Yakama Nation

Upper Columbia Habitat Restoration Project

ANNUAL REPORT

Report covers work performed under BPA Project #2009-003-00
Master Agreement #56662 - Releases 111, 119, and 142

Report was completed under BPA Project #2009-003-00
Master Agreement #56662 - Release 111

REPORT COVERS WORK FROM JANUARY 1ST, 2017 THROUGH DECEMBER 31ST, 2017

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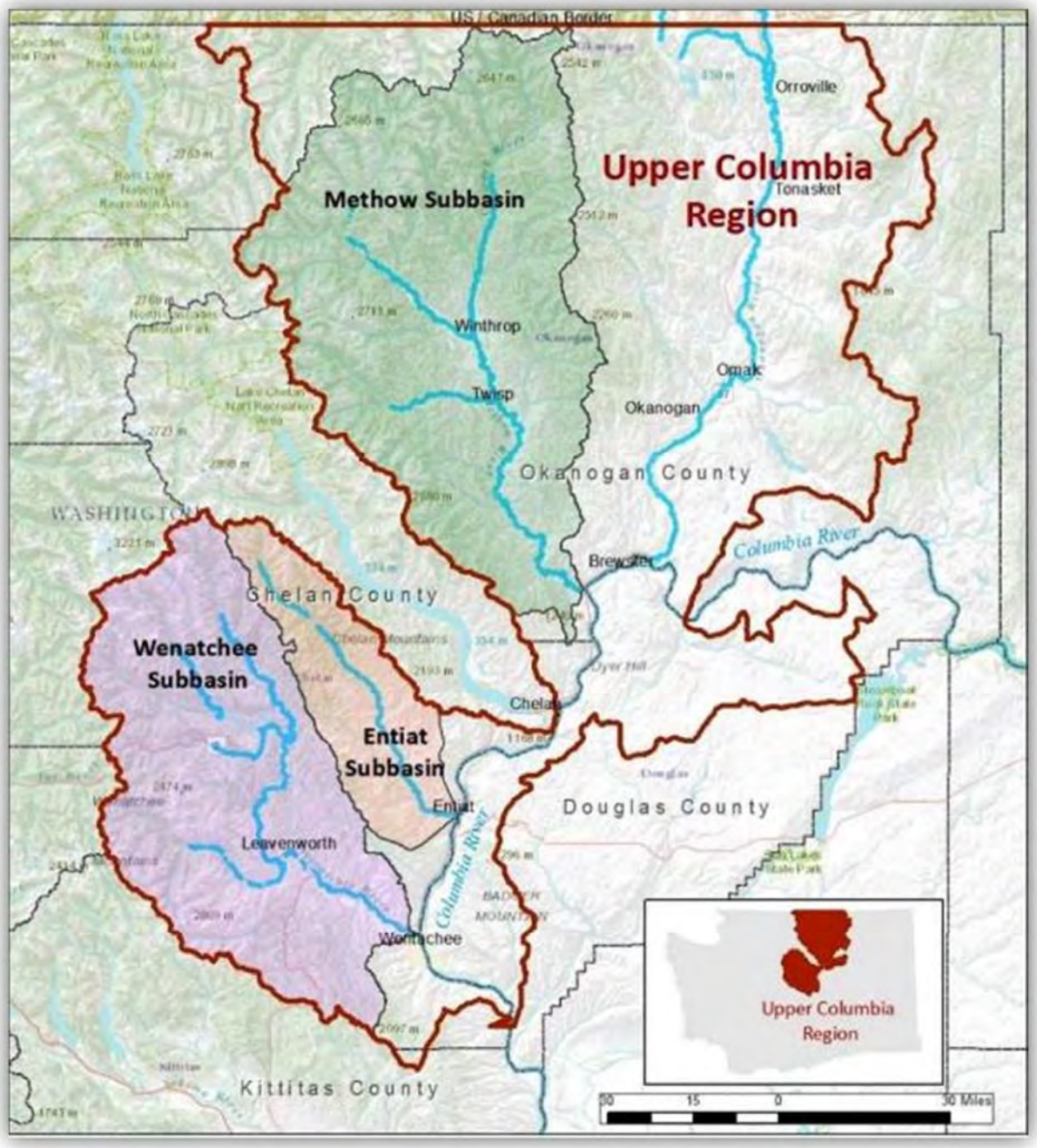
Project Overview

Using funding from the 2008 Columbia Basin Fish Accords, the Yakama Nation Fisheries' Upper Columbia Habitat Project (YN UCHRP) plans and implements habitat related salmon and steelhead recovery actions in the Wenatchee, Entiat, and Methow Subbasins as guided by the Federal Columbia River Power System (FCRPS) biological opinion. This report summarizes the work performed by the YN UCHRP under BPA Project #2009-003-00-Master Agreement #56662 in calendar year 2017. This one year time period spanned multiple Scopes of Work and Budget Releases under Master Agreement 56662, including portions of Releases 111, 119, and 142.

During this reporting period, the YN UCHRP built upon previous project development momentum to move forward reach assessments in priority tributaries, conservation acquisitions, and restoration designs for future projects, and to complete multiple large scale habitat restoration projects which contribute directly to FCRPS biological opinion targets. Restoration actions completed during the reporting period include:

- **Twisp River Newby Narrows Project (Methow Subbasin)**
- **Twisp River Horseshoe Side Channel Phase 1 Project (Methow Subbasin)**
- **Big Valley Fish Enhancement Project (Methow Subbasin)**
- **Chewuch River Mile 15.5 to 17 (Methow Subbasin)**
- **Entiat 3D Revisited Large Wood Enhancement (Entiat Subbasin)**
- **Entiat Stillwaters Fish Enhancement (Entiat Subbasin)**
- **Meacham Flats Fish Enhancement (Wenatchee Subbasin)**

Upper Columbia Basin Map



Restoration Objectives/Strategies/Priorities

Salmon habitat restoration objectives, strategies, and priorities in the Upper Columbia Basin are guided by the 2007 Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan (Recovery Plan) and the frequently updated Regional Technical Team Biological Strategy (Biological Strategy), which is Appendix C of the Recovery Plan. The Recovery Plan and Biological Strategy identify specific priority areas and impaired ecological conditions by which targeted restoration actions are expected to help increase population metrics for endangered fish stocks. Within priority areas identified by the Biological Strategy, the YN UCHRP performs habitat and geomorphic reach assessments to better understand existing conditions and ecological concerns for the development of restoration actions. From these reach assessments we identify specific project actions that could be implemented to reduce ecological impairments. The reach assessments are reviewed by the Regional Technical Team and the new information is used to update to Biological Strategy as necessary.

Priority restoration actions identified in the reach assessments are developed by YN UCHRP staff into on the ground restoration projects through coordination and partnerships with underlying landowners, permitting/regulatory/land management agencies, local governments, and other restoration project sponsors. Most project coordination is facilitated through the Watershed Action Teams. The YN UCHRP uses engineering and design firm subcontractors to develop detailed habitat restoration plans. Prior to implementation, final project designs are agreed to by participating and/or affected landowners and are used to acquire necessary permits and federal consultation permissions.

As deemed necessary to ensure prioritized restoration work can proceed, the YN UCHRP acquires land or right of entry agreements using both 2008 Columbia Basin Fish Accord funds and other grant monies available for targeted acquisitions. YN UCHRP acquisition projects are prioritized based on the identified need and existing prioritization scheme used to determine the schedule of habitat restoration work.

At the time of completing an individual reach assessment, we utilize a project prioritization scheme on all identified restoration actions within the reach assessment area to determine where to prioritize our restoration work, and which types of actions to pursue to get the highest biological benefit. Reach assessment project ranking methods generally follow the following guidelines:

Reach Assessment Project Prioritization Guidelines

For each project site identified through a reach assessment process, assign the following scores in a table:

Step 1: **Benefit Score** Projects are scored according to 4 benefit categories, which include a "recovery gap" category and 3 additional categories. Scores for each category are summed to obtain the ***Benefit Score***.

Step 2: **Cost Score** Projects are given a ***Cost Score***, which reflects the overall *relative cost* for the project based on techniques, access, and construction feasibility issues.

Step 3: **Benefit-to-Cost Score** Total benefit score (sum of all 4 benefit scores) is divided by the cost score to obtain the ***Benefit-to-Cost Score***.

Step 4: **Feasibility Designation** Projects are given a ***Feasibility Designation*** based on the overall likely feasibility of being able to implement the project within a 10-year timeframe.

1. Benefit Score

The Benefit Score includes the summation of scores from 4 categories. These include the Recovery Gap score (0-6 points), the Fish Use score (1-3 points), the Root Causes score (1-3 points), and the Ecological Concerns Score (1-4). The guidelines for scoring are provided below.

Recovery Gap

Existing Condition Rating (1-7)

1 – Very low ecosystem function and habitat quality. Highly altered systems.
2 – Low ecosystem function and habitat quality.
3 – Low-to-moderate ecosystem function and habitat quality.
4 – Moderate ecosystem function and habitat quality.
5 – Moderate-to-high ecosystem function and habitat quality.
6 – High ecosystem function and habitat quality.
7 – Very high level of natural ecosystem function and habitat quality. Pristine, unaltered systems.

Achievable Condition Rating (1-7)

These ratings use the same categories as above but reflect the future potential recovery trajectory. This is a rating of what can realistically be achieved given past and on-going impacts and constraints of land use, infrastructure, social acceptance, and ownership. Ratings should reflect an "optimistic potential scenario" in order to not discount large potential changes.

Final Gap Score (0-6)

This is simply the achievable condition rating minus the existing condition rating. This represents the gap that can be filled between existing and target conditions through restoration measures.

Fish Use

3 – High existing or potential productivity area for spawning or rearing for multiple species
2 – Moderate existing or potential productivity area for one or more species
1 – Low existing or potential productivity area for one or two species

Root Causes

3 – Restoration of root causes and key physical processes that create and maintain habitat over time
2 – Partial restoration of root causes
1 – Primarily a structurally-focused restoration strategy that doesn't significantly address underlying causes

Ecological Concerns Score

4 – Addresses multiple high priority ecological concerns
3 – Addresses one high priority ecological concern
2 – Addresses one or more moderate priority ecological concerns
1 – Addresses only low priority ecological concerns

2. Cost Score

The cost score reflects the relative cost for the project based on techniques, access, and feasibility issues. This is a relative cost, not an absolute cost, so the scale of the project is NOT factored into this score. The cost score ranges from 1 to 3, with 1 reflecting relatively lower cost projects. The following guidelines/examples can help to determine the cost score.

3 – High relative cost

- Uses high cost techniques (e.g. constructed banks, highly engineered log jams, extensive channel shaping, extensive infiltration galleries)
- Deep excavation or long distance hauling of spoils
- Entails construction of additional new flood control or bank erosion features (e.g. setback levees or buried rip-rap)
- Extensive planting or invasive weed control
- Limited, difficult, or remote access
- Intensive de-watering requirements

2 – Moderate relative cost

- Uses moderate cost techniques (e.g. typical log jam structures)
- Moderate excavation and hauling distance of spoils
- Typical planting or invasive weed control
- Moderate access conditions
- Standard or no de-watering requirements

1 – Low relative cost

- Uses low cost techniques (e.g. non-ballasted log placements)
- Minimal excavation and hauling distance of spoils

- Little to no planting or weed control
- Easy access conditions
- No de-watering required
- Availability of free materials or volunteer labor

3. Benefit-to-Cost Score

The benefit-to-cost score is simply the benefit score divided by the cost score. This is a relative value used to compare project benefits.

4. Feasibility Designation

The feasibility designation is the overall likely feasibility of being able to implement the project within a 10-year timeframe. This is based on landownership, as well as economic, regulatory, political, social, permitting, or other considerations that are known to impact the feasibility of conducting projects within a reasonable timeframe. The feasibility designation is not used as part of the project scoring because feasibility issues may change over time and it is desirable to evaluate project benefits independent of feasibility. The designations include the following:

High feasibility

- No known feasibility issues.
- One or two landowners; or landowner(s) has already indicated willingness

Moderate feasibility

- There are potential feasibility constraints that could affect the likelihood of project implementation within a 10-year timeframe
- Three to five landowners; or there is reason to believe landowner(s) would grant permission

Unlikely feasibility

- There are known feasibility constraints that would be expected to limit the ability to implement the project within a 10-year timeframe
- More than five landowners: or there is reason to believe landowner(s) would not grant permission

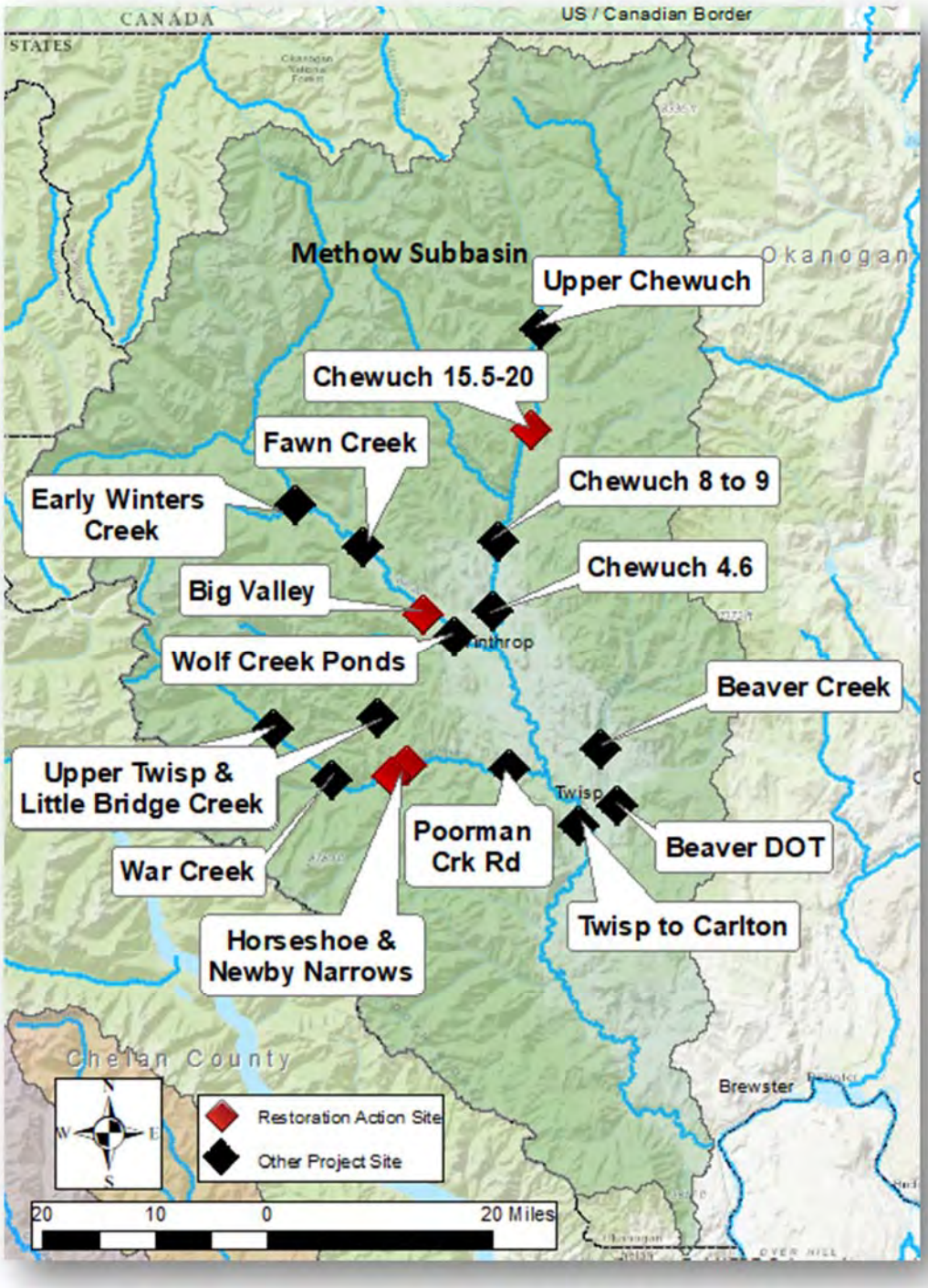
Sample Ranking Table

Project Information					Benefit Score							Cost Score	Cost Benefit	Feasibility Designation
Project Name	Sub Reach	Downstream RM	Upstream RM	Total Length (mi)	Restoration Gap Analysis: Existing Condition (1-7)	Restoration Gap Analysis: Achievable Target (1-7)	Restoration Gap Analysis: Final Gap Score Target - Existing (0-6)	Painting and Potential Fish Use: Score (1-3)	Root Causes: Score (1-3)	Ecological Concerns: Score (1-4)	Total Benefit Score	Score (1-3)	Benefit to Cost Score	Feasibility Designation
Project 1	1	0	1	1	2	6	4	2	2	4	12	2	6	Moderate
Project 2	2	1	2	1	4	5	1	2	1	2	8	1	8	High

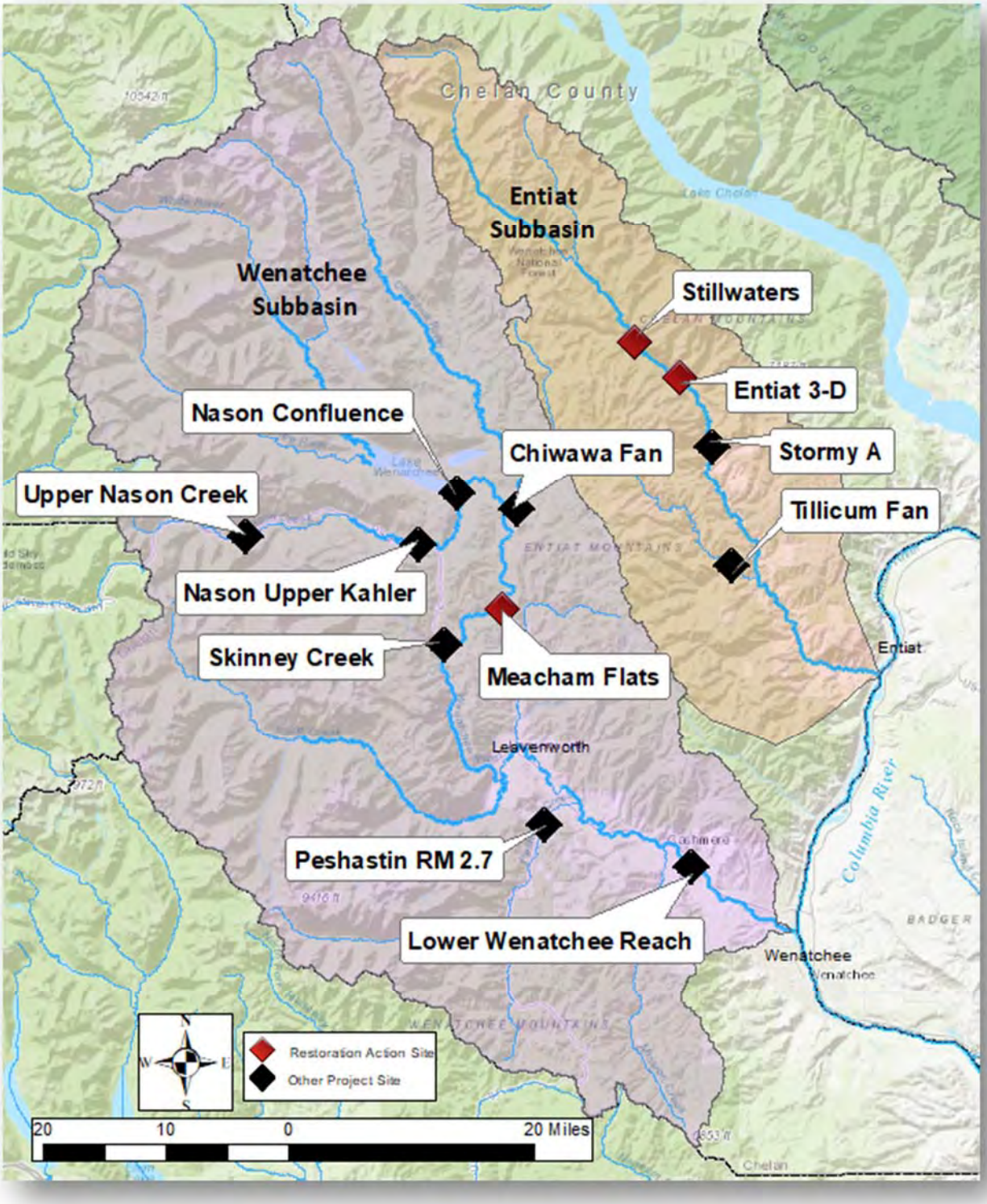
Project Details by Subbasin

(Maps and Tables)

Methow Subbasin Project Location Map



Entiat and Wenatchee Subbasins Project Location Map



Methow Subbasin Summary Table

Reach	Generic Project Name	Pisces WE Title	Contract	WE	WE Type	Status
Big Valley (Upper Middle Methow)	Big Valley Project	CCR-38229/Mod. 1 Big Valley South Habitat Complexity 2012-101	REL 119	AH	Restoration/Construction	Completed - 2017
		CCR-38229/Mod. 1 Big Valley South Construction Oversight 2012-101	REL 119	AG	Design/Engineering	Completed - 2017
		CCR-38229/Mod. 1 Big Valley South Structure Removal 2012-101	REL 119	AI	Restoration/Construction	Completed - 2017
Lower Chewuch	Chewuch 4.6 Project	Chewuch RM 4.6 Design 2017-176	REL 142	V	Design/Engineering	Extended to CY18
	Chewuch 8 to 9 Project	Chewuch RM 8 to 9 Design 2017-177	REL 142	W	Design/Engineering	Extended to CY18
	Chewuch RM 15.5 to 20 Project	Chewuch River Mile 15.5-17 Fish Enhancement ELS Construction 2012-97	REL 119	V	Restoration/Construction	Completed - 2017
		Chewuch River Mile 15.5-17 Fish Enhancement Construction Oversight 2012-97	REL 119	T	Design/Engineering	Completed - 2017
		Chewuch River Mile 15.5-17 Fish Enhancement Side Channel Construction 2012-97	REL 119	U	Restoration/Construction	Completed - 2017
		Chewuch River Mile 17-20 Fish Enhancement Project Design 2015-140	REL 119	W	Design/Engineering	Completed - 2017
Upper Chewuch	YN Reach Assessment	Upper Chewuch Habitat Assessment 2017-180	REL 142	Z	Assessment	Extended to CY18
Early Winters	Early Winters Creek 20 Below Project	Early Winters Creek - Twenty Below Engineering 2014-117	REL 119	Q	Design/Engineering	Postponed in 2017
		Early Winters Creek - Twenty Below Construction Management 2014-117	REL 119	R	Design/Engineering	Postponed in 2017
		Early Winters Creek - Twenty Below Construction 2014-117	REL 119	S	Restoration/Construction	Postponed in 2017
	Methow Basin EWD Instream Flow Project	CCR-38229/Mod. 1 Methow Basin EWD Instream Flow Project - Water Rights Assessment 2015-152	REL 119	X	Water Rights Transfer	Extended to CY18
Upper Twisp	Twisp River War Creek Bridge Project	CCR-38229/Mod. 1 Twisp River - War Creek Restoration Engineering 2015-148	REL 119	AD	Design/Engineering	Extended to CY18
	Upper Twisp River USFS Projects	Upper Twisp River and Tributaries Project Design (USFS Projects) 2016-162	REL 142	AH	Design/Engineering	Extended to CY18
	YN Reach Assessment	Upper Twisp River Habitat Assessment 2016-162	REL 119	F	Assessment	Completed - 2017

Reach	Generic Project Name	Pisces WE Title	Contract	WE	WE Type	Status
Middle Twisp (Upper and Lower Twisp)	Newby Narrows Project	CCR-38229/Mod. 1 Newby Narrows Fish Habitat Enhancement Project Construction-Phase 2 2015-153	REL 119	AF	Restoration/Construction	Completed - 2017
		CCR-38229/Mod. 1 Newby Narrows Fish Habitat Project Construction Oversight-Phase 2 2015-153	REL 119	AE	Design/Engineering	Completed - 2017
	Twisp Horseshoe Side Channel Project	CCR-38229/Mod. 1 Twisp Horseshoe Side Channel Construction (RM 11.5) 2010-39	REL 119	AB	Restoration/Construction	Partial Completion - 2017
		CCR-38229/Mod. 1 Twisp Horseshoe Side Channel Design (RM 11.5) 2010-39	REL 119	Z	Design/Engineering	Completed - 2017
		CCR-38229/Mod. 1 Twisp Horseshoe Side Channel Construction Management (RM 11.5) 2010-39	REL 119	AA	Design/Engineering	Partial Completion - 2017
		CCR-38229/Mod. 1 Twisp River - Horseshoe PHASE 2 Restoration Engineering 2010-39	REL 119	AC	Design/Engineering	Extended to CY18
Little Bridge Creek	Little Bridge Creek Projects	Little Bridge Creek Design (USFS Projects) 2017-182	REL 142	AJ	Design/Engineering	Extended to CY18
Lower Twisp	Twisp Poorman Creek Road Project	Poorman Creek Road Side Channel Project - Design 2012-100	REL 142	AF	Design/Engineering	Extended to CY18
Middle Methow	M2 TCR Projects	M2 Twisp To Carlton Projects Design 2017-191	REL 142	AS	Design/Engineering	Extended to CY18
Upper Methow	Upper Methow Fawn Creek Project	Fawn Creek Project - Design 2015-147	REL 142	AD	Design/Engineering	Extended to CY18
Wolf Creek	Wolf Creek Pond Project	Wolf Creek Ponds Design 2017-188	REL 142	AT	Design/Engineering	Extended to CY18
Beaver Creek	Beaver Creek Reach 5 Project	Beaver Creek Reach 5 - Design 2017-171	REL 142	AA	Design/Engineering	Extended to CY18
	Beaver Creek RM 2.6 (DOT) Project	Beaver Creek DOT Design 2017-194	REL 142	AC	Design/Engineering	Extended to CY18
	YN Reach Assessment	CCR-38229/Mod. 1 Beaver Creek Reach Assessment 2015-154	REL 119	Y	Assessment	Completed - 2017

