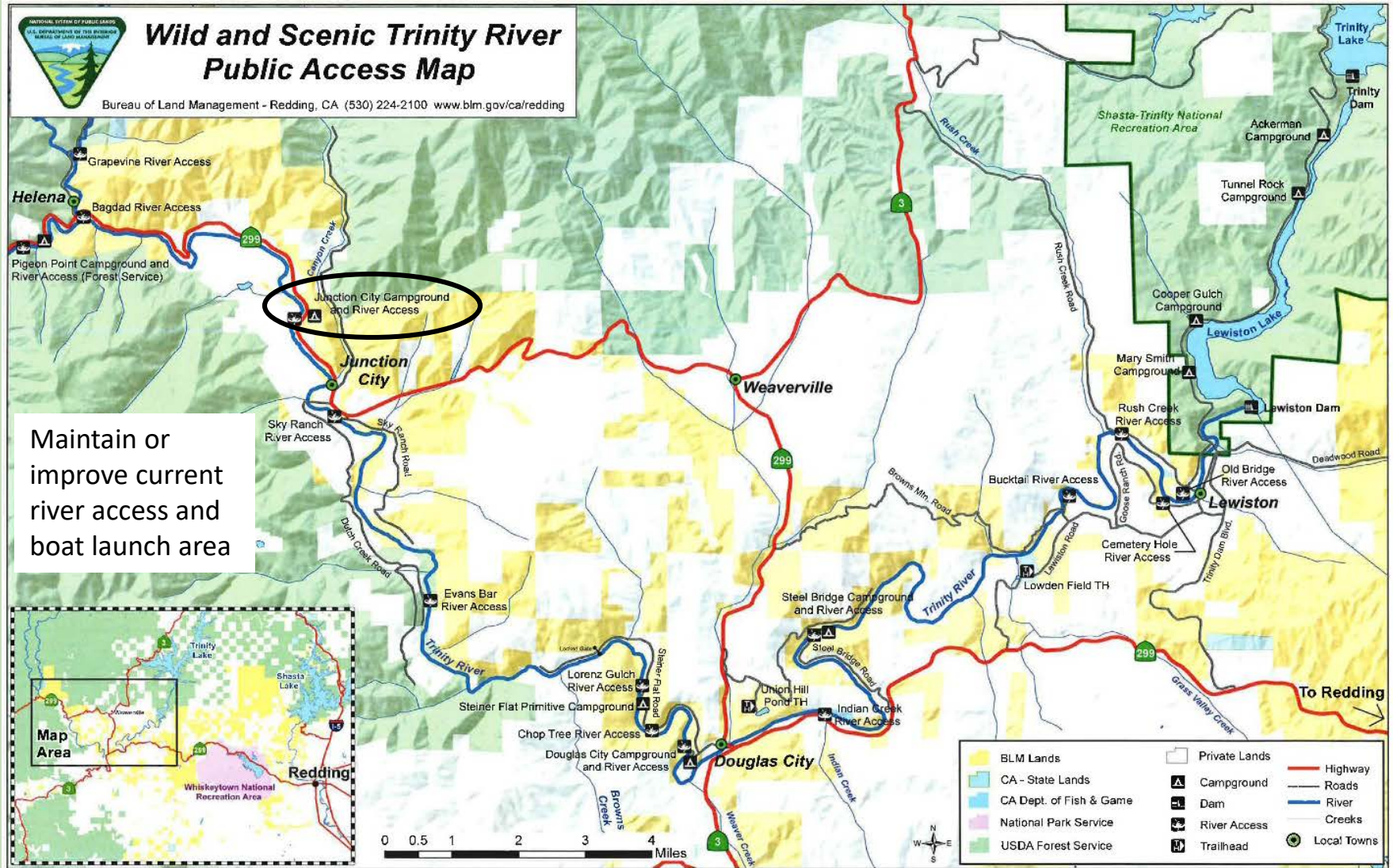
- Project site ownership a mix of private property and BLM land.
- Site is approximately 84 acres in area; 61% (51 acres) is BLM, 39% (33 acres) privately owned.
- A total of 27 parcels are included within the 300 ft ESL buffer zone.

# Mining Claim

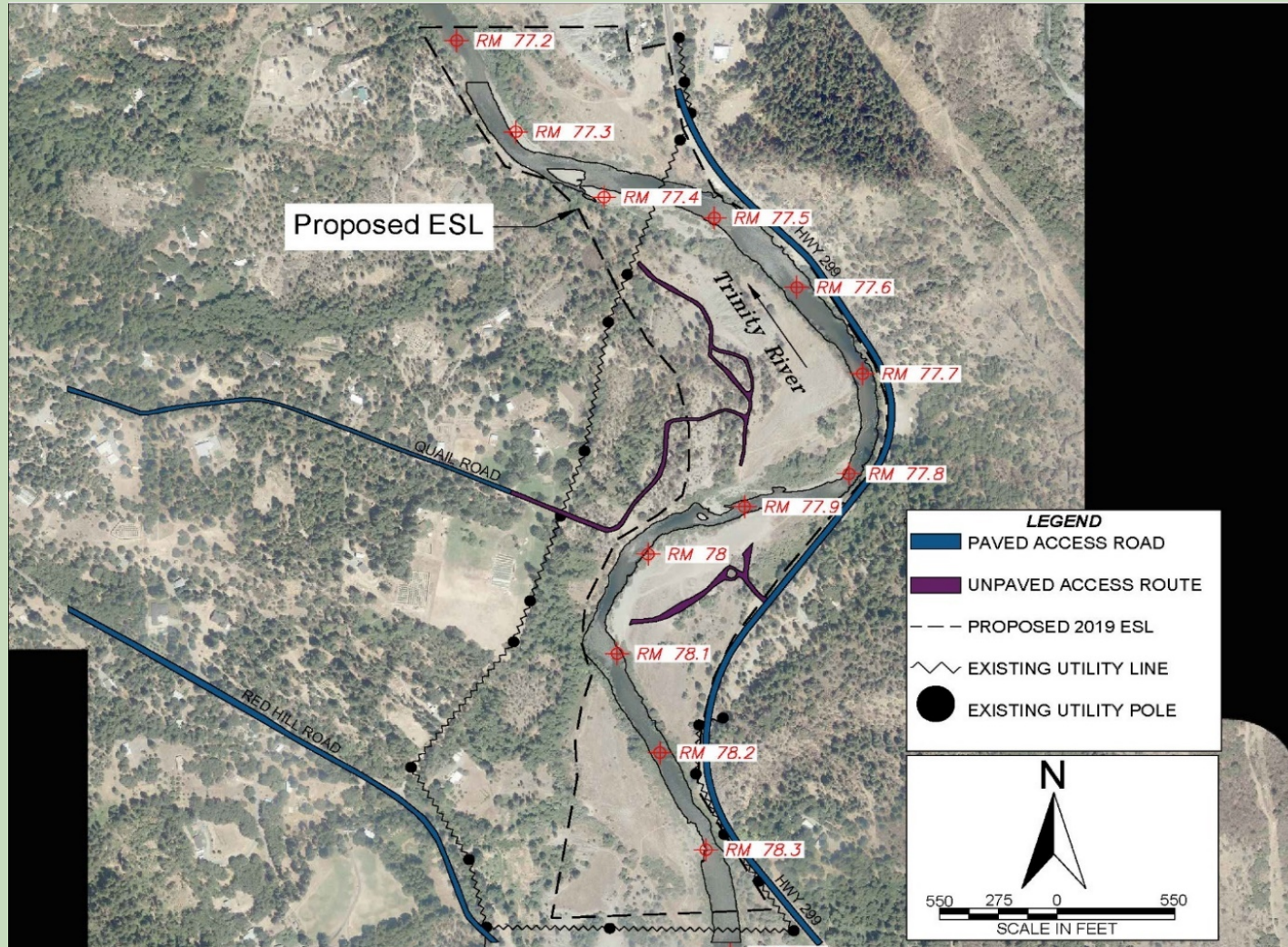
- Active mining claim exists within the ESL (Serial# CAMC311700).
- Includes 20 acres between the left and right bank between RM77.4 and RM77.5
- Two Claimants: Barbara Reynolds, living in Eugene, OR, and Katherine Truitt, living in Arcata, CA.



# Recreation



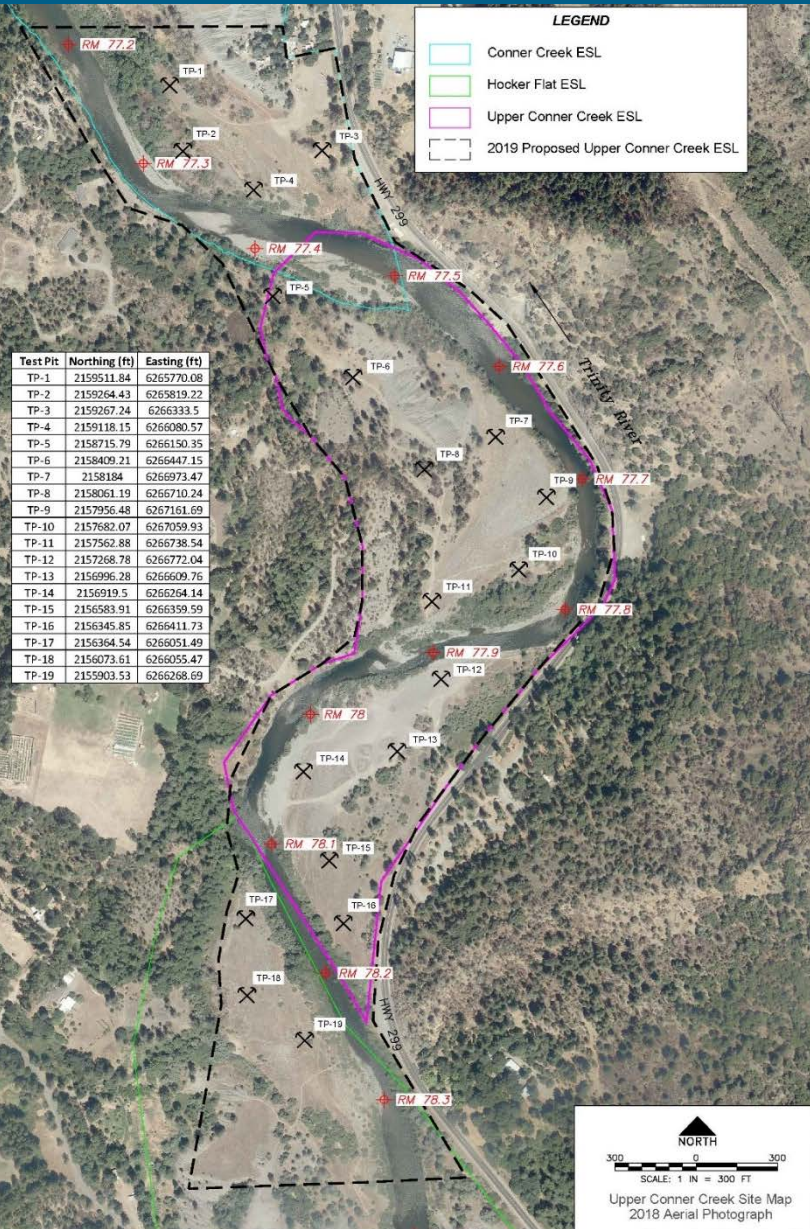
# Existing Infrastructure



# Existing Infrastructure

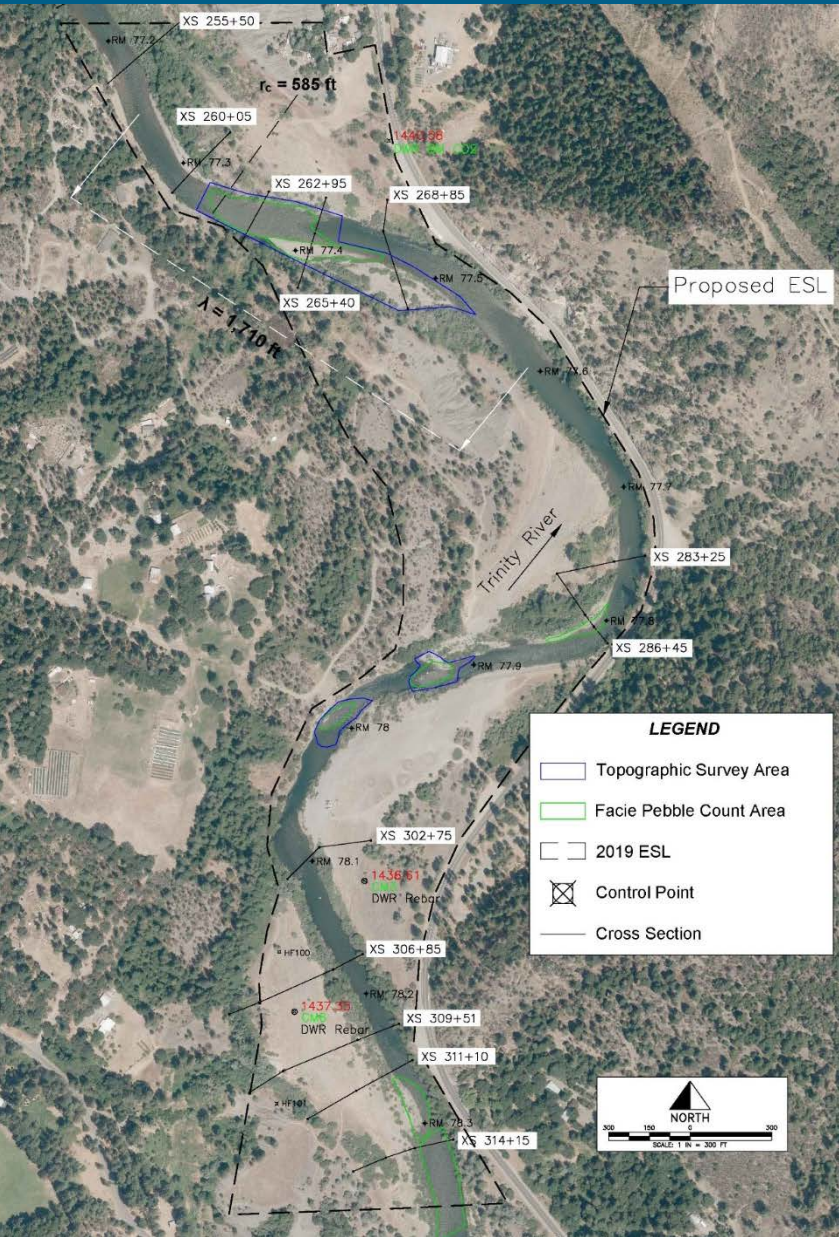


# Geotechnical



- Valley-scale geology: fits with the geology presented in the Upper Junction City Valley Existing Conditions Report.
- Preliminary test pit locations proposed and submitted to TRRP in 2019.
- Test pit locations were selected to provide reasonable description of coarse sediment resources and of groundwater at the time of excavation.

