

A wide, rocky riverbed flows through a dense forest. The riverbed is composed of numerous grey and brown rocks of various sizes, interspersed with fallen branches and debris. The surrounding forest is lush with green trees and shrubs. On the left bank, a person wearing an orange vest and a hat stands near a large, weathered log. The overall scene depicts a natural, somewhat overgrown river environment.

UPPER YAKIMA BULL TROUT HABITAT RESTORATION PROJECTS

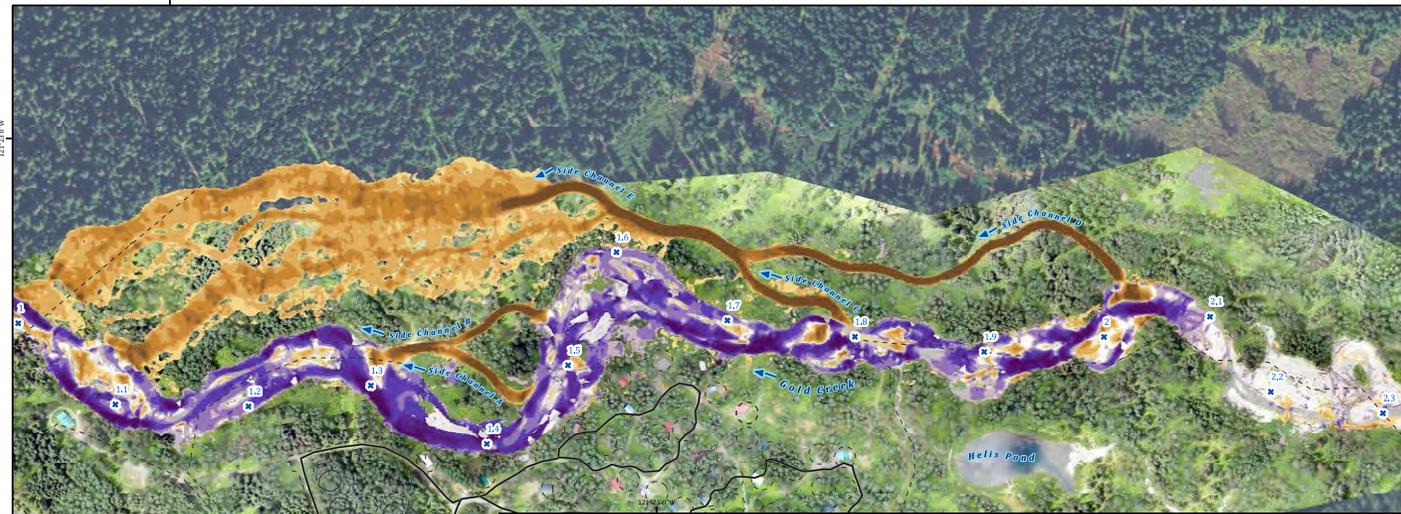
Gold Creek | Kachess River | Box Canyon

Mitch Long and Melissa Speeg
Kittitas Conservation Trust



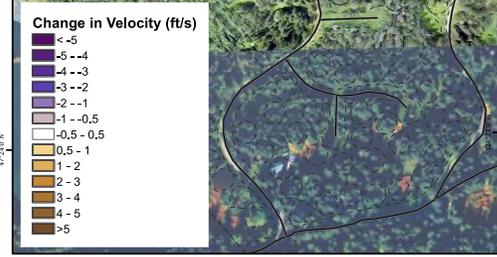


GOLD CREEK



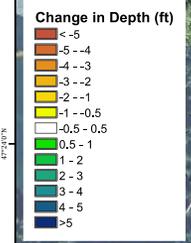
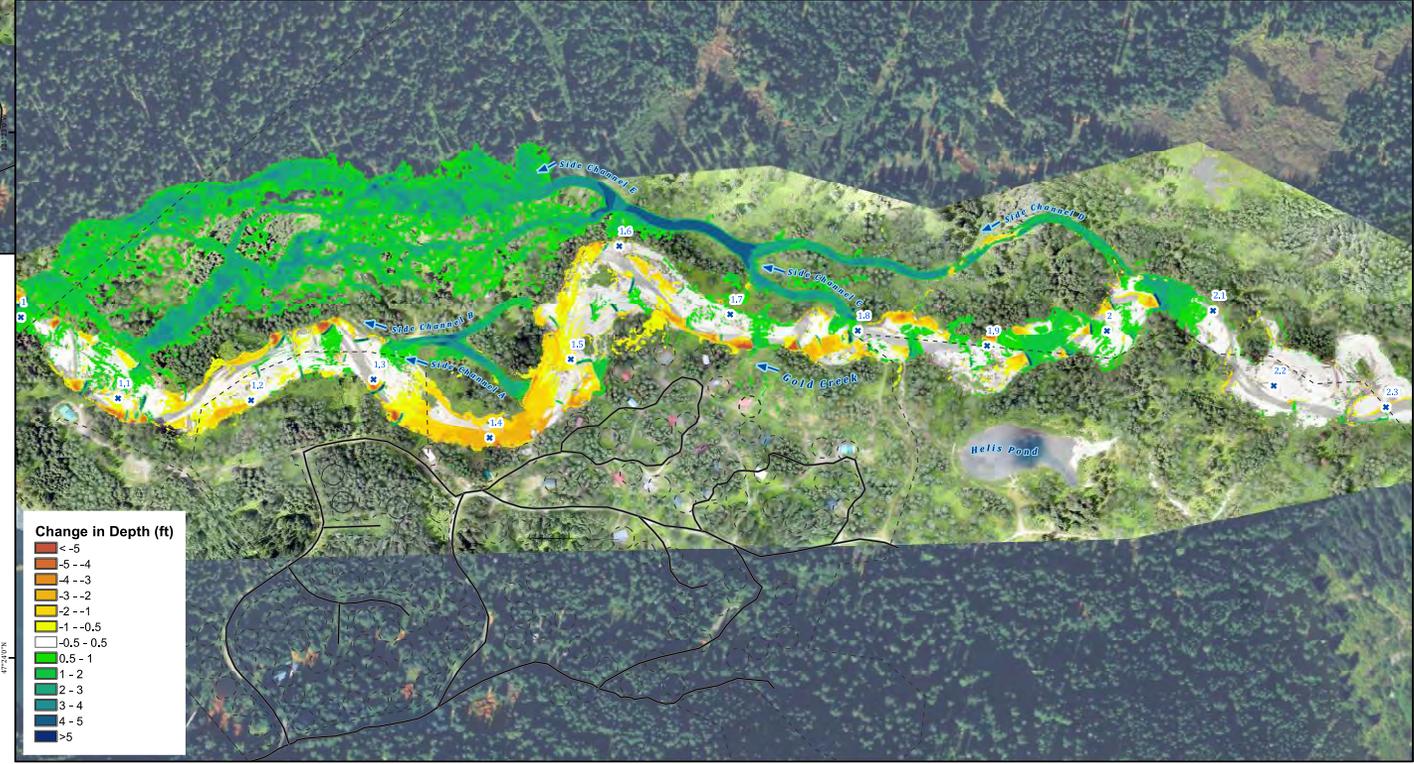
Updated Proposed Conditions hydraulic model results

- Incorporating design changes
- Minimizing flood risk to private property



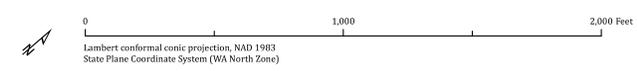
Gold Creek Instream Restoration
Change in Velocity (EC vs PC) - Q100 (3000cfs)
 Hydraulic results calculated using RiverFlow 2D
 Aerial Imagery: 2016 Aerial Photography (Kittitas Conservation Trust) and 2015 NAIIP imagery (USDA)