Entiat Subbasin Summary Table

Reach	Generic Project Name	Pisces WE Title	Contract	WE	WE Type	Status
Upper Middle Entiat	Entiat 3-D Project	CCR-38229/Mod. 1 Entiat 3-D LWM Revisited Habitat Enhancement Project Construction 2009-29	REL 119	AO	Restoration/Construction	Completed - 2017
		CCR-38229/Mod. 1 Entiat 3-D LWM Revisited Design Engineering 2009-29	REL 119	AM	Design/Engineering	Completed - 2017
		CCR-38229/Mod. 1 Entiat 3-D LWM Revisited Construction Management 2009-29	REL 119	AN	Design/Engineering	Completed - 2017
	Entiat Stillwaters Project	Upper Burns Rip-Rap Enhancement Construction 2013-107	REL 119	O	Restoration/Construction	Completed - 2017
		Upper Burns Engineering and Construction Oversight 2013-107	REL 119	N	Design/Engineering	Completed - 2017
		Signal Peak Side-Channel Construction 2013-108	REL 119	L	Restoration/Construction	Completed - 2017
		Signal Peak Rip-Rap Enhancement Construction 2013-108	REL 119	M	Restoration/Construction	Completed - 2017
		Signal Peak Engineering and Construction Oversight 2013-108	REL 119	K	Design/Engineering	Completed - 2017
		Entiat Upper Stillwaters USFS Design 2017-167	REL 142	E	Design/Engineering	On-Going
	Entiat Stormy A	Stormy Area A - USFS Re-Design 2014-125	REL 142	F	Design/Engineering	On-Going
Mad River	Tillicum Fan Project	Tillicum Creek Fan Design 2016-161	REL 119	P	Design/Engineering	Extended to CY18
	YN Reach Assessment	Mad River Reach Assessment 2017-172	REL 142	J	Assessment	On-Going

Wenatchee Subbasin Summary Table

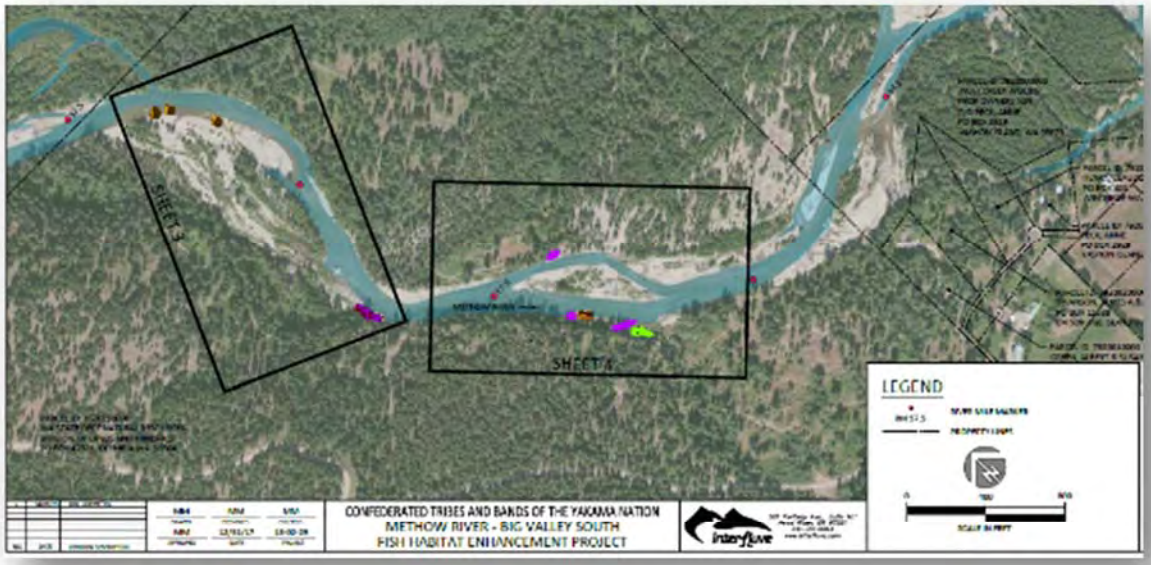
Reach	Generic Project Name	Pisces WE Title	Contract	WE	WE Type	Status
Upper Wenatchee	Meacham Flats Project	CCR-38229/Mod. 1 Meacham Flats Habitat Restoration Construction 2015-127	REL 119	AL	Restoration/Construction	Completed - 2017
		CCR-38229/Mod. 1 Meacham Flats Habitat Restoration Engineering - 2012-102	REL 119	AJ	Design/Engineering	Completed - 2017
		CCR-38229/Mod. 1 Meacham Flats Habitat Restoration Construction Oversight - 2012-102	REL 119	AK	Design/Engineering	Completed - 2017
	Skinney Creek Project	Skinney Creek Design 2015-144	REL 119	H	Design/Engineering	Extended to CY18
	Chiwawa Fan Project	Chiwawa Fan Design 2016-165	REL 119	J	Design/Engineering	Extended to CY18
	Nason Confluence Project	Nason Confluence Design 2013-105	REL 119	I	Design/Engineering	Extended to CY18
Nason Creek	YN Reach Assessment	Upper Nason Habitat Assessment 2017-192	REL 142	N	Assessment	On-Going
	Nason Kahler Project	Upper Kahler - Design 2017-166	REL 142	O	Design/Engineering	On-Going
Peshastin Creek	Peshastin RM 2.7 Project	Peshastin 2.7 Design 2016-160	REL 119	G	Design/Engineering	Extended to CY18

Methow Subbasin Details

Upper Middle Methow Assessment Unit

Big Valley Project (Completed Restoration Action)

Land Ownership: Washington Department of Natural Resources (WA DNR)



Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

Engineering, design, and permitting phases of this project were completed in 2015, and the project was scheduled to be implemented in 2015 and 2016 but was delayed due to contracting issues with WA DNR. The project was finally implemented in its entirety in 2017 with good results.

The project included installing large log structures during base flows to promote lateral channel migration, sort bedload, create scour pools, and create cover habitat in the Methow River. The project also involved removing a non-functional mechanical cable car system that was originally intended to transport public trail users across the Methow River. Riprap and concrete footings associated with the non-functional cable car system were removed from the river and floodplain using funding provided by WA DNR. Extensive floodplain restoration including wetland creation and native plant restoration in denuded areas were included in the project.

Restoration Metrics:

Three main channel large wood structures installed to promote lateral channel migration, natural wood recruitment, and increased floodplain inundation.

One partially buried bank log structure was installed for cover habitat and to promote retention of a scour pool.

Cable car “people-mover” system was removed from the site, including concrete footings and riprap that extended into the main river channel.

Existing natural large wood structures and wood pieces in and near the river channel were stabilized in place using vibratory installed timber piles throughout the project area.

Two new alcove/backwater channels were created and enhanced with large wood cover.

An old ditch within the floodplain was decommissioned by removing an abandoned concrete weir and filling a portion of the ditch.

Five acres of native plant restoration was placed to restore riparian vegetation conditions.

Lower Chewuch Assessment Unit

Chewuch RM 15.5 to 20 Project (Partially Completed Restoration Action)

Land Ownership: United States Forest Service (USFS)

Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

Engineering, design, and permitting phases of this project were completed in 2016, and the project was scheduled to be implemented from rivermile 15.5 to 17 in 2017 and from rivermile 17 to 20 in 2018.

In 2017 we completed implementation of the rivermile 15.5 to 17 section of the project zone which consisted of constructing seven main channel log structures and developing a side channel inlet to reconnect flows into a 2,800 foot long side channel. At the conclusion of conducting side channel construction activities in 2017, perennial flow was restored into the side channel system. Large wood structures were installed in the project reach to improve channel margin cover habitat, capture other large woody debris transporting in the river during spring floods, and to create diverse hydraulic conditions that promote pool scour and gravel sorting. Many of the structures were completed with whole green trees extracted from the surrounding forest.

In 2018 we will construct many more large wood structures along the main Chewuch River channel to improve fish habitat conditions and promote habitat forming natural processes.

Restoration Metrics:

Four partially buried bank log structure were installed for cover habitat and to promote retention of scour pools in the bed of the Chewuch River.

Three main channel large wood structures installed to promote lateral channel migration, natural wood recruitment, and increased floodplain inundation.

One 2,800 long side channel system was reconnected as a perennial flow through side channel with only 650 linear feet of excavation needed to connect the entire side channel with perennial flow.

Chewuch Rivermile 4.6 Project (Engineering Only)

Land Ownership: Washington Department of Fish and Wildlife (WDFW)

Summary:

In 2017 we started collecting data and drafting restoration concepts for a section of WDFW owned floodplain at rivermile 4.6 in the Chewuch River. Project opportunities identified for this site in the 2010 Lower Chewuch Reach Assessment include floodplain connectivity, side channel enhancements, stream bank restoration, and large wood enhancements. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018.

Chewuch Rivermile 8 to 9 Project (Engineering Only)

Land Ownership: WDFW / Private

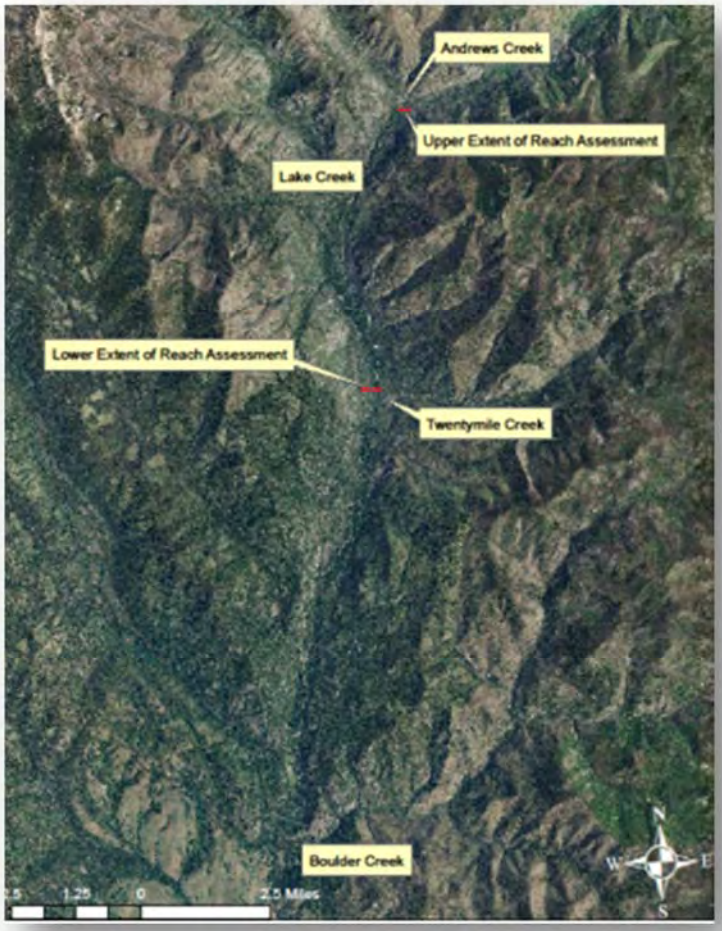
Summary:

In 2017 we started collecting data and drafting restoration concepts for a section of WDFW and privately owned floodplain between rivermile 8 and 9 in the Chewuch River. Project opportunities identified for this site in the 2010 Lower Chewuch Reach Assessment include floodplain connectivity, side channel enhancements, stream bank restoration, and large wood enhancements. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018.

Upper Chewuch Assessment Unit

Upper Chewuch River Habitat Assessment (Including Boulder Creek)

Land Ownership: USFS



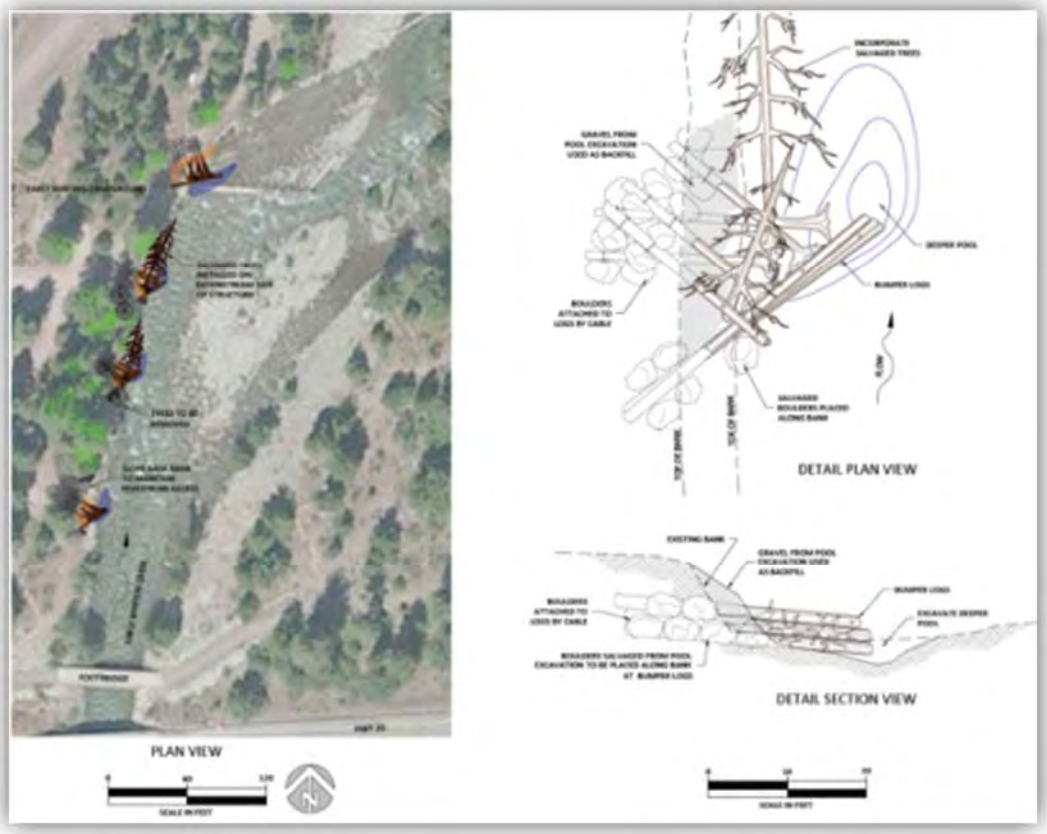
Summary:

In 2017 we partnered with the USFS to conduct a comprehensive evaluation of stream habitat conditions in the anadromous bearing portions of the Upper Chewuch River Assessment Unit and several tributaries, including Boulder Creek. This project didn't get underway until October 2017, so most work will be conducted in 2018. During the reporting period this effort focused on collecting new habitat data using the USFS Level II Habitat Data protocol, while also compiling existing data collected by the USFS over the last three decades. This information will be used in partnership with USFS to develop additional salmon habitat treatments in the Chewuch watershed. The Upper Twisp River Habitat Assessment will continue in 2018 with reporting products due towards the end of that calendar year.

Early Winters Creek Assessment Unit

Early Winters Creek 20 Below Project (Project Postponed)

Land Ownership: USFS



Summary:

Engineering of this project took place in 2015 for implementation in 2016, however problems with the USFS Aquatic Restoration Biological Opinion (ARBO) II process delayed implementation until 2017. During the spring of 2017 high flows caused rapid bank erosion in the project area, significantly changing the sites hydraulic conditions and making the previous engineered plans unsuitable for implementation. The project initially involved creating four large wood structures and associated scour pools along the left bank of Early Winters Creek near the USFS Early Winters Creek Campground. The updated Highway 20 bridge and a pedestrian bridge upstream of the camping area has focused scouring flows towards the left bank of the creek and caused accelerated erosion which this project seeks to treat.

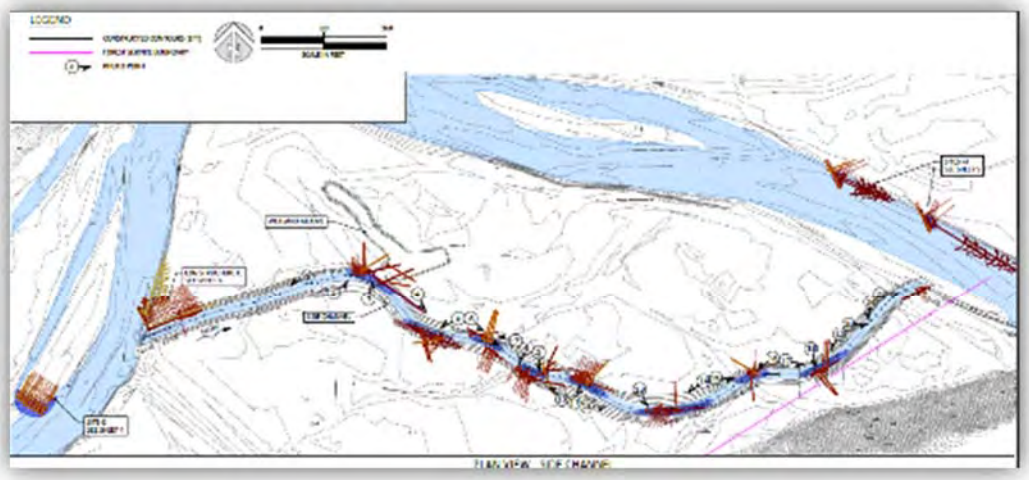
The USFS and the YN UCHRP have agreed to postpone any project actions at this site until future survey work can be conducted.

Lower Twisp Assessment Unit

Middle Twisp Reach – (Lower and Upper Twisp Assessment Units)

Newby Narrows Project (Completed Restoration Action)

Land Ownership: Yakama Nation and Private



Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

In 2015 the Yakama Nation used outside funding to acquire the Newby Narrows properties (approximately 45 acres of riverfront and floodplain) upstream of the Little Bridge Creek confluence on the Twisp River. The 2015 Middle Twisp River Reach Assessment identified the Newby Narrows project site as a priority location to restore side channel habitats and increase main channel complexity.

In 2016 and 2017 we implemented a detailed restoration plan for the site which included construction of a 1,200 foot long side channel and associated apex large wood structures, as well as installing four bank buried large wood structures on the main stem of the Twisp River.

Restoration Metrics:

Six main channel margin large wood structures installed consisting of 105 imported logs with roots and 10 whole trees salvaged from the nearby floodplain.

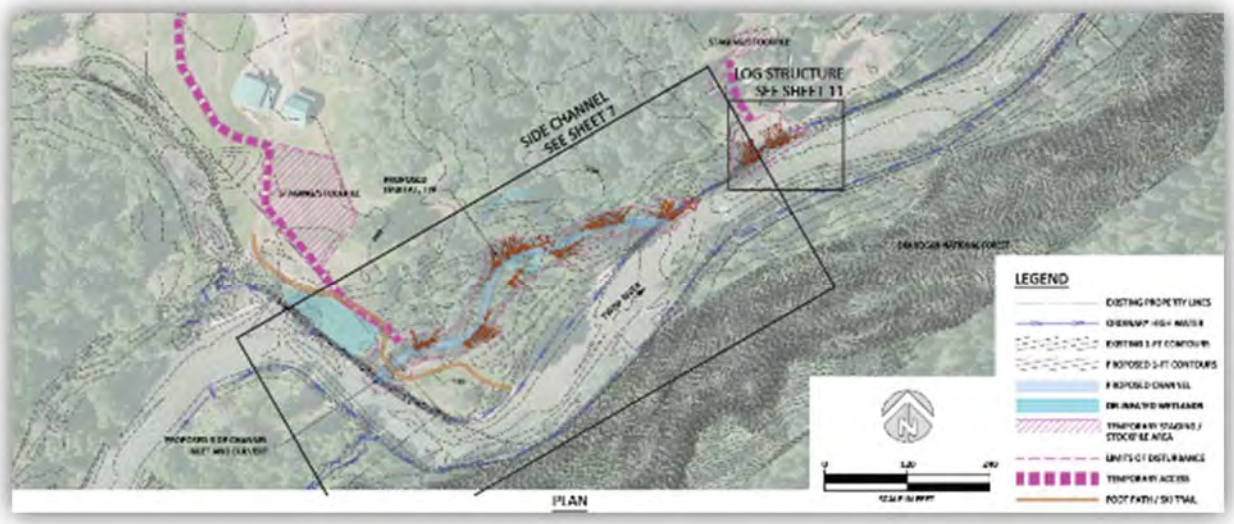
Twelve hundred feet of perennial side channel was created.

Nine large wood structures with associated scour pools were installed within the side channel.

One hundred linear feet of wetland/alcove habitat was created

Horseshoe Side Channel Phase 1 (Partially Completed Restoration Action)

Land Ownership: Private



Detailed Map of Project Site:

The As-Built Plans for this project site will be provided in 2018 when implementation is completed.

Summary:

In 2017 we completed construction of a large alcove side channel and the installation of multiple bank buried large wood structures in the main channel of the Twisp River near rivermile 11. We plan to return to this site in 2018 to install a culvert within an existing armored bank at the upper end of the alcove to create a perennial surface flow channel. Groundwater discharge into the alcove channel persisted at this site ever since project completion, and the channel stayed ice free during the winter of 2017. This project occurs in close proximity to the Horseshoe Side Channel Phase 2 project area, but is on a separate implementation timeline due to not being influenced by USFS National Environmental Policy Act (NEPA) review timelines.

Restoration Metrics:

Five hundred feet of perennial groundwater fed alcove channel was created.

Two main channel margin large wood structures were installed to create bank margin complexity and promote scour pools in the bed of the Twisp River.

Horseshoe Side Channel Phase 2 (Engineering Only)

Land Ownership: USFS, Private, and Methow Conservancy

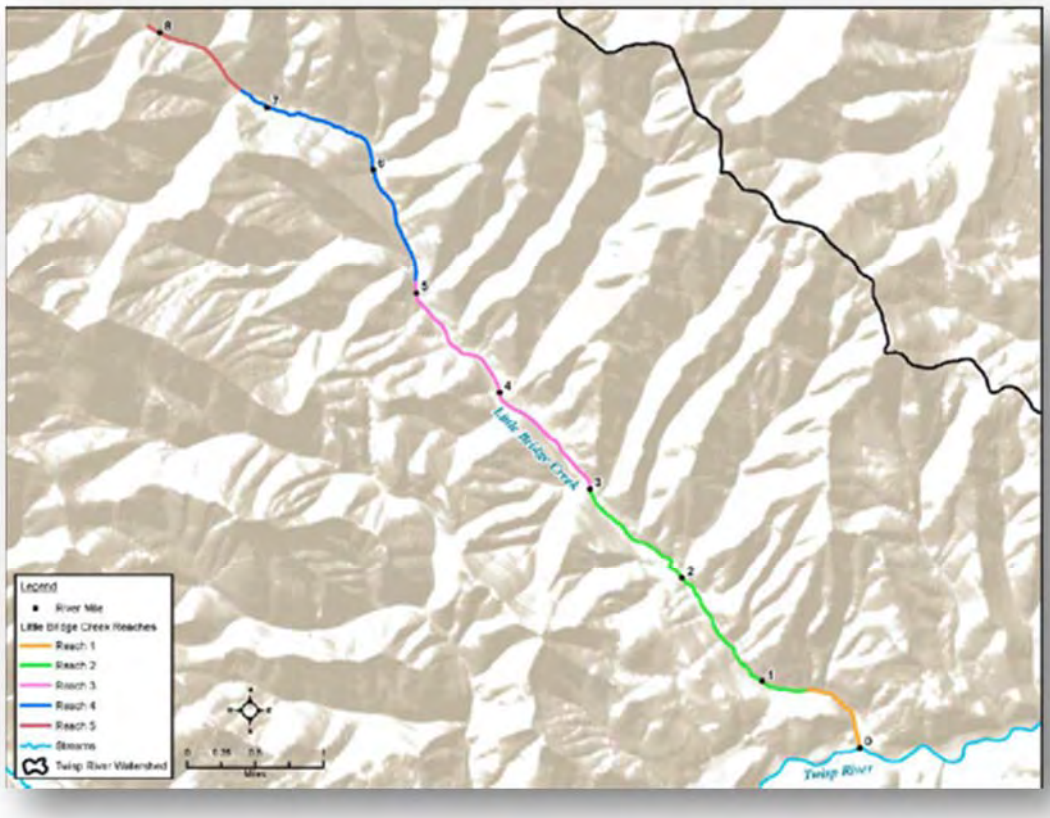
Summary:

Due to USFS NEPA review timelines, this project will not be implemented until 2020. However, the project was partially designed in 2017 to support a USFS NEPA analysis. In 2017 additional field data was collected on groundwater water elevations on USFS lands, subsurface geology information, and additional hydraulic modeling to support development of extensive large wood treatments in the project area. The project seeks to reconnect a 3,000 foot long groundwater fed side channel complex that crosses USFS lands and adjacent private properties on the left floodplain of the Twisp River near river mile 11.8. The project will divert surface waters from the Twisp River on USFS lands into the upper end of the cut-off side channel complex to restore fish passage into the groundwater fed pools. Levee construction and wood removal in the 1970s caused rampant downcutting of the river channel in this section of the Twisp River, and this project seeks to restore the floodplain connectivity and enhance off-channel and wetland habitats through reactivation of the floodplain. Select excavation at the upstream end of the project area, coupled with intensive main channel wood treatments will help reconnect flood flows with the Horseshoe Side Channel floodplain and will dramatically increase the amount and quality of juvenile salmonid rearing habitat in the project reach.