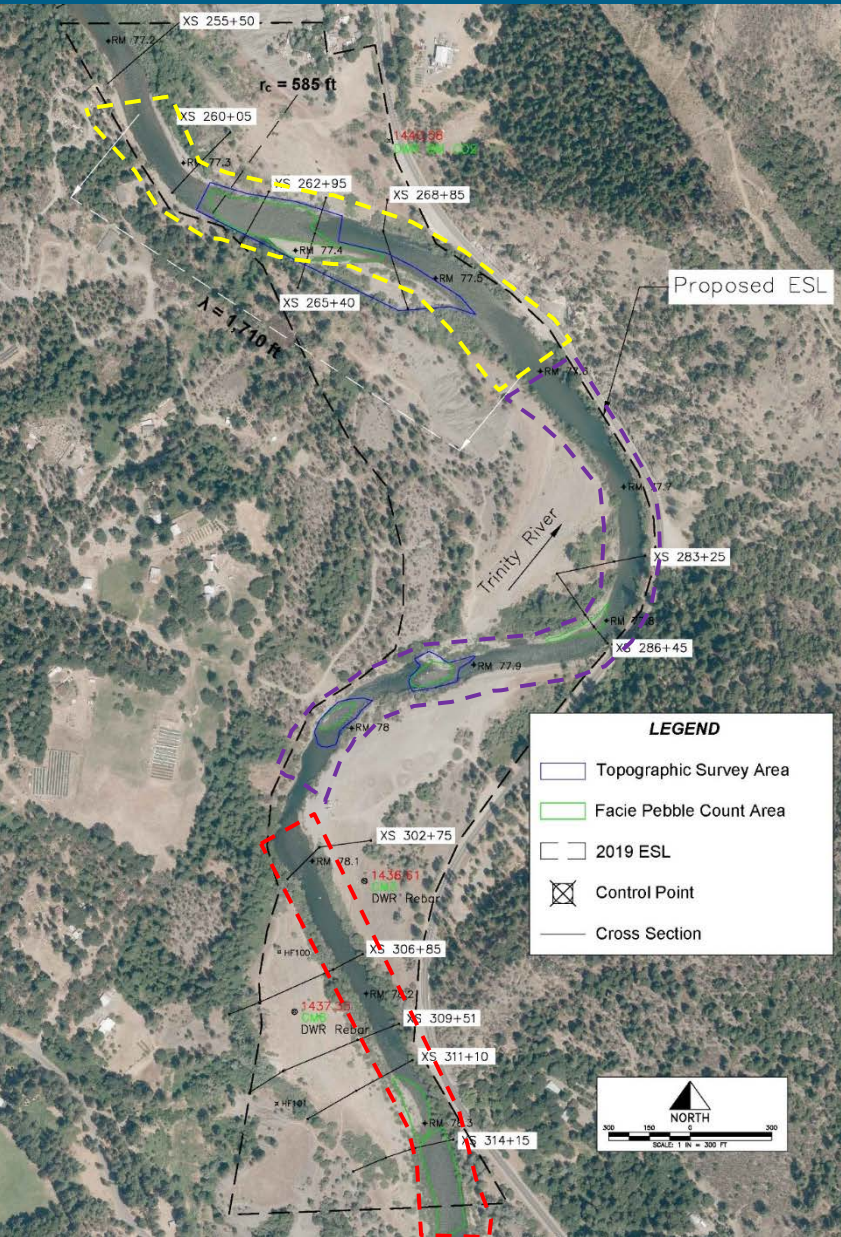
# Current Geomorphic Conditions



- Meander wavelength
- Radius of curvature
- Topographic change
- Substrate size
- Large wood

# Current Geomorphic Conditions

## (Meander Wavelength and Radius of Curvature)



### Meander Wavelength (downstream to upstream)

Measured	CDG Value	% Difference
1,710 ft	1,470 ft	16%
1,960 ft	1,470 ft	33%
2,584 ft	1,470	76%

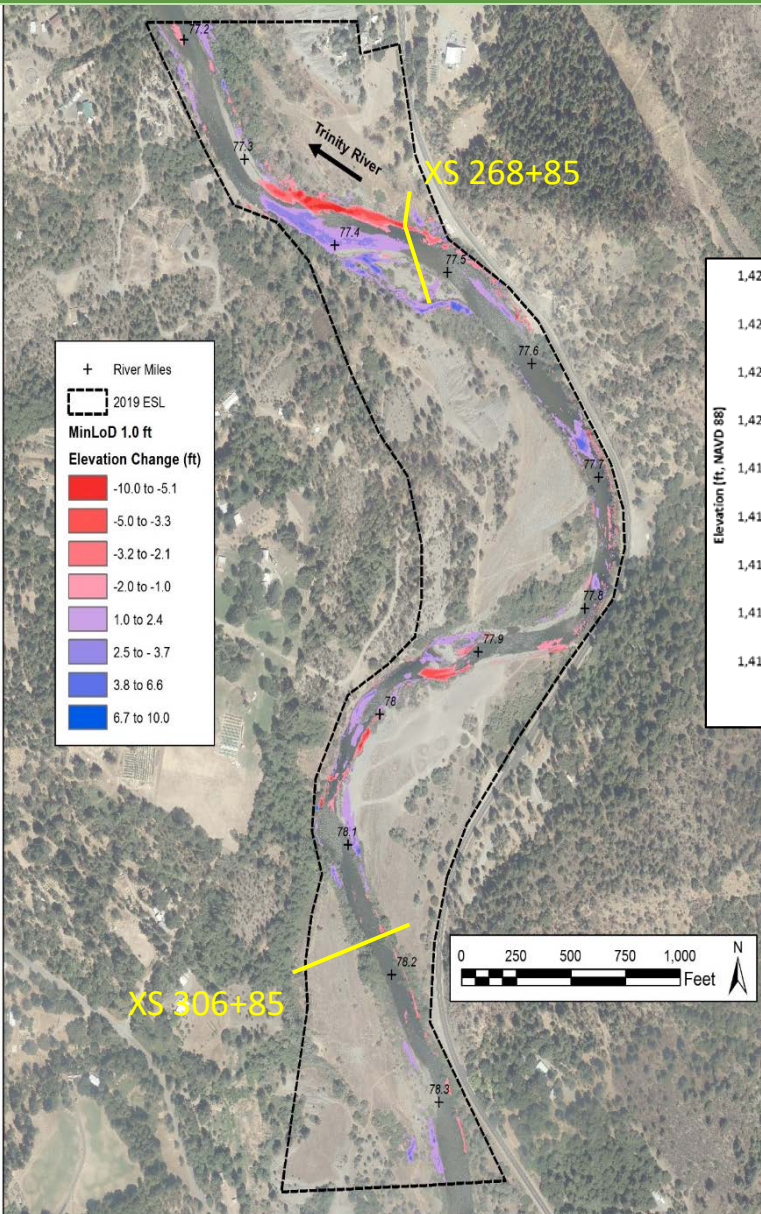
### Radius of Curvature

Measured	CDG Value	% Difference
585 ft, 720 ft	500 ft	17%, 44%
485 ft, 612 ft	500 ft	-3%, 22%
2,533 ft, 1,514 ft	500 ft	406%, 203%

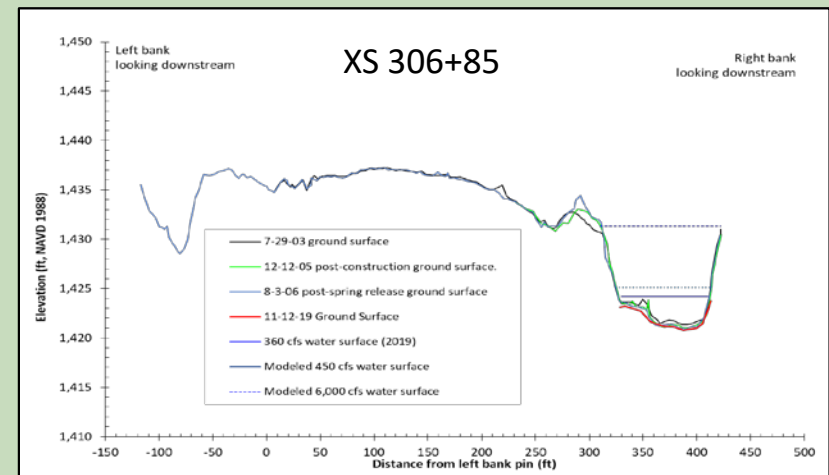
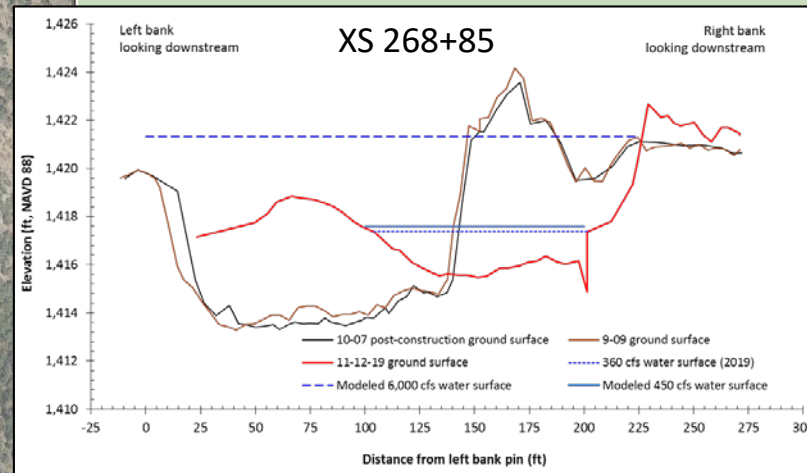
**\*\*Meander continue past extent of image\*\***

# Current Geomorphic Conditions

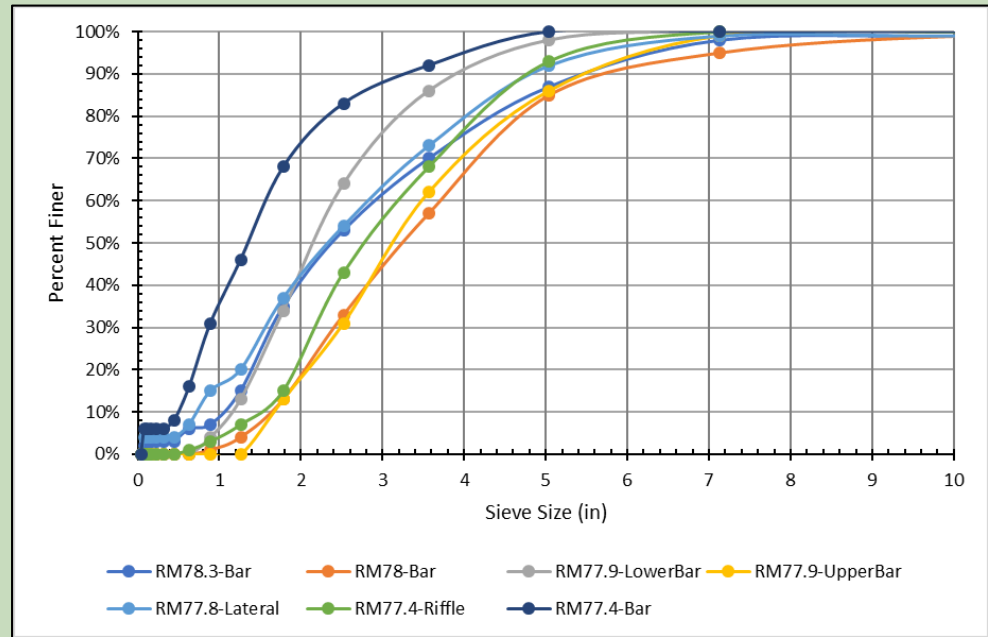
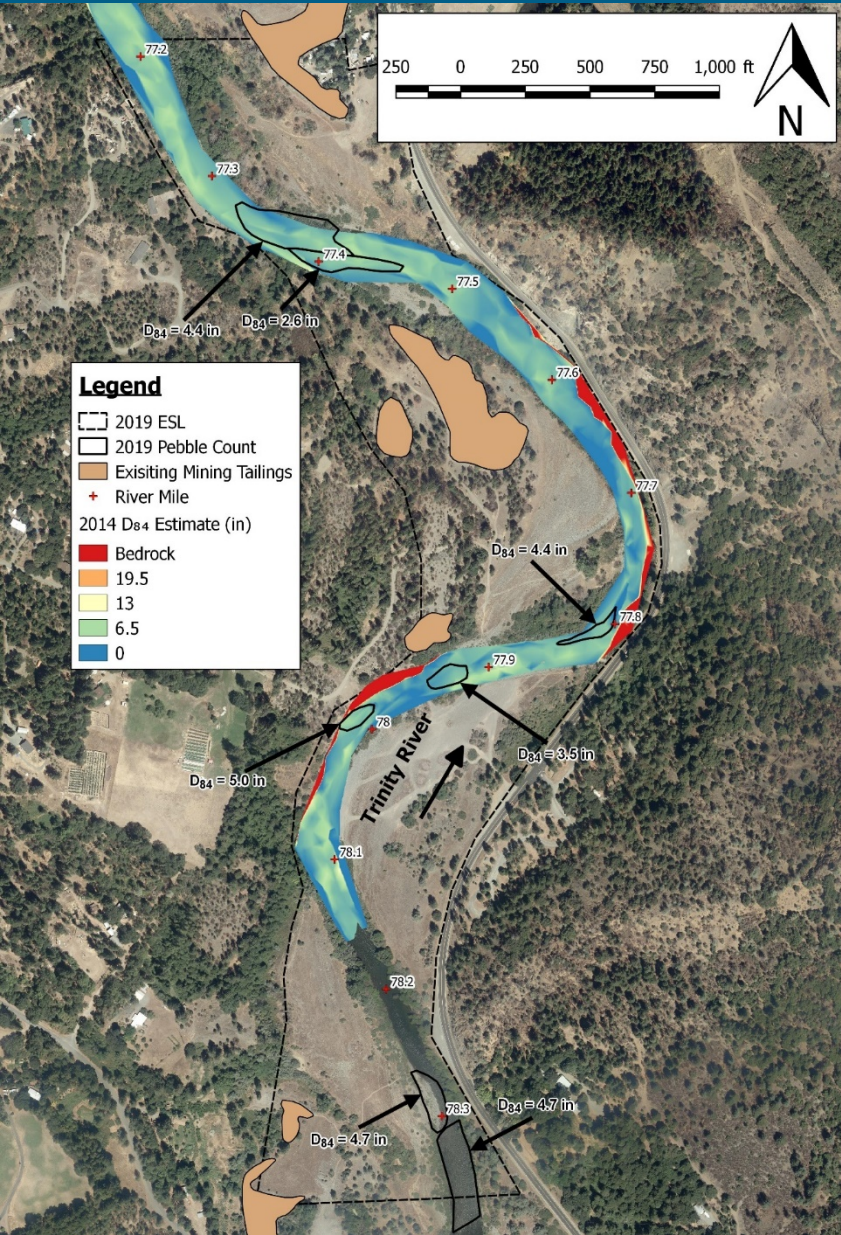
## (Topographic Change between 2012 and 2019)



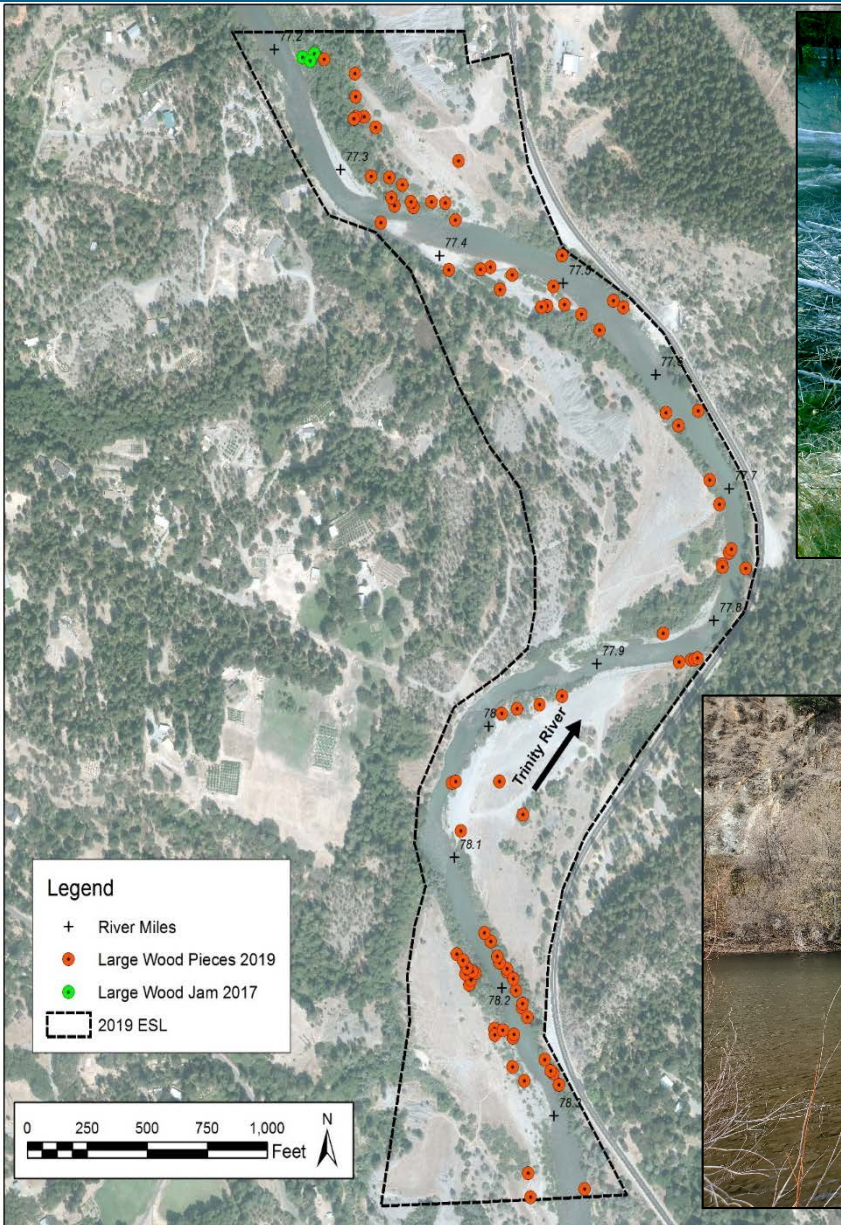
- GCD analysis indicates:
  - Channel migration into right bank at RM77.4
  - Aggradation occurring at bar features throughout the project reach.