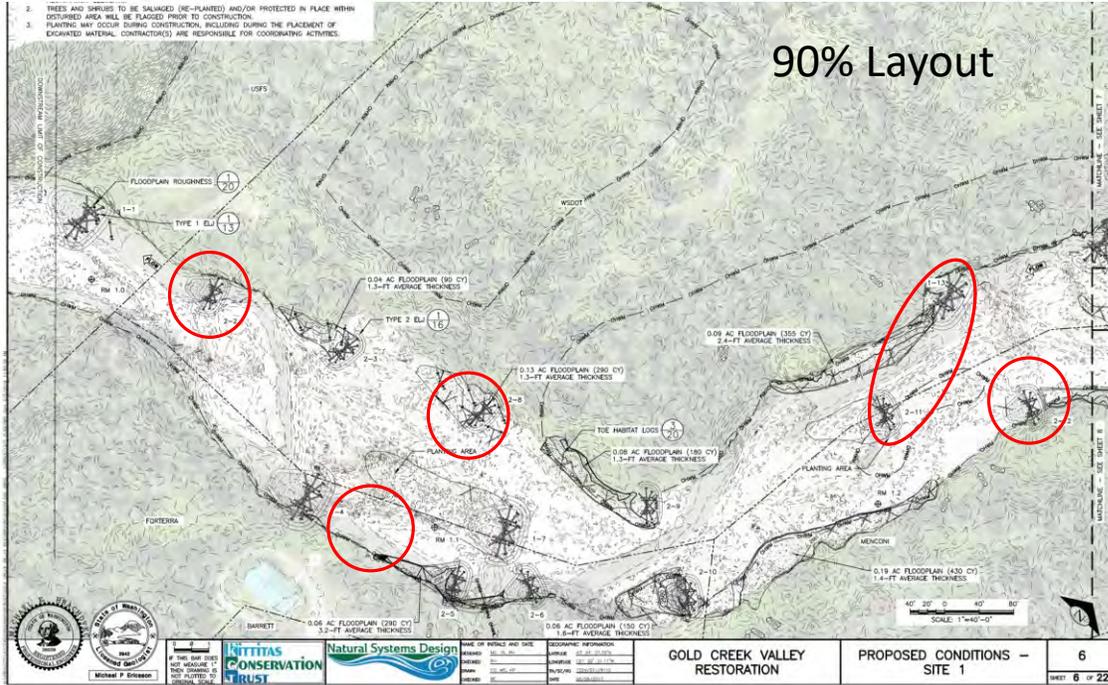
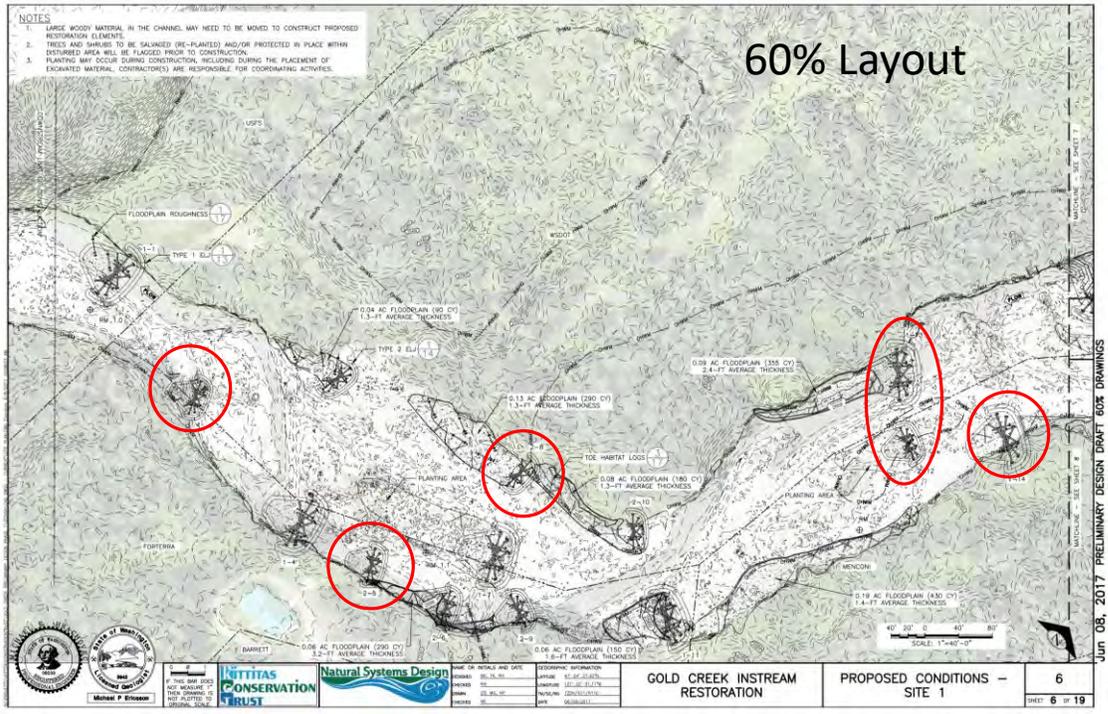
15 River Mile
 Roads
 Tax Parcels



Gold Creek Instream Restoration
Change in Depth (EC vs PC) - Q100 (3000cfs)
 Hydraulic results calculated using RiverFlow 2D
 Aerial Imagery: 2016 Aerial Photography (Kittitas Conservation Trust) and 2015 NAIIP imagery (USDA)