Little Bridge Creek – (Lower Twisp Assessment Unit)

Little Bridge Creek Project (Engineering Only)

Land Ownership: USFS



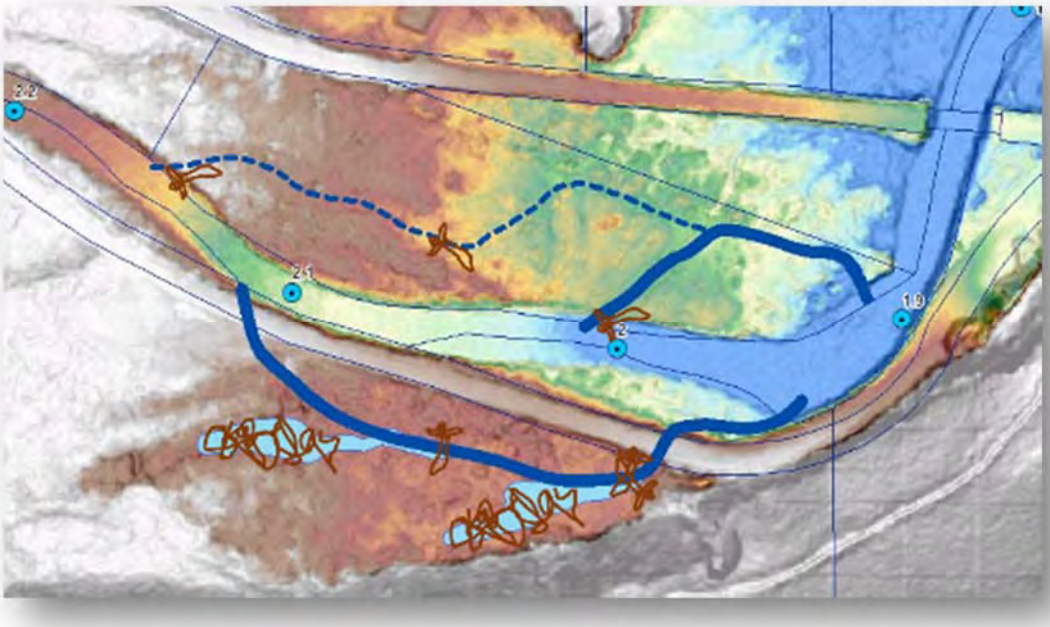
Summary:

In 2017 we started collecting data and drafting restoration concepts for the lower portion of Little Bridge Creek based on recommendations contained in the 2017 Upper Twisp River Habitat Assessment. Project opportunities identified for this area include floodplain connectivity, side channel enhancements, stream bank restoration, and large wood enhancements. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018.

Lower Twisp Reach – (Lower Twisp Assessment Unit)

Twisp Poorman Creek Road Project (Engineering Only)

Land Ownership: Private, Methow Salmon Recovery Foundation (MSRF)



Summary:

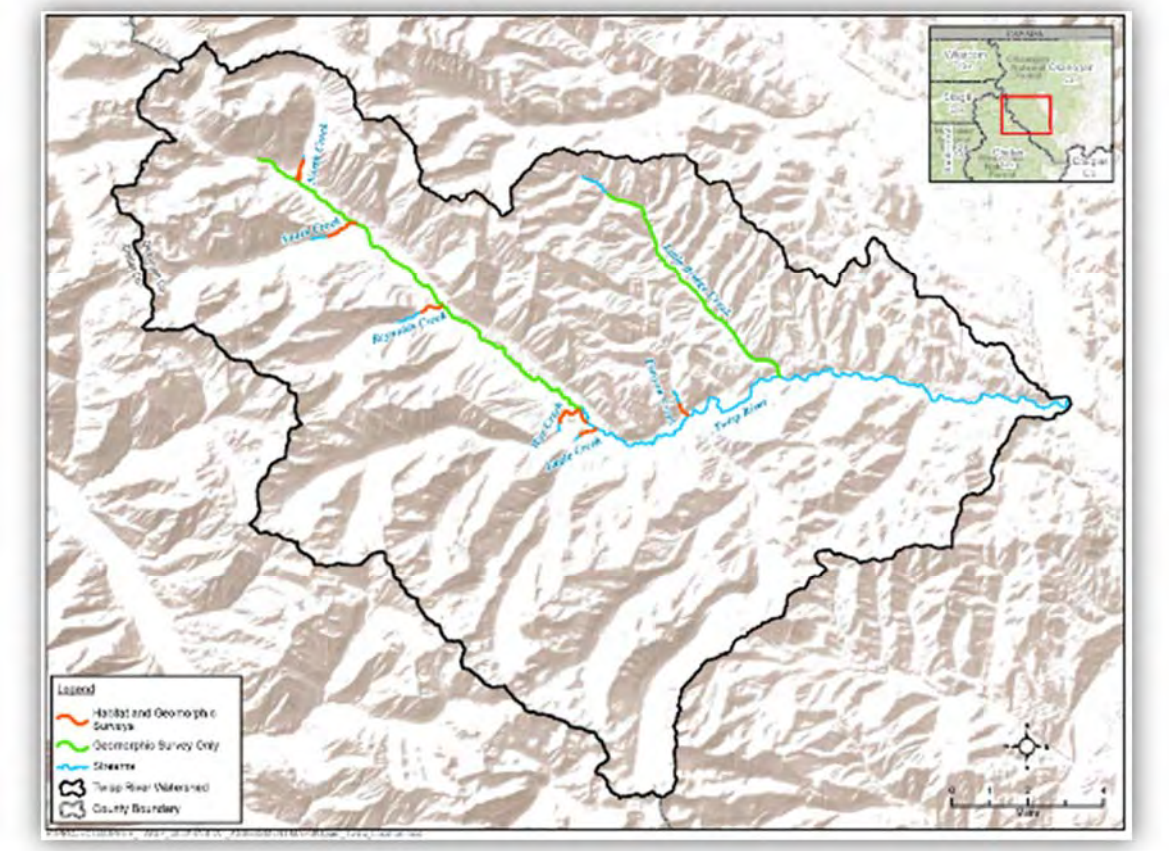
This project was first analyzed for restoration actions starting in 2010 at the completion of the 2010 Lower Twisp Reach Assessment. The properties targeted for restoration were acquired by MSRF using Yakama Nation Accord Funding in 2011 and in 2013 we implemented some large wood restoration actions in the main channel of the Twisp River on the left bank of the project area. In 2014 we discontinued evaluating project actions at the site because the Methow Valley Irrigation District (MVID) instream flow improvement project was set to take place and we needed to allow time for that project to run its course and then collect data on how that project would affect groundwater discharges on the right bank floodplain.

In October 2017 we started analyzing groundwater conditions at the site and began revamping our side channel restoration alternatives based on updated field data and hydraulic modeling. Most of the design work associated with this project will be conducted in 2018 because project field work didn't start occurring until the fall of 2017.

Upper Twisp Assessment Unit

Upper Twisp River Habitat Assessment (Completed)

Land Ownership: USFS



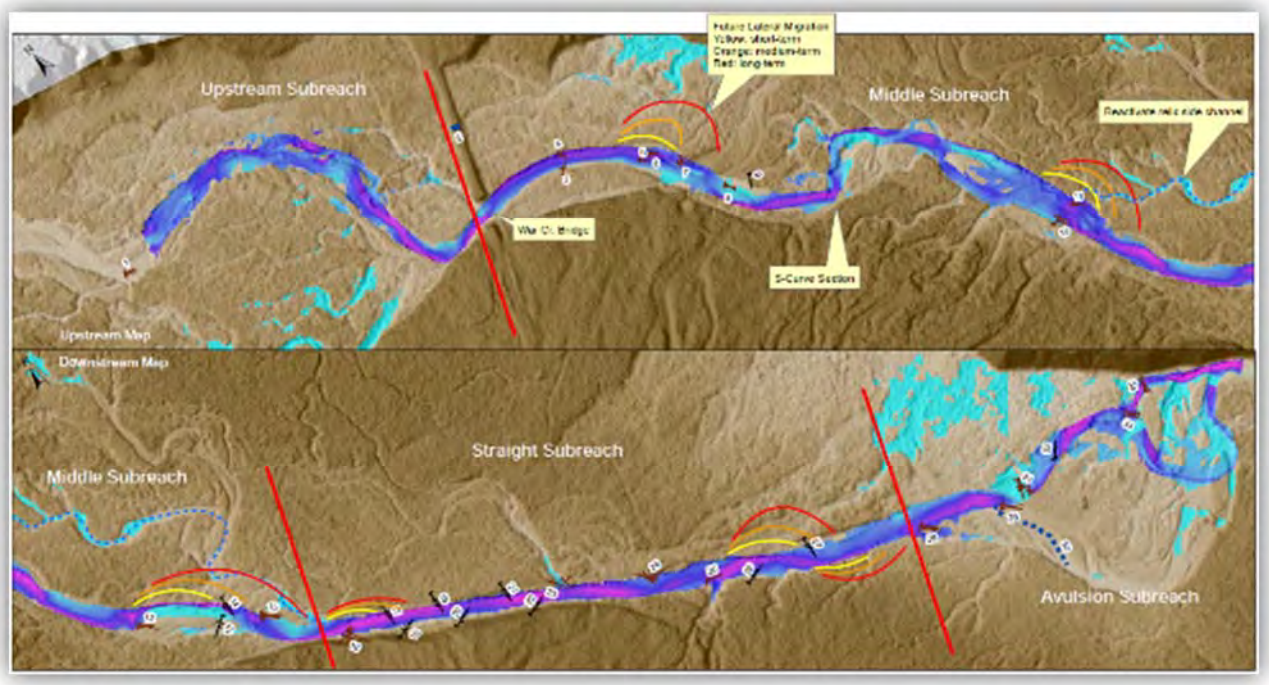
Summary:

In 2016 and 2017 we partnered with the USFS to conduct a comprehensive evaluation of stream habitat conditions in the anadromous bearing portions of the Upper Twisp River Assessment Unit and several Twisp River tributaries, including Little Bridge Creek. In 2017 we utilized the field data collected in 2016 using the USFS Level II Habitat Data protocol to produce a report detailing existing habitat conditions, changes in conditions over time, and a restoration plan for the project area including specific project recommendations that can be implemented to improve salmon habitat conditions in the near term.

This report will be used to coordinate USFS NEPA evaluations of project actions in 2019 and 2020, allowing us to implement restoration actions on USFS lands in 2020 and 2021.

Twisp River War Creek Project (Engineering Only)

Land Ownership: USFS



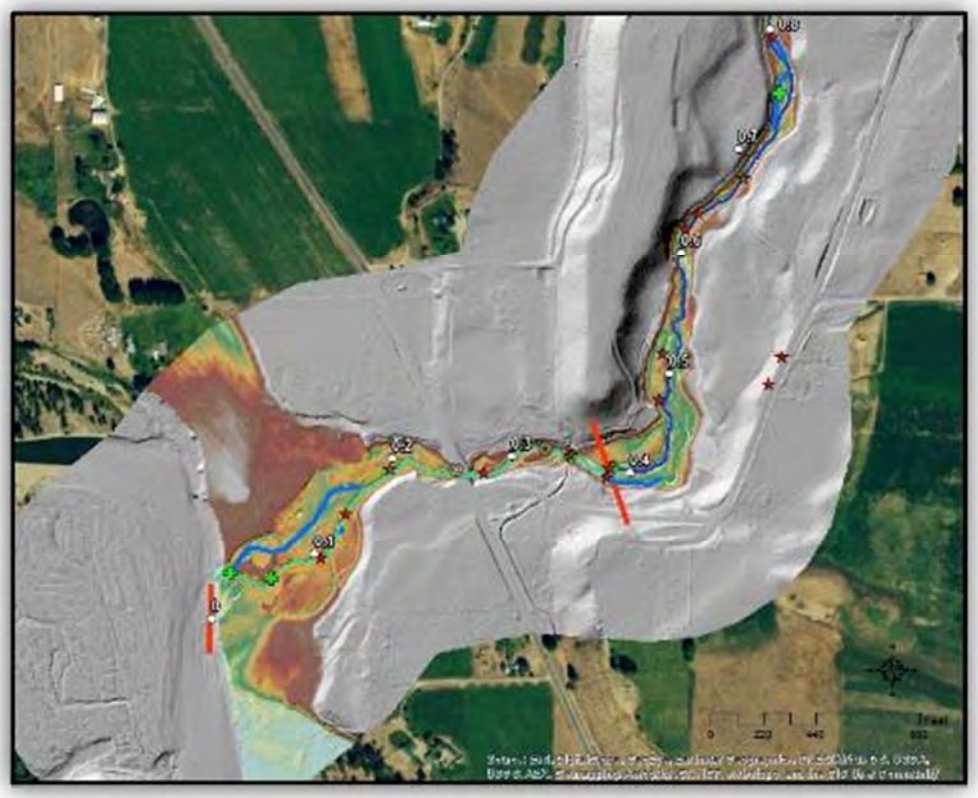
Summary:

The Twisp River War Creek Project area was identified as a high priority site for addressing ecological concerns in the 2015 Middle Twisp Reach Assessment. The road infrastructure associated with the USFS War Creek Bridge and historic wood removal from the Twisp River have decreased side channel and wetland habitat conditions, instream structural complexity, and bed and channel form. In 2016, in coordination with the USFS, we completed topographic survey, hydraulic modeling, and other data collection activities to produce a concept design report and concept cartoons for USFS evaluation. In 2017 we worked with USFS staff to select proposed project elements for full design for implementation in 2020.

Beaver Creek Assessment Unit

Lower Beaver Creek Reach Assessment (Completed)

Land Ownership: Private, MSRF, WDFW, USFS

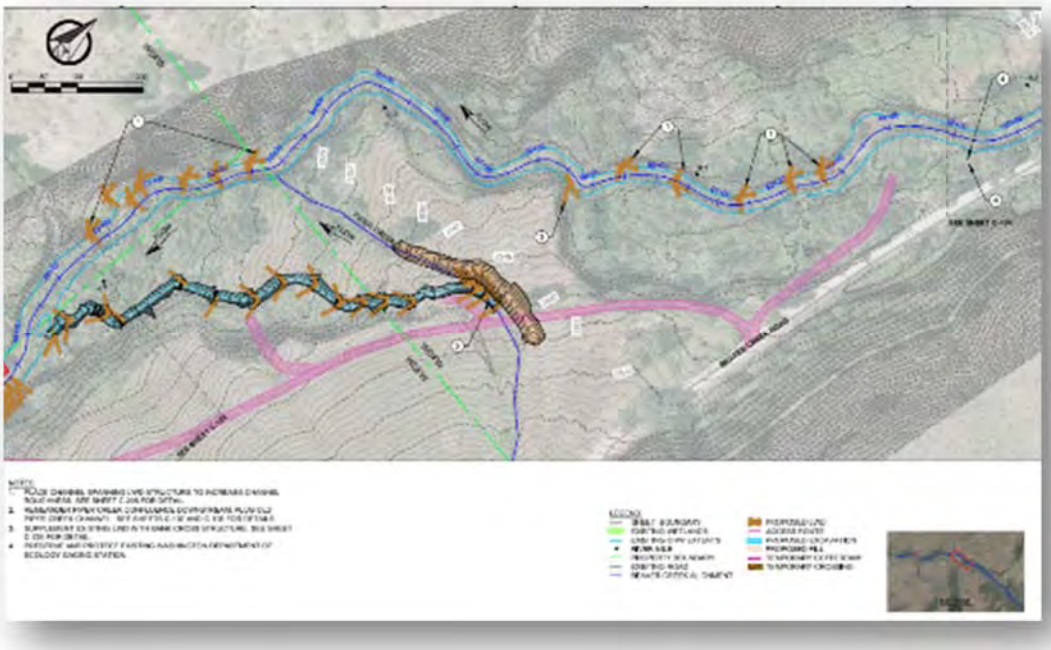


Summary:

In the spring 2016 we initiated work on a reach assessment of the lower 11 miles of Beaver Creek in the Methow Subbasin. This assessment conducted habitat surveys, geomorphic surveys, LiDAR data collection, hydraulic modeling and project identification and prioritization to support expanding salmon recovery efforts throughout the basin. In 2017 we completed this Reach Assessment and completed Regional Technical Team (RTT) review. We are now developing restoration actions in the Reach Assessment area based on this assessment.

Beaver Creek Reach 5 Project (Engineering Only)

Land Ownership: WDFW / USFWS

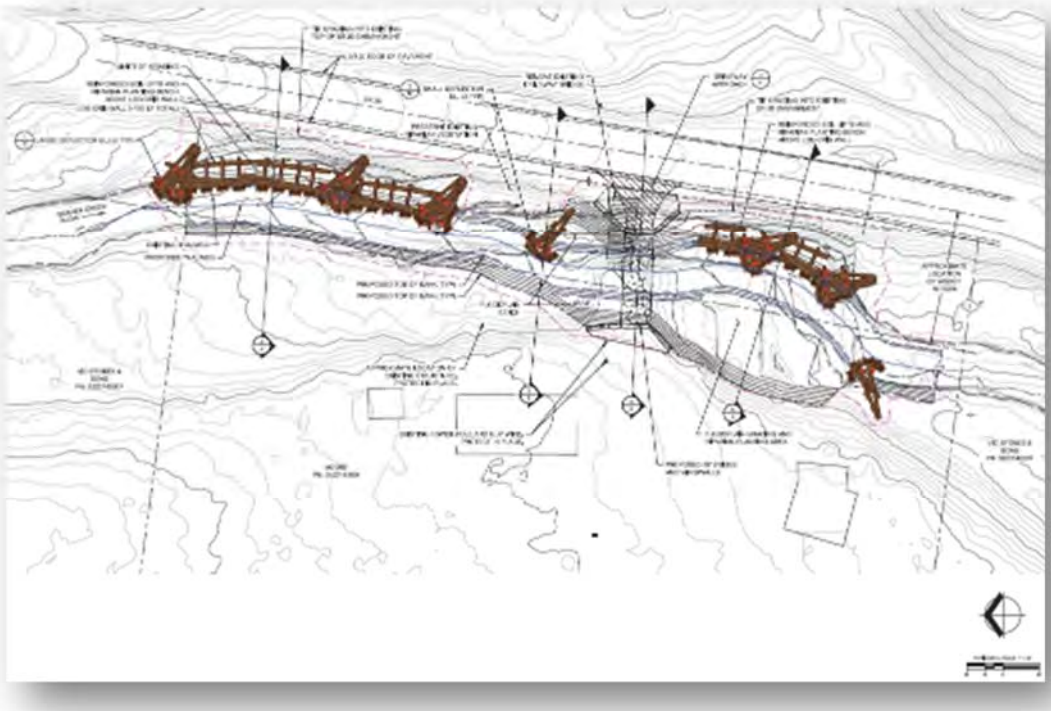


Summary:

In 2017, based on the recommendations from the 2017 Beaver Creek Reach Assessment, we drafted detailed restoration concepts for an extensive portion of Beaver Creek on WDFW lands from rivermile 7 to 9.5. Project opportunities in this area include restoring floodplain connectivity, side channel enhancements, stream bank restoration, and large wood enhancements. In the fall of 2017 we met with WDFW to review the project concepts and agreed to begin further designs for the project site based on the concepts we presented. In late 2017 we began developing more in-depth designs for the project site with an agreement to try to implement a restoration plan for 2 miles of the project area in 2019 under the framework of the WDFW/YN MOU.

Beaver Creek DOT Project (Engineering Only)

Land Ownership: Private / Washington State Department of Transportation (WSDOT)



Summary:

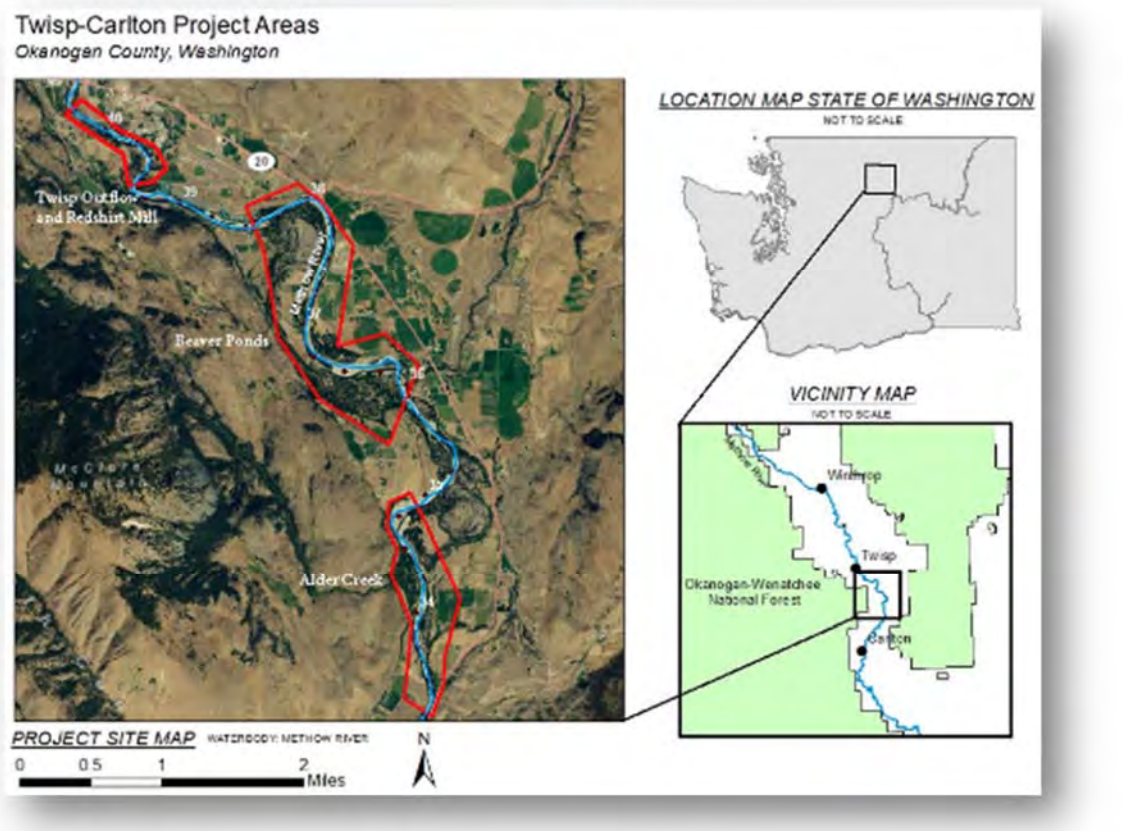
During completion of the 2017 Beaver Creek Reach Assessment we were contacted by WSDOT with a proposal to cooperate on a fish habitat restoration action at one of their Chronic Environmental Deficiency sites at rivermile 2.7. The Beaver Creek Reach Assessment identified restoration opportunities for this site including floodplain connectivity, side channel enhancements, stream bank restoration, and large wood enhancements. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018.

Middle Methow Assessment Unit

Twisp to Carlton Reach – (Middle Methow Assessment Unit)

Twisp to Carlton Reach Project (Engineering Only)

Land Ownership: Private, WDFW, DNR



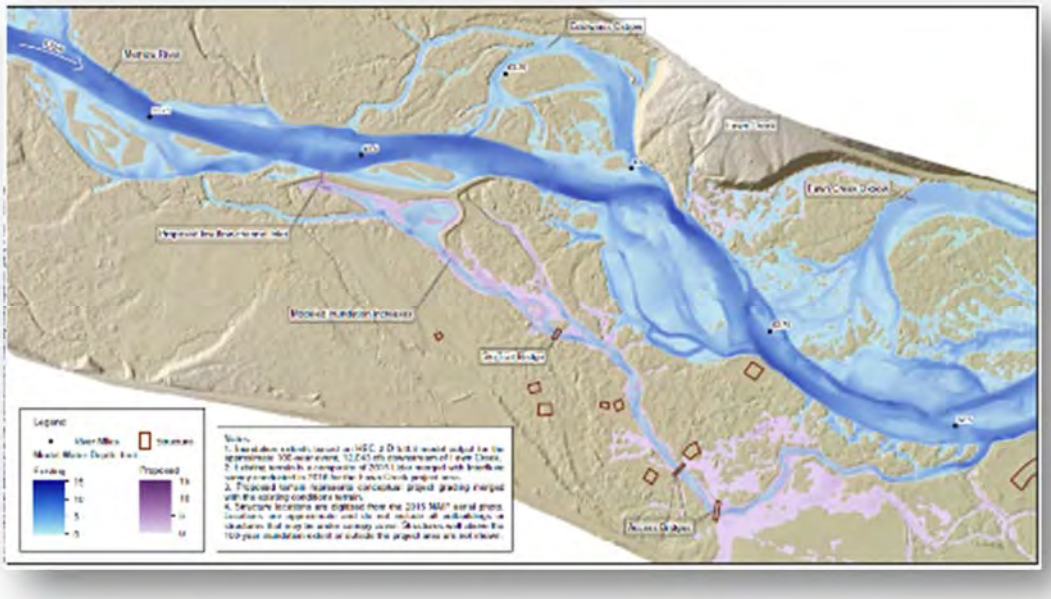
Summary:

In 2017 the Cascade Columbia Fisheries Enhancement Group completed the Twisp to Carlton M2 Reach Assessment. Through coordination with the Methow Restoration Council, the YN UCHRP agreed to begin developing restoration concepts for 3 priority project areas identified in the Twisp to Carlton Reach Assessment, ranging from the Alder Creek confluence upstream to the Town of Twisp. We have been coordinating with WDFW, private landowners, the Town of Twisp, and DNR to develop salmon habitat restoration actions throughout this project zone. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018.