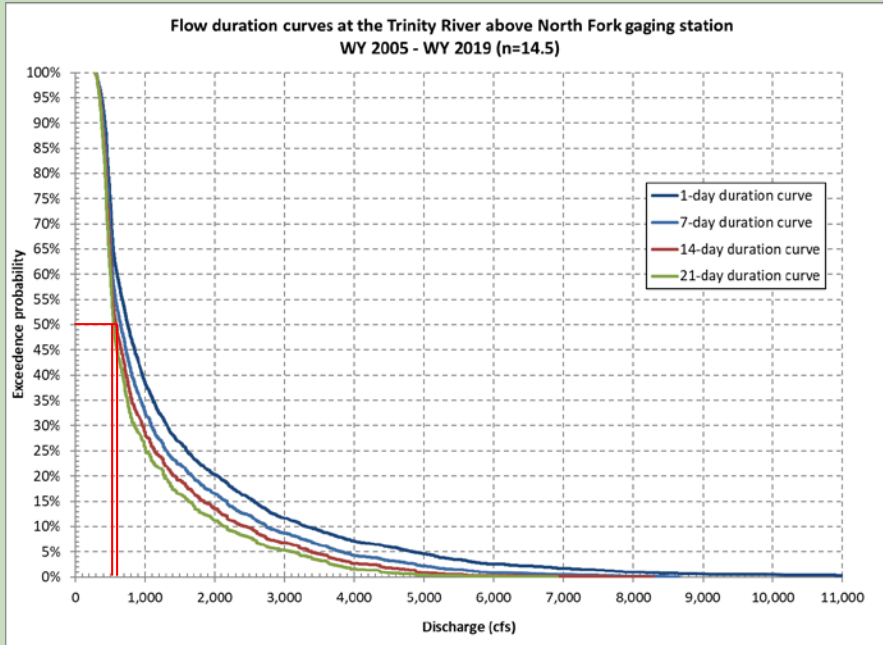
# Current Geomorphic Conditions (Existing Substrate)



# Current Geomorphic Conditions



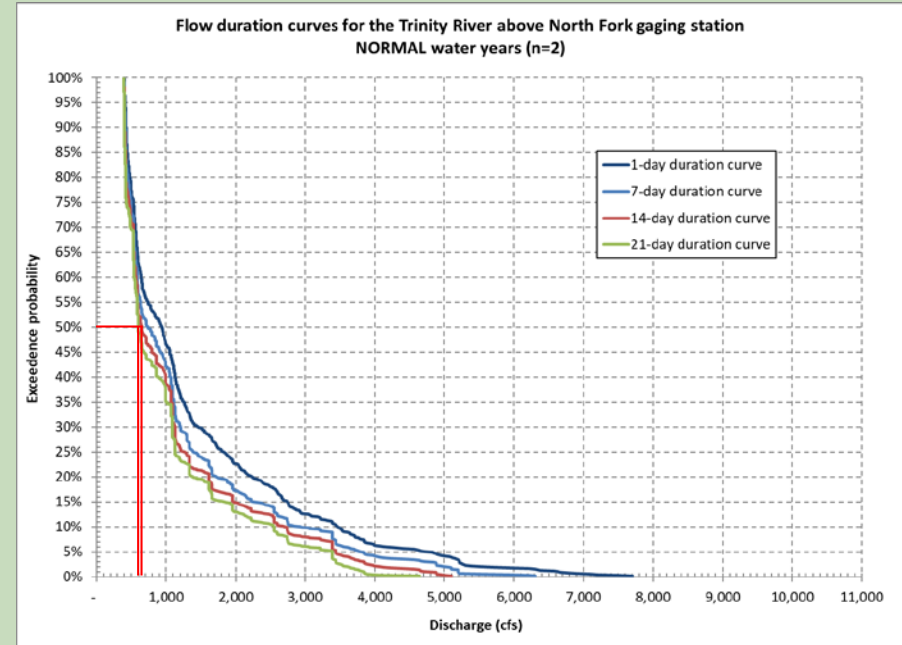
# Hydrology: Annual FDCs



**All Water Year Types 2005-2019**

**14-day  $Q_{50}$  = 585 cfs**

**21-day  $Q_{50}$  = 545 cfs**

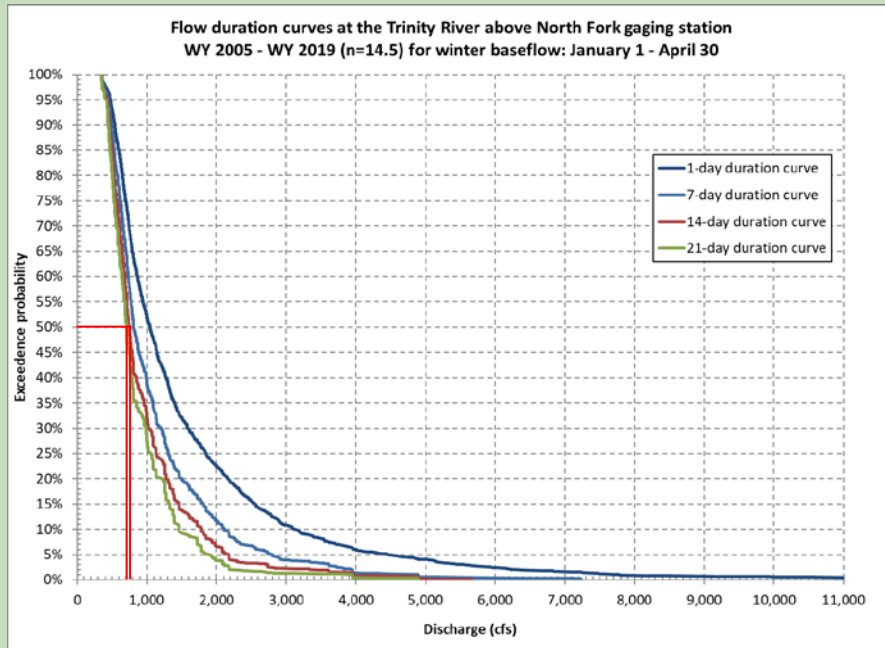


**Normal Water Years 2005-2019**

**14-day  $Q_{50}$  = 650 cfs**

**21-day  $Q_{50}$  = 600 cfs**

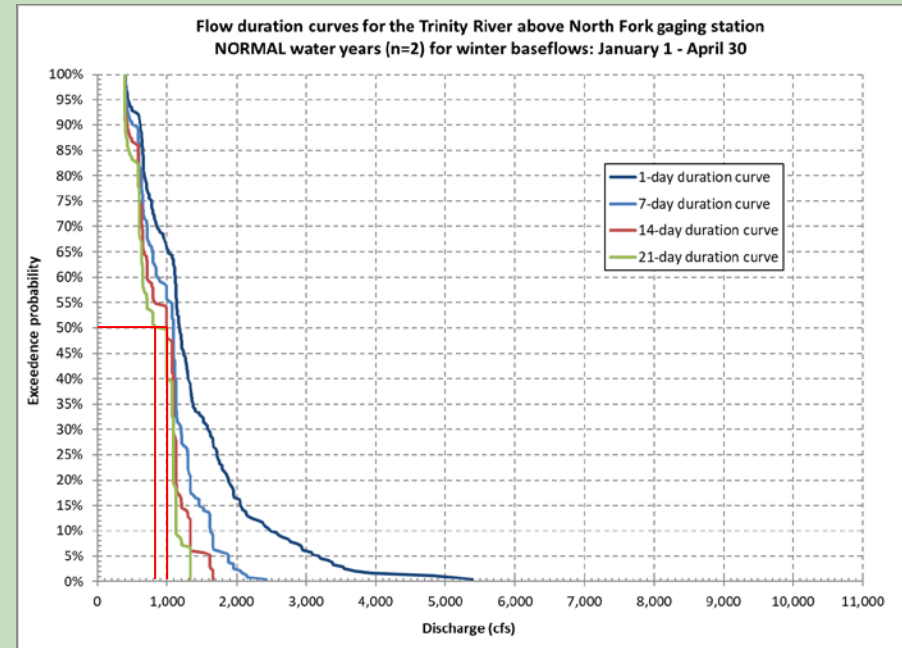
# Hydrology: Winter Rearing FDCs



**All Water Year Types 2005-2019**

**14-day  $Q_{50}$  = 650 cfs**

**21-day  $Q_{50}$  = 600 cfs**



**Normal Water Years 2005-2019**

**14-day  $Q_{50}$  = 995 cfs**

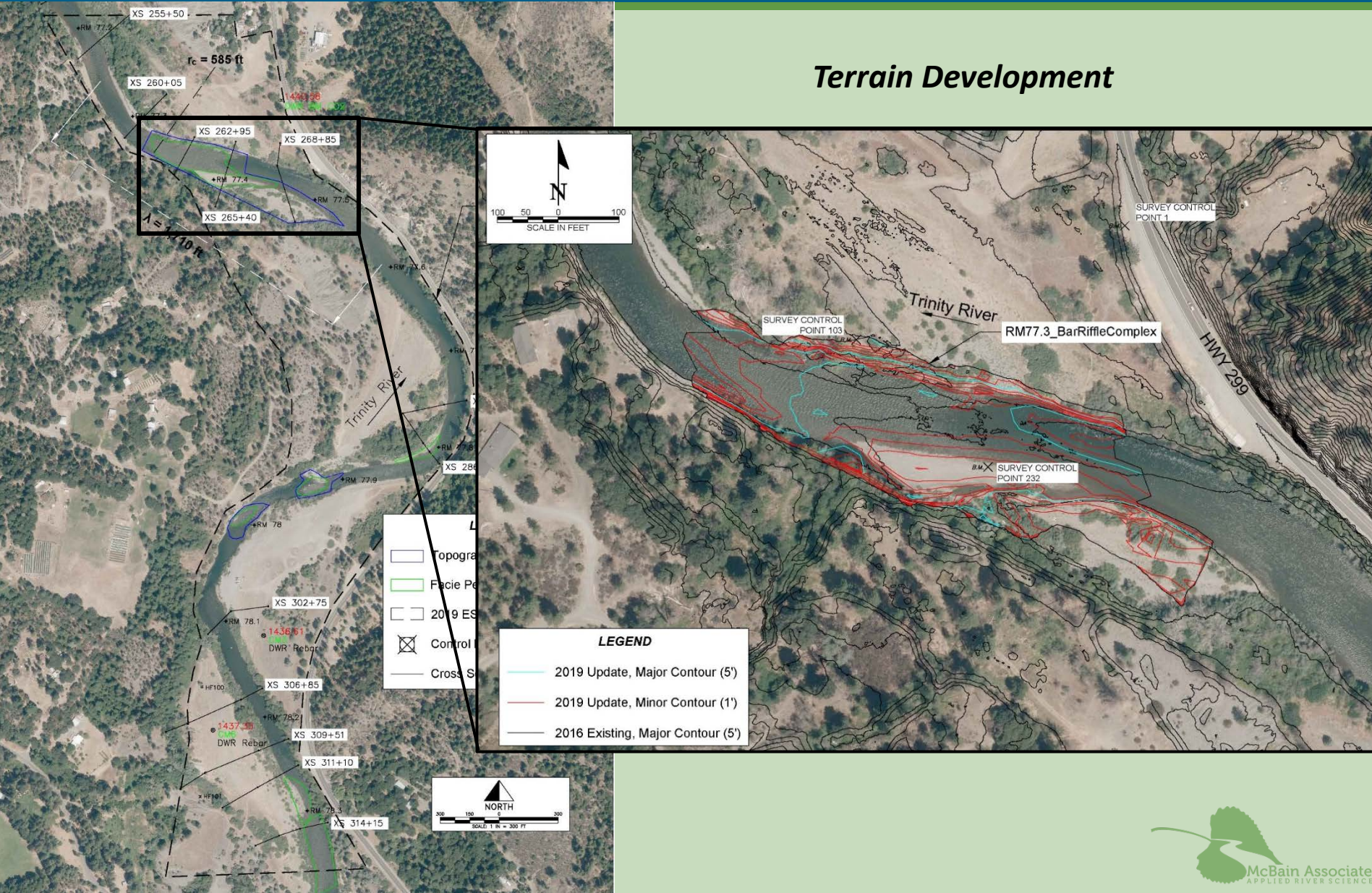
**21-day  $Q_{50}$  = 835 cfs**

# Hydraulic Model: Model Development

- Existing conditions modeled developed in HEC-RAS 2-D
- Following the initial site visit, three locations were identified for topographical surveys to update the 2016 topography.
- Roughness polygons applied for different regions of the project reach; in-channel roughness varied with flow
- Model was calibrated using WSE measurements collected by HVTF in Spring 2019 (~8,500 cfs), edge of water data extracted from 2016 LiDAR data (380 cfs), and WSE data collected by MA in Fall 2019 (~360 cfs)