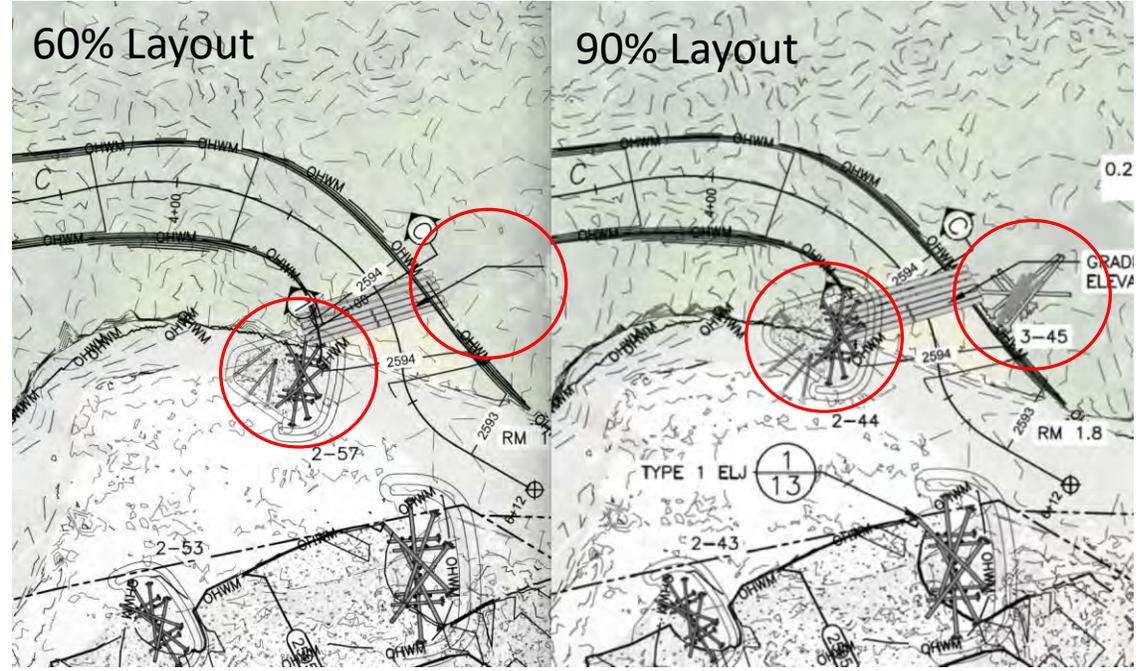
15 River Mile
 Roads
 Tax Parcels



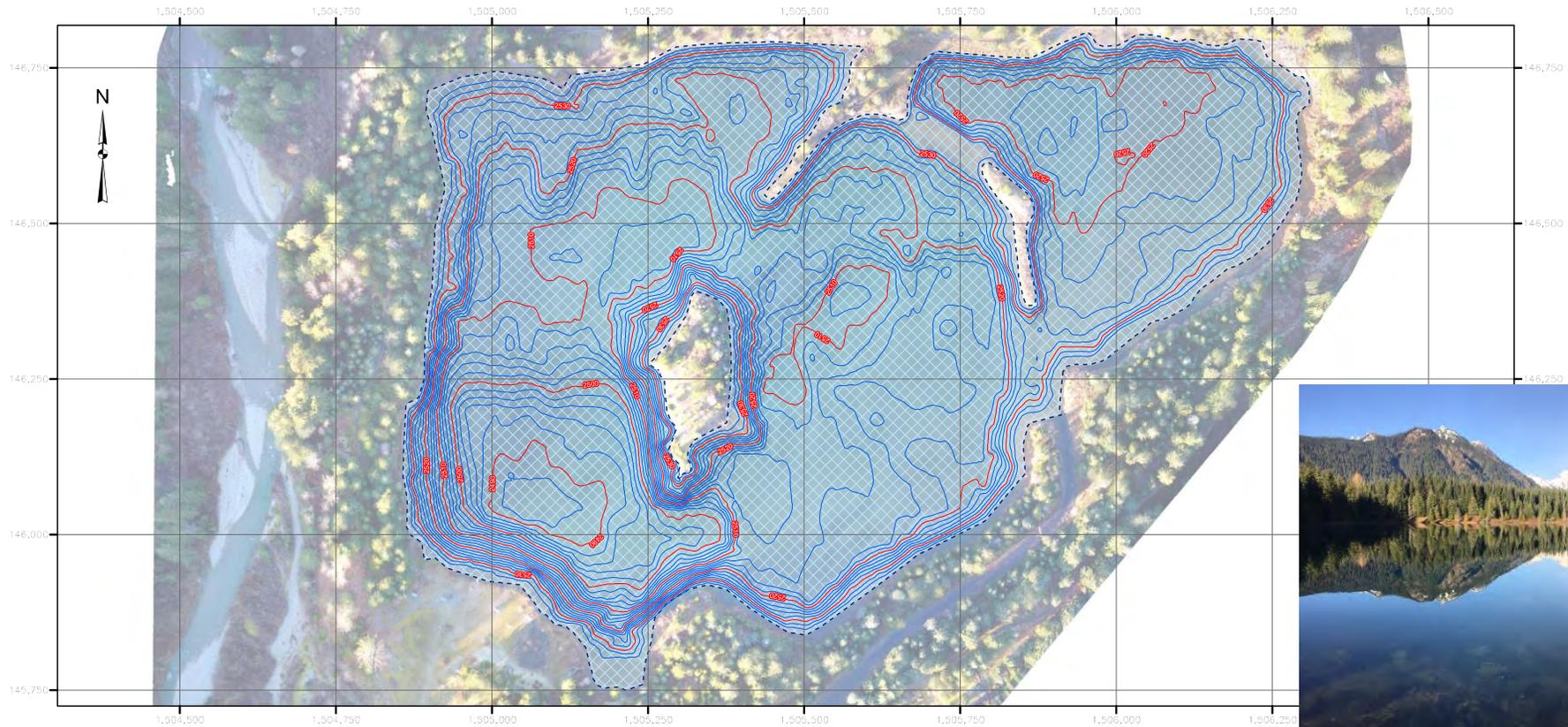


Updated locations and types of proposed instream structures

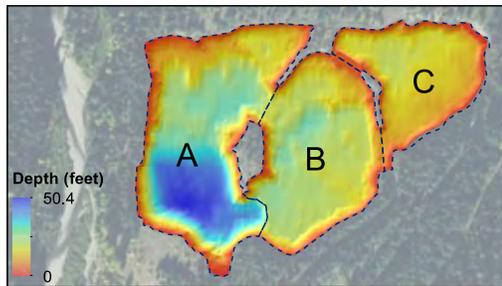
- to reflect the current condition of the channel
- Limit constricting the channel below 60-ft to reduce likelihood of channel spanning logjams from forming
- Minor adjustments at side channel inlet locations, including additional upstream structure to limit widening potential



Bathymetry data collection at Gold Creek Pond



Bathymetric Surface Model:



	Pond Level (ft)	Area (Acres)	Storage Volume (yd ³)	Max Depth (ft)
Total Pond Area	2,536.76	22.5	700,144	50.4
Basin A		10.1	383,535 (55%)	50.4
Basin B		7.4	218,272 (31%)	30.3
Basin C		5	99,337 (14%)	21.2

Notes:

Projected Coordinate System and Datum: NAD 1983 2011 StatePlane Washington North FIPS 4601 Ft US
Vertical Datum: NAVD88 (Geoid 12B)

This Digital Surface Model (DSM) was created from interpolated single-beam echosounder data. See accompanying report for additional detail.
Storage Volume was calculated as the displacement between the model surface below and the pond level using ArcGIS 3D Analyst.

The imagery and surface model are not certified survey data overseen or signed by a Registered Professional Land Surveyor.
User acknowledges NewFields is not liable for misuse. Appropriate use should be discussed with NewFields.

Legend:

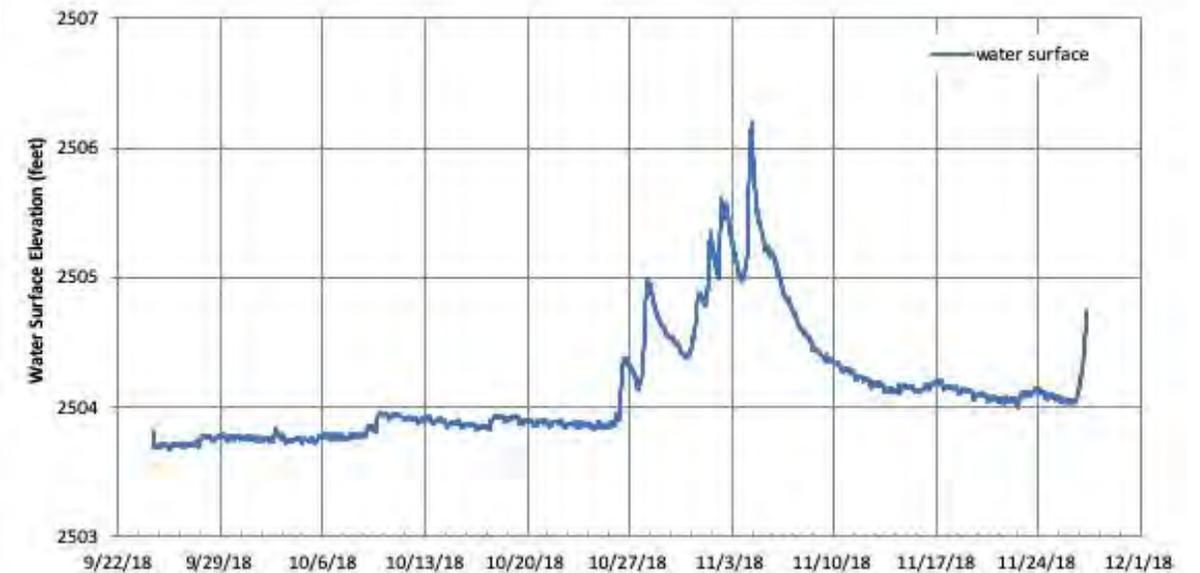
- 2-ft contour interval
- 10-ft contour interval
- Model Boundary