Upper Methow Assessment Unit

Upper Methow Fawn Creek Project (Engineering Only)

Land Ownership: Private, WDFW, DNR, Okanogan County



Summary:

We continued topographic survey and modeling, stakeholder outreach, project concept development, and design report drafting for this project area in 2017. In the Weeman Bridge area of the project zone we had one key landowner decide to withdraw support for any restoration actions for the time being so we are no longer pursuing restoration designs at that site. The Fawn Creek site involves at least nine private landowners, as well as Okanogan County, WA DNR, and WDFW. Landowner outreach continues to indicate strong support for large scale restoration actions in this critical spring Chinook and steelhead spawning area.

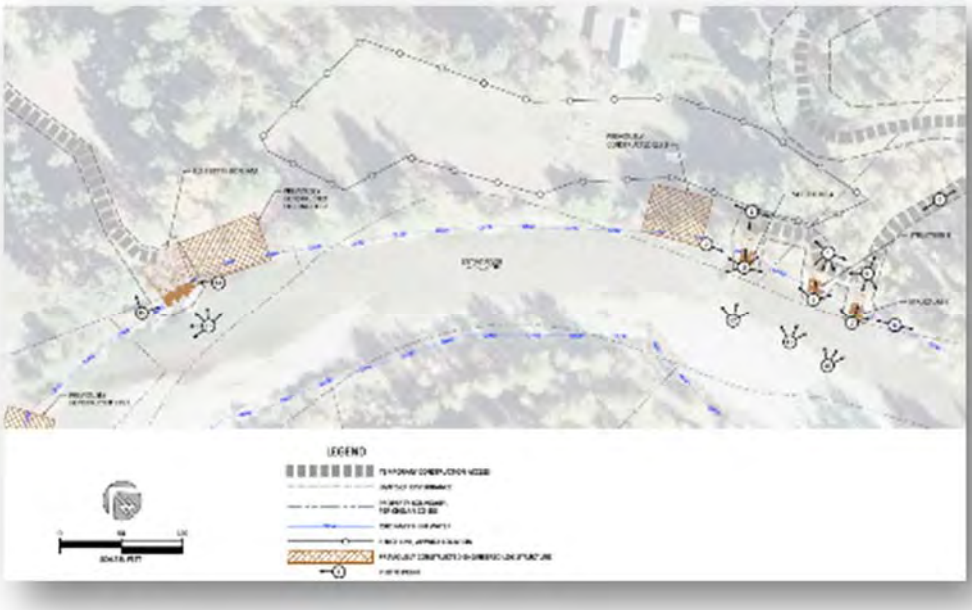
In 2017 we engaged in targeted property acquisitions to allow the most biologically beneficial restoration work to proceed at this site. Acquisition work will proceed into 2018. Potential work in the Fawn Creek area includes extensive side channel reconnection, levee augmentation and/or removal, and mainstem large wood treatments. We plan to continue the design effort in 2018 while coordinating with the multiple landowner and government agency interests that exist at this site.

Entiat Subbasin Details

Upper Middle Entiat Assessment Unit

Entiat 3-D Revisited Project (Completed Restoration Action)

Land Ownership: Private



Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

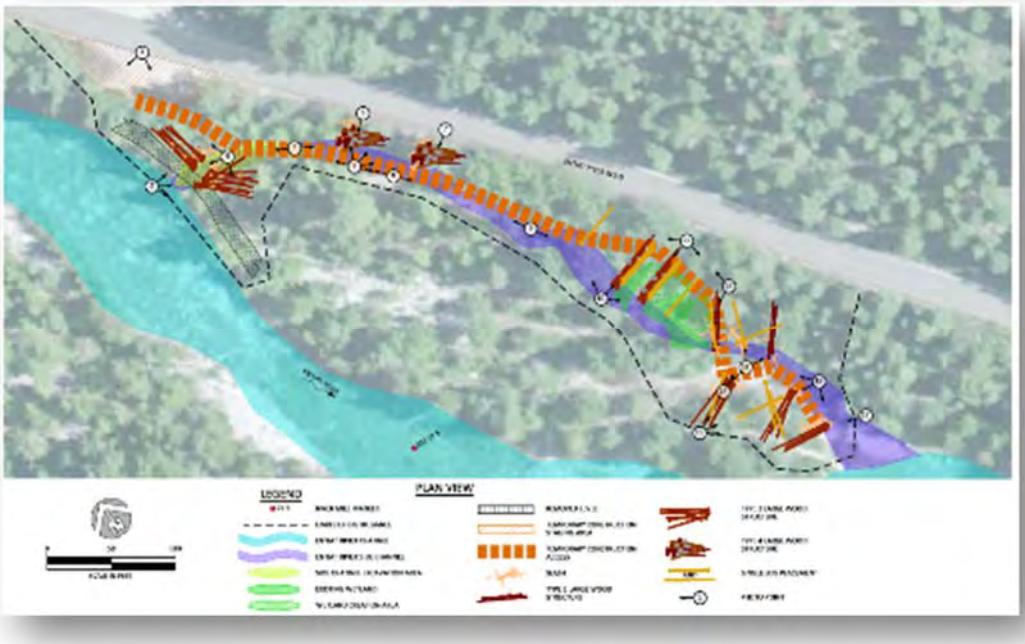
This project is a continuation of large wood restoration work that was completed in 2012. Based on renewed landowner support for fish habitat because of the effectiveness of the 2012 work, and a determination by DNR that this area is not state aquatic lands, we were able to extend the amount of bank buried large wood treatments along the left bank of the Entiat River in 2017. The 3-D LWM Revisited project entailed adding logs to the upstream side of existing log structure #2 by approximately 20 feet. Additionally three smaller structures were installed just below existing structure #3 from 2012. Lastly, fabric encapsulated soil lifts (FESL) were created along the face of the structures to further add complexity and stability to the structures as well as provide a suitable base for planting benches.

Restoration Metrics:

Four partially buried bank log structure were installed for cover habitat and to promote retention of scour pools in the bed of the Entiat River.

Entiat Stillwaters Project (Completed Restoration Action)

Land Ownership: USFS



Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

The Entiat Stillwaters Project included construction at both the Signal Peak and Upper Burns restoration sites on USFS lands in 2017. The project consisted of levee removal, side-channel restoration, large wood enhancements of a riprap bank, and creation of bank buried log structures on the river margins. Design work for this project occurred during 2014 and 2015 for implementation scheduled in 2016, however the project was delayed due to a delay in the USFS NEPA process. The project was finally implemented in its entirety in 2017.

This project included using a transportable crane to place pre-fabricated boulder ballasted wood pieces along the riprap banks to increase stream margin cover habitat. Prefabrication of the wood units with all-thread rods and use of the crane was necessary because of current restrictions in using steel cable in the ARBO II.

Restoration Metrics:

One boulder riprap levee was removed to restore floodplain connectivity at high flows

Five hundred feet of side channel habitat was enhanced with wetland plantings and large wood additions.

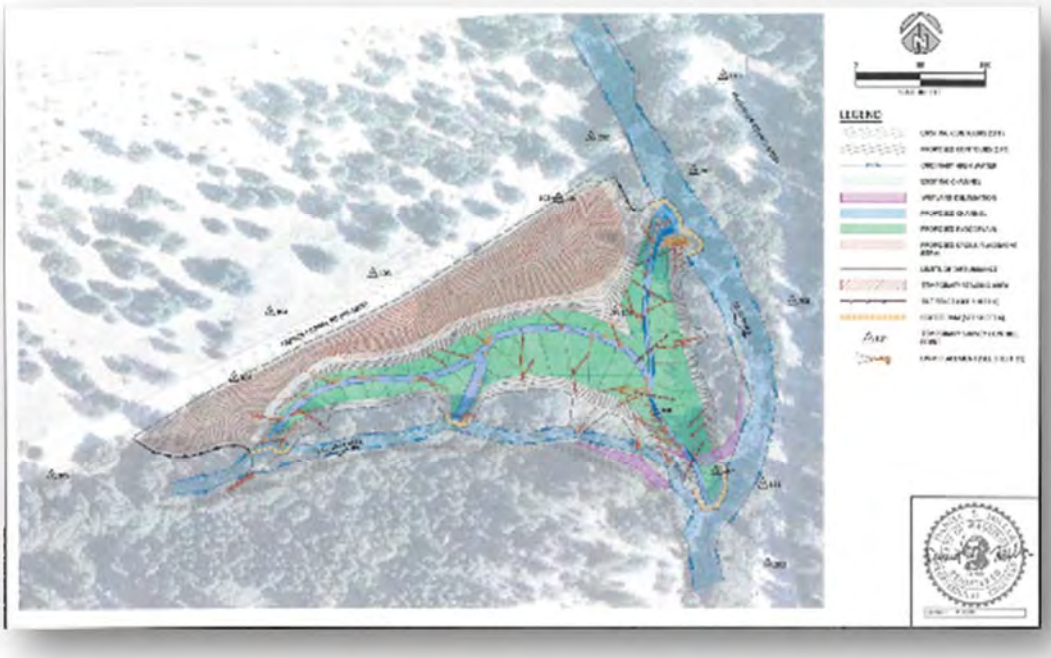
Three partially buried bank log structure were installed for cover habitat and to promote retention of scour pools in the bed of the Entiat River.

Four hundred feet of riprap bank was treated with large wood placements on top of the large angular riprap boulders to increase channel margin complexity and cover habitat.

Mad River Assessment Unit

Tillicum Fan Project (Engineering Only)

Land Ownership: USFS



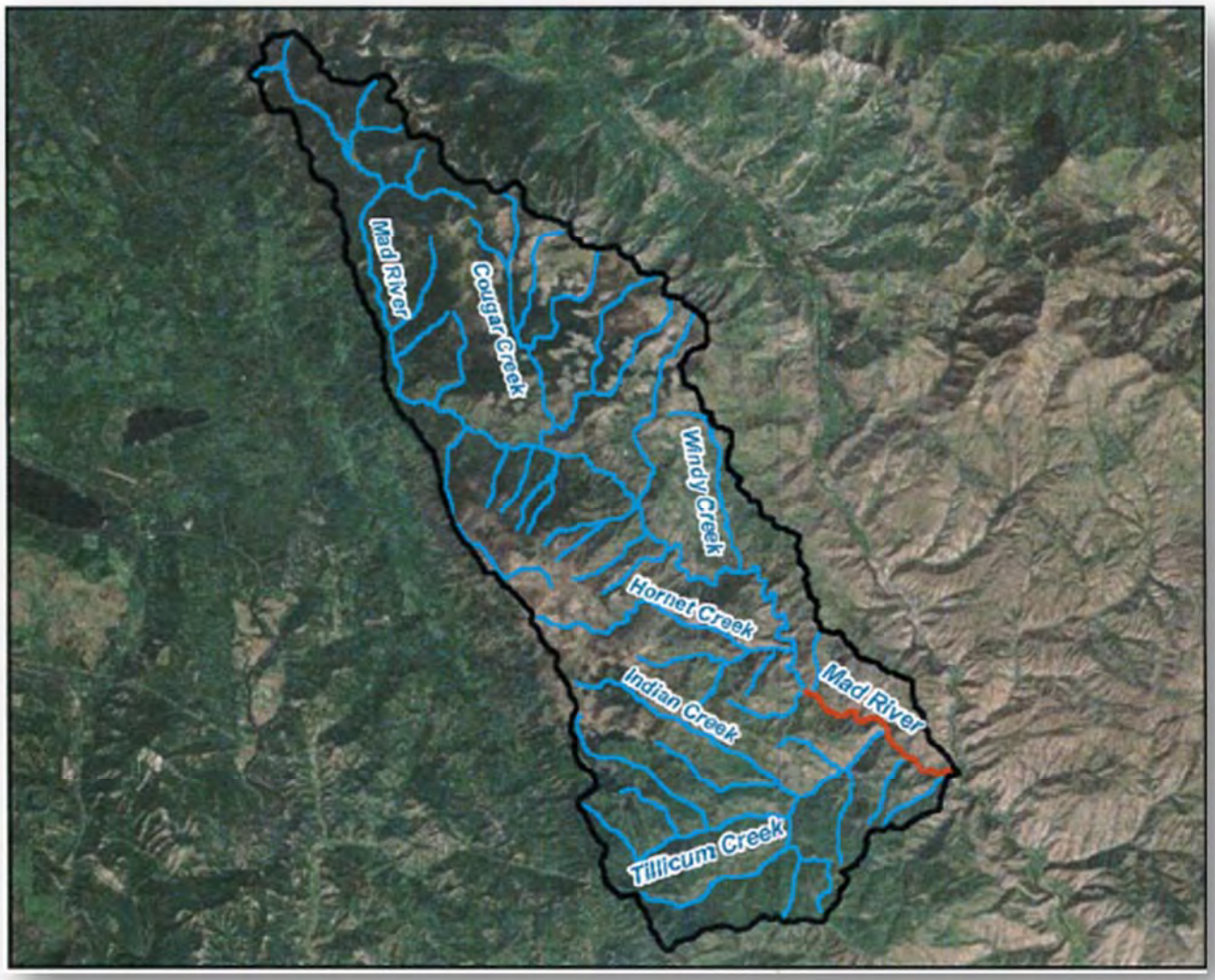
Summary:

The YN has been partnering with the USFS to reconnect both Tillicum Creek and the Mad River with the Tillicum Creek alluvial fan floodplain to improve fish habitat. The site is the location of an old homestead and currently used as a seasonal sheep grazing site. Tillicum Creek is highly incised and does not regularly come in contact with the floodplain. As recent as late summer/fall 2016, it has been used as a sheep grazing pasture and has some old plantings of alfalfa.

In 2017 we produced final permitting plans for the Tillicum Creek site for implementation in 2018. Through this project we will create roughly 1,000 feet of new side channel habitat, recreate new perennial side channels to the Mad River, restore native riparian and floodplain vegetation on Tillicum fan, and incorporate new large wood structures into the Mad River and Tillicum Creek to create more complex bank margin habitat.

Mad River Habitat Assessment

Land Ownership: USFS and Private



Summary:

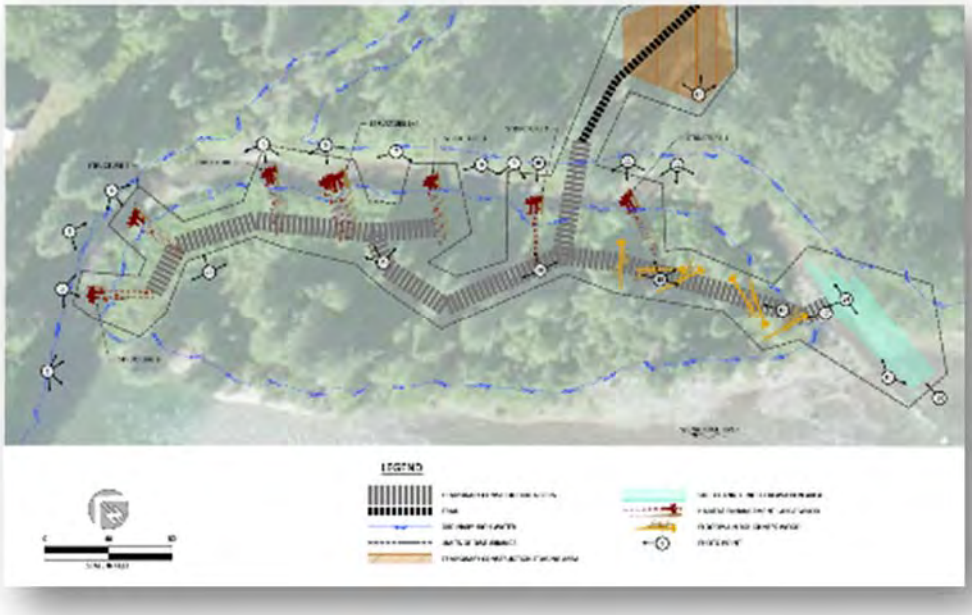
We are partnering with the USFS to conduct a comprehensive evaluation of stream habitat conditions in the lower section of the Mad River where most anadromous fish use takes place. This project didn't get underway until October 2017, so most work will be conducted in 2018. During the reporting period this effort focused on collecting new habitat data using the USFS Level II Habitat Data protocol, while also compiling existing data collected by the USFS over the last three decades. This information will be used in partnership with USFS to develop additional salmon habitat treatments in the Mad River watershed. The Mad River Habitat Assessment will continue in 2018 with reporting products due towards the end of that calendar year.

Wenatchee Subbasin Details

Upper Wenatchee Assessment Unit

Meacham Flats Project (Completed Restoration Action)

Land Ownership: Private / DNR



Detailed Map of Project Site:

For details about the location of project elements on the site please refer to Attachment 1 – Constructed Projects As-Builts.

Summary:

This project consisted of improving the hydrology of an existing side channel on the left bank of the Wenatchee River through targeted excavation, and enhancing the side channel habitat with large wood structures. The project was designed in 2015 for implementation in 2016, however delays in permitting with WA DNR postponed this project until 2017. It was completed in 2017 in its entirety.

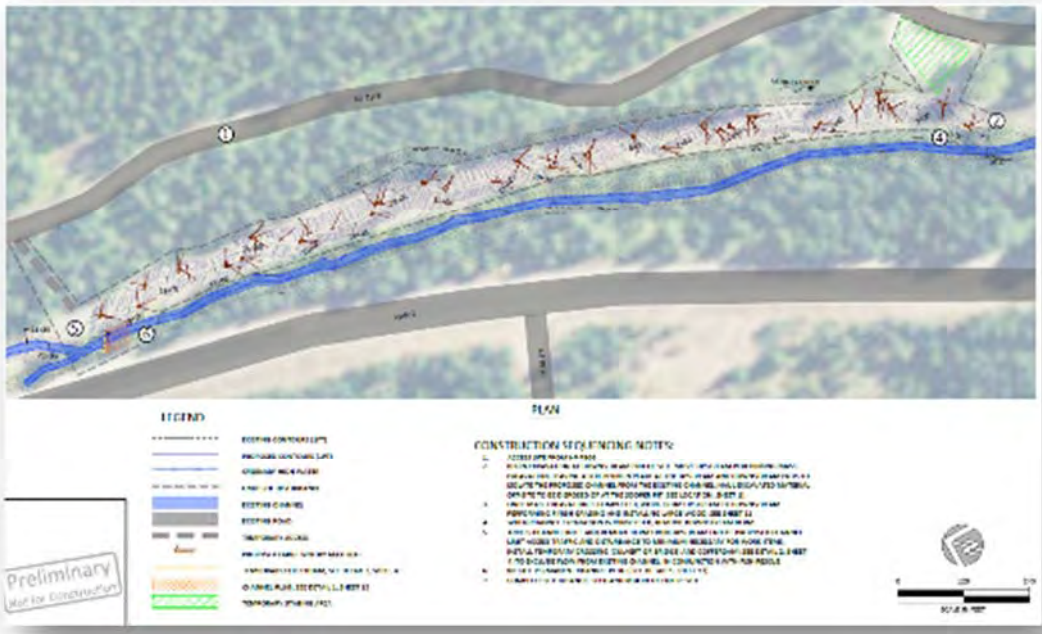
Restoration Metrics:

Seven bank buried large wood structures were placed within the Meacham Flats side channel to increase channel margin cover habitat and promote scour pools in the bed of the side channel.

Roughly 80 feet of fill was removed from the head of the side channel to increase inundation frequency of the Wenatchee River into the side channel and increase the amount of flow during spring runoff.

Skinney Creek Project (Engineering Only)

Land Ownership: USFS

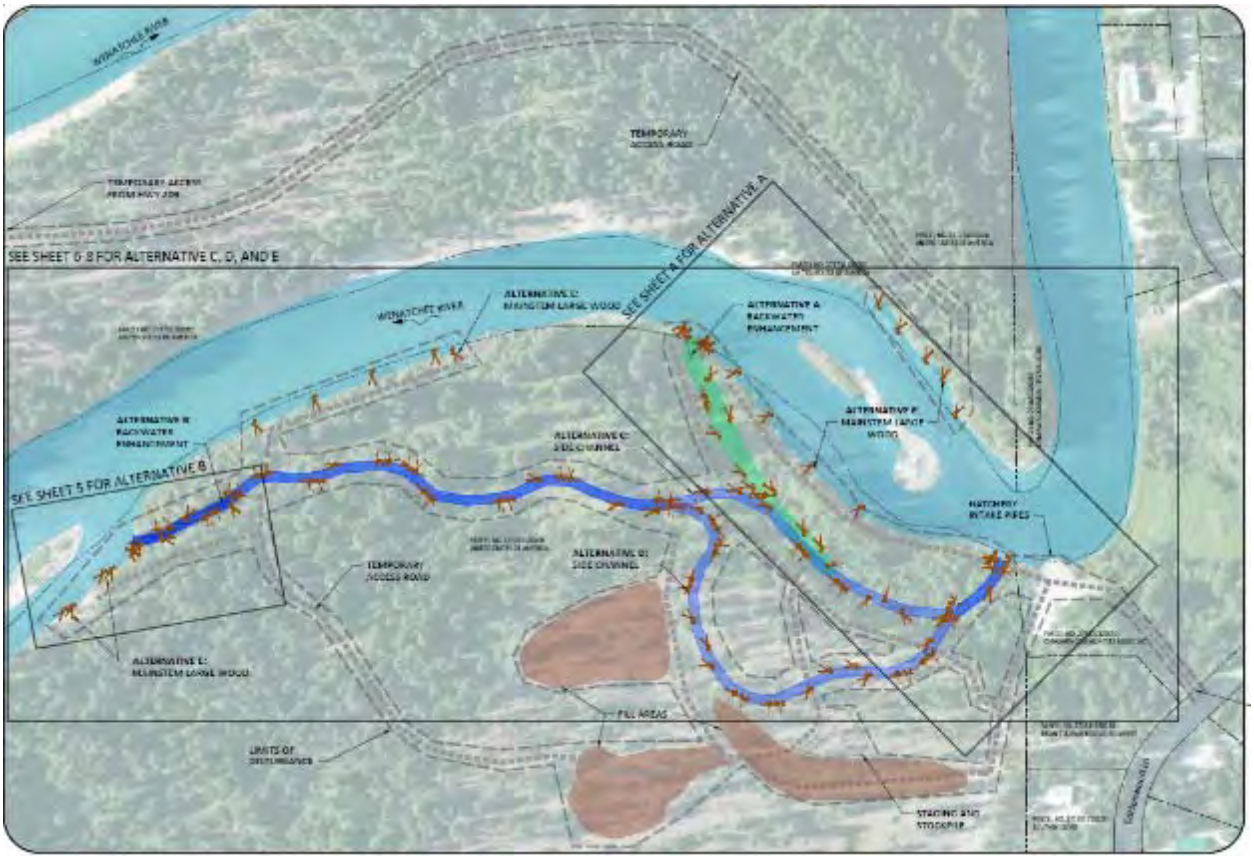


Summary:

In 2016 we produced multiple detailed concepts for restoration of a 1,800 linear foot section of Skinney Creek that is constrained by the old WSDOT Highway 2 road prism. The highway was moved to a new location three years ago and the land was granted back to the USFS. We are partnering with USFS to develop a restoration project for this site to be implemented in 2019. Design work to create permit level plans occurred in 2017, however delayed coordination with USFS is requiring this design work to continue into 2018. The design is focused on restoring the natural function of Skinney creek by improving connection to the floodplain, by reducing fine sediment inputs, and by improving riparian condition.

Chiwawa Fan Project (Engineering Only)

Land Ownership: USFS



Summary:

In 2015 we produced multiple detailed concepts for side channel restoration on USFS lands along the toe of the Chiwawa River fan along the Wenatchee River where large wood removal and human development impacts have decreased side channel connectivity. In 2017 we continued development of conceptual alternatives working with USFS staff. We are seeking to restore a 2,000 foot long side channel with perennial flow. In 2017 we devised a groundwater study plan for the site with USFS staff to determine how a reactivated side channel might interact with groundwater inputs. Groundwater monitoring and additional design work is now scheduled to occur in 2018.