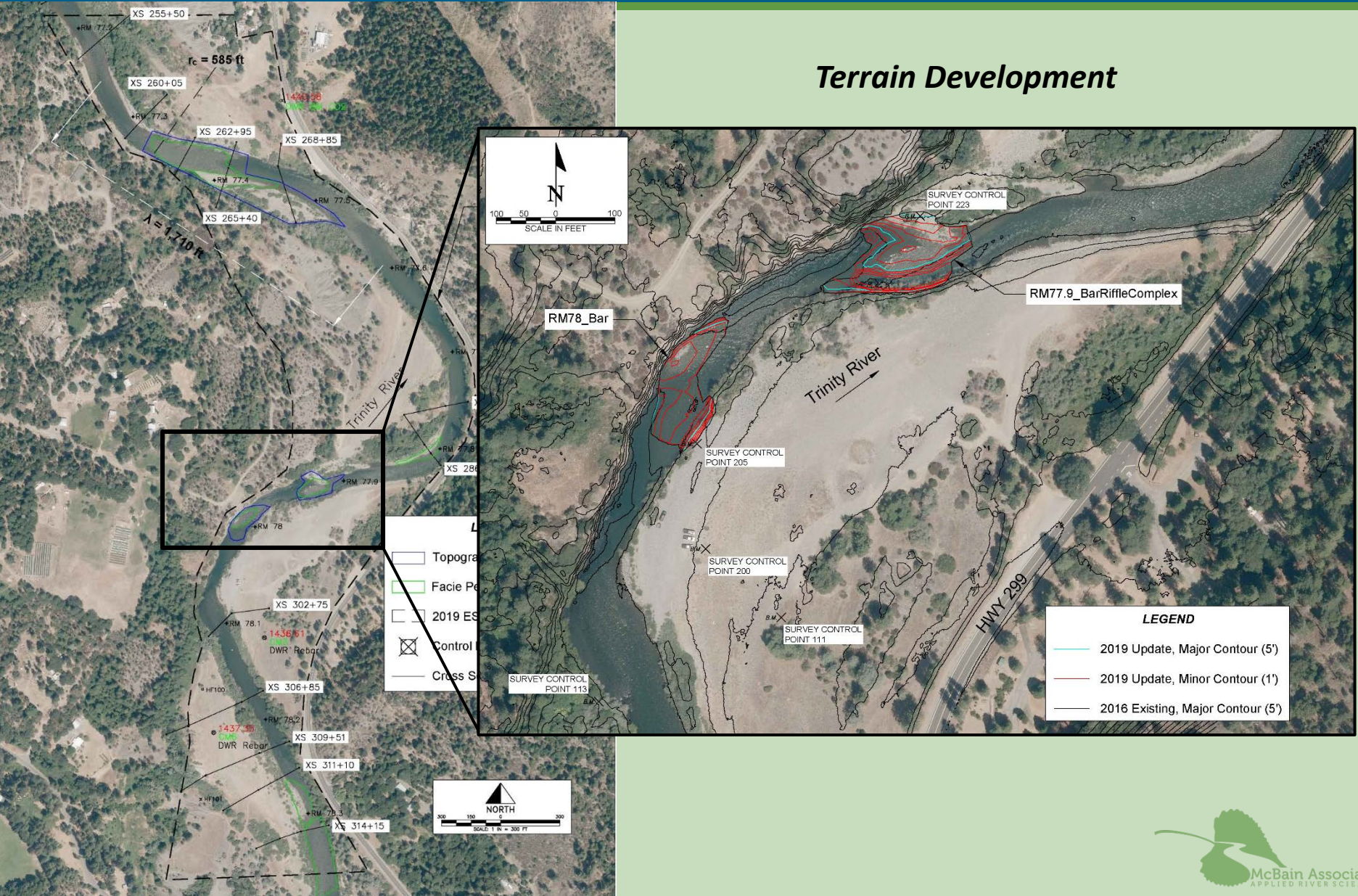
# Hydraulic Model: Model Development

## Terrain Development



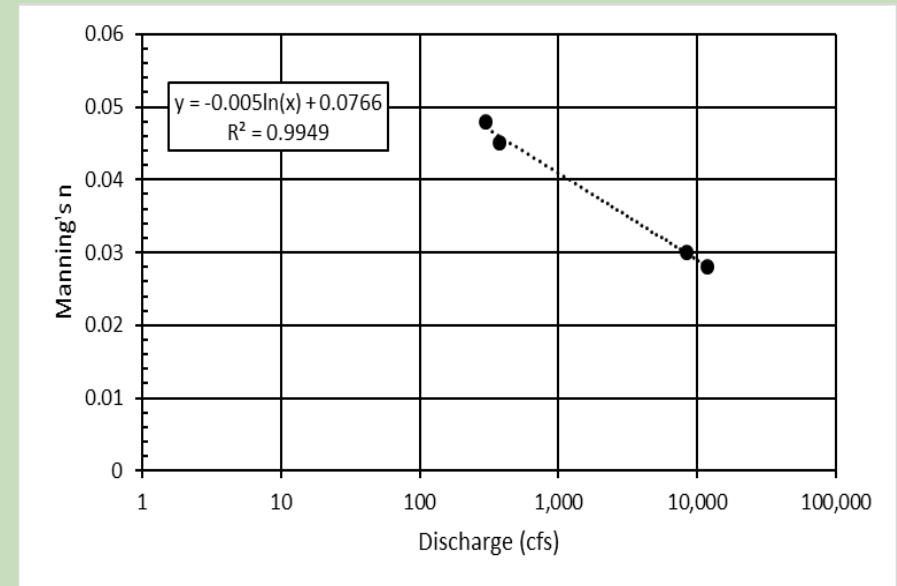
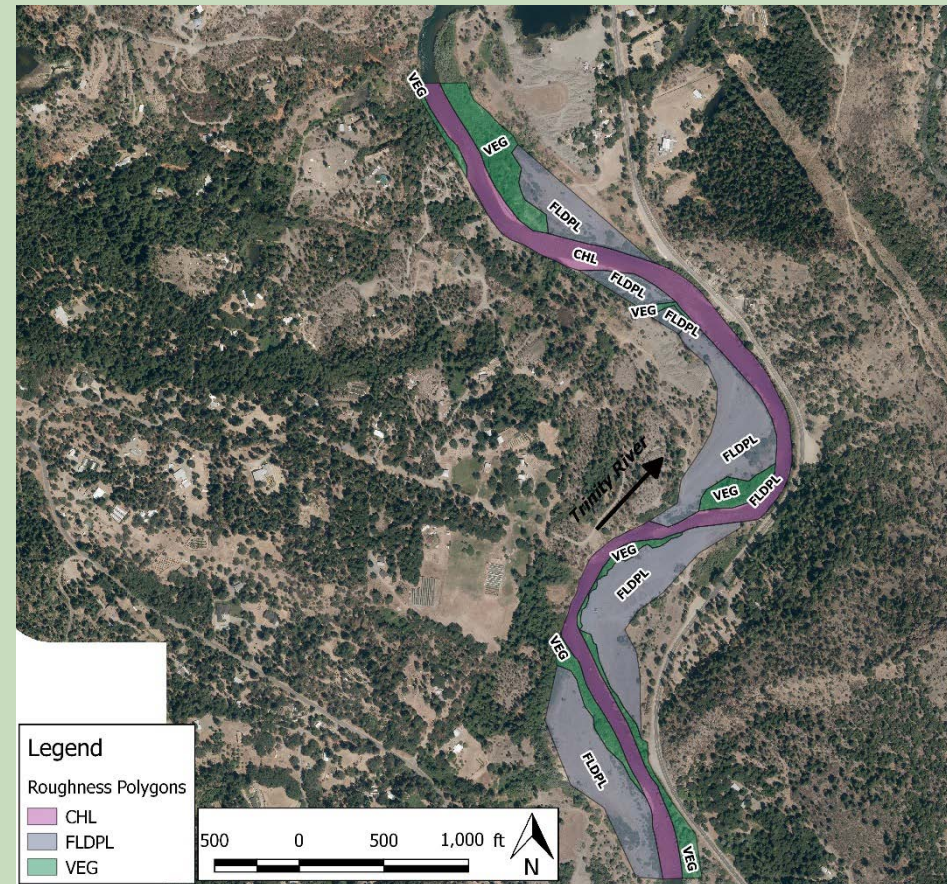
# Hydraulic Model: Model Development

## Terrain Development



# Hydraulic Model: Model Development

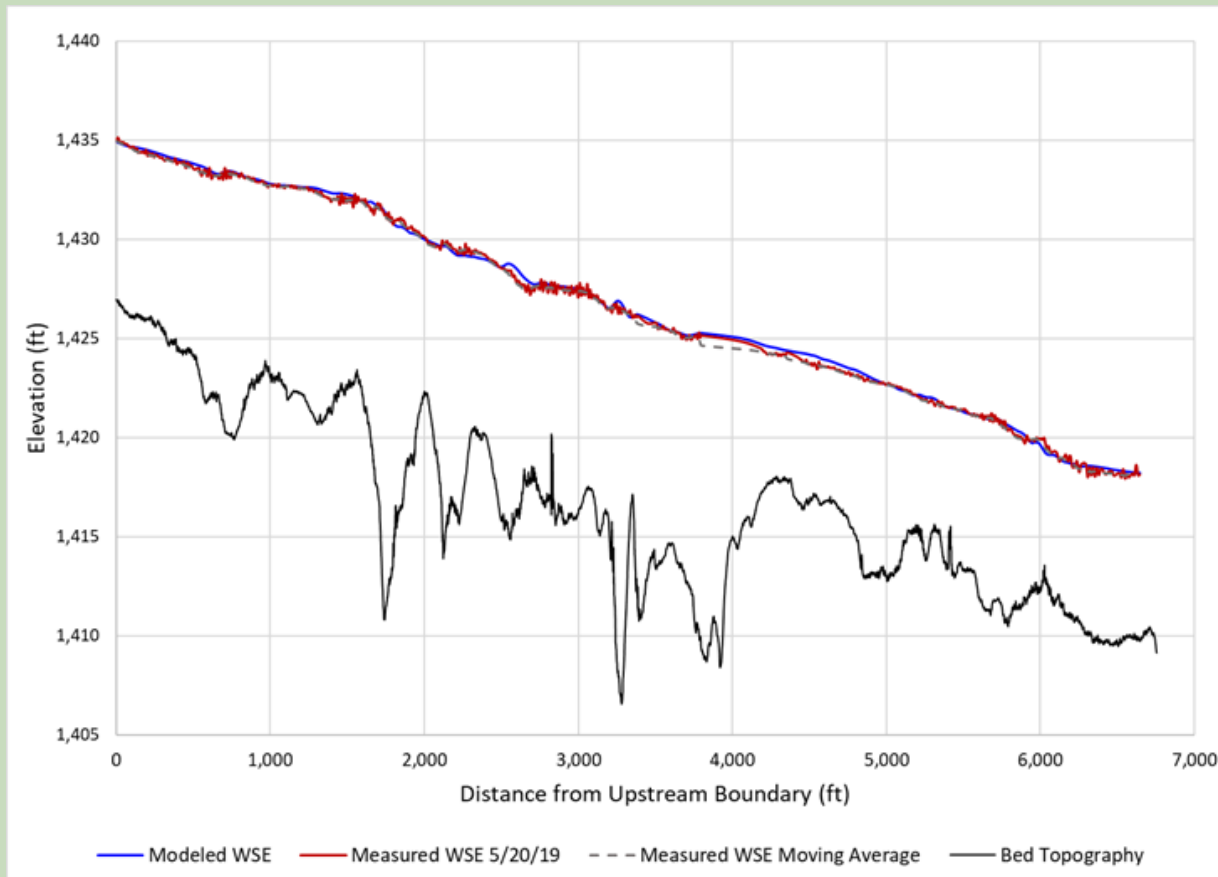
## Model Roughness



# Hydraulic Model: Model Development

## *Model Calibration, High Flow*

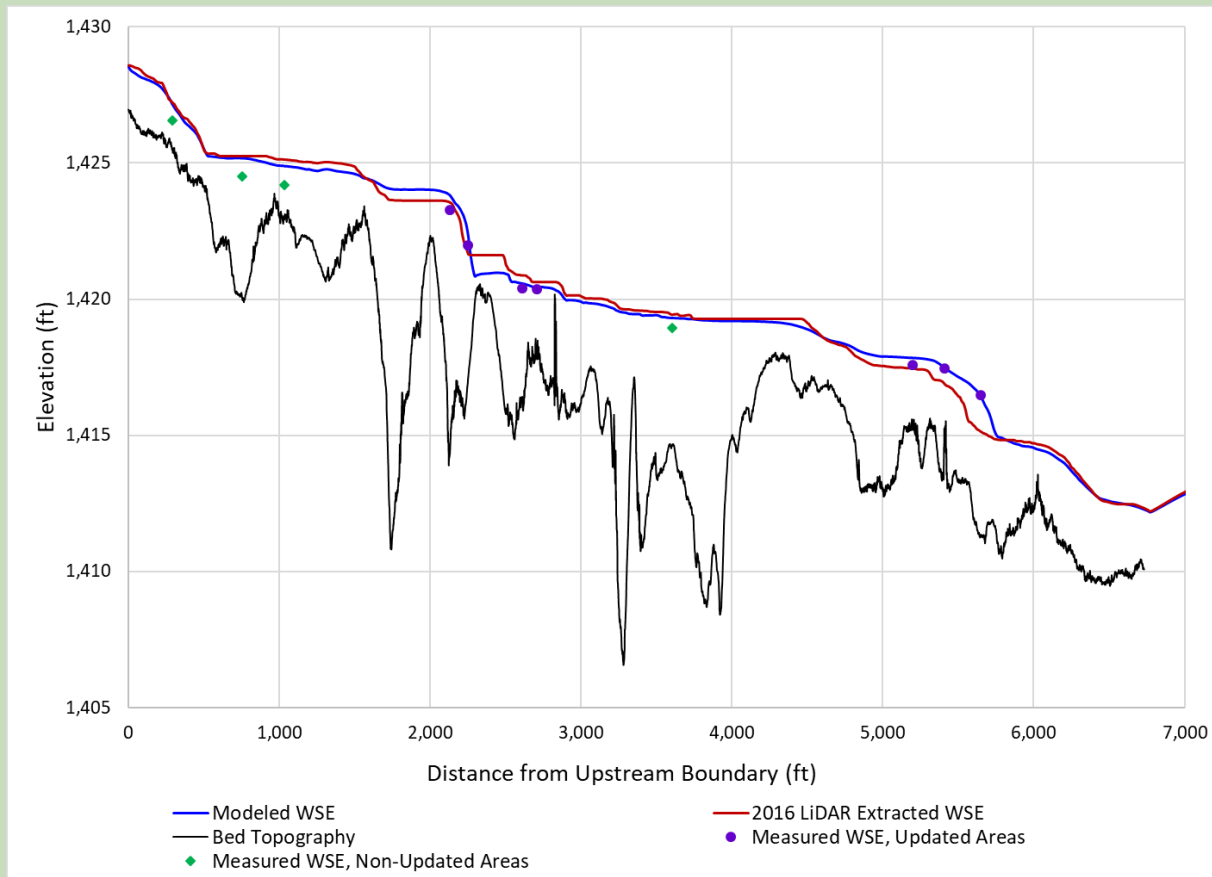
Scenario	Over	Under	RMSE
High Flow	0.69 ft	0.67 ft	0.19 ft
Low Flow, 2016 LiDAR Extracted WSE	0.39 ft	0.32 ft	0.17 ft
Low Flow, Nov 2019 WSE	0.52 ft	0.05 ft	0.07 ft