Project		Gold Creek Valley Design	
		Gold Creek Pond Bathymetry	
Location	Kittitas County, WA	Figure No.	01A - DRAFT
Acquisition Date	Nov. 08, 2018		



Gold Creek Frontage Road Hydrologic Monitoring

- Installed groundwater and surface water monitoring network
 - 7 groundwater wells (10-ft deep)
 - 2 additional WSDOT wells
 - 11 surface water gages
 - Collecting data from Fall 2018 - Fall 2019



KACHESS RIVER





OVERVIEW

Enhance bull trout habitat on a reach of river that dewateres most summers

- Improve the quality of habitat
- Increase the available habitat for rearing bull trout when dewatering occurs

ASSESSMENT

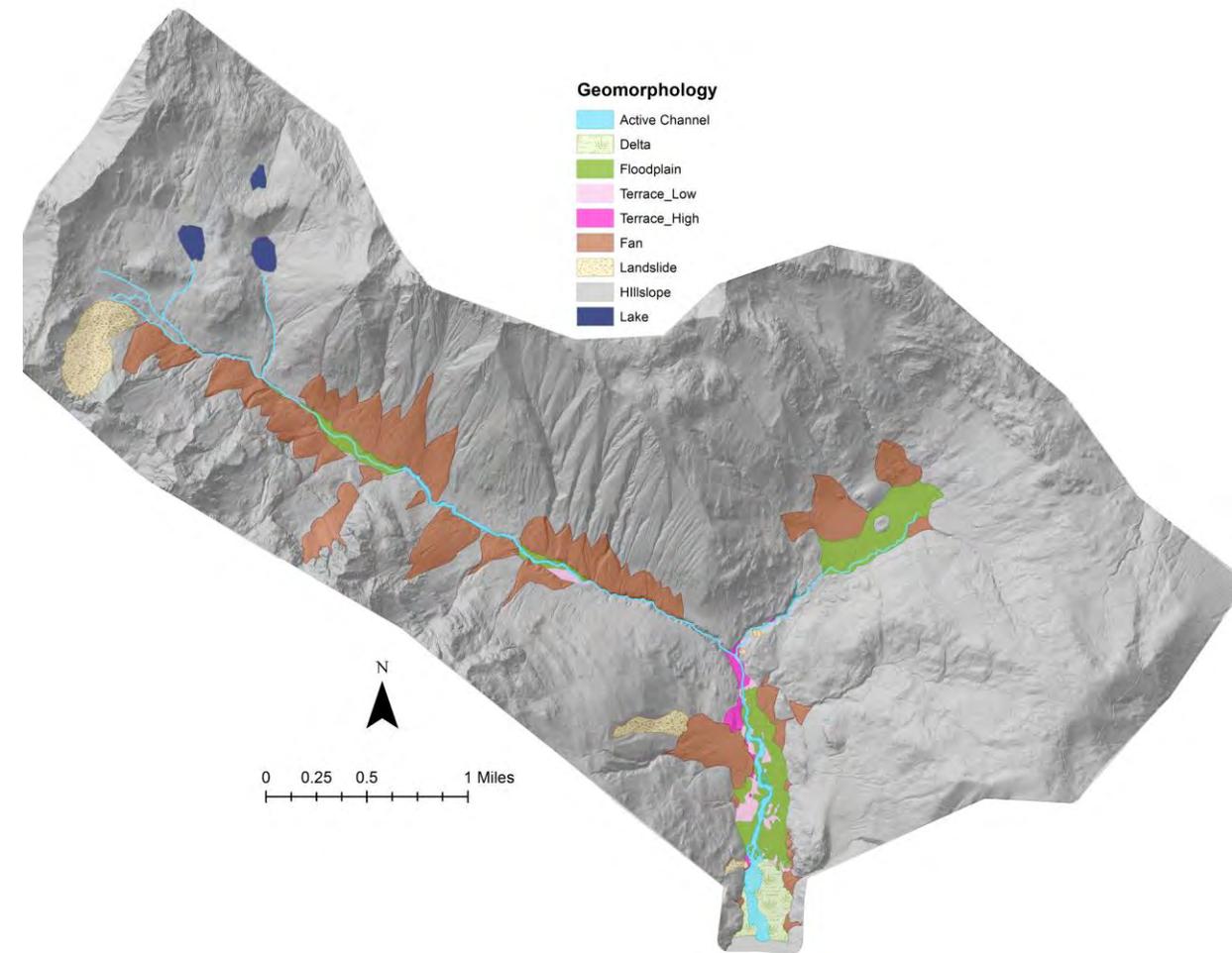
Installed piezometers

Collected flow measurements

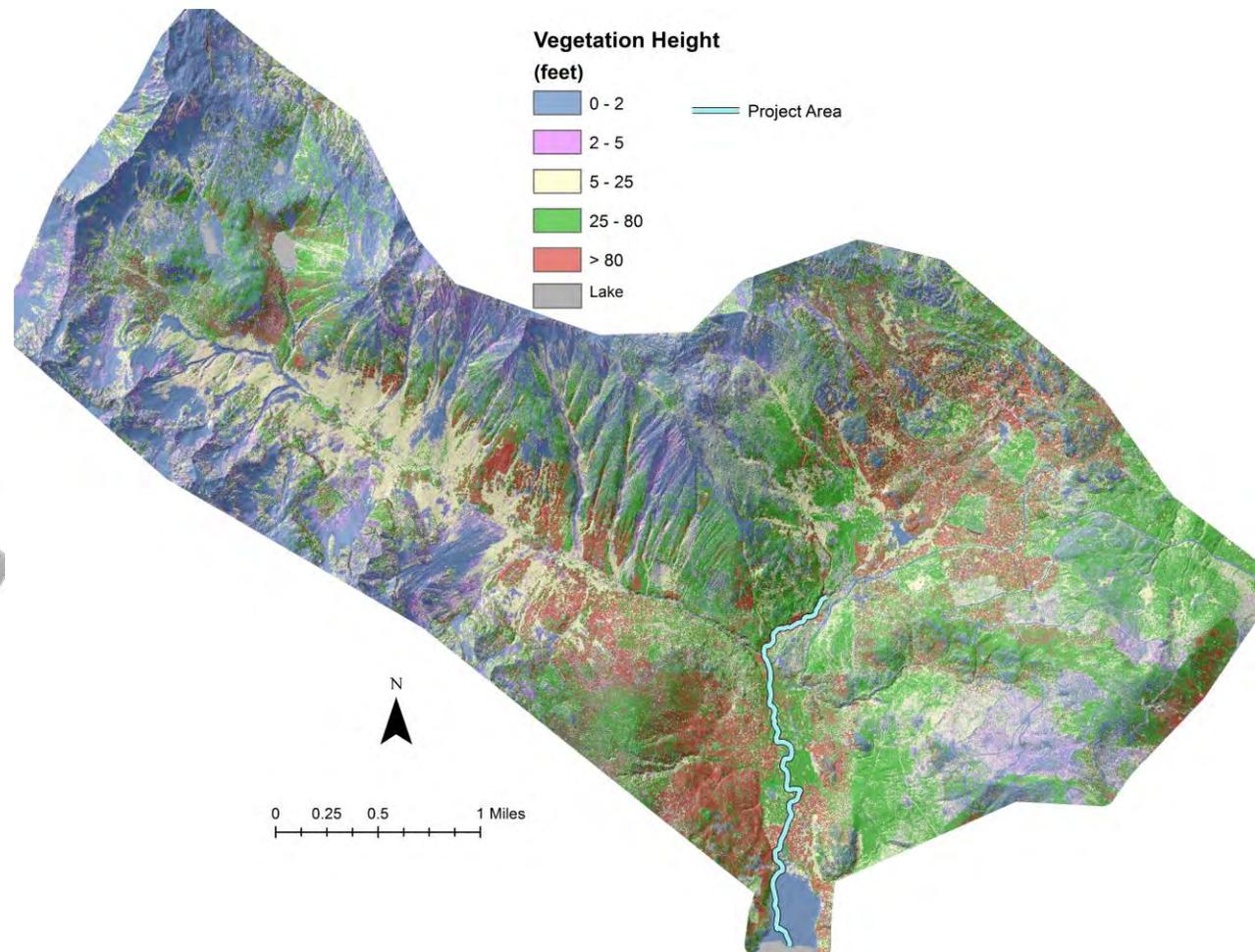
Obtained LiDAR

Completed ground survey





GEOMORPHOLOGY



VEGETATION

REACH 2

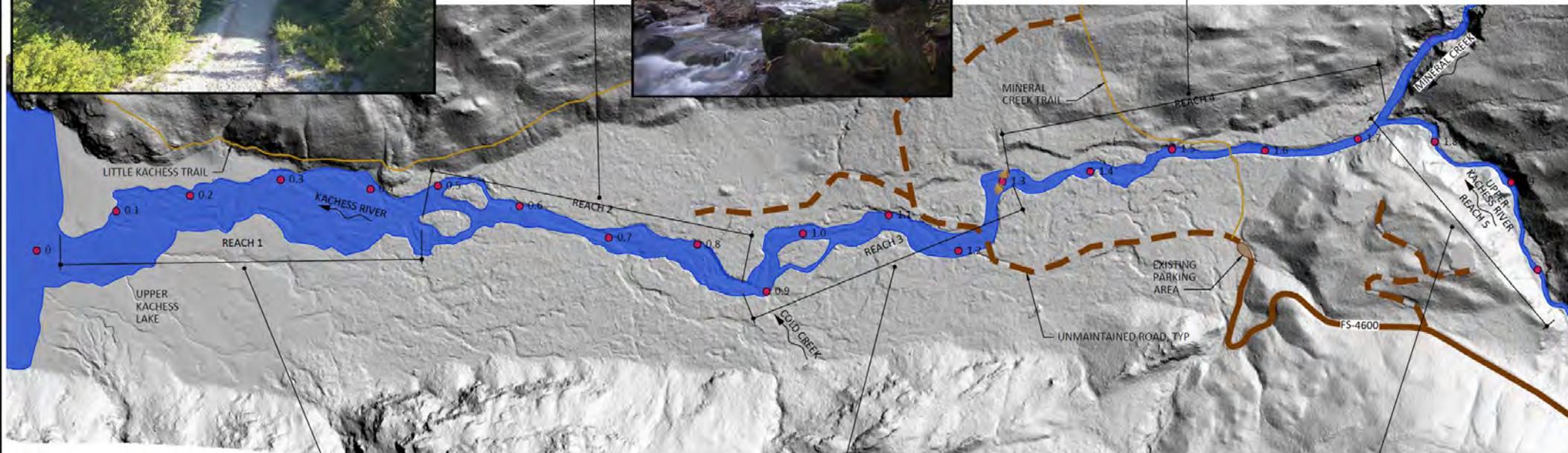


REACH 2