Nason Confluence Project (Engineering Only)

Land Ownership: USFS

Summary:

In 2015 we produced multiple detailed concepts for side channel restoration on USFS lands at the confluence of Nason Creek with the Wenatchee River where bridge construction, large wood removal, and human development impacts have decreased lateral channel migration and reduced side channel connectivity. In 2017 we continued development of conceptual alternatives working with USFS staff. We are seeking to restore hundreds of feet of groundwater fed alcove side channels with perennial flow. In 2017 we devised a groundwater study plan for the site with USFS staff to determine how side channel actions might interact with groundwater inputs. Groundwater monitoring and additional design work is now scheduled to occur in 2018.

Nason Creek Assessment Unit

Upper Nason Creek Habitat Assessment

Land Ownership: USFS and Private

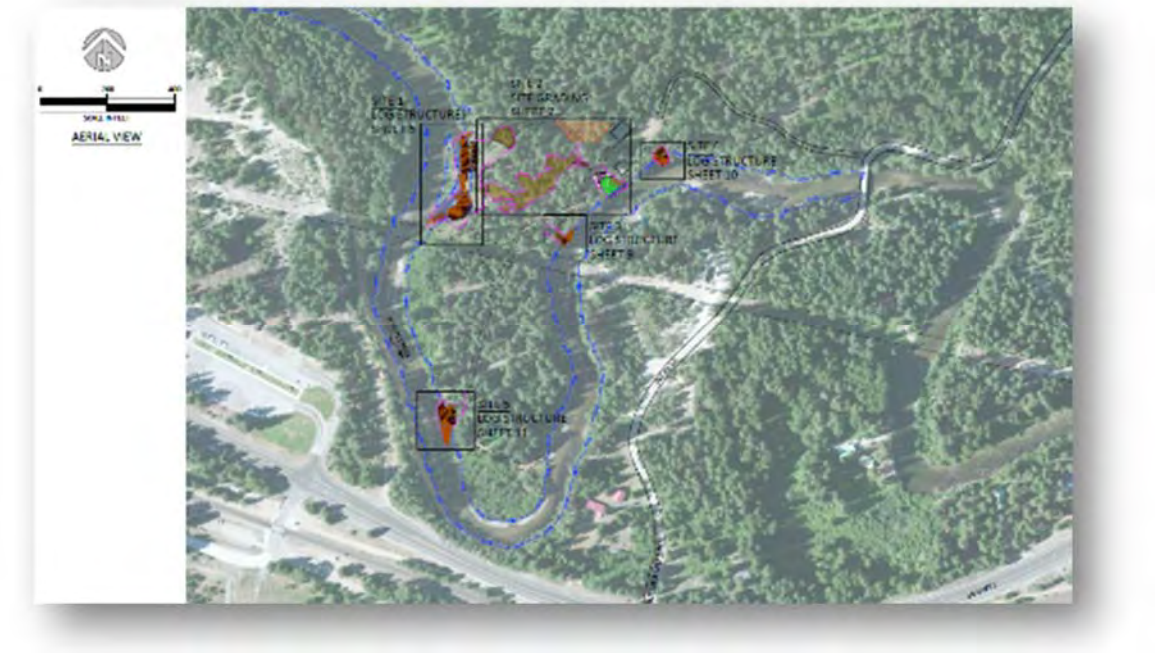
Summary:

We are partnering with the USFS to conduct a comprehensive evaluation of stream habitat conditions in the highest section of Nason Creek where previous assessments have not occurred yet geomorphic conditions are promising for habitat restoration actions. The study area begins at the train bridge over White Pine Road (river mile 14.1) and extends up to White Pine Creek.

This project didn't get underway until October 2017, so most work will be conducted in 2018. During the reporting period this effort focused on collecting new habitat data using the USFS Level II Habitat Data protocol.

Upper Kahler Project (Engineering Only)

Land Ownership: Private



Summary:

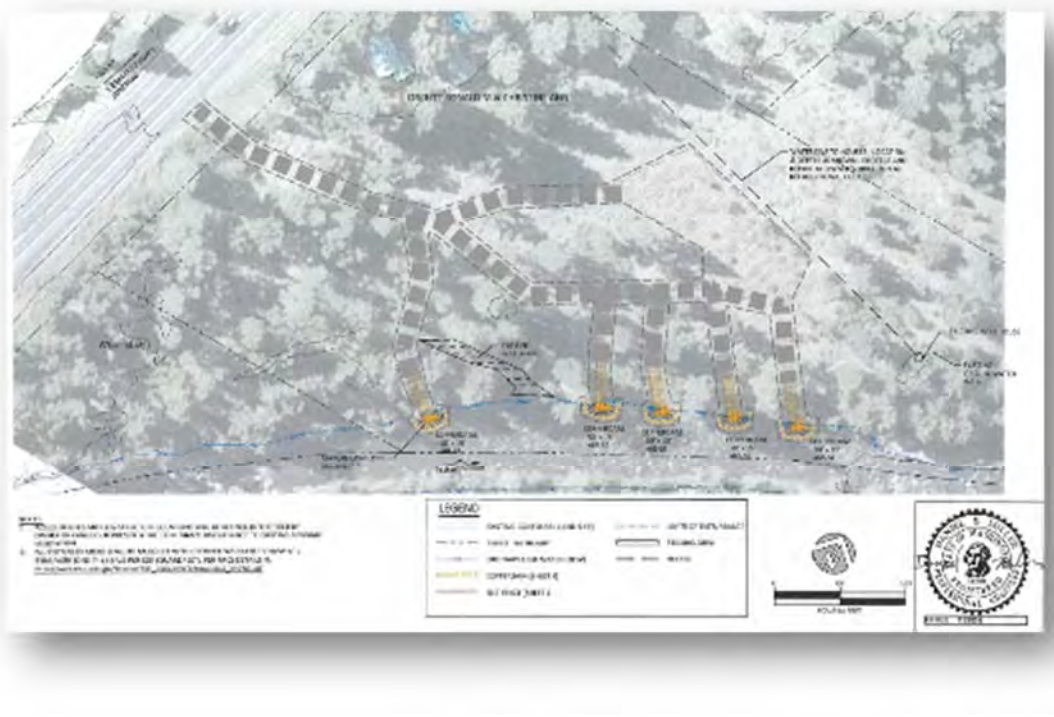
In the spring of 2017 the landowner at the Upper Kahler project site notified us of their desire to participate in a restoration project we had discussed with them in 2010 after the completion of the 2009 Kahler Reach Assessment by the United States Bureau of Reclamation (US BOR). At that time we became concerned that another historically stable large meander bend of Nason Creek would be cut-off by an avulsion induced by land development practices. The avulsion threatened to disconnect hundreds of feet of productive spring Chinook spawning grounds and substantially straighten the thread of the river.

The landowner had attempted to get permission to construct a concrete or rock bulkhead to prevent an avulsion form taking place, but the permitting agencies suggested the landowner work with restoration practitioners to see if there was an opportunity for a more fish friendly solution. Data collection for this site did not start until October 2017, so most of the design work will take place in 2018 with a target to implement in 2018 to prevent the avulsion from occurring.

Peshastin Creek Assessment Unit

Peshastin Creek RM 2.7 Project (Engineering Only)

Land Ownership: Private



Summary:

Side channel restoration concepts were developed for this project area in 2016, however permitting delays postponed groundwater testing for this project site until 2017, so the projected restoration implementation was delayed to 2018.

In 2017 we completed groundwater testing at the site and reinitiated the design process. In late 2017 we determined side channel restoration was not feasible due to inadequate site hydrology and slope, so we developed a large wood enhancement plan for the left bank of Peshastin Creek as the ultimate preferred design alternative.

Post-Implementation Monitoring

Objective

All projects constructed by the YN UCHRP are monitored for multiple years to ensure engineering and stability objectives are achieved. Monitoring is performed by qualified professional engineers using a monitoring plan written by the design team at the completion of construction. The following generalized Scope of Work details the typical monitoring tasks and timelines associated with our monitoring work.

Generic Monitoring Scope of Work

Create and Provide a Design Report

The Design Report summarizes project goals, field data collection, and technical design of the project including site survey, hydrology, hydraulics, grading, anchoring, and quantities/totals.

Produce a Monitoring Plan

The Monitoring Plan documents the post-construction conditions of the site and will outline future monitoring activities that will be completed. Documentation of post-construction conditions include a description of the completed project, preparation of as-built drawings, and results of initial post-construction monitoring. This information serves as a baseline for comparison to future monitoring data. The plan will also identify specific future monitoring activities and schedule.

Monitoring activities to be described in the plan may include photos, notes/sketches, measurements, ocular sediment data, and other activities depending on the project type and objectives. The monitoring schedule will describe the plan for regular scheduled monitoring as well as for monitoring in response to high water events. There will also be a discussion of site conditions that would trigger action items or interventions/adaptive management.

Monitoring

Monitoring efforts at the site focus on qualitative post-construction performance and an evaluation of constructed features and associated physical habitats. The monitoring activities and the data collected include: repeat photographs from mapped locations, simple hand measurements and sketches of zones of erosion, scour and sediment deposition. Revegetation will be monitored and documented via photographs and sketches of zones of plant species complexity and vigor. Documentation will be a narrative description with representative photos and sketched graphics as needed to illustrate change.

Monitoring Phase 1- Site Investigation

Task 1 - Hydrologic history

River flows are recorded at USGS gages within each watershed the work was performed. A summary of maximum flows between monitoring events should be summarized in each report. Flows at the time of the monitoring effort should be summarized with a comparison to mean

daily discharge. Effort will be made to conduct monitoring at similar flows to provide comparable observation efficiencies and photos.

Task 2 - Photo Points

Locations are identified that will visually document individual features, overall condition and the associated physical habitat. Photo point locations are identified in the as-built reports. Photos are taken at those approximate locations for each subsequent monitoring year.

Notes should be taken of project feature, photo orientation and unique conditions or features the photographs are documenting. Efforts will be made to produce high resolution photos of similar magnification and framing to provide easy visual comparison of project changes for reports and presentations.

Task 3 -Field Sketches and Narrative

At each constructed feature, a field sketch and narrative of any changes from prior monitoring conditions will be completed. Photographs from prior monitoring events will be compared to field conditions to estimate changes. Sketches will be as detailed as possible based on observations and simple measurements and should include a plan and elevation sketch at each location. The as-built reports provide construction plans for use as base graphics for sketches of locations and extents of erosion, scour and deposition areas, accumulation of debris, adjacent river bed and bank conditions and their approximate dimensions relative to the constructed feature. Substrate sizes in scour and deposition zones will be estimated on the percent composition using the Wentworth scale metrics and noted on the sketch. Total number of woody material will be summarized to identify projects are gaining / loosing material.

Task 4 - Action triggers

If monitoring activities detect undesirable performance or change to the habitat work, a range of actions or responses may be initiated based on professional opinion.

- No action needed.
- For minor change in function, a flag may be placed in the monitoring report to watch and respond at a later time if the condition worsens.
- Moderate changes may require a recommendation for intervention based on professional opinion and work by YN to remedy the issue.
- Serious changes that would influence human safety or infrastructure may require design and contractor with heavy equipment to remedy the issue.

The findings, recommendation, and decision will be documented in each report year as it becomes necessary.

Task 5 - Revegetation areas

Identify deficiencies in the revegetation efforts for each site, which may include:

- plant species complexity
- plant vigor
- invasive species

The degree of deficiency would be based upon percent of total area, or area of specific problem item. Noted deficiencies in vegetation reestablishment may prompt action to improve site recovery, reduce sediment mobilization and invasive species propagation.

Monitoring Phase 2 – Reporting

Task 6 - Monitoring Report

Following completion of each round of in the field monitoring, a report will be developed to present the assimilated monitoring notes and photos. The report will include a description of methods including any variation to the monitoring plan and reasons for variation, site conditions at the time of monitoring, and a summary of preceding flow conditions characterized by the record from the USGS gage with a focus on peak events that may have occurred prior to monitoring. The report will include a brief section for each monitored feature including representative photographs from each photo point and a narrative describing the conditions of the habitat feature, noting any changes to the structures or physical habitats between monitoring years.

Monitoring Schedule

Monitoring should begin the subsequent year following construction to establish changed conditions. Monitoring will typically be conducted in years 1, 2, 3, and 5 following the construction year. The as-built reports will be used for comparison for all future monitoring efforts and will allow for determination of the type and magnitude of change to features over time.

Phase 1 – July through August
Phase 2 – September through December

Monitoring Actions Performed During the Reporting Period

Sub-basin	Project	Construction Year	Year 1 Monitoring	Year 2 Monitoring	Year 3 Monitoring	Year 5 Monitoring
Entiat	Entiat 3-D Project	2012	2013	2014	2015	2017
Methow	Old Schoolhouse - Beaver Creek Project	2013	2014	2015	2016	2018
	Cheweuch 8 Mile Ranch Project	2012	2013	2014	2015	2017
	Chewuch RM 10 Project	2012	2013	2014	2015	2017
	Chewuch RM 11.75 to 13 Project (USFS portion)	2013	2014	2015	2016	2018
	Chewuch RM 11.75 to 13 Project (River Right Side Channel)	2015	2016	2017	2018	2020
	Chewuch RM 13 to 15.5 Project (WDFW and USFS)	2015	2016	2017	2018	2020
	Twisp Ponds Left Bank Project (ELJs)	2012	2013	2014	2015	2017
	Twisp Poorman Creek Road Project	2014	2015	2016	2017	2019
	Twisp RM 3 Project	2014	2015	2016	2017	2019
	M2 1890s Project	2014	2015	2016	2017	2019
	M2 LWD Project (Eagle Rocks)	2012	2013	2014	2015	2017
	M2 LWD Project (Sugar Dike)	2013	2014	2015	2016	2018
	M2 LWD Project (Two Channels)	2014	2015	2016	2017	2019
	Fender Mill Side Channel	2015	2016	2017	2018	2020
	Twisp Ponds Left Bank Side Channel	2016	2017	2018	2019	2021
Wenatchee	YN Sunnyslope (ELJs)	2013	2014	2015	2016	2018
	Nason LWP Project (1st Bend)	2013	2014	2015	2016	2018
	Nason UWP Reach 3 & 4	2015	2016	2017	2018	2020
	Nason LWP Groups 2 & 3	2016	2017	2018	2019	2021
	Natapoc Project	2015	2016	2017	2018	2020
	Peshastin RM 0.8 Project	2013	2014	2015	2016	2018

Summary of Monitoring Findings During the Reporting Period

For most completed project sites no action triggers were identified through post implementation monitoring during the reporting period. The spring runoff in each project subbasin in 2017 proved to be higher than usual, in some cases exceeding a 20 year event. Most sites saw the highest spring discharges yet since their implementation.

One site that was flagged for observation in 2016 was the a large channel spanning log structure that formed across the Chewuch River at the entrance to the Chewuch River Right side channel which was constructed in 2015. In 2017, high flows caused the channel spanning structure to break apart and now there is no longer accumulated wood at the side channel inlet apart from the original engineered structure in this section of the Chewuch River.

At the 1890s Side Channel along the Methow River near the town of Twisp, the high spring flows caused surface water from the Methow River to pass under the WSDOT Highway 20 bridge at the head end of the channel, bringing a large current of water down the historic channel alignment and into the constructed channel area starting at the pipe outlet location at station 41+00. The boulder carpet placed around the pipe outlet and around the head end of the constructed channel cut successfully held the post project grade and prevented a significant head cut from forming in the upper channel bed. However some smaller diameter gravels and silt did mobilize during the peak flow event, which deposited some gravel and small cobbles into the pipe outlet zone.

Performance of the infiltration gallery was not affected by the cobble/gravel deposits near the pipe outlet because the gallery invert is still well above the elevation of the deposited bed load. However it is recommended by the project engineer that the gravel/cobble mound be shoveled out by hand to recreate the post project plunge pool conditions and prevent additional sediment deposition from occurring at the pipe outlet.

Lessons Learned

Two thousand seventeen was an unprecedented year in implementing large restoration project for the YN UCHRP. We accomplished major restoration actions in each of the three project subbasins, and in the Methow Subbasin we conducted simultaneous work in three major river systems (Methow, Chewuch, and Twisp). Within these projects we continue to employ emerging and innovative restoration techniques focused on enhancing the effectiveness of the habitat improvements, decreasing disturbance impacts to adjacent non-target environments, and/or increasing the efficiency of the restoration work to decrease project costs or increase the speed at which projects can be completed. Below are some of the lessons we learned in the 2017 reporting period based on our innovative approaches to restoration:

- Instream coffering using vibratory driven sheet pile is a very effective and efficient way to achieve site isolation requirements for instream construction work. We coffered and removed coffering from dozens of sites in the Methow Subbasin in 2017 during the instream work window with little issues producing elevated turbidity outside of the work zone. Some coffered areas were greater than 300 feet long. Coffering was done exclusively with custom length steel z-sheets driven by a MOVAX 80 side grip mounted on a three-hundred series excavator.
- Looking at the effect of sediment deposition caused by the 2017 high spring runoff in side channel systems we had constructed in previous years, it was apparent that the design objective of increasing sediment scour at low flow stages in alcove systems using an infiltration gallery was a great success.
- Unintentional mortality of pre-existing vegetation around infiltration gallery collection areas continues to be a persistent downside of employing this hydrology augmentation tool. The direct thermal and hydrology benefits to constructed fish habitat, and the ability to replace affected vegetation through planting efforts that deepen the root systems of native woody plants still make the infiltration gallery a promising tool for creating climate change resilient temperature refuge habitats for anadromous salmonids, however the effects of vegetation stress needs to be factored in during the design process if highly sensitive vegetation resources exist nearby a proposed gallery site.

Yakama Nation

Upper Columbia Habitat Restoration Project

ANNUAL REPORT

Report covers work performed under BPA Project #2009-003-00
Master Agreement #56662 - Releases 111, 119, and 142

Report was completed under BPA Project #2009-003-00
Master Agreement #56662 - Release 111

REPORT COVERS WORK FROM JANUARY 1ST, 2017 THROUGH DECEMBER 31ST, 2017

Attachment 1 – Completed Projects As-Builts

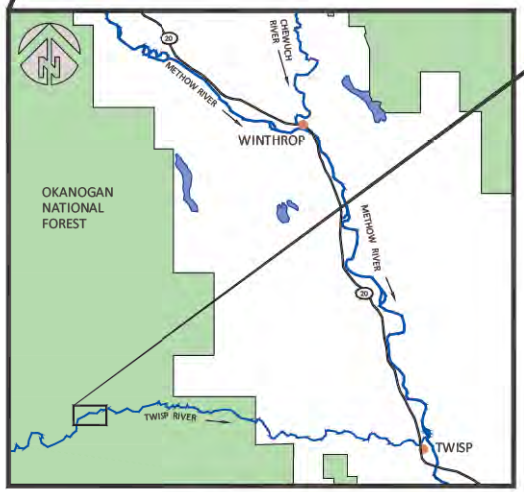
- **Twisp River Newby Narrows Project (Methow Subbasin)**
- **Big Valley Fish Enhancement Project (Methow Subbasin)**
- **Chewuch River Mile 15.5 to 17 (Methow Subbasin)**
- **Entiat 3D Revisted Large Wood Enhancement (Entiat Subbasin)**
- **Entiat Stillwaters Fish Enhancement (Entiat Subbasin)**
- **Meacham Flats Fish Enhancement (Wenatchee Subbasin)**

* note that because the Twisp Horseshoe Project was not completed in 2017, we have not yet created an as-built plan set for this project site. We anticipate providing the as-builts in the 2018 report.

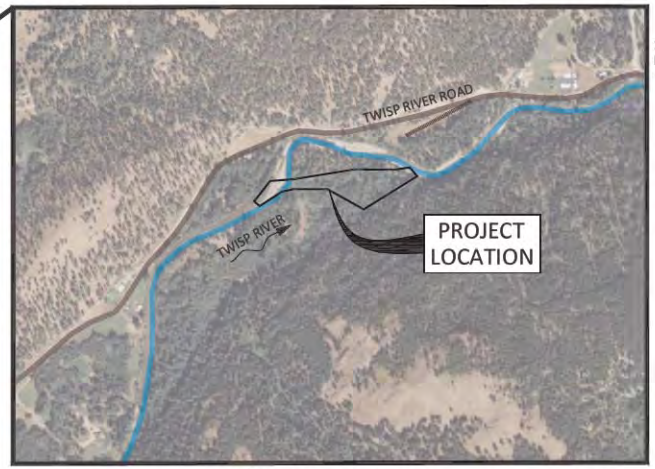
MIDDLE TWISP RIVER - NEWBY NARROWS HABITAT ENHANCEMENT PROJECT

AS-BUILT PLANS

OKANOGAN COUNTY, WASHINGTON



VICINITY MAP



SITE MAP

LATITUDE: 48°22'37" NORTH
LONGITUDE: 120°17'49" WEST

SECTION 11 & 12, TOWNSHIP 33N, RANGE 20E

Sheet Index	
Sheet Number	Sheet Title
1	COVER, SHEET INDEX, SITE MAPS
2	SITE OVERVIEW
3	SITE A
4	SITE G
5	SITES I & J
6	SITE K
7	SIDE CHANNEL

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE BPA HABITAT IMPROVEMENT PROGRAM, PROGRAMMATIC BIOLOGICAL OPINION (HIP III).

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MM	MM	MM
APPROVED	DATE	PROJECT
MM	12/31/17	150224

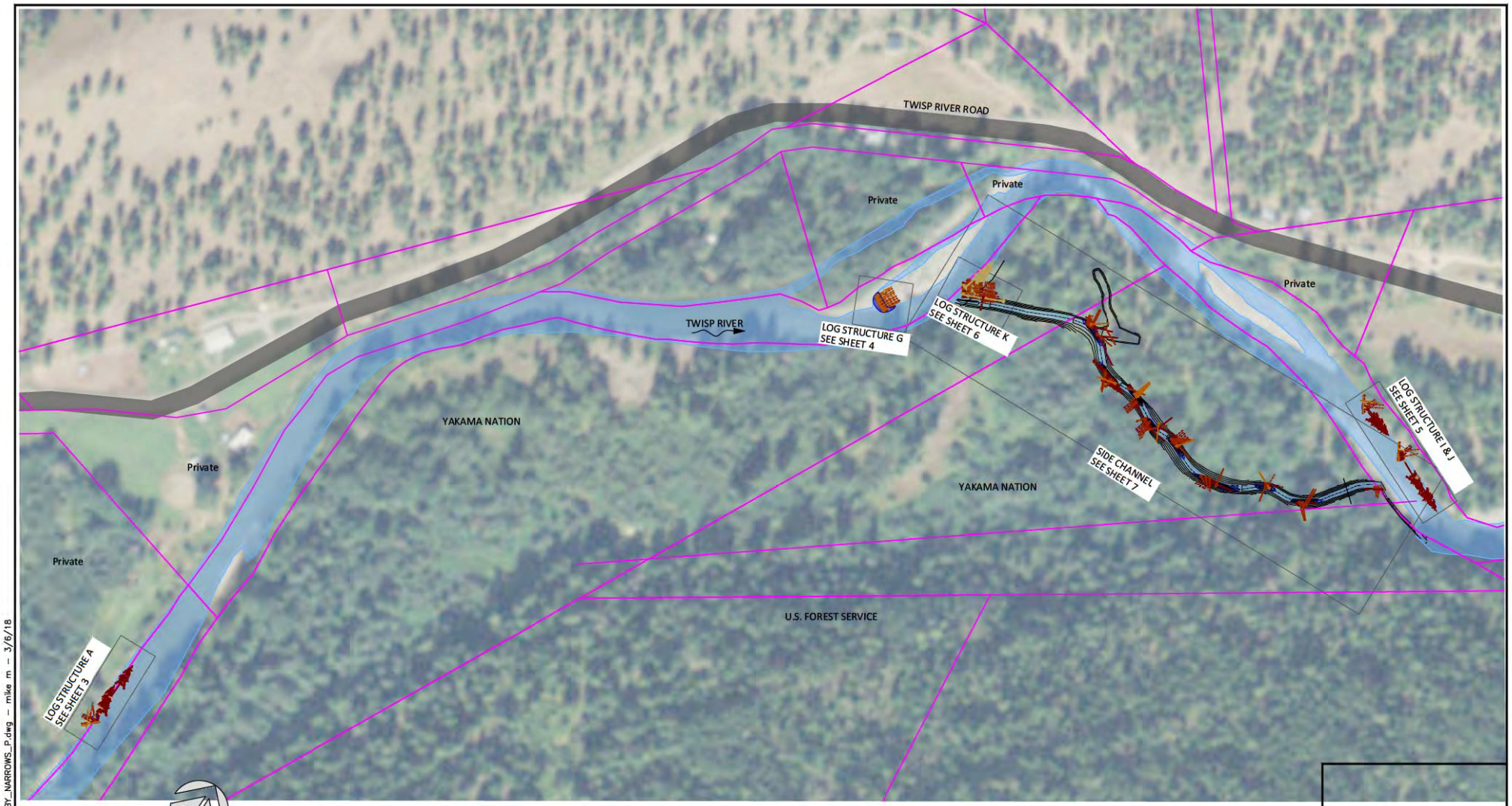
YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9008
www.interfluve.com