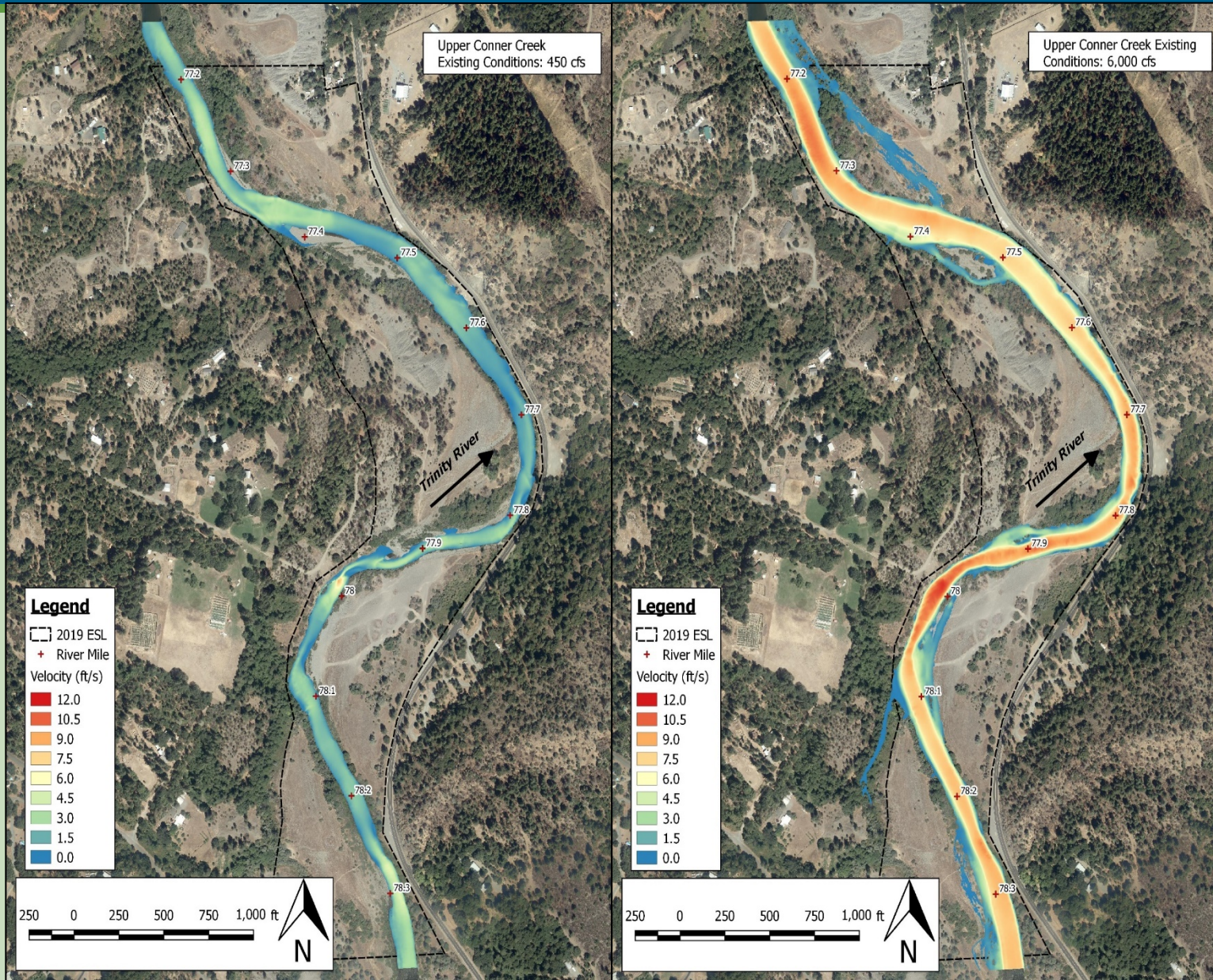
# Hydraulic Model: Model Development

## Model Calibration, Low Flow

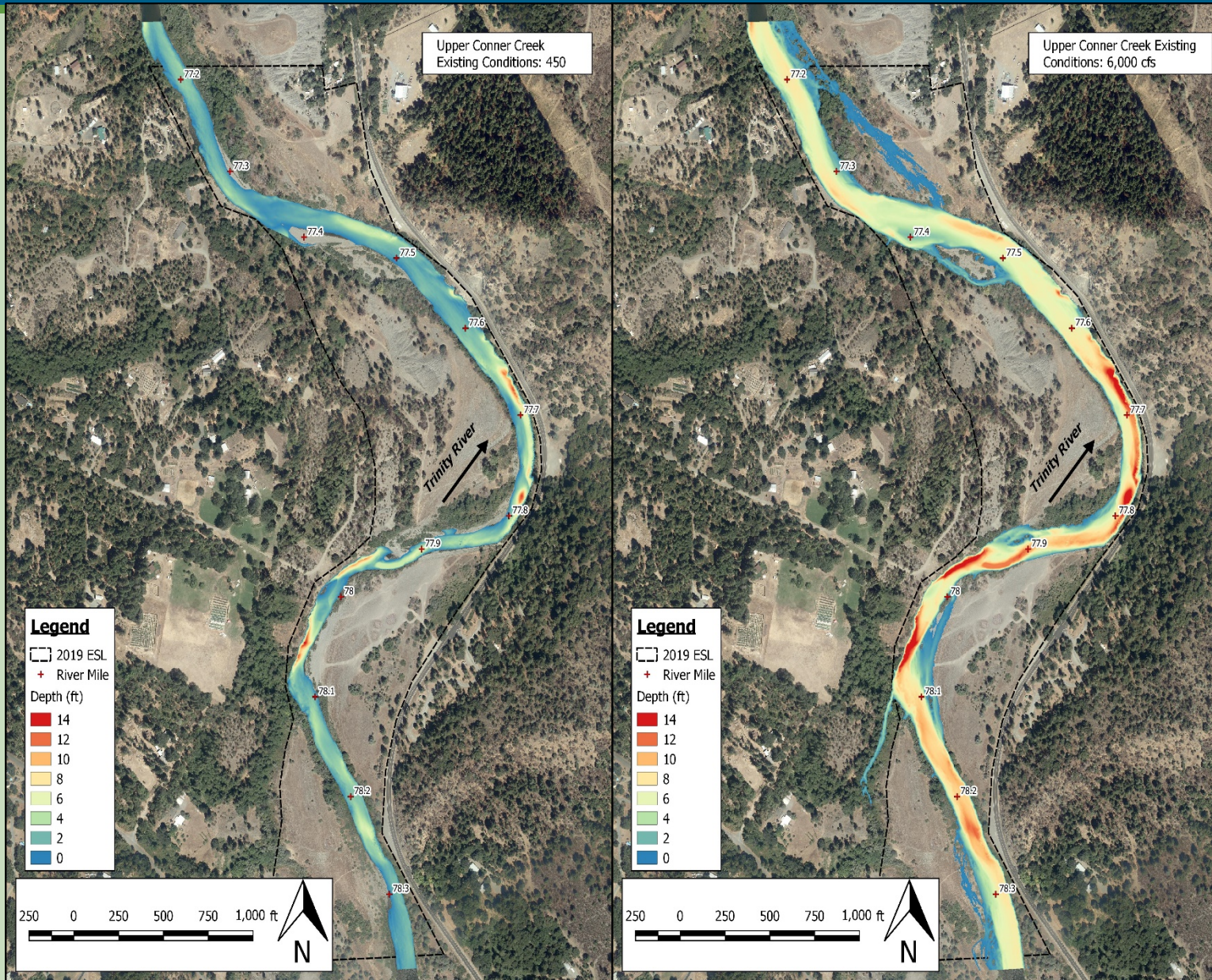
Scenario	Over	Under	RMSE
High Flow	0.69 ft	0.67 ft	0.19 ft
Low Flow, 2016 LiDAR Extracted WSE	0.39 ft	0.32 ft	0.17 ft
Low Flow, Nov 2019 WSE	0.52 ft	0.05 ft	0.07 ft



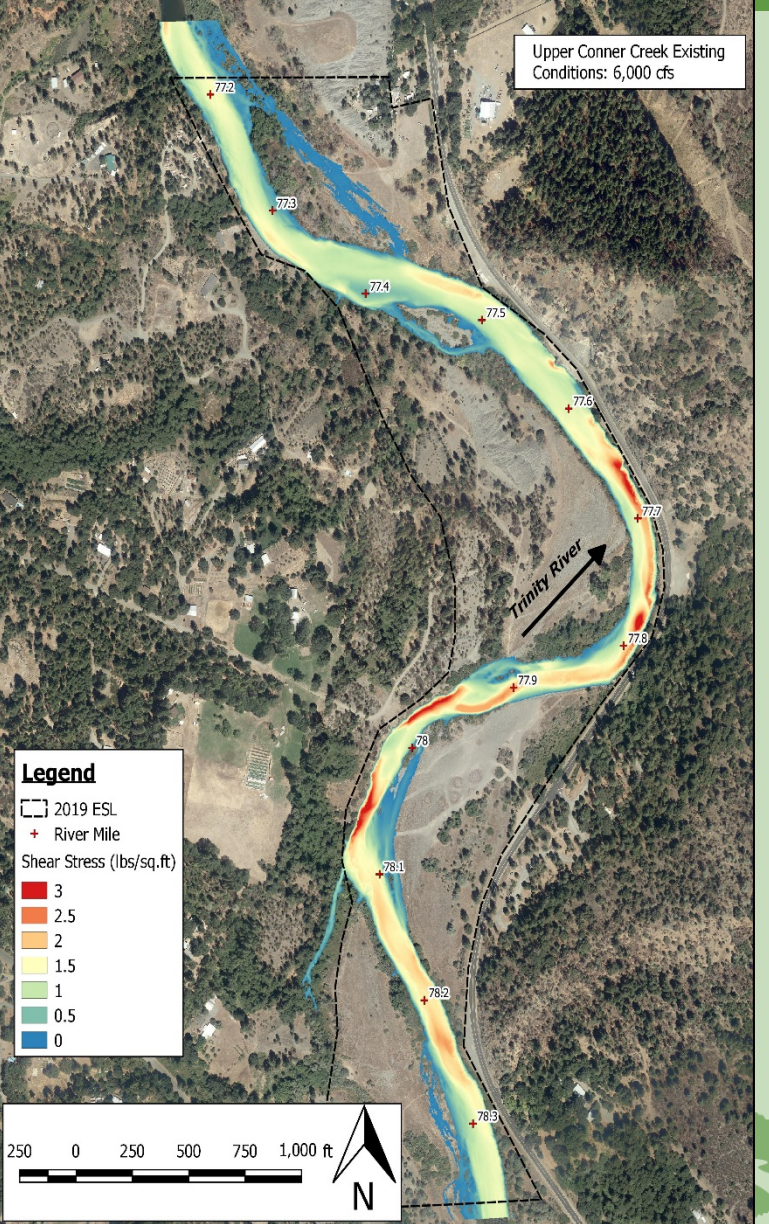
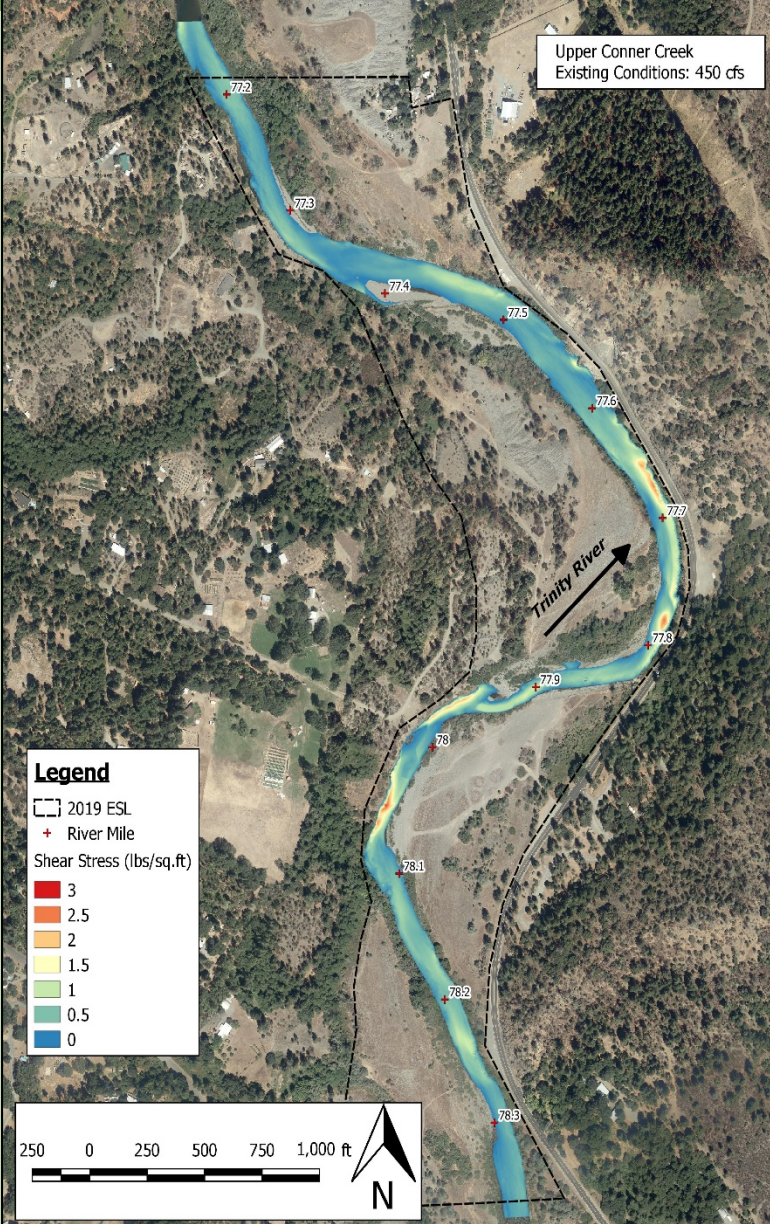
# Hydraulic Model: Model Results, Velocity



# Hydraulic Model: Model Results, Depth



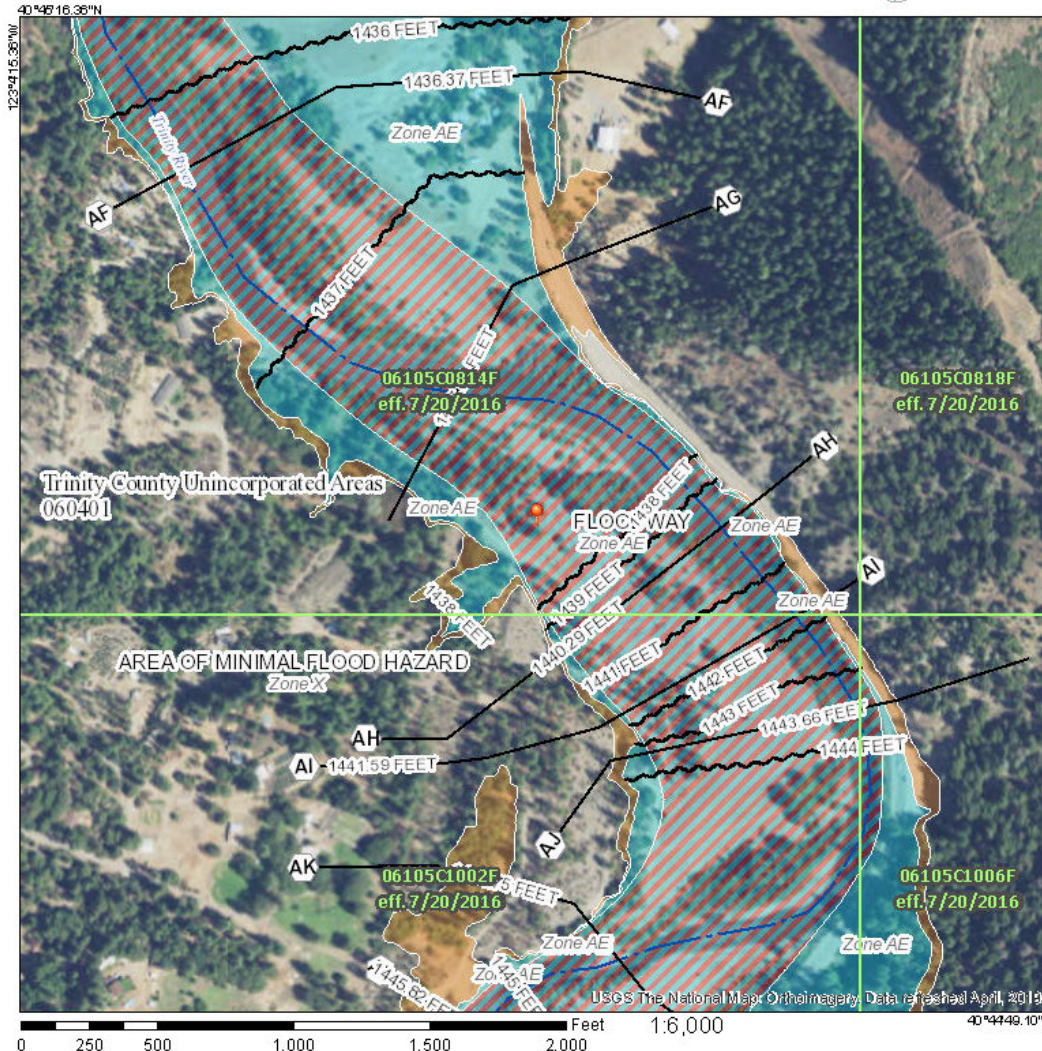
# Hydraulic Model: Model Results, Shear Stress





# FEMA 100-Year Floodmap

## National Flood Hazard Layer FIRMette



### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) Zone A, V, AGD
  - With BFE or Depth Zone AE, AG, AH, VE, AR
  - Regulatory Floodway
- OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
  - Future Conditions 1% Annual Chance Flood Hazard Zone X
  - Area with Reduced Flood Risk due to Levee. See Notes, Zone X
  - Area with Flood Risk due to Levee Zone O
- OTHER AREAS**
- Area of Minimal Flood Hazard Zone X
  - Effective LOMRs
  - Area of Undetermined Flood Hazard Zone O
- GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- OTHER FEATURES**
- Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transsect
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transsect Baseline
  - Profile Baseline
  - Hydrographic Feature
- MAP PANELS**
- Digital Data Available
  - No Digital Data Available
  - Unmapped

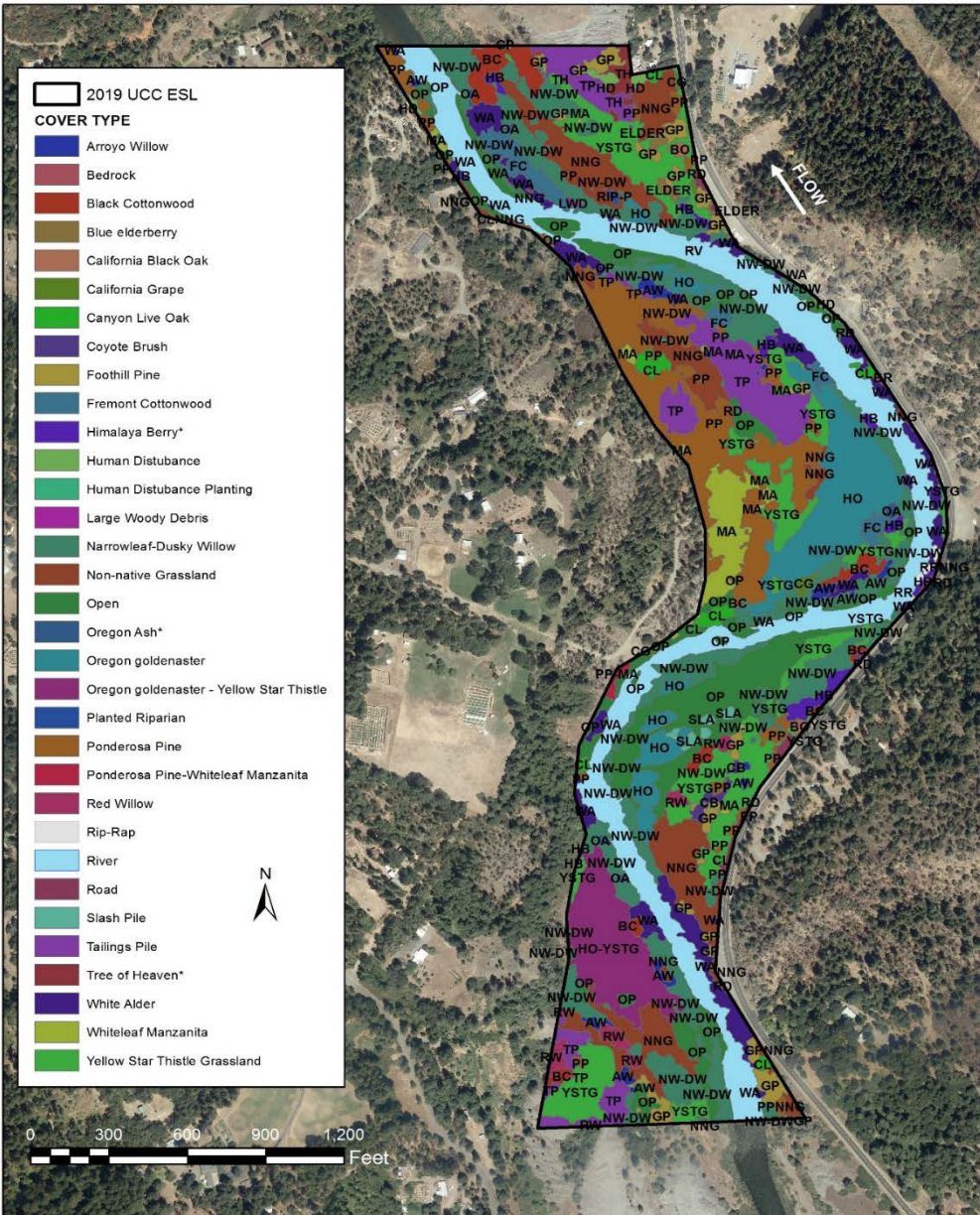
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/9/2020 at 4:28:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