THIS IS AN AGGRADING REACH WITH A BROAD, OVER-WIDENED, PLANE-BED CHANNEL IN WHICH FLOW RUNS SUB-SURFACE IN THE SUMMER.

REACH 4



REACH 4
THIS REACH IS STEEPER AND PARTIALLY CONFINED TO CONFINED. THE UPSTREAM END IS CONFINED BY DISCONTINUOUS LEVES. FLOW IN THIS REACH IS PERENNIAL.



REACH 1



REACH 1
THE KACHESS RIVER DELTA IS EFFECTED BY SEASONAL LAKE LEVELS. VEGETATION IS LIMITED TO LARGE STUMPS LEFT BEHIND WHEN THE AREA WAS LOGGED. SECTIONS OF THE LOW FLOW CHANNEL SEASONALLY RUN DRY.

REACH 3



REACH 3
THIS REACH CONTAINS DISCONNECTED SCOUR POOLS FORMED BY KEY PIECES OF LARGE WOOD. THIS REACH IS OVER-WIDENED AND LACKS HABITAT DIVERSITY. MID-CHANNEL BARS ARE PRESENT, BUT VEGETATED ISLANDS HAVE FAILED TO ESTABLISH.

REACH 5



REACH 5
THIS IS A CONFINED REACH WITH INCREASED GRADIENT AND INCREASED HABITAT COMPLEXITY. FLOWS ARE PERENNIAL AND THE UPSTREAM END IS DEFINED BY A BARRIER FALLS.

NOTE:
PROJECT AREA IS ENTIRELY WITHIN OKANOGAN-WENATCHEE NATIONAL FOREST.