COVER, SHEET INDEX, SITE MAPS

SHEET 1 OF 7

D:\work-2017\newby\plans\FI_NEWBY_NARROWS_P.dwg — mike m — 3/6/18



LEGEND

PROPERTY BOUNDARIES (OKANOGAN COUNTY GIS)

FOREST SERVICE BOUNDARY (TACKMAN SURVEY)

0 200 400

SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

NS	MM, GJ, LH	MM, GJ
DRAWN	DESIGNED	CHECKED
MM	12/31/17	150224
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

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Hood River, OR 97031
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PROJECT SITES
OVERVIEW

SHEET
2 OF 7

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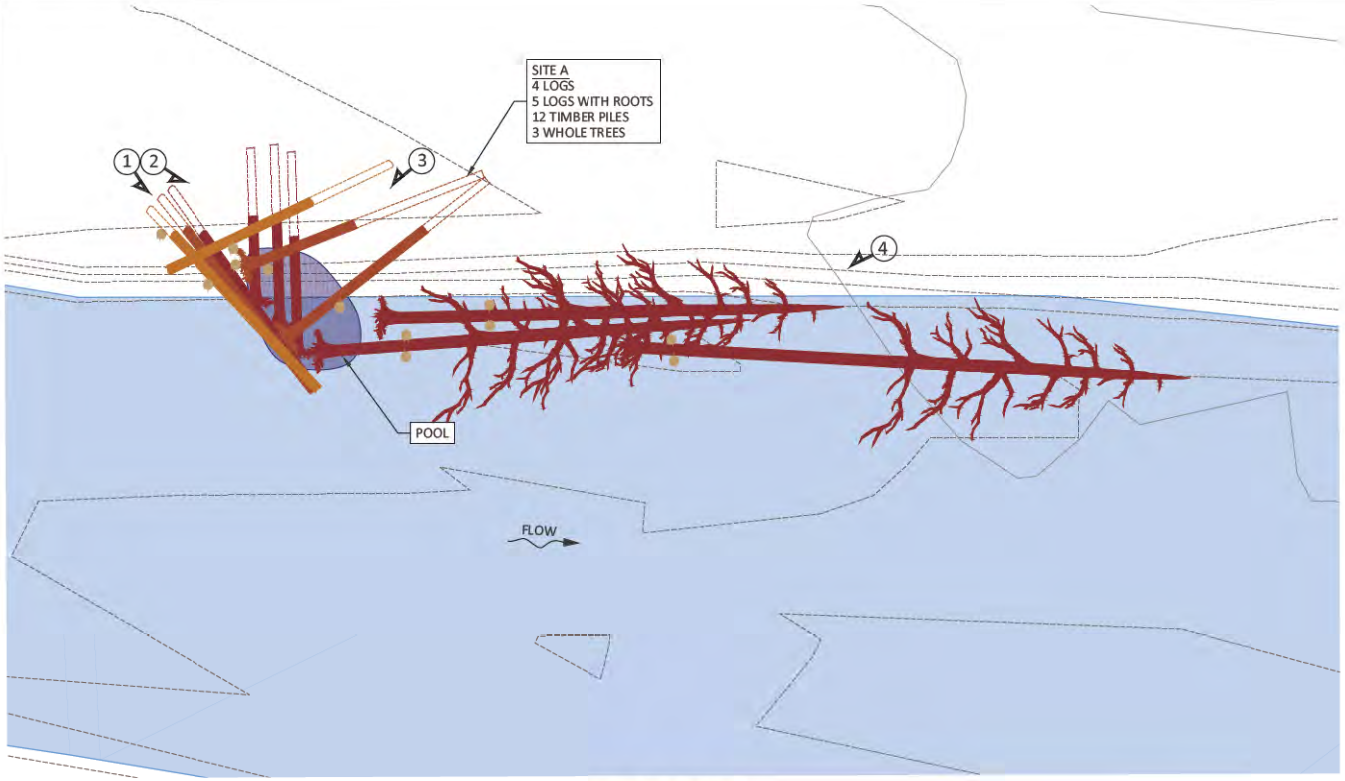

PLAN VIEW - LOG STRUCTURE A

LEGEND

- TYPICAL LOW WATER
- LAYER 1 LOG
- LAYER 2 LOG
- LAYER 3 LOG
- TIMBER PILE
- WHOLE TREE
- # PHOTO POINT

N

0 20 40

SCALE IN FEET

D:\work--2017\newby\plans\FI_NEWBY_NARROWS_P.dwg -- mike m -- 3/6/18

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MM	MM	MM
APPROVED	DATE	PROJECT
MM	12/31/17	150224

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MIDDLE TWISP RIVER
NEWBY NARROWS

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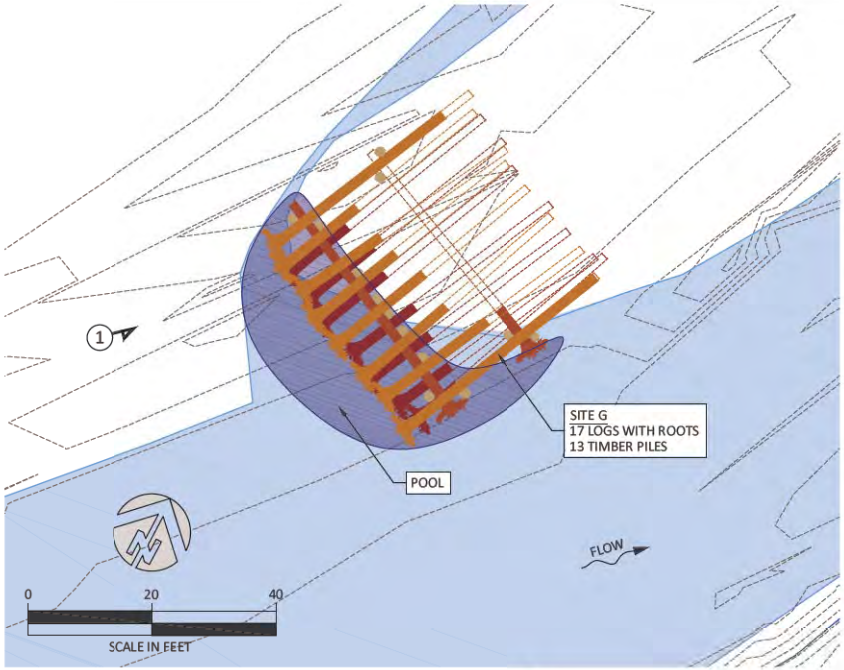
SITE A

SHEET
3 OF 7



PLAN VIEW - LOG STRUCTURE G

LEGEND

- TYPICAL LOW WATER
- LAYER 1 LOG
- LAYER 2 LOG
- LAYER 3 LOG
- TIMBER PILE
- (#) PHOTO POINT

D:\work--2017\newby\plans\FI_NEWBY_NARROWS_P.dwg -- mike m -- 3/6/18

NO.	BY	DATE	REVISION DESCRIPTION

NS DRAWN	MM, GJ, LH DESIGNED	MM, GJ CHECKED
MM APPROVED	12/31/17 DATE	150224 PROJECT

YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

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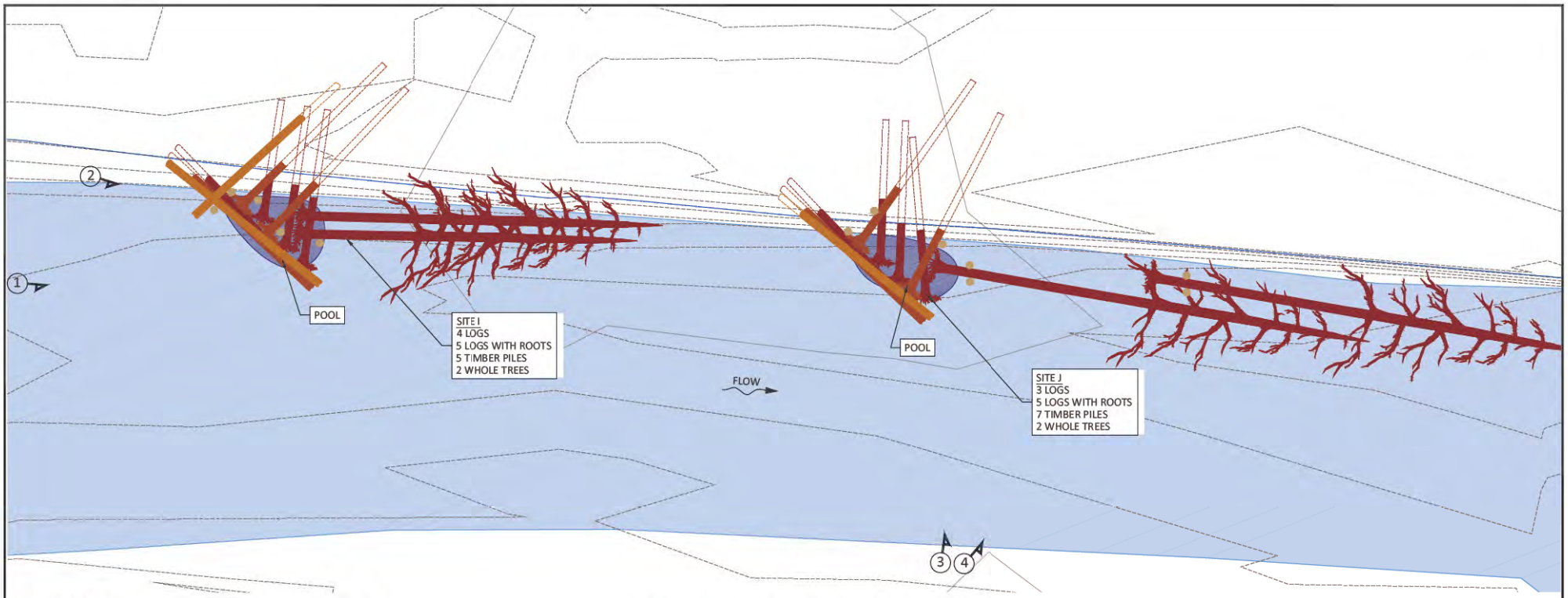
SITE G

SHEET 4 OF 7



LEGEND

- TYPICAL LOW WATER
- LAYER 1 LOG
- LAYER 2 LOG
- LAYER 3 LOG
- TIMBER PILE
- WHOLE TREE
- # PHOTO POINT

0 20 40

SCALE IN FEET

PLAN VIEW - LOG STRUCTURES I-J

D:\work--2017\newby\plans\FI_NEWBY_NARROWS_P.dwg -- mike m -- 3/6/18

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MM	MM	MM
APPROVED	DATE	PROJECT
MM	12/31/17	150224

YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

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Hood River, OR 97031
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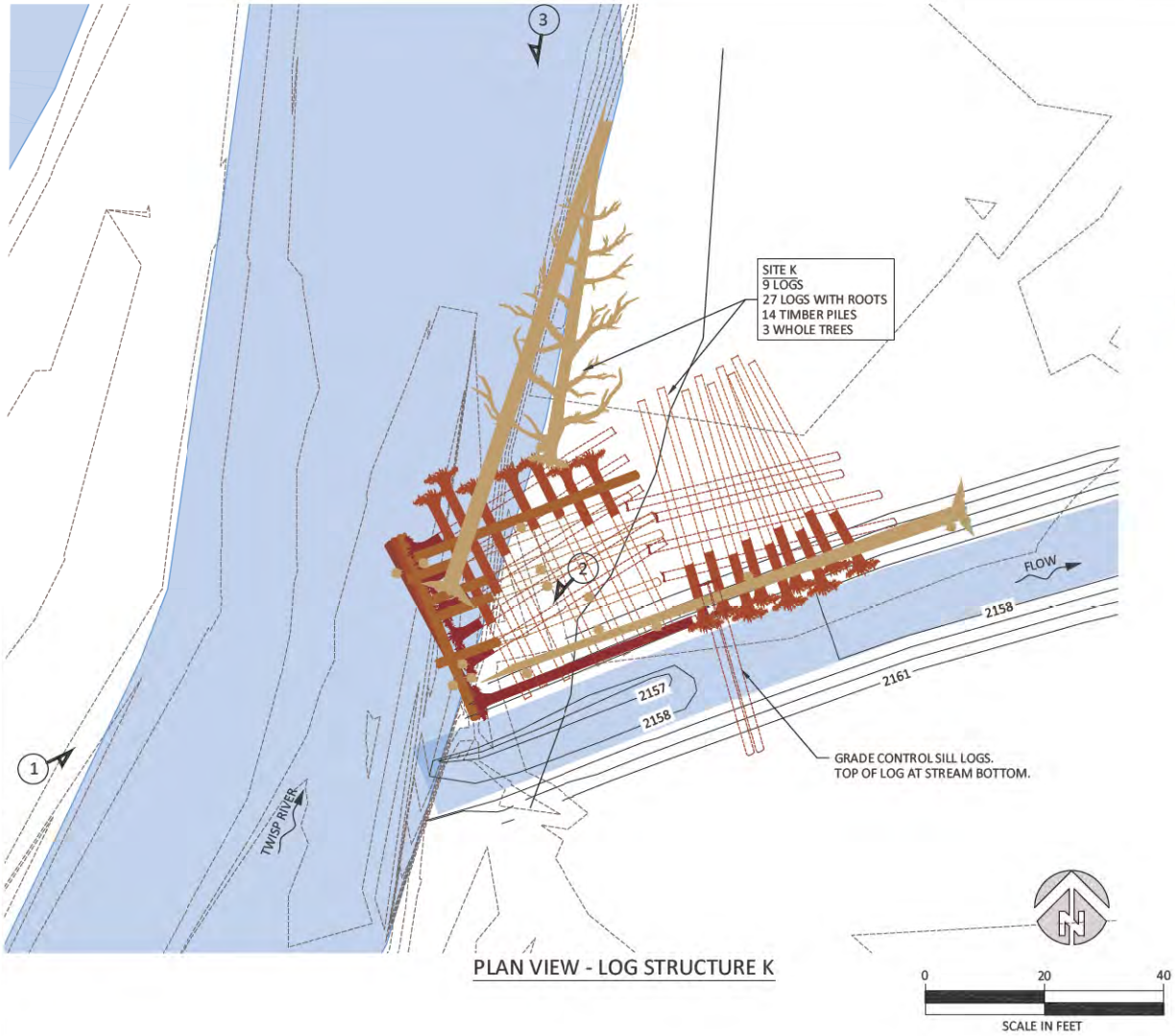
SITES I & J

SHEET 5 OF 7



LEGEND

- CONSTRUCTED CONTOURS
- TYPICAL LOW WATER
- LAYER 1 LOG (PLAIN LINE WHERE BURIED)
- LAYER 2 LOG
- LAYER 3 LOG
- TIMBER PILE
- WHOLE TREE
- # PHOTO POINT

PLAN VIEW - LOG STRUCTURE K

0 20 40

SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

MM DRAWN	MM DESIGNED	MM CHECKED
MM APPROVED	12/31/17 DATE	150224 PROJECT

YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

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Hood River, OR 97031
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SITE K

SHEET 6 OF 7

D:\work-2017\newby\plans\FI_NEWBY_NARROWS_P.dwg - mike m - 3/6/18

LEGEND

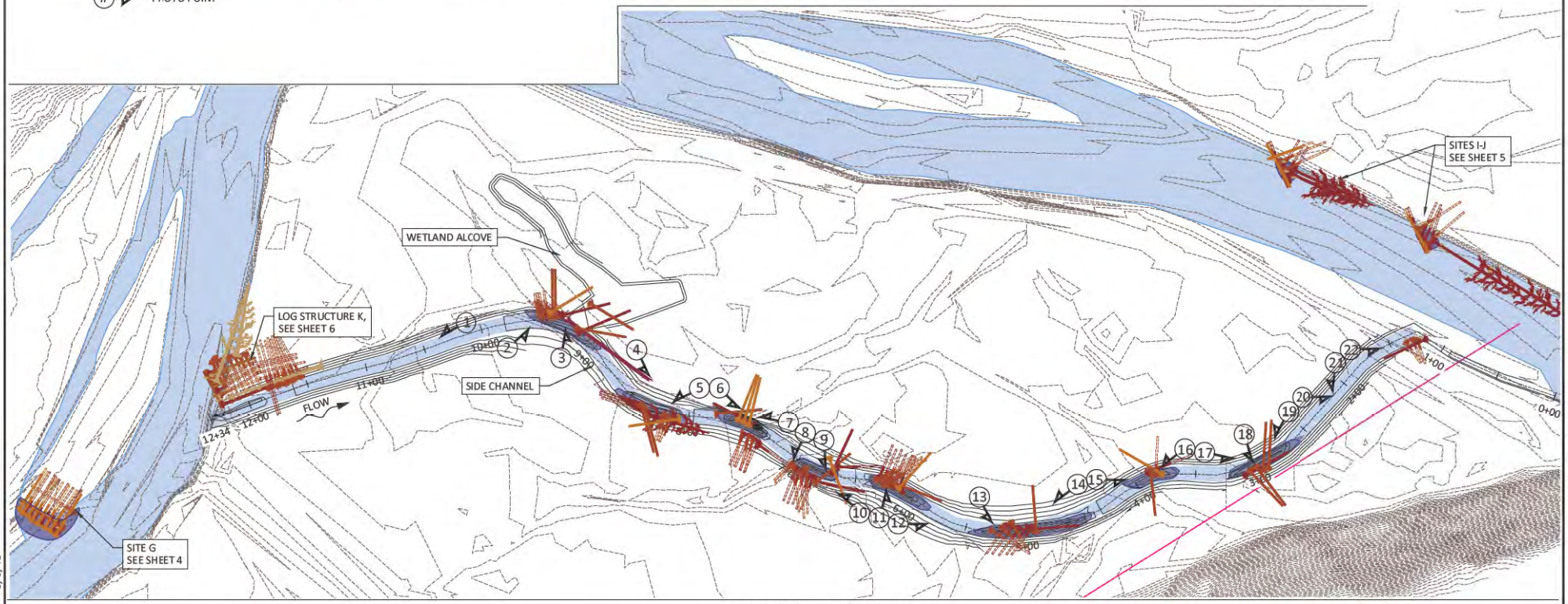
CONSTRUCTED CONTOURS (1FT)

FOREST SERVICE BOUNDARY

PHOTO POINT

0 80 160

SCALE IN FEET



PLAN VIEW - SIDE CHANNEL

NO.	BY	DATE	REVISION DESCRIPTION

NS DRAWN	MM, GJ, LH DESIGNED	MM, GJ CHECKED
MM APPROVED	12/31/17 DATE	150224 PROJECT

YAKAMA NATION FISHERIES
MIDDLE TWISP RIVER
NEWBY NARROWS

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SIDE CHANNEL

SHEET 7 OF 7

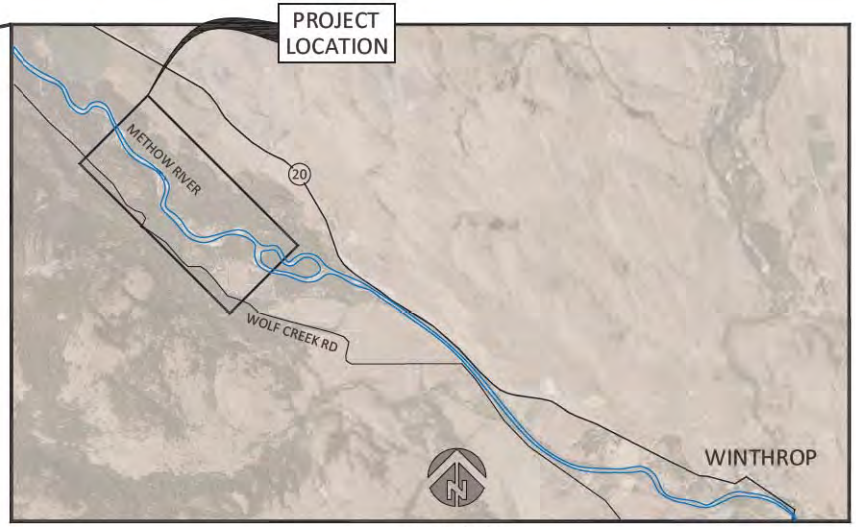
D:\work-2017\newby\plans\FI_NEWBY_NARROWS_P.dwg – mike m – 3/6/18

METHOW RIVER - BIG VALLEY SOUTH

FISH HABITAT ENHANCEMENT PROJECT

ASBUILT PLANS WITH MONITORING PHOTO POINTS

VICINITY MAP
NOT TO SCALE



SITE MAP
SCALE - 1" = 5000'

UPSTREAM END OF PROJECT AREA:
LATITUDE 120°17'16.8" W
LONGITUDE 48°30'55.4" N
SECTION 25, TOWNSHIP 35N, RANGE 20E

DOWNSTREAM END OF PROJECT AREA:
LATITUDE 120°16'11.1" W
LONGITUDE 48°30'20.2" N
SECTION 25, TOWNSHIP 35N, RANGE 21E

WATERBODY: METHOW RIVER

TRIBUTARY OF: COLUMBIA RIVER

YAKAMA NATION FISHERIES
2 JOHNSON LANE
WINTHROP WA, 98862

SHEET INDEX

1 - COVER, SHEET INDEX & VICINITY MAPS
2 - PROJECT SITES OVERVIEW
3 - PLAN VIEW UPSTREAM SITES
4 - PLAN VIEW DOWNSTREAM SITES

NO.	DATE	REVISION DESCRIPTION
1	04/02/15	30% SUBMITTAL

DRAWN	DESIGNED	CHECKED
MM	MM	MM
APPROVED	DATE	PROJECT
MM	12/31/17	13-02-29

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
METHOW RIVER - BIG VALLEY SOUTH
FISH HABITAT ENHANCEMENT PROJECT

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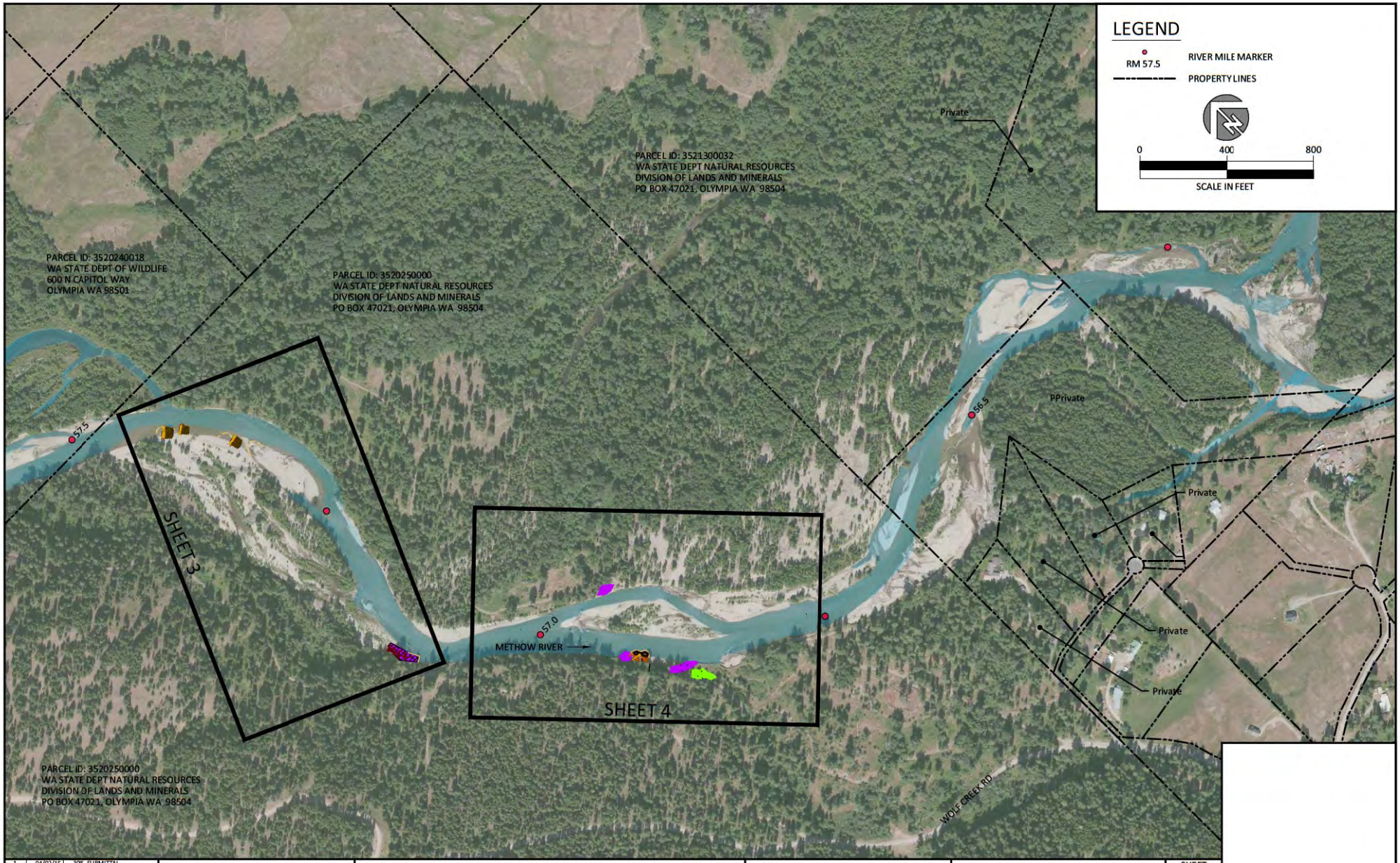
COVER, SHEET INDEX & VICINITY MAPS