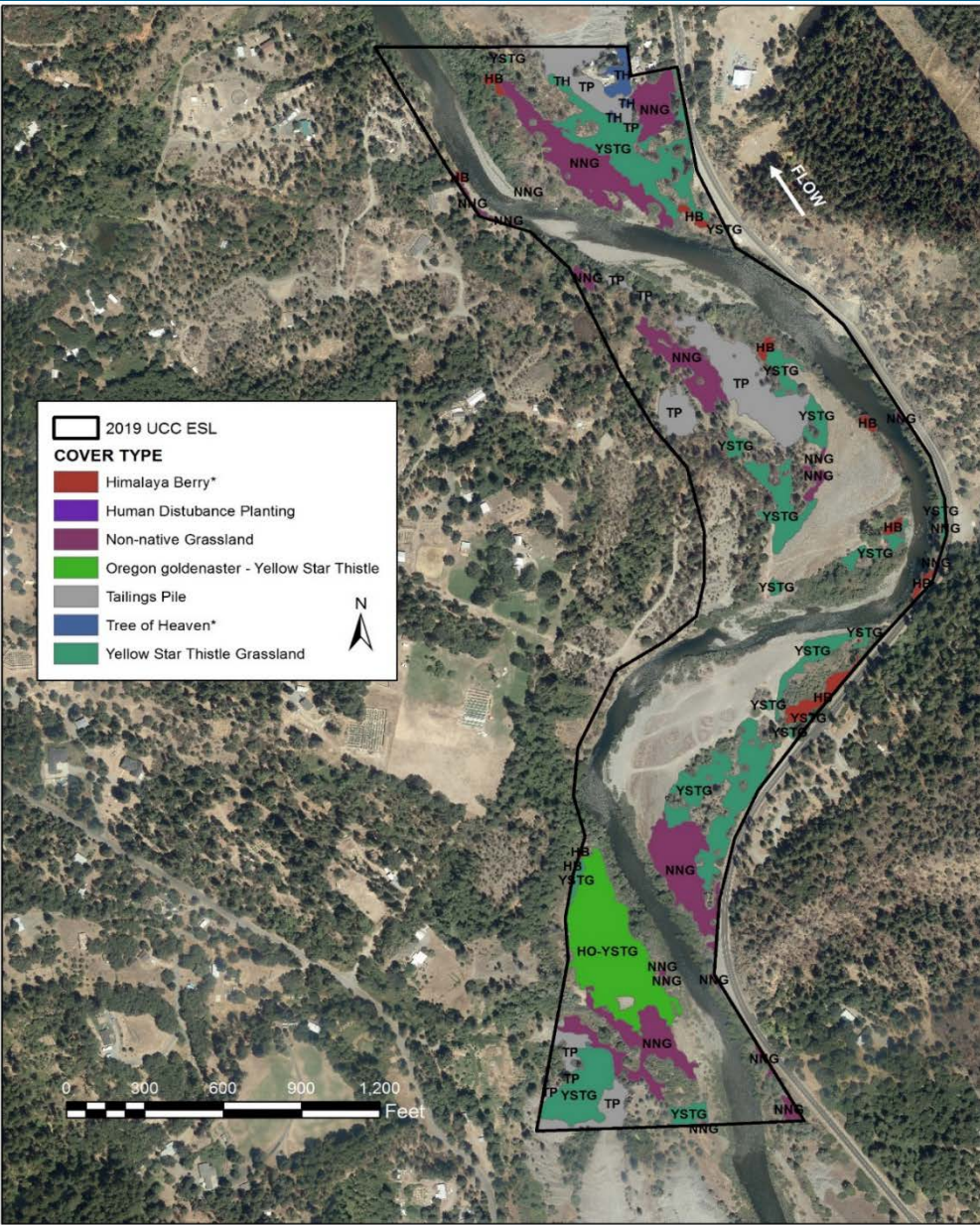
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Existing Vegetation



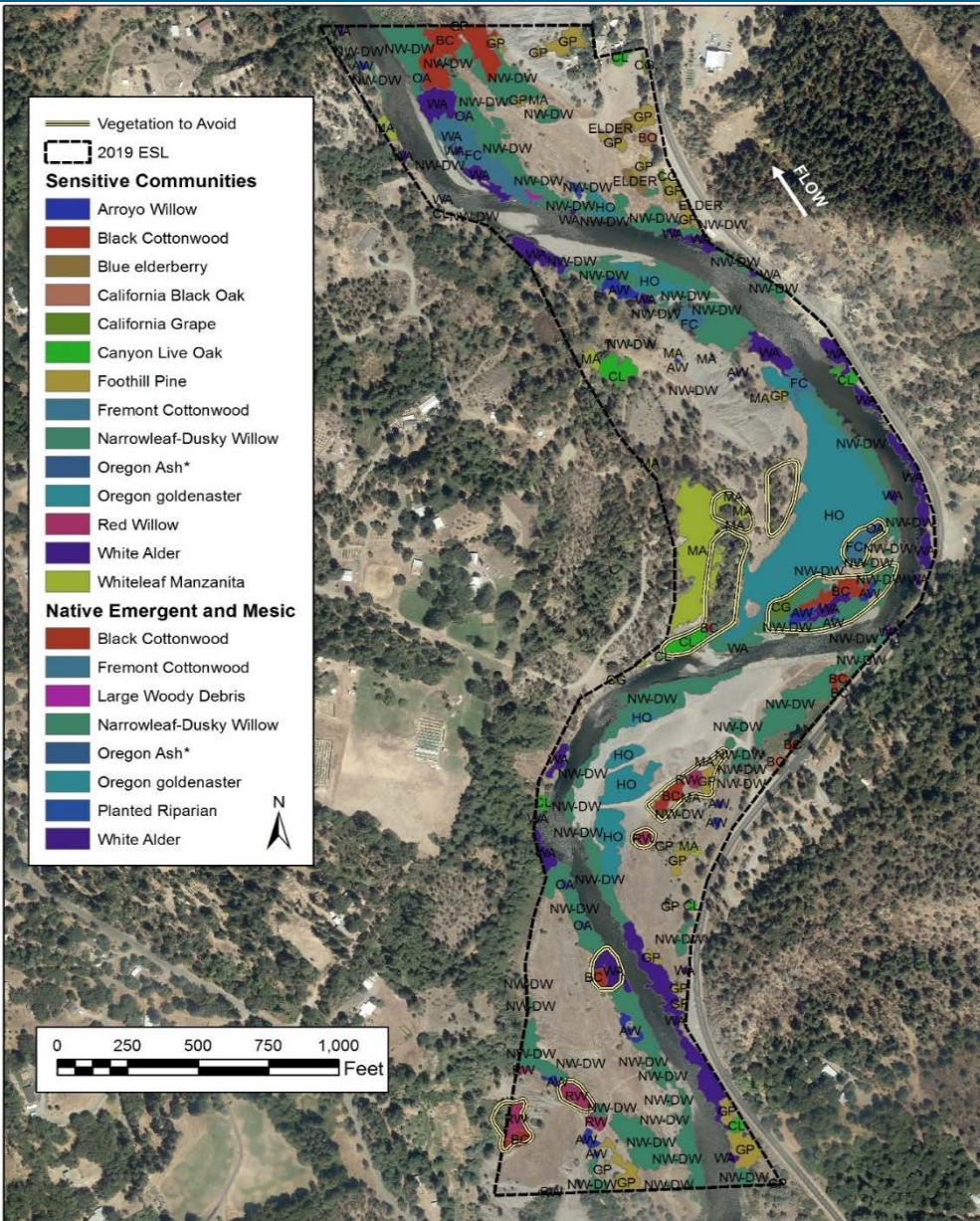
- Project area cover 84 acres
  - 57.6 acres are vegetated
  - 26.4 acres are open

# Existing Vegetation



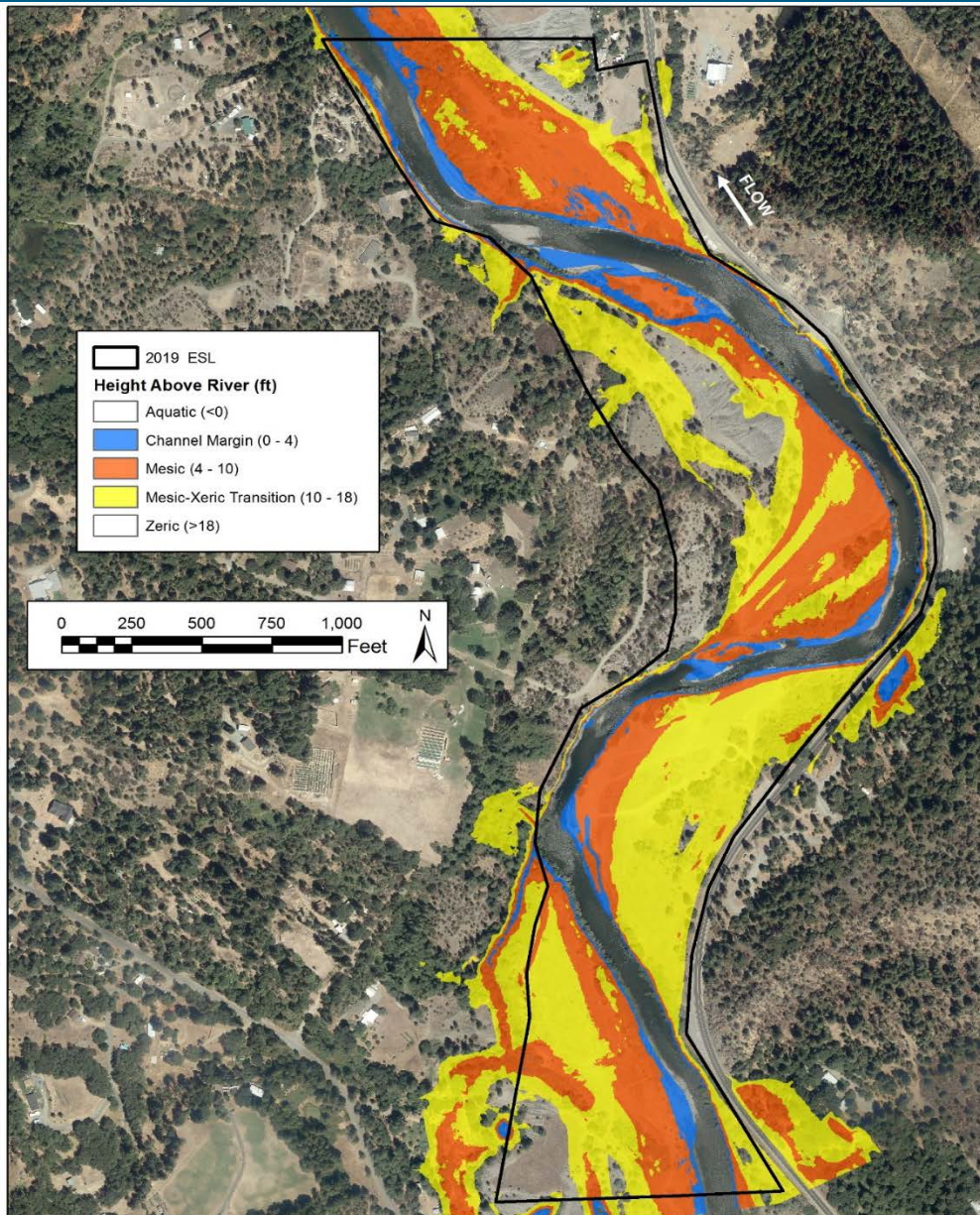
- Project area cover 84 acres
  - 57.6 acres are vegetated
  - 26.4 acres are open
- 16.6 acres of the vegetated area are dominated by non-native plants.

# Existing Vegetation



- Project area cover 84 acres
  - 57.6 acres are vegetated
  - 26.4 acres are open
- 16.6 acres of the vegetated area are dominated by non-native plants.
- The remaining 41 acres are composed of sensitive natural plant communities.
- J. Lee delineated save vegetation areas during Summer 2019.

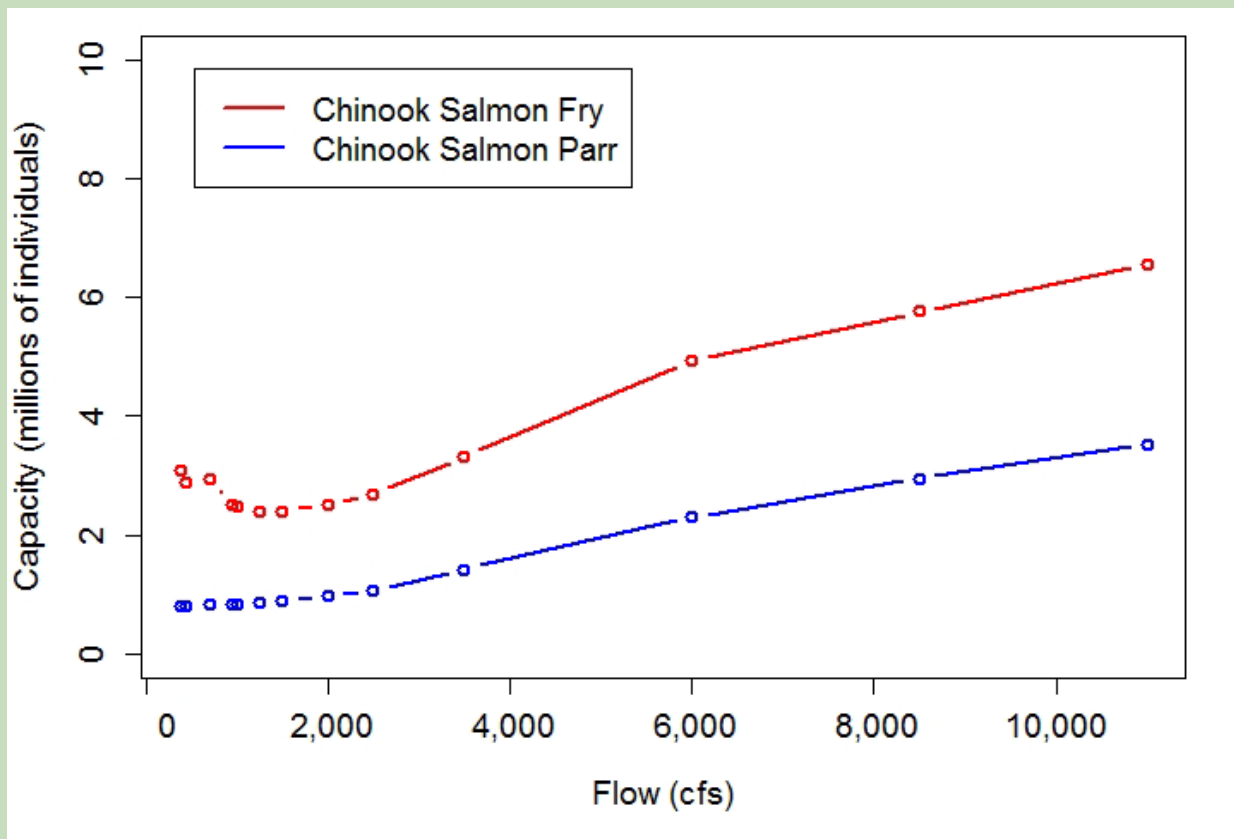
# Existing Vegetation



- Height above river analysis completed to determine existing habitat zonation. Based on zonation criteria determined through a box-plot analysis by J. Bair.