NO.	BY	DATE	REVISION DESCRIPTION

NS	DM, PL	PL
DRAWN	DESIGNED	CHECKED
DM	4/2/2019	180213
APPROVED	DATE	PROJECT

KITTITAS CONSERVATION TRUST
UPPER KACHESS RIVER RESTORATION
CONCEPT DESIGN

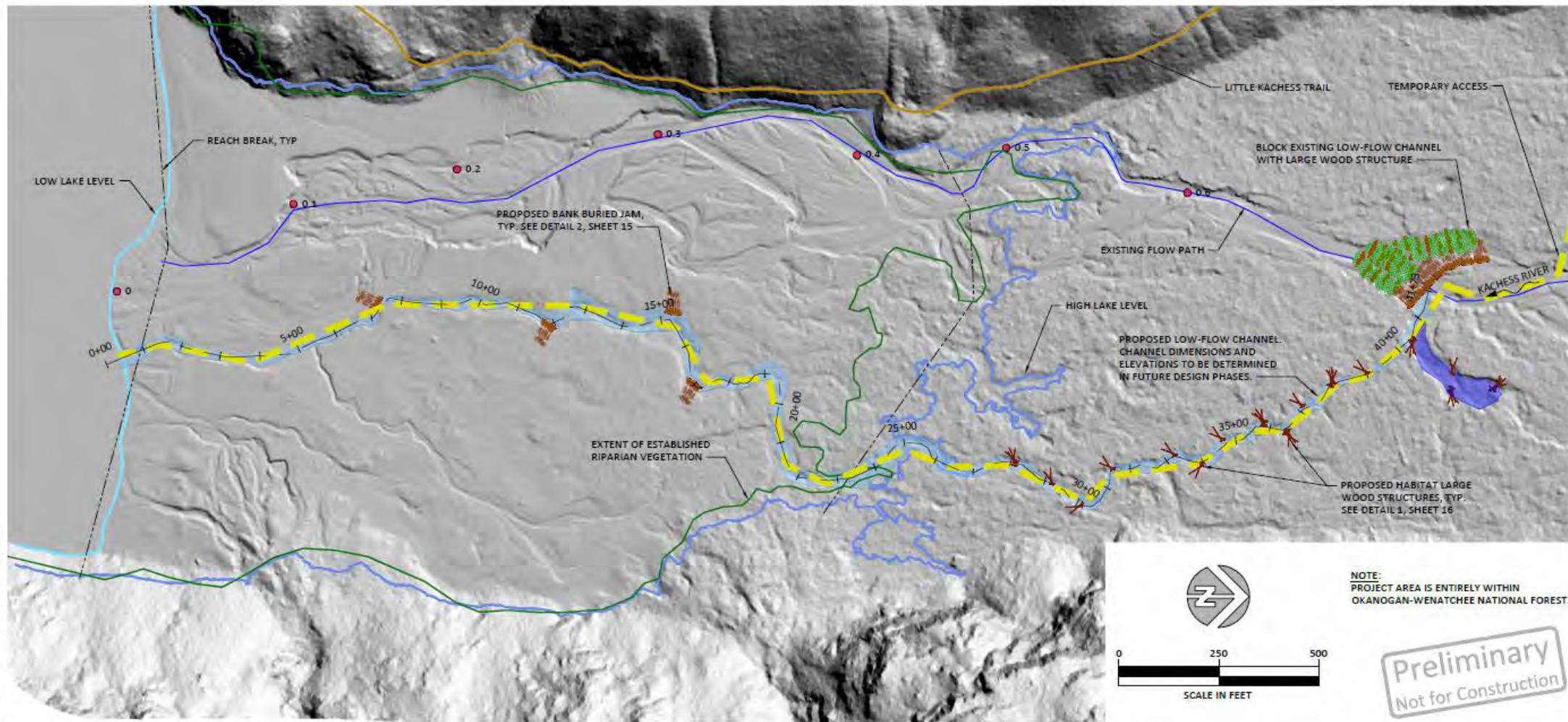


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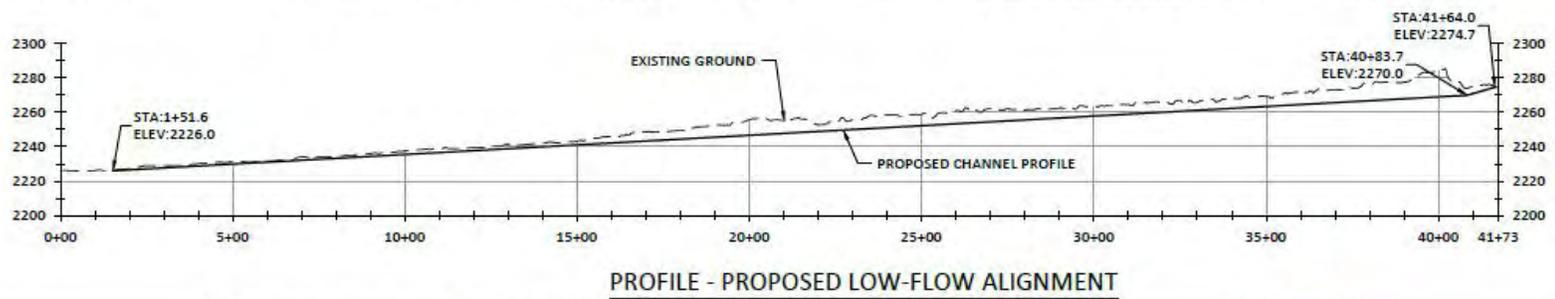
SITE OVERVIEW

D:\N\Kachess\B\Kachess\Map\Kachess_C.dwg - 4/2/19



NOTE:
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OKANOGAN-WENATCHEE NATIONAL FOREST.

Preliminary
Not for Construction



PROFILE - PROPOSED LOW-FLOW ALIGNMENT

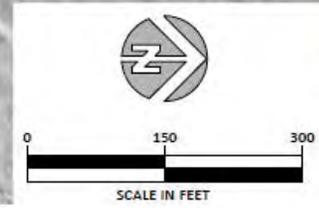
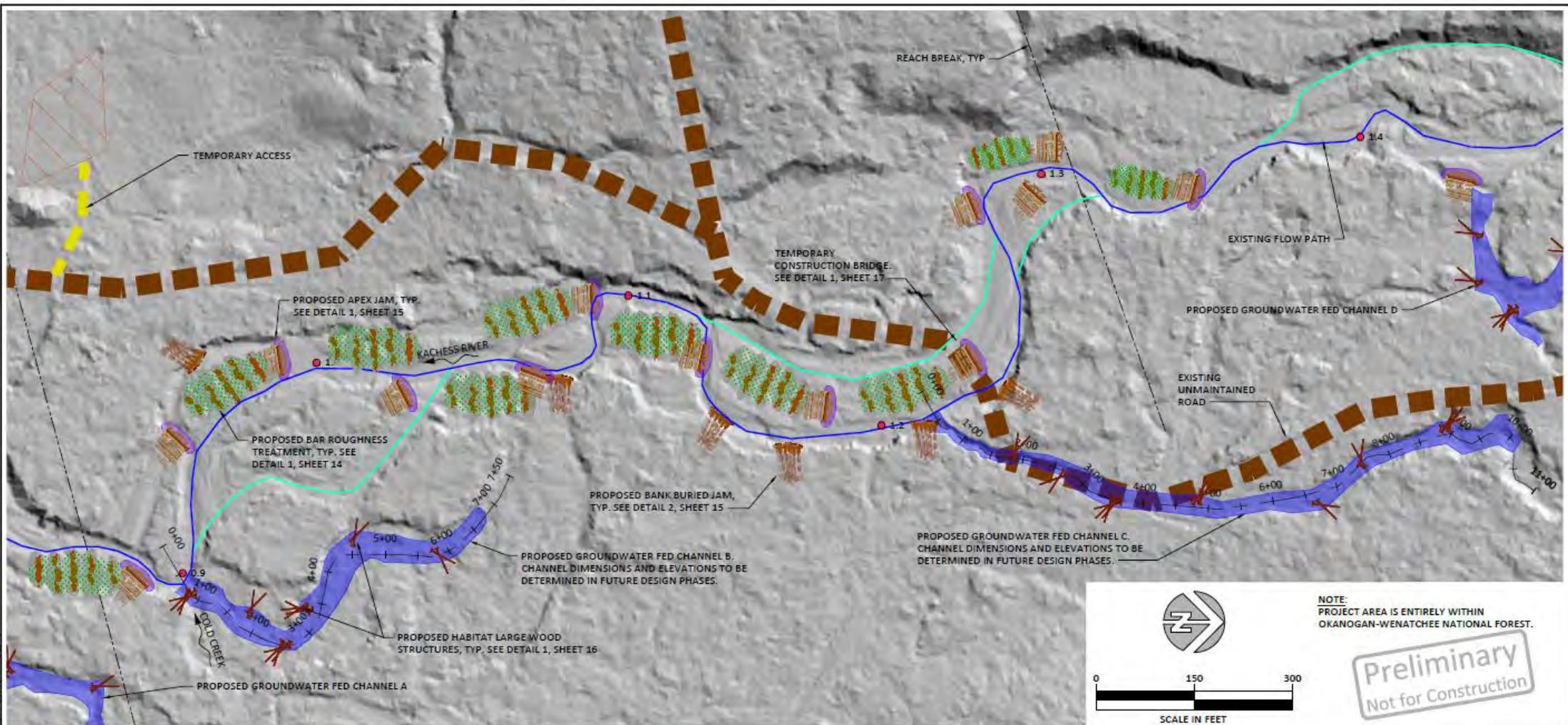
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DM APPROVED	4/2/2019 DATE	180213 PROJECT