SHEET 1 OF 4



NO.	DATE	REVISION DESCRIPTION
1	04/02/15	30% SUBMITTAL

MM	MM	MM
DRAWN	DESIGNED	CHECKED
MM	12/31/17	13-02-29
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
METHOW RIVER - BIG VALLEY SOUTH
FISH HABITAT ENHANCEMENT PROJECT

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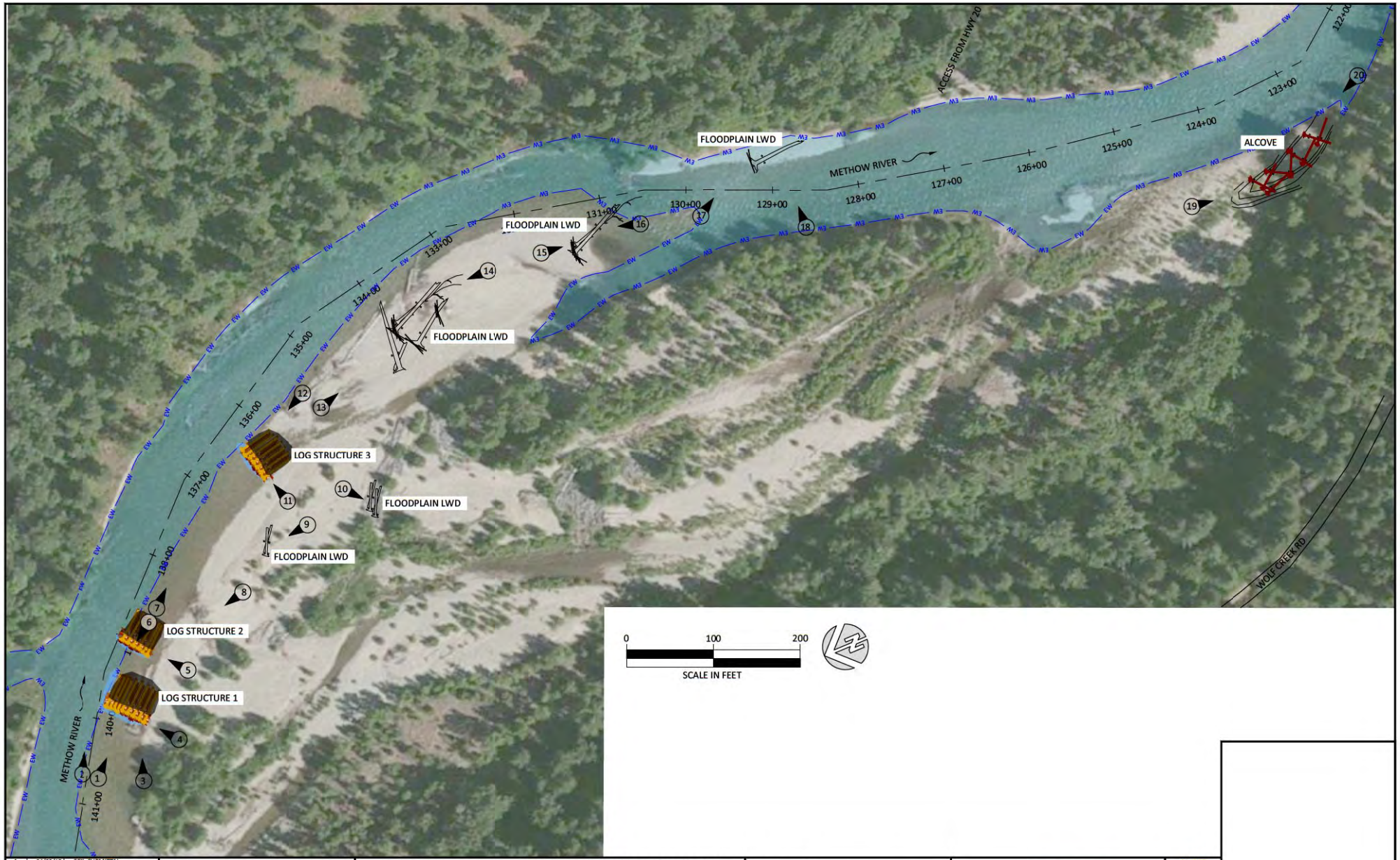
PROJECT AREAS

SHEET
2 OF 4



NO.	DATE	REVISION DESCRIPTION
1	04/02/15	30% SUBMITTAL

MM	MM	MM
DRAWN	DESIGNED	CHECKED
MM	12/31/17	13-02-29
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
METHOW RIVER - BIG VALLEY SOUTH
FISH HABITAT ENHANCEMENT PROJECT

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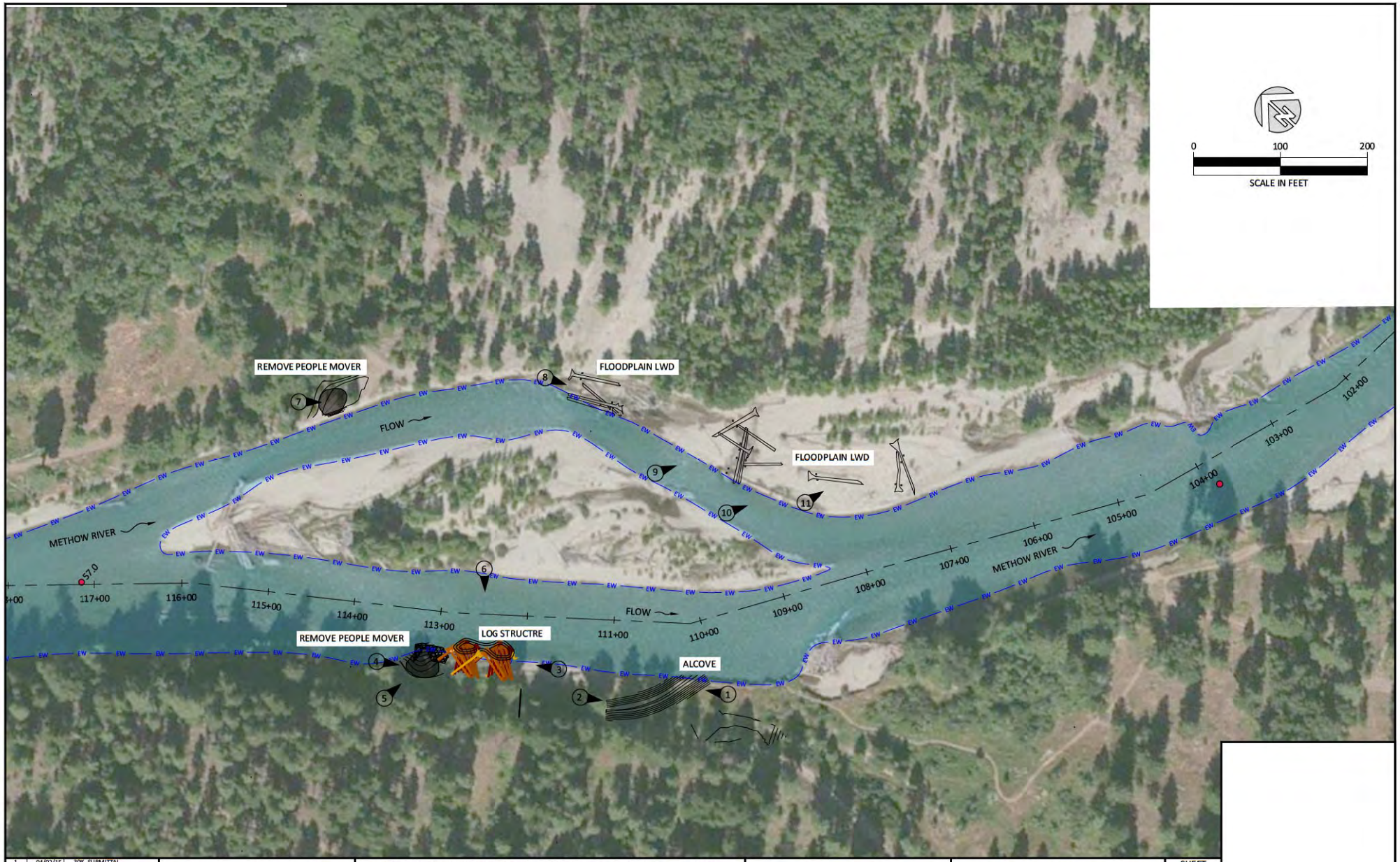
PLAN VIEW
UPSTREAM SITES

SHEET
3 OF 4



NO.	DATE	REVISION DESCRIPTION
1	04/02/15	30% SUBMITTAL

DRAWN	DESIGNED	CHECKED
MM	MM	MM
APPROVED	DATE	PROJECT
MM	12/31/17	13-02-29

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
METHOW RIVER - BIG VALLEY SOUTH
FISH HABITAT ENHANCEMENT PROJECT

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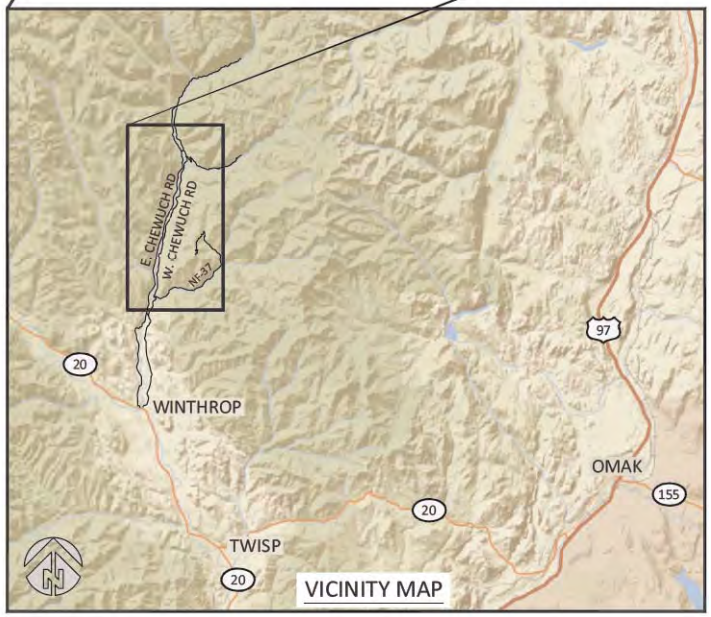
PLAN VIEW
DOWNSTREAM SITES

SHEET
4 OF 4

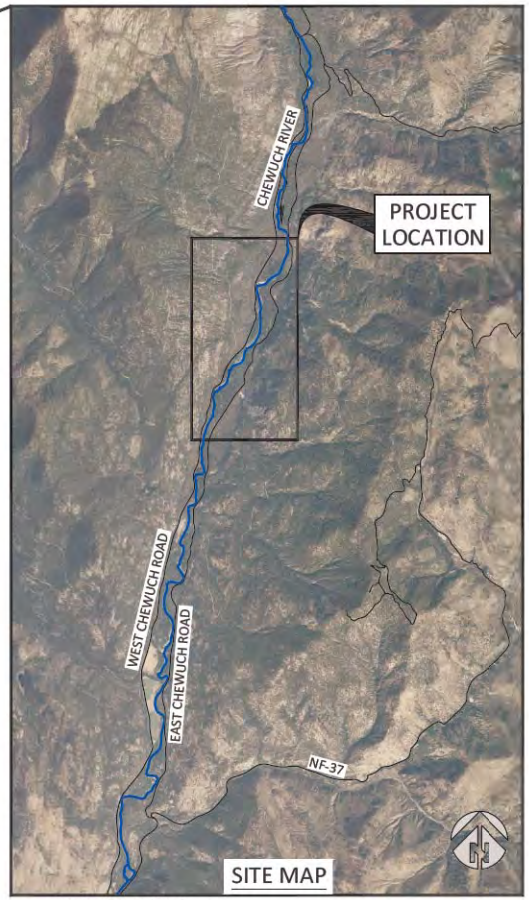
CHEWUCH RIVER MILE 15.5-17

FISH HABITAT ENHANCEMENT PROJECT

As Built Plans



VICINITY MAP



SITE MAP

SITE LOCATION:

LATITUDE: 48°39'27" NORTH
LONGITUDE: 120°08'30" WEST
OKANOGAN COUNTY, WASHINGTON

WATERBODY: CHEWUCH RIVER
TRIBUTARY OF: METHOW RIVER

YAKAMA NATION FISHERIES
2 JOHNSON LANE
WINTHROP WA, 98862

SHEET LIST

1 COVER, SHEET LIST AND VICINITY MAP
2 PROJECT SITES OVERVIEW
3 SITES B & C
4 SITES D & E
5 SITE H
6 SITE I
7 SITE J
8 SITE K

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-25-2018

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MM	MB,MM	MB
APPROVED	DATE	PROJECT
MM	12/31/17	

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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Hood River, OR 97031
541.386.9003
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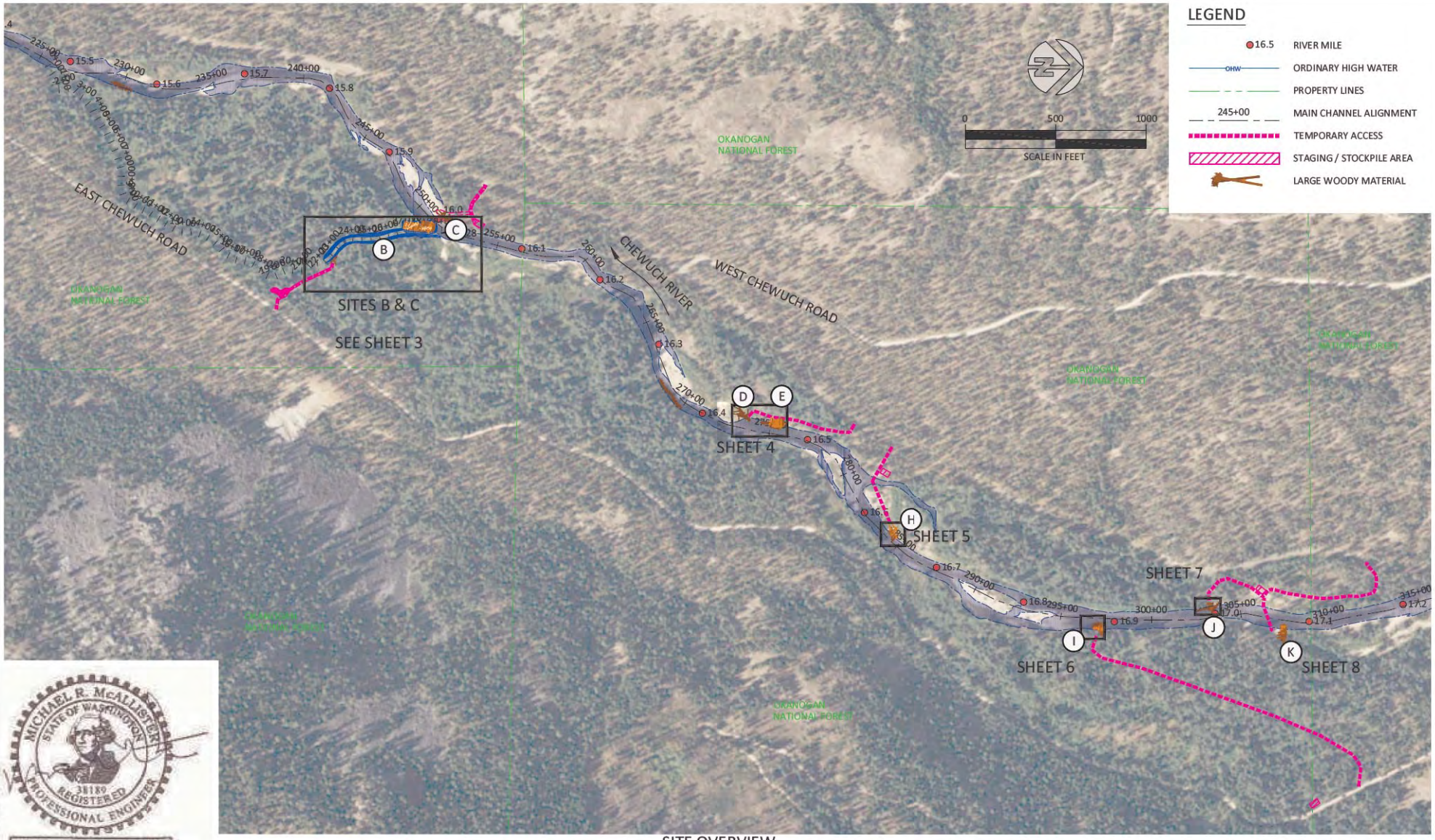
COVER, SHEET LIST AND VICINITY MAP

SHEET 1 OF 8



SITE OVERVIEW

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38189
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 09-25-2018

NO.	BY	DATE	REVISION DESCRIPTION

MM DRAWN	MB,MM DESIGNED	MB CHECKED
MM APPROVED	12/31/17 DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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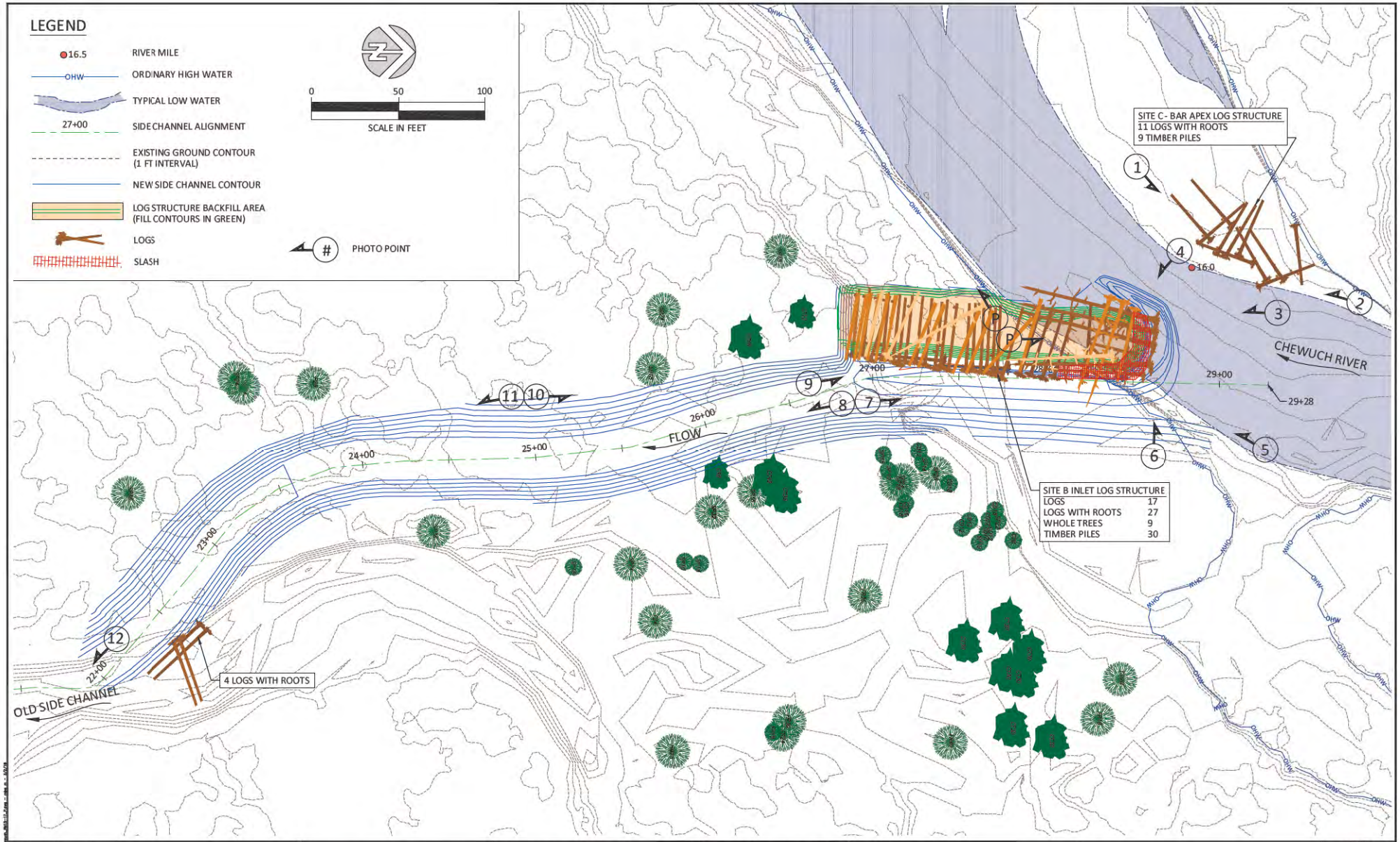
PROJECT SITES OVERVIEW

SHEET 2 OF 8



NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
MM	MB,MM	MB
APPROVED	DATE	PROJECT
MM	12/31/17	

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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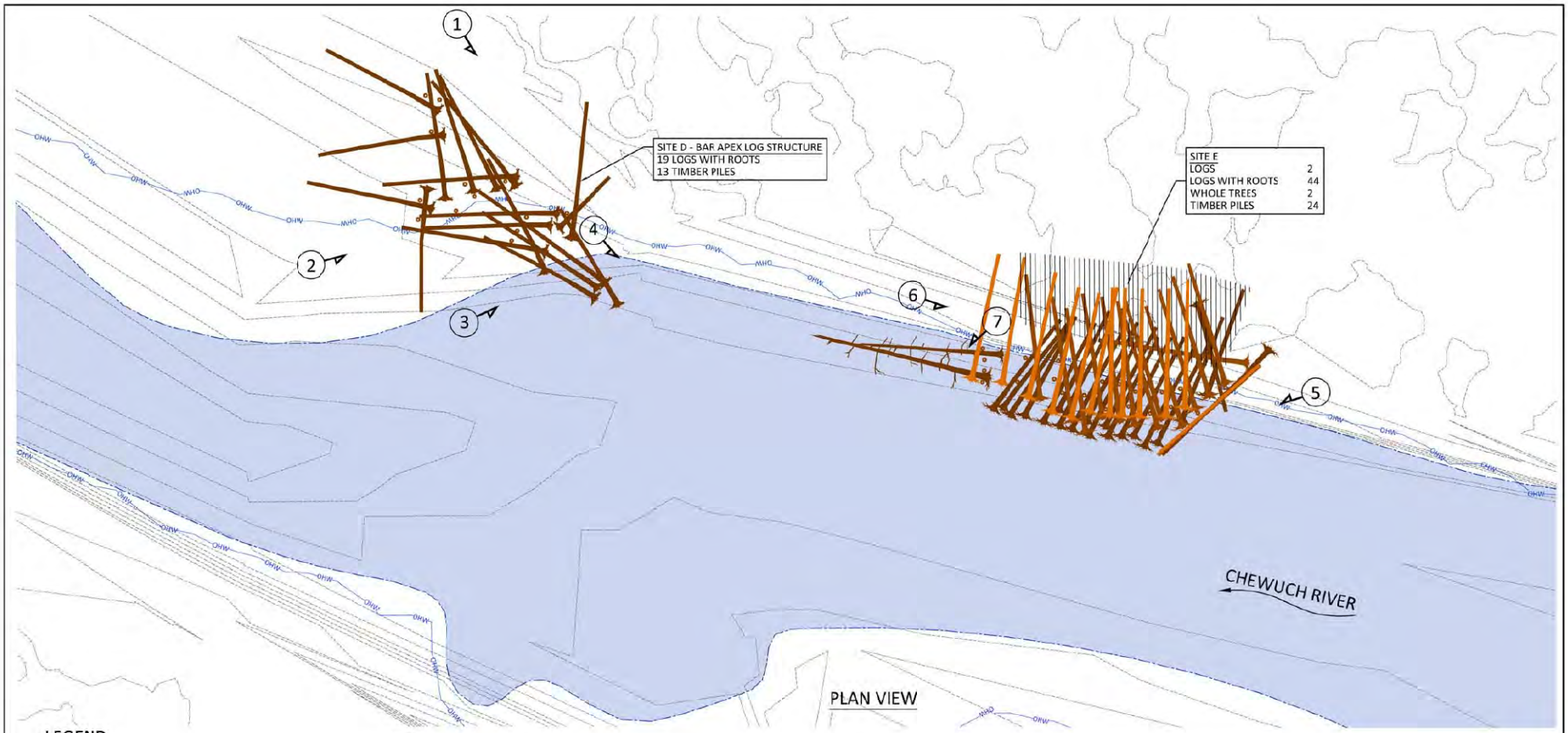
SITES B & C

SHEET 3 OF 8



LEGEND

- 16.5 — RIVER MILE
- OHW — ORDINARY HIGH WATER
- TYPICAL LOW WATER LINE
- LARGE WOODY MATERIAL
- SLASH
- LWD BURIAL
- # — PHOTO POINT