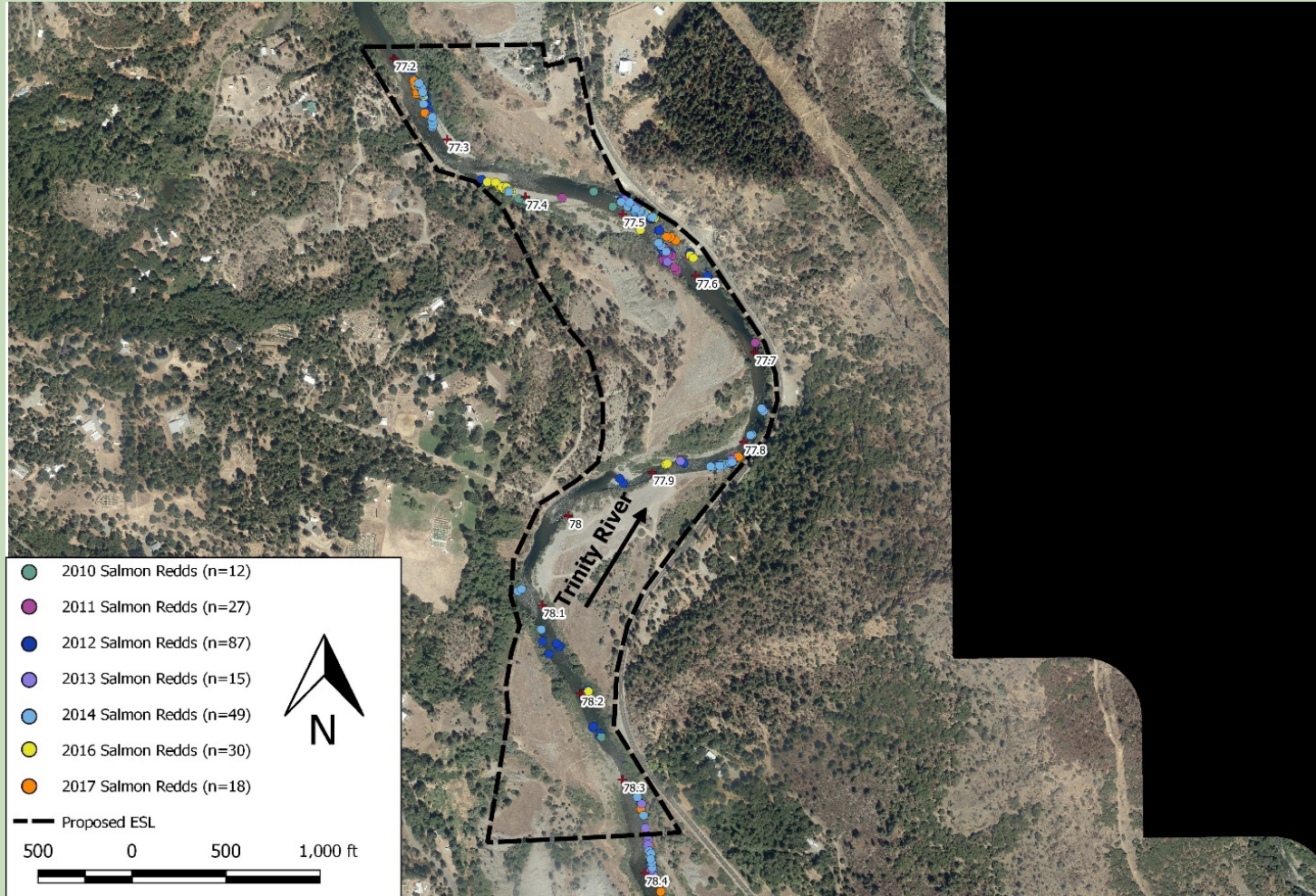
Habitat Zone	Acres	Percent of Project Site
<b>Aquatic</b>	14.34	17.0%
<b>Emergent Margin</b>	5.59	6.6%
<b>Mesic</b>	22.28	26.5%
<b>Mesic-Xeric Transition</b>	26.42	31.4%
<b>Xeric</b>	15.59	18.5%
<b>Grand Total</b>	84.23	100.0%

# Chinook Salmon - Rearing



Chinook Salmon Life Stage	Capacity (millions of individuals) at Specified Flow												
	380 cfs	450 cfs	700 cfs	950 cfs	1,000 cfs	1,250 cfs	1,500 cfs	2,000 cfs	2,500 cfs	3,500 cfs	6,000 cfs	8,500 cfs	11,000 cfs
Fry	3.08	2.89	2.95	2.50	2.47	2.40	2.40	2.52	2.69	3.32	4.93	5.76	6.57
Parr	0.80	0.81	0.85	0.83	0.84	0.87	0.89	0.98	1.07	1.42	2.30	2.96	3.53

# Chinook Salmon - Spawning



# Salmonid - Holding

- Holding habitat analysis based on Gaeuman and Krause 2013.

Pool Designation	Number	Max Depth (ft) <sup>1</sup>	75 <sup>th</sup> Percentile Depth (ft) <sup>1</sup>	Max Depth (ft) <sup>2</sup>	75 <sup>th</sup> Percentile Depth (ft) <sup>2</sup>
RM78.25	120	5.43	4.36	5.93	4.92
JC Campground 1	121	10.53	7.69	14.17	7.96
JC Campground 2	122	11.66	9.28	11.04	7.48
Upper Conner 1	123	12.88	8.91	13.01	8.10
Upper Conner 2	124	9.68	6.32	8.87	6.89
Upper Conner 3	125	14.19	9.42	12.64	7.45

<sup>1</sup>From Gaeuman and Krause (2013), measured in 2011.  
<sup>2</sup>Based on modeling results using 2019 Existing Conditions DTM.



# Amphibians and Reptiles

## ACRONYMS

ADLT: Adult  
EM: Egg Mass  
JVN: Juvenile  
LRV: Larvae

## Foothill Yellow-Legged Frog Observations

- 2016 Observations
- 2013 Observation

▭ Proposed ESL



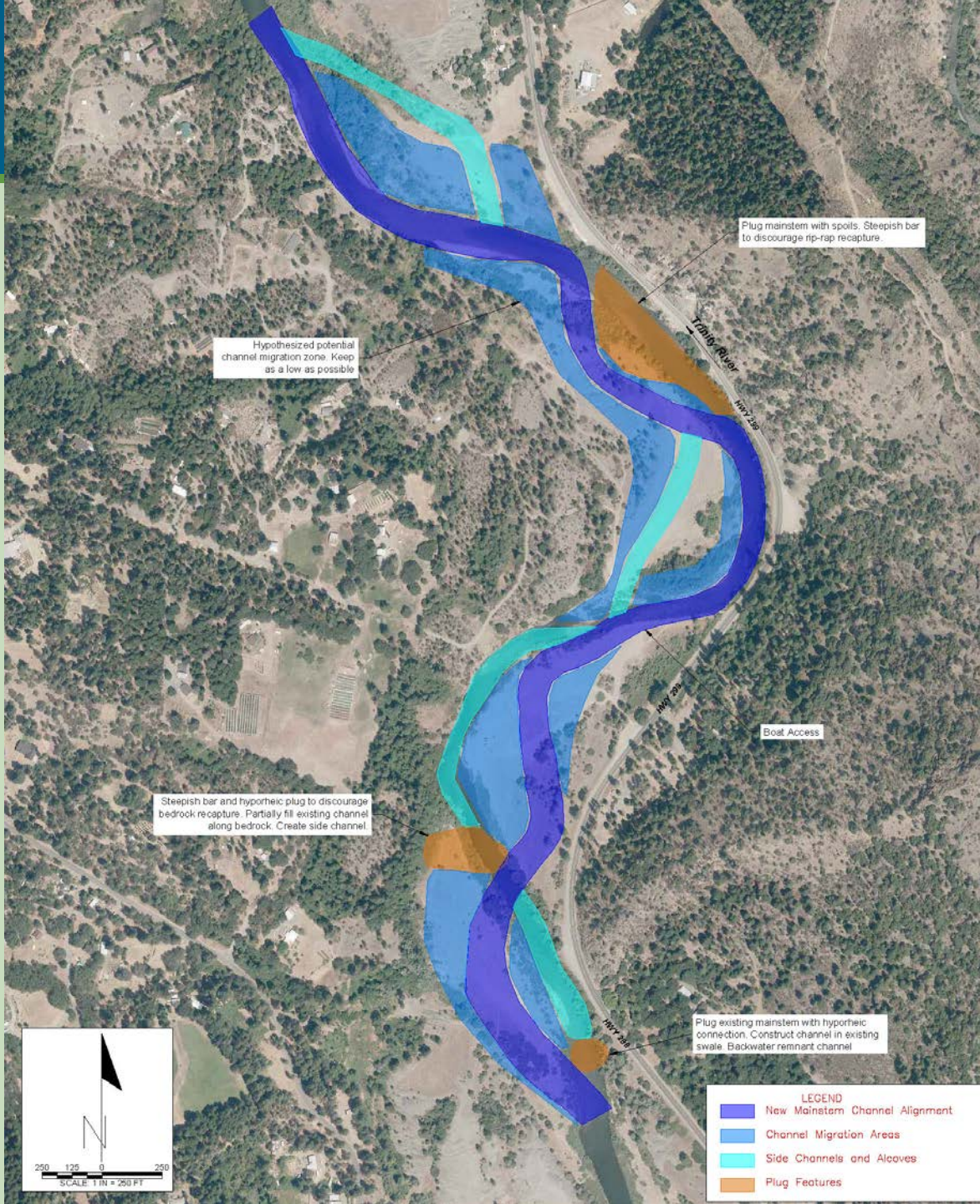
500 0 500 1,000 ft



- Herpetological data in the project ESL is sparse.
- Foothill Yellow Legged Frog observations from 2013 and 2016.
- A single adult western pond turtle observation from 2014 and 2015.

# Next Steps

- Finalize existing conditions report based on comments from Design Workgroup.
- Compile conceptual designs from Hoopa Design Team; Meet with and get any additional input/ideas from broader Design Workgroup teams.
- Compile and develop conceptual design alternatives and evaluate using metrics.
- Select preferred action and alternative.
- Build 3-D surfaces based on preferred action and alternative (planform, sections and profiles).
- Develop 30% design hydraulic model and conduct performance metrics analyses.
- Work with TRRP to update ESL to accommodate points of access.
- Work with TRRP to begin process of test pit excavation.
- Prepare and submit to Design Workgroup, draft 30% design drawings, report and supporting analyses.



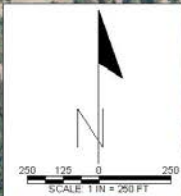
Hypothesized potential channel migration zone. Keep as low as possible

Plug mainstem with spoils. Steepish bar to discourage rip-rap recapture

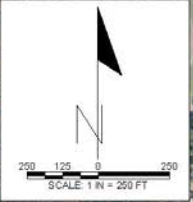
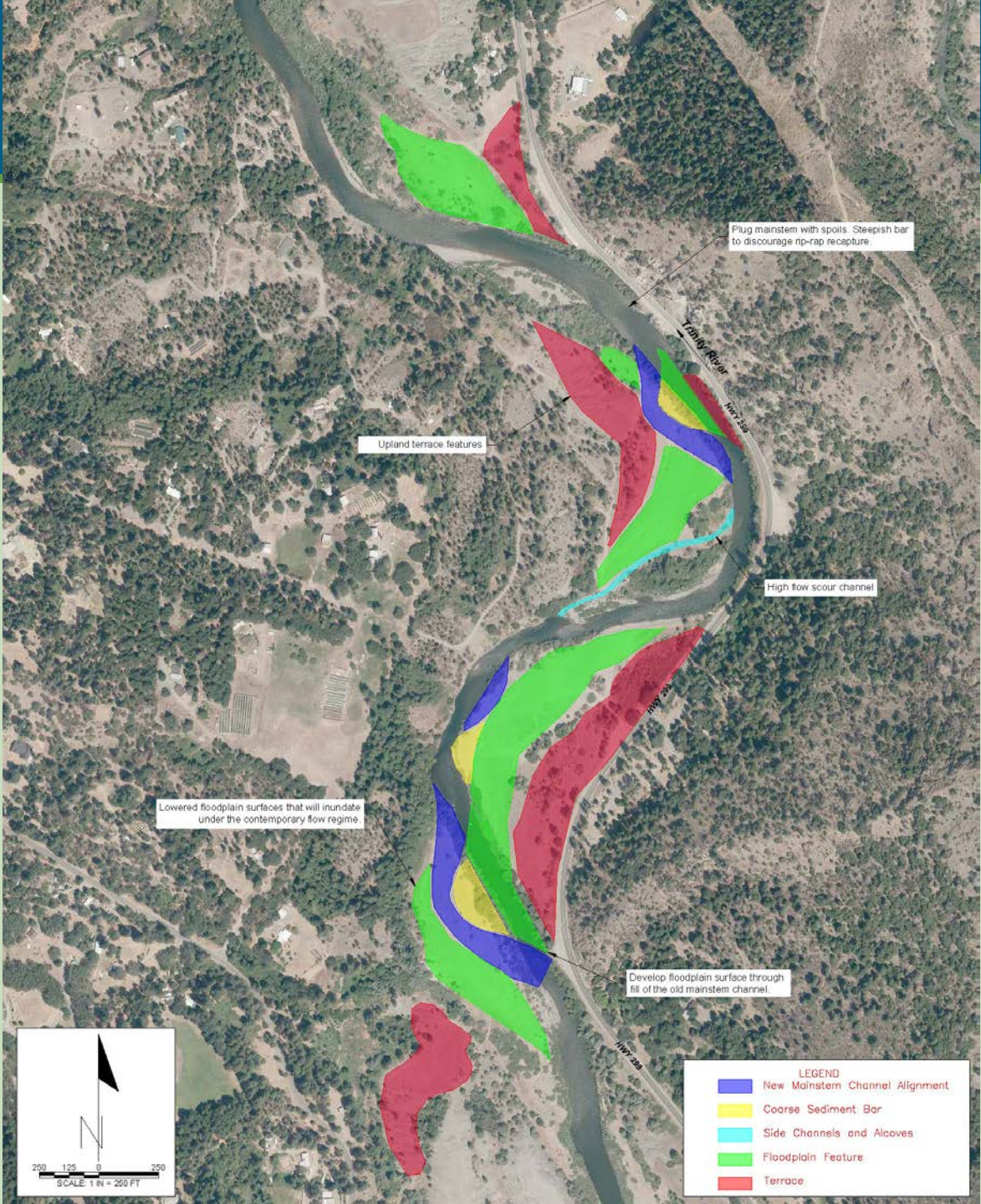
Steepish bar and hyporheic plug to discourage bedrock recapture. Partially fill existing channel along bedrock. Create side channel

Boat Access

Plug existing mainstem with hyporheic connection. Construct channel in existing swale. Backwater remnant channel

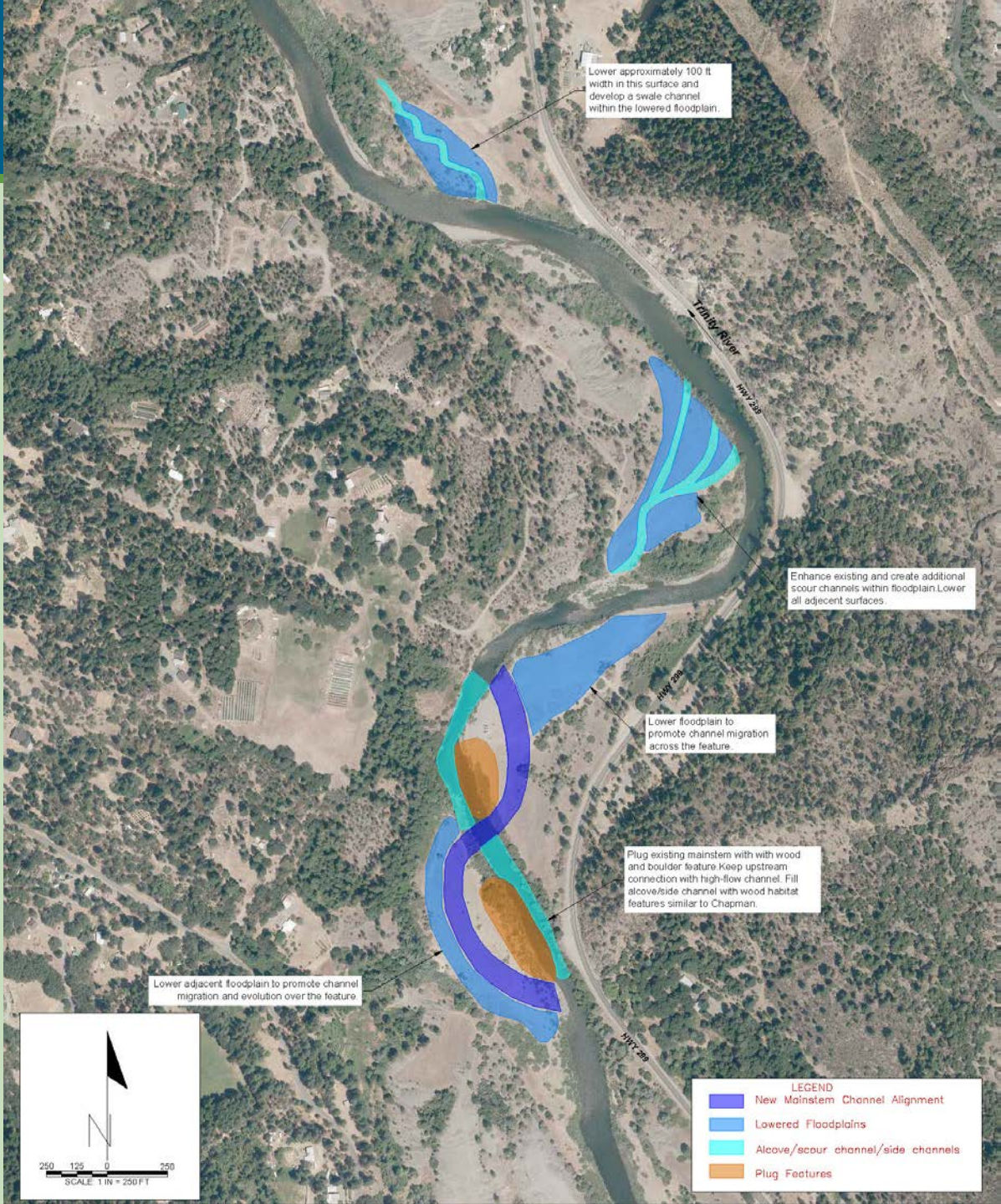


LEGEND	
<span style="color: blue;">■</span>	New Mainstem Channel Alignment
<span style="color: lightblue;">■</span>	Channel Migration Areas
<span style="color: cyan;">■</span>	Side Channels and Alcoves
<span style="color: orange;">■</span>	Plug Features



LEGEND

<span style="color: blue;">■</span>	New Mainstem Channel Alignment
<span style="color: yellow;">■</span>	Coarse Sediment Bar
<span style="color: cyan;">■</span>	Side Channels and Alcoves
<span style="color: green;">■</span>	Floodplain Feature
<span style="color: red;">■</span>	Terrace



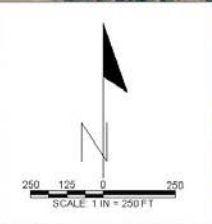
Lower approximately 100 ft width in this surface and develop a swale channel within the lowered floodplain.