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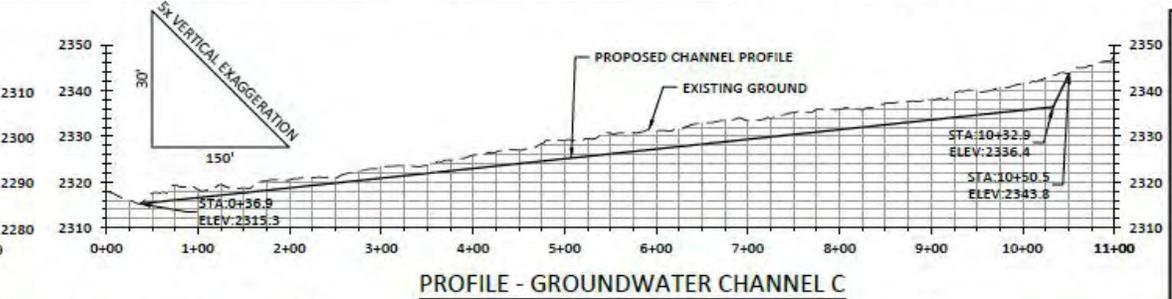
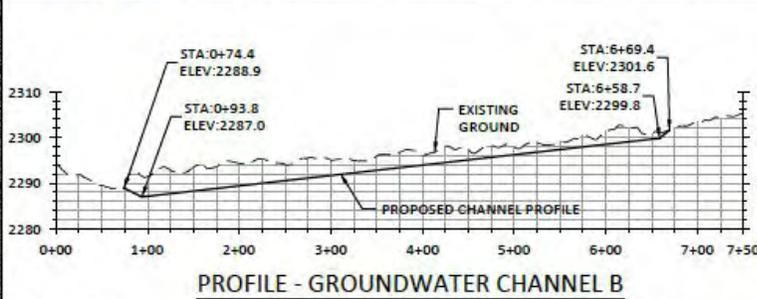
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PROPOSED CONDITIONS -
REACH 1 & 2, ALTERNATIVE 2



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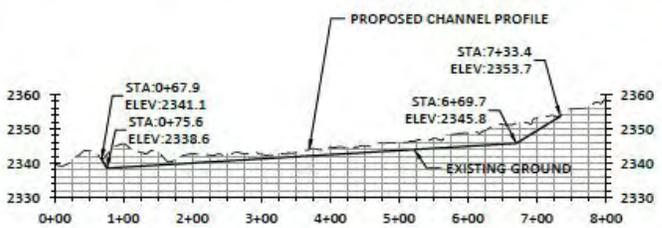
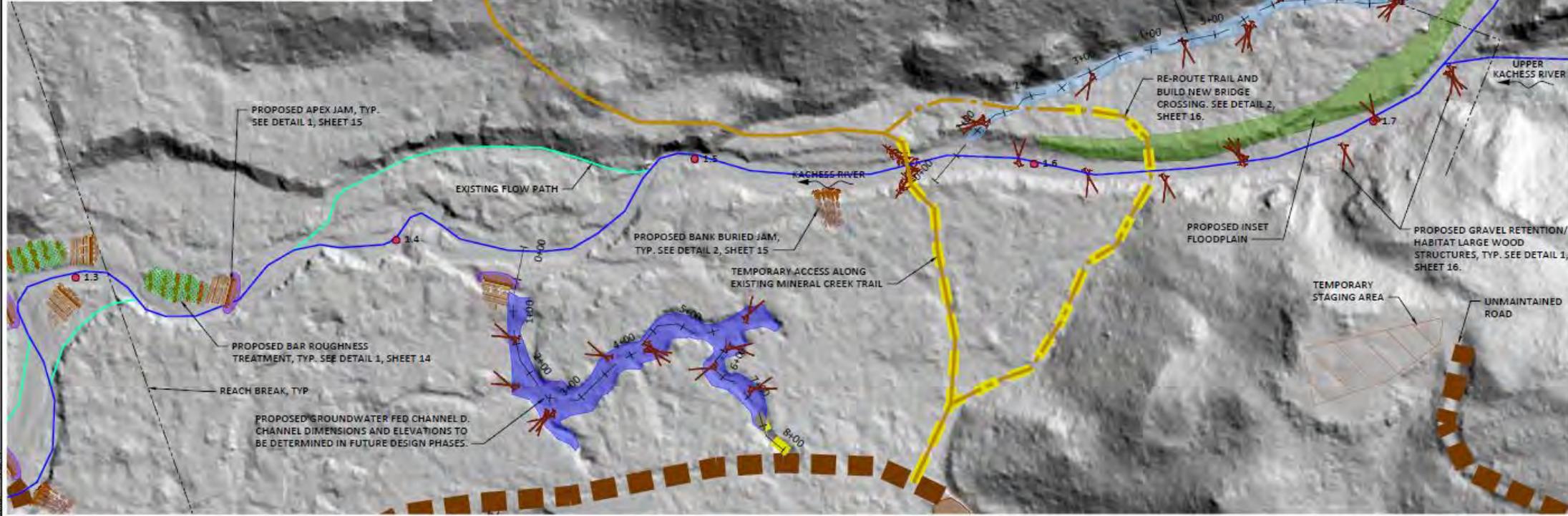
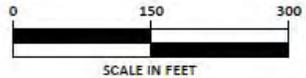


PROPOSED CONDITIONS -
REACH 3

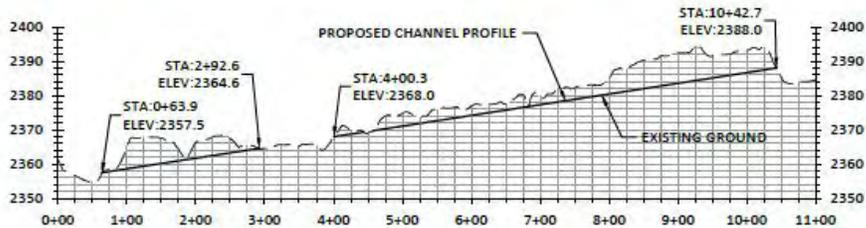
Preliminary
Not for Construction



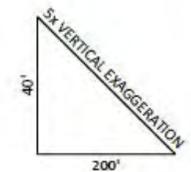
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NATIONAL FOREST.



PROFILE - GROUNDWATER CHANNEL D



PROFILE - HIGH-FLOW CHANNEL



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CONCEPT DESIGN

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PROPOSED CONDITIONS -
REACH 4