Enhance existing and create additional scour channels within floodplain. Lower all adjacent surfaces.

Lower floodplain to promote channel migration across the feature.

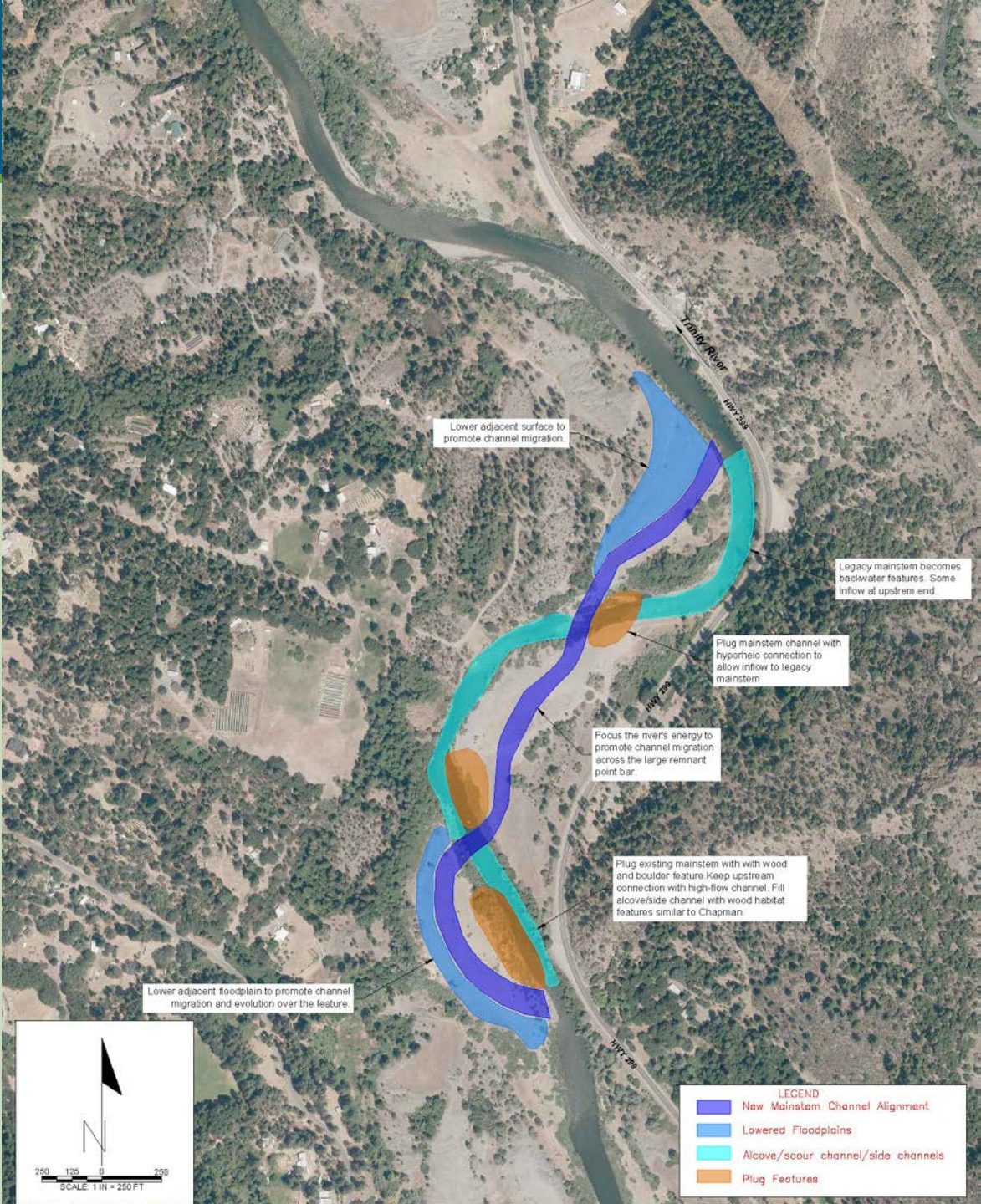
Plug existing mainstem with wood and boulder feature. Keep upstream connection with high-flow channel. Fill alcove/side channel with wood habitat features similar to Chapman.

Lower adjacent floodplain to promote channel migration and evolution over the feature.



**LEGEND**

- New Mainstem Channel Alignment
- Lowered Floodplains
- Alcove/scour channel/side channels
- Plug Features



Lower adjacent surface to promote channel migration.

Legacy mainstem becomes backwater features. Some inflow at upstream end

Plug mainstem channel with hyporheic connection to allow inflow to legacy mainstem

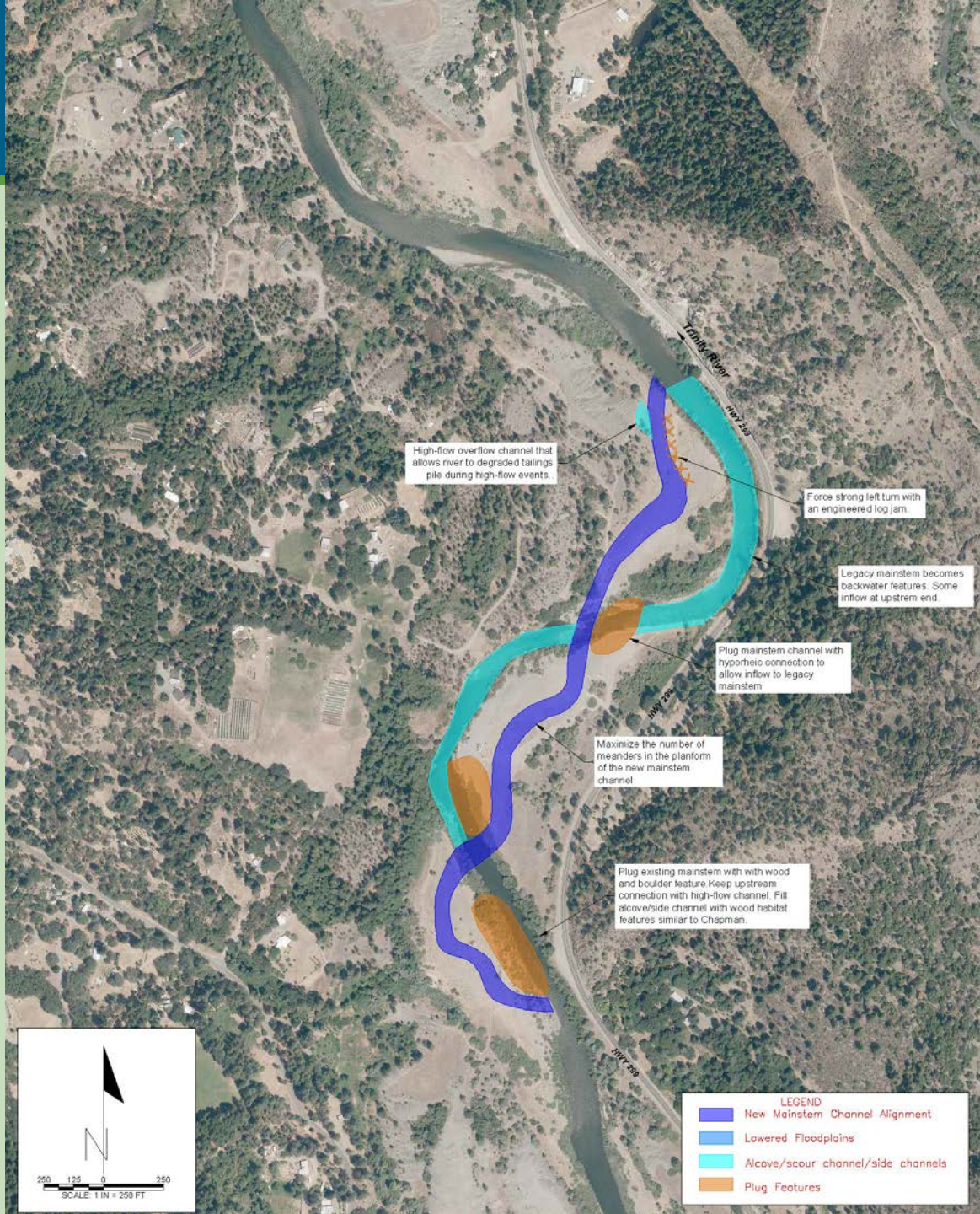
Focus the river's energy to promote channel migration across the large remnant point bar.

Plug existing mainstem with wood and boulder feature. Keep upstream connection with high-flow channel. Fill alcove/side channel with wood habitat features similar to Chapman

Lower adjacent floodplain to promote channel migration and evolution over the feature.



LEGEND	
<span style="color: blue;">█</span>	New Mainstem Channel Alignment
<span style="color: cyan;">█</span>	Lowered Floodplains
<span style="color: orange;">█</span>	Alcove/acour channel/side channels
<span style="color: brown;">█</span>	Plug Features



High-flow overflow channel that allows river to degraded tailings pile during high-flow events

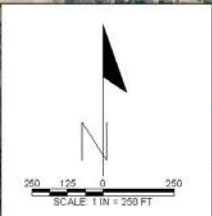
Force strong left turn with an engineered log jam

Legacy mainstem becomes backwater features. Some inflow at upstream end

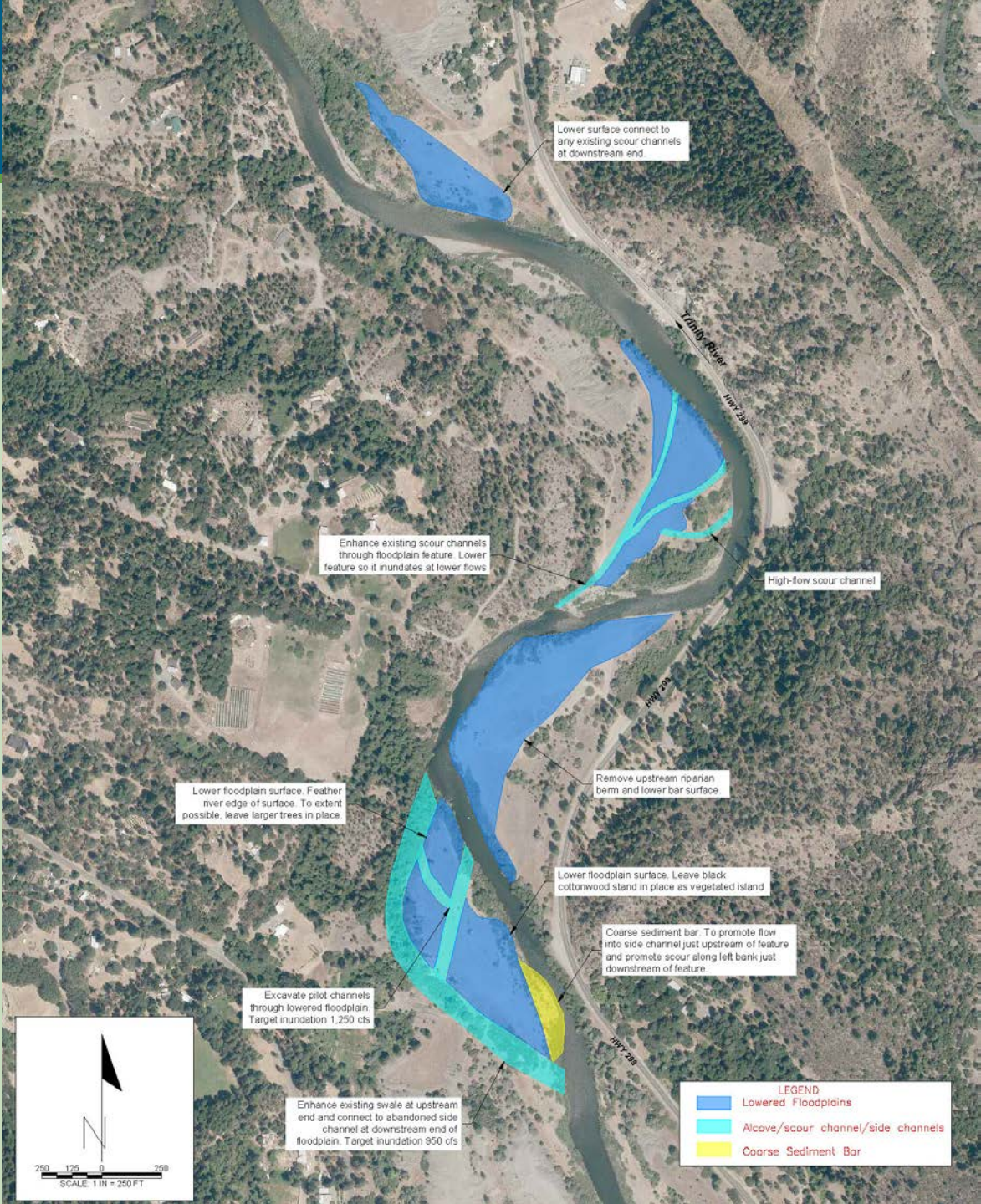
Plug mainstem channel with hyporheic connection to allow inflow to legacy mainstem

Maximize the number of meanders in the planform of the new mainstem channel

Plug existing mainstem with wood and boulder feature. Keep upstream connection with high-flow channel. Fill alcove/side channel with wood habitat features similar to Chapman.



LEGEND	
<span style="color: blue;">█</span>	New Mainstem Channel Alignment
<span style="color: lightblue;">█</span>	Lowered Floodplains
<span style="color: cyan;">█</span>	Alcove/scour channel/side channels
<span style="color: orange;">█</span>	Plug Features



Lower surface connect to any existing scour channels at downstream end.

Enhance existing scour channels through floodplain feature. Lower feature so it inundates at lower flows

High-flow scour channel

Lower floodplain surface. Feather inner edge of surface. To extent possible, leave larger trees in place

Remove upstream riparian berm and lower bar surface

Lower floodplain surface. Leave black cottonwood stand in place as vegetated island

Coarse sediment bar. To promote flow into side channel just upstream of feature and promote scour along left bank just downstream of feature.

Excavate pilot channels through lowered floodplain. Target inundation 1,250 cfs

Enhance existing swale at upstream end and connect to abandoned side channel at downstream end of floodplain. Target inundation 950 cfs

**LEGEND**

- Lowered Floodplains
- Alcove/scour channel/side channels
- Coarse Sediment Bar

North arrow pointing up.

Scale bar: 250 125 0 125 250

SCALE 1 IN = 250 FT