NEXT STEPS

Data collection | Permitting | Final Designs

BOX CANYON

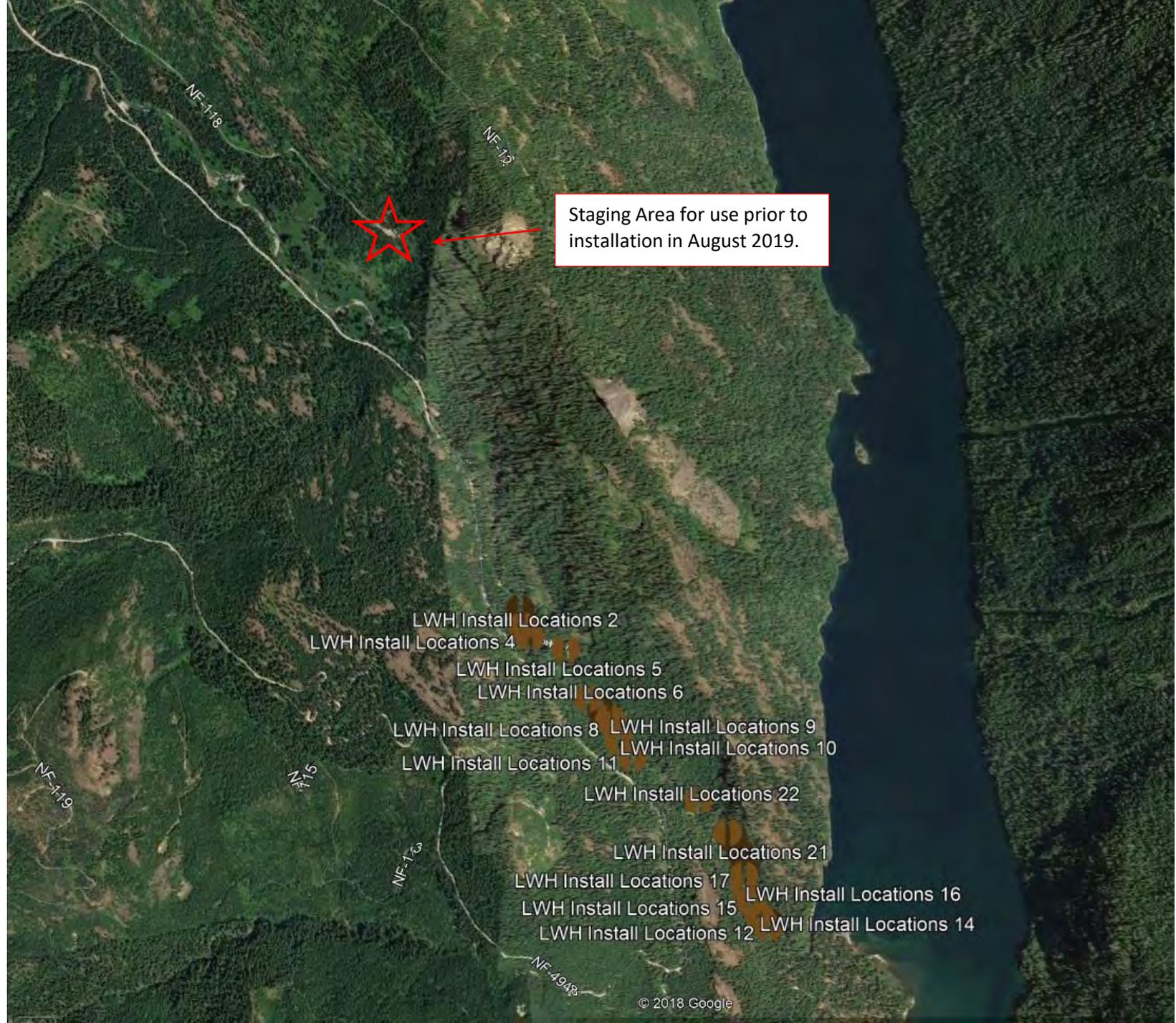


OVERVIEW

Placement of 360 pieces of wood to improve bull trout habitat

High velocity reach that has deficiency of large woody habitat

Anticipated to take 2 days to implement



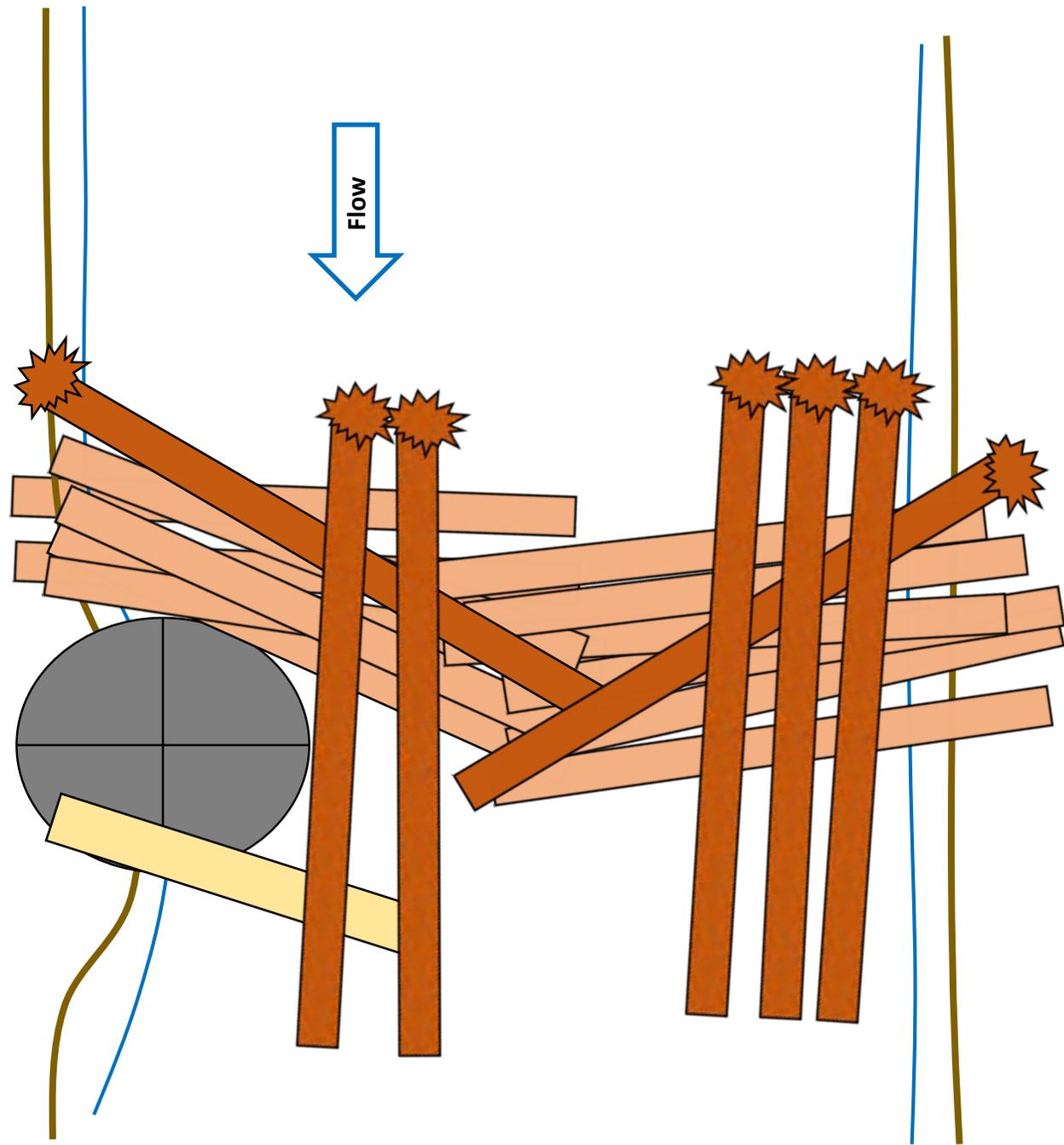


PROJECT DESIGN

WDFW Survey Data

Collaboration with US Fish and Wildlife Service (USFWS) and Forest Service staff

Coordination with the Yakima Basin Bull Trout Working Group

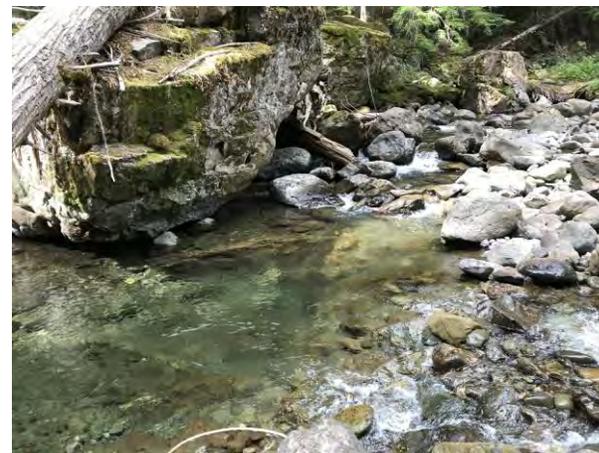


LWH Installation

Location 19

Cut logs = 12

Logs with rootwads = 7



PLANNING

Coordinating with Forest Service to obtain hazard trees and prevent insect infestation

Staging area and helicopter refueling site

Permitting almost complete





NEXT STEPS

Obtain all needed wood for project

Complete all permitting

Coordinate with Yakama Nation on helicopter timing

**Implementation
August 2019!!!**

An aerial photograph of a mountain valley. The valley floor is covered in a dense forest of evergreen trees. A wide, light-colored riverbed, possibly a braided river, winds through the center of the valley. The surrounding mountains are steep and covered in forest, with some rocky outcrops and patches of snow or ice visible on the higher peaks. The sky is blue with scattered white clouds. The word "QUESTIONS?" is overlaid in large white letters on the left side of the image.

QUESTIONS?