0 30 60
SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

MM	MB,MM	MB
DRAWN	DESIGNED	CHECKED
MM	12/31/17	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

inter·fluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SITES D & E

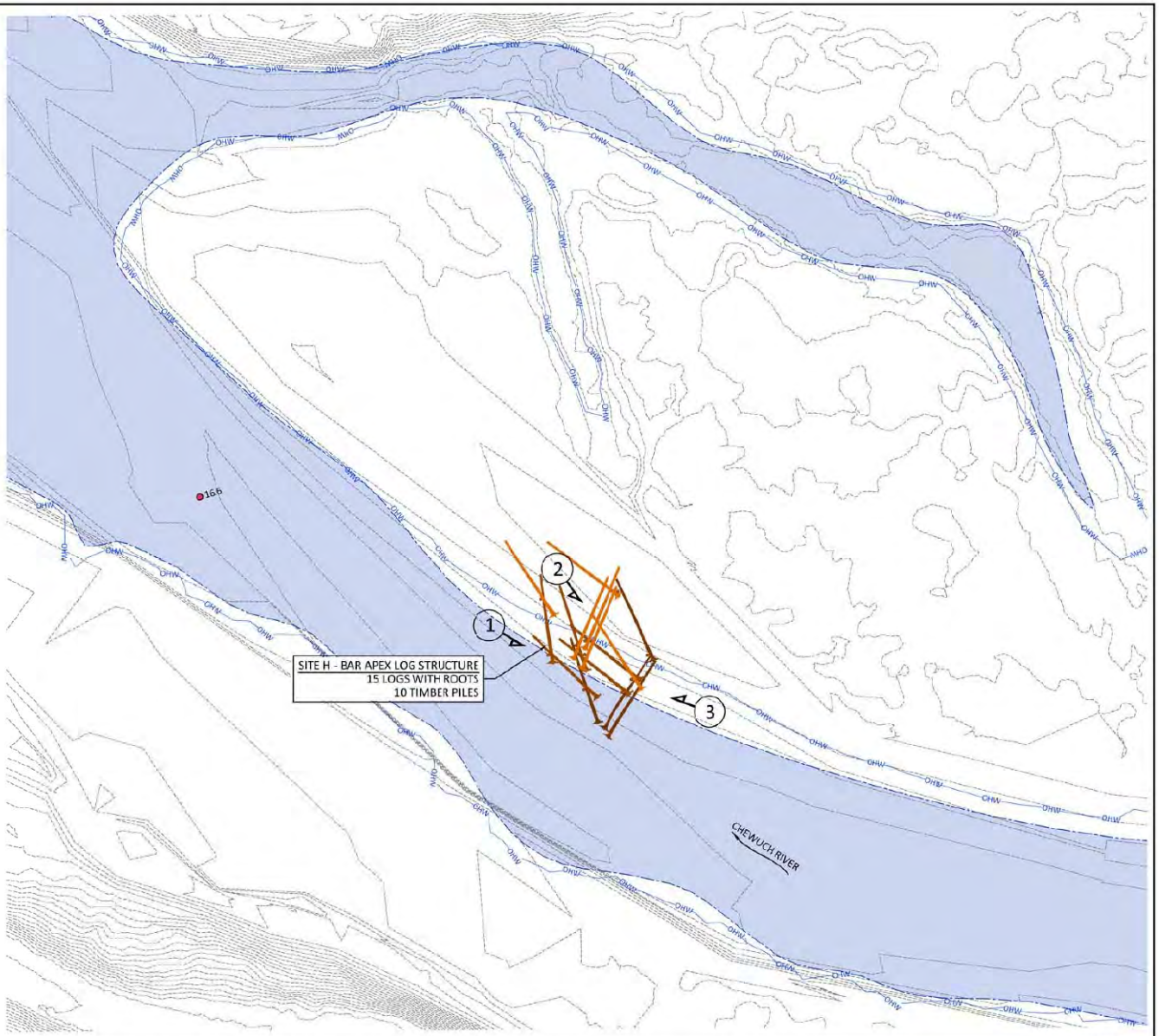
SHEET
4 OF 8

LEGEND

- 16.5 — RIVER MILE
- OHW — ORDINARY HIGH WATER
- TYPICAL LOW WATER LINE
- LIMITS OF DISTURBANCE
- STAGING / STOCKPILE AREA
- LARGE WOODY MATERIAL
- # — PHOTO POINT

0 40 80

SCALE IN FEET



NO.	BY	DATE	REVISION DESCRIPTION

MM DRAWN	MB,MM DESIGNED	MB CHECKED
MM APPROVED	12/31/17 DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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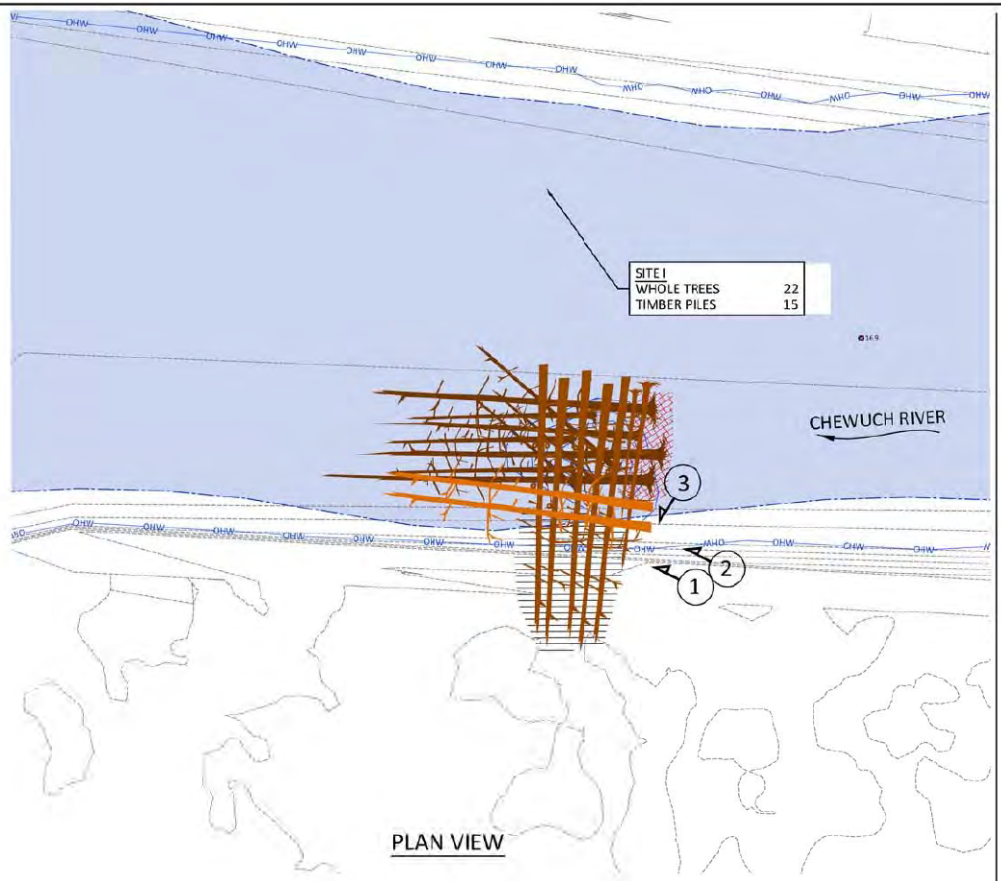
SITE H

SHEET 5 OF 8



PLAN VIEW

LEGEND

- L6.5 — RIVER MILE
- OHW — ORDINARY HIGH WATER
- TYPICAL LOW WATER LINE
- WHOLE TREES
- SLASH
- LWD BURIAL
- # — PHOTO POINT

0 30 60

SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

MM	MB,MM	MB
DRAWN	DESIGNED	CHECKED
MM	12/31/17	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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SITE I

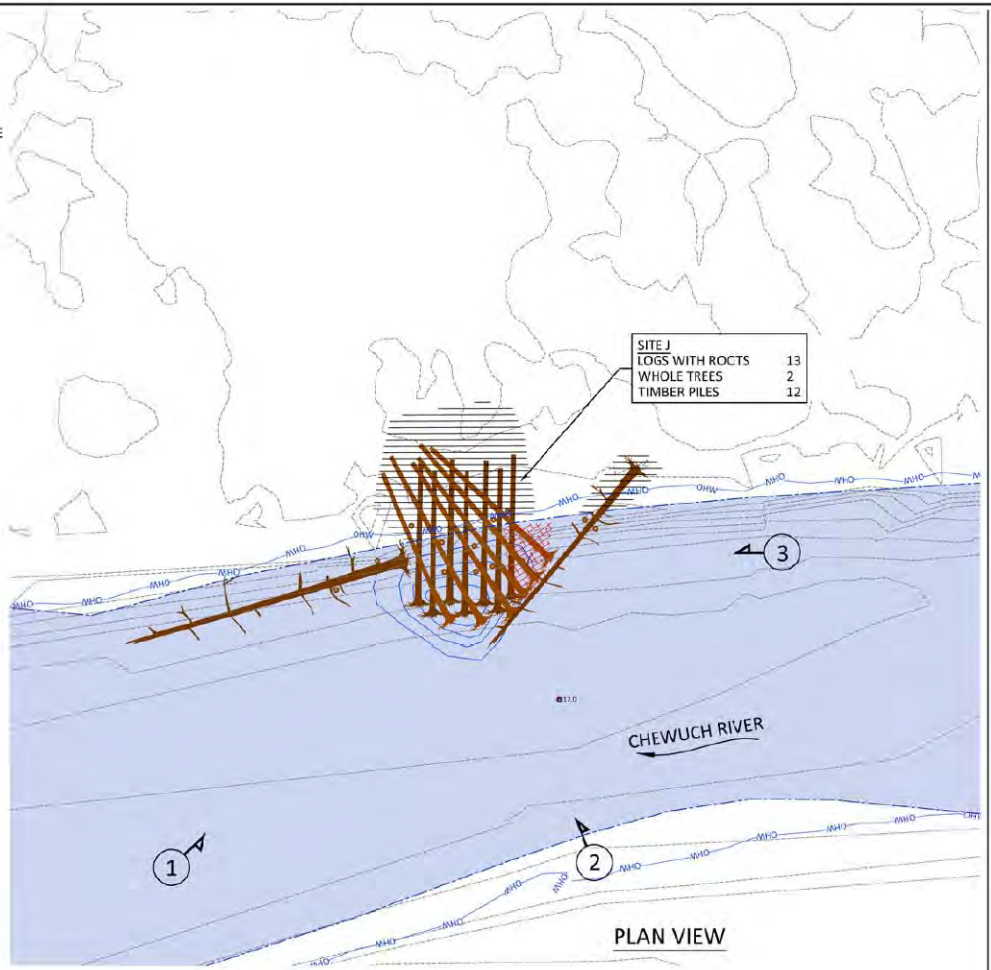
SHEET 6 OF 8

LEGEND

- 16.5 — RIVER MILE
- OHW — ORDINARY HIGH WATER
- TYPICAL LOW WATER LINE
- LOGS
- SLASH
- LWD BURIAL
- P — PHOTO POINT

0 30 60

SCALE IN FEET



NO.	BY	DATE	REVISION DESCRIPTION

MM DRAWN	MB,MM DESIGNED	MB CHECKED
MM APPROVED	12/31/17 DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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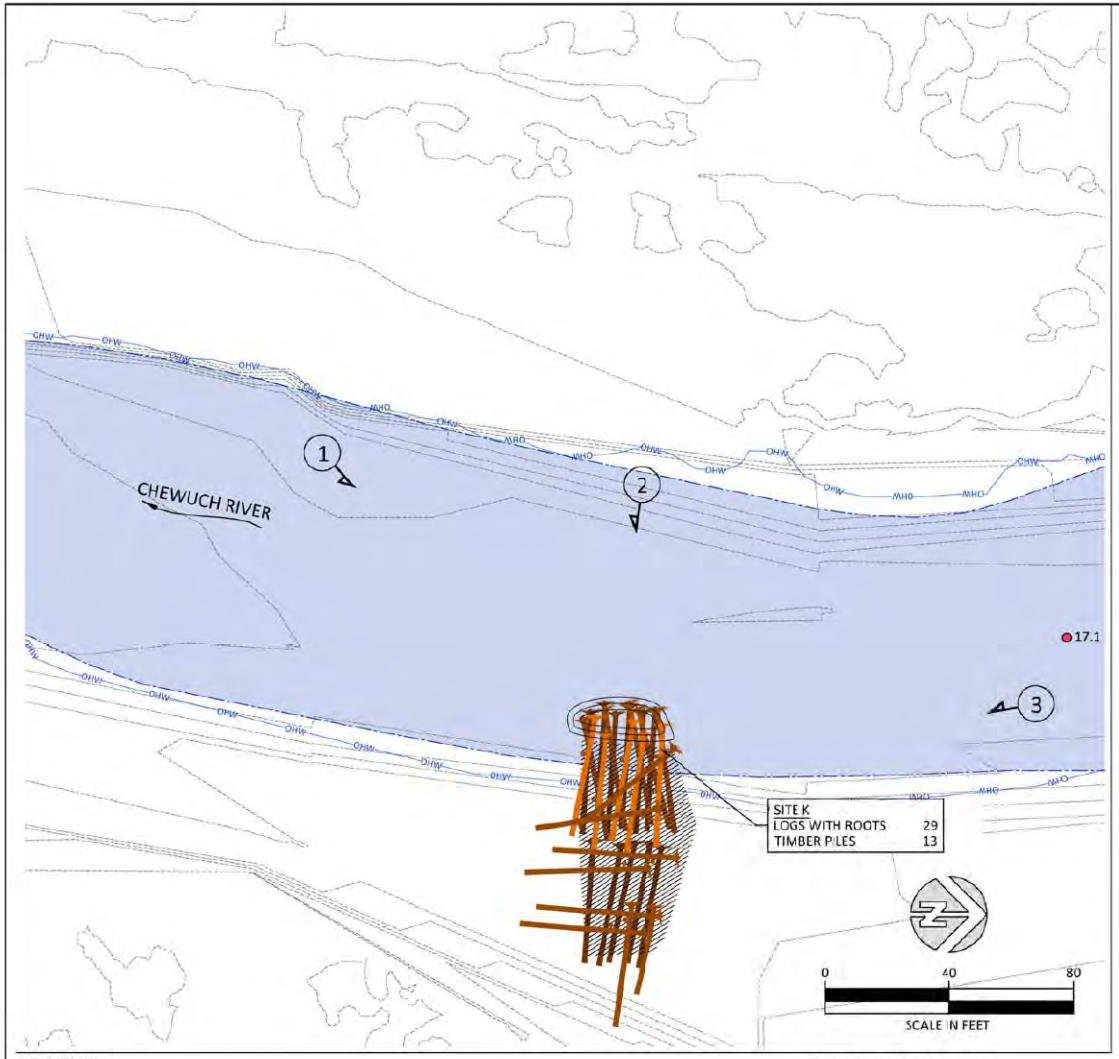
SITE J

SHEET 7 OF 8



SITE K PLAN VIEW

LEGEND

- 12.5 — RIVER MILE
- OHW — ORDINARY HIGH WATER
- TYPICAL LOW WATER LINE
- LOGS
- LWD BURIAL
- # — PHOTO POINT

NO.	BY	DATE	REVISION DESCRIPTION

MM	MB,MM	MB
DRAWN	DESIGNED	CHECKED
MM	12/31/17	
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
CHEWUCH RM 15.5-17
FISH ENHANCEMENT PROJECT

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SITE K

SHEET 8 OF 8

Entiat River – 3D LWM Revisited

Monitoring Plan

October 2017

Prepared for:

Yakima Nation Fisheries

Prepared by:

Inter-Fluve, Inc.

LEGEND

- TEMPORARY CONSTRUCTION ACCESS
- LIMITS OF DISTURBANCE
- PROPERTY BOUNDARY, PER CHELAN CO GIS
- OHW — ORDINARY HIGH WATER
- FENCE LINE, APPROX LOCATION
- PREVIOUSLY CONSTRUCTED ENGINEERED LOG STRUCTURE
- 1 — PHOTO POINT

0 50 100

SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

DRAWN	DESIGNED	CHECKED
NS	DM	DM
APPROVED	DATE	PROJECT
DM	10/4/17	14-02-43 WO3

CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION
ENTIAT 3D LWM REVISITED
MONITORING PLAN

501 Portway Avenue, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PHOTO POINT LOCATIONS

SHEET 1 OF 1

Entiat River – Upper Stillwaters Habitat Enhancement Project

Monitoring Plan

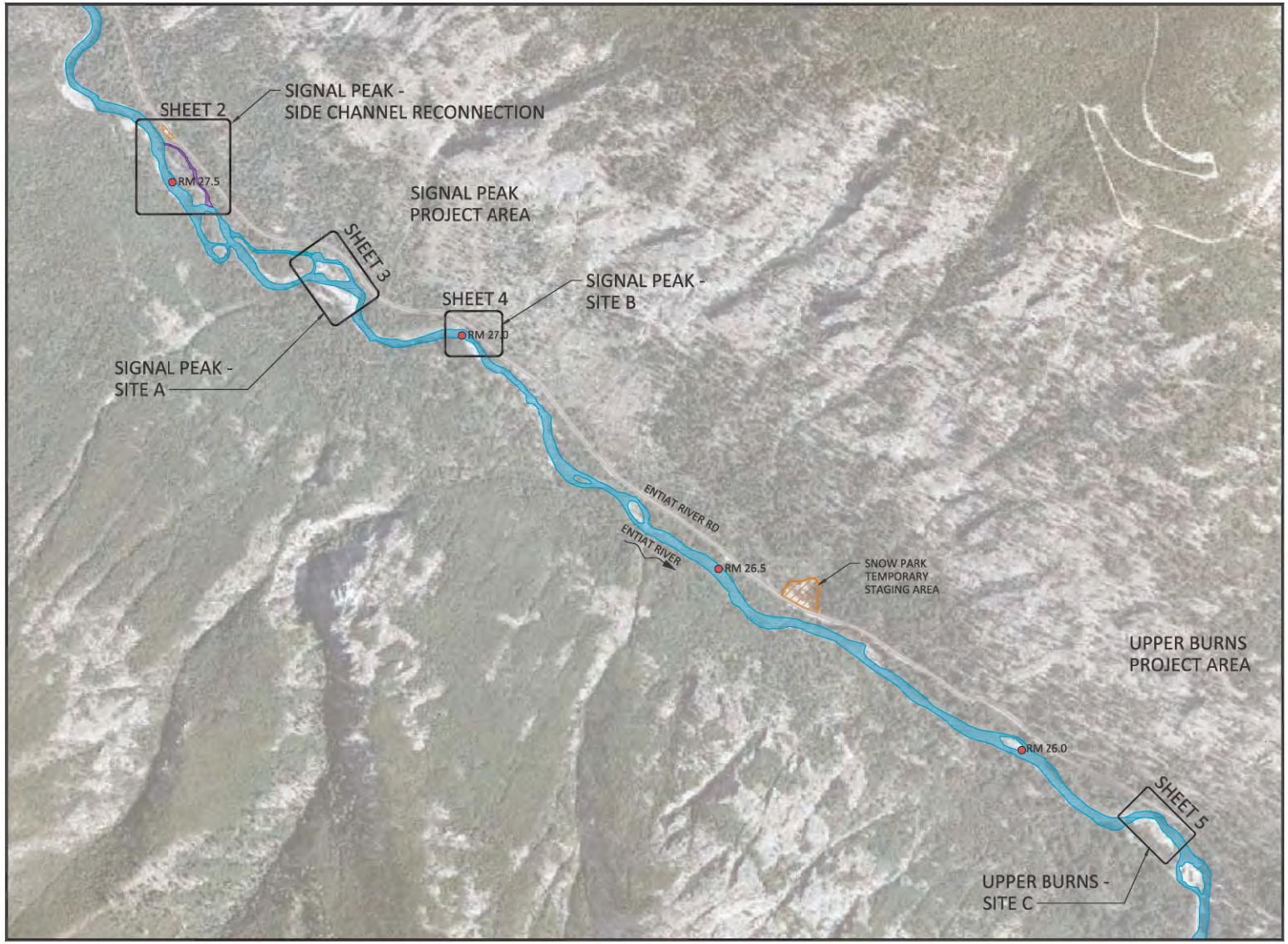
October 2017

Prepared for:

Yakima Nation Fisheries

Prepared by:

Inter-Fluve, Inc.



PLAN VIEW

0 800 1600

SCALE IN FEET

LEGEND

- RM 26.5 — RIVER MILE MARKER
- EXISTING ENTIAT RIVER CHANNEL
- PROPOSED ENTIAT SIDE CHANNEL
- TEMPORARY CONSTRUCTION STAGING

NO.	BY	DATE	REVISION DESCRIPTION

NS DRAWN	GJ, DM, LH DESIGNED	GJ,DM CHECKED
DM APPROVED	10/5/17 DATE	140205 PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
MONITORING PLAN

interfluve
501 Portway Avenue, Suite 101
Hood River, OR 97031
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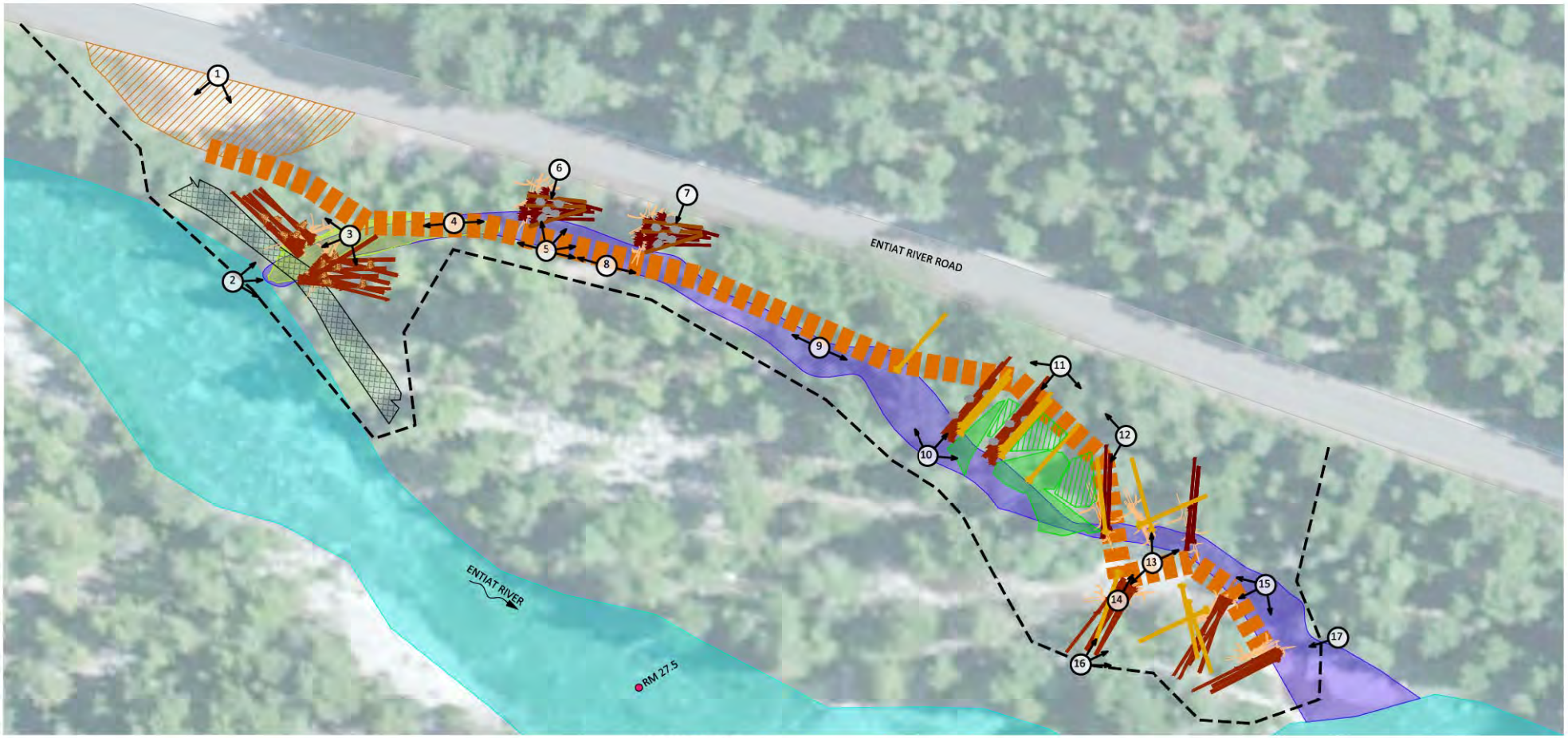
SITE OVERVIEW AND
SHEET KEY

SHEET
1 OF 5



PLAN VIEW

LEGEND

- 27.5 — RIVER MILE MARKER
- LIMITS OF DISTRUBANCE
- ENTIAT RIVER CHANNEL
- ENTIAT RIVER SIDE CHANNEL
- SIDE CHANNEL EXCAVATION AREA
- EXISTING WETLAND
- WETLAND CREATION AREA
- REMOVED LEVEE
- TEMPORARY CONSTRUCTION STAGING AREA
- TEMPORARY CONSTRUCTION ACCESS
- SLASH
- TYPE 1 LARGE WOOD STRUCTURE
- TYPE 2 LARGE WOOD STRUCTURE
- TYPE 4 LARGE WOOD STRUCTURE
- AND — SINGLE LOG PLACEMENT
- 1 — PHOTO POINT

0 50 100
SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

NS	GJ, DM, LH	GJ,DM
DRAWN	DESIGNED	CHECKED
DM	10/5/17	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
MONITORING PLAN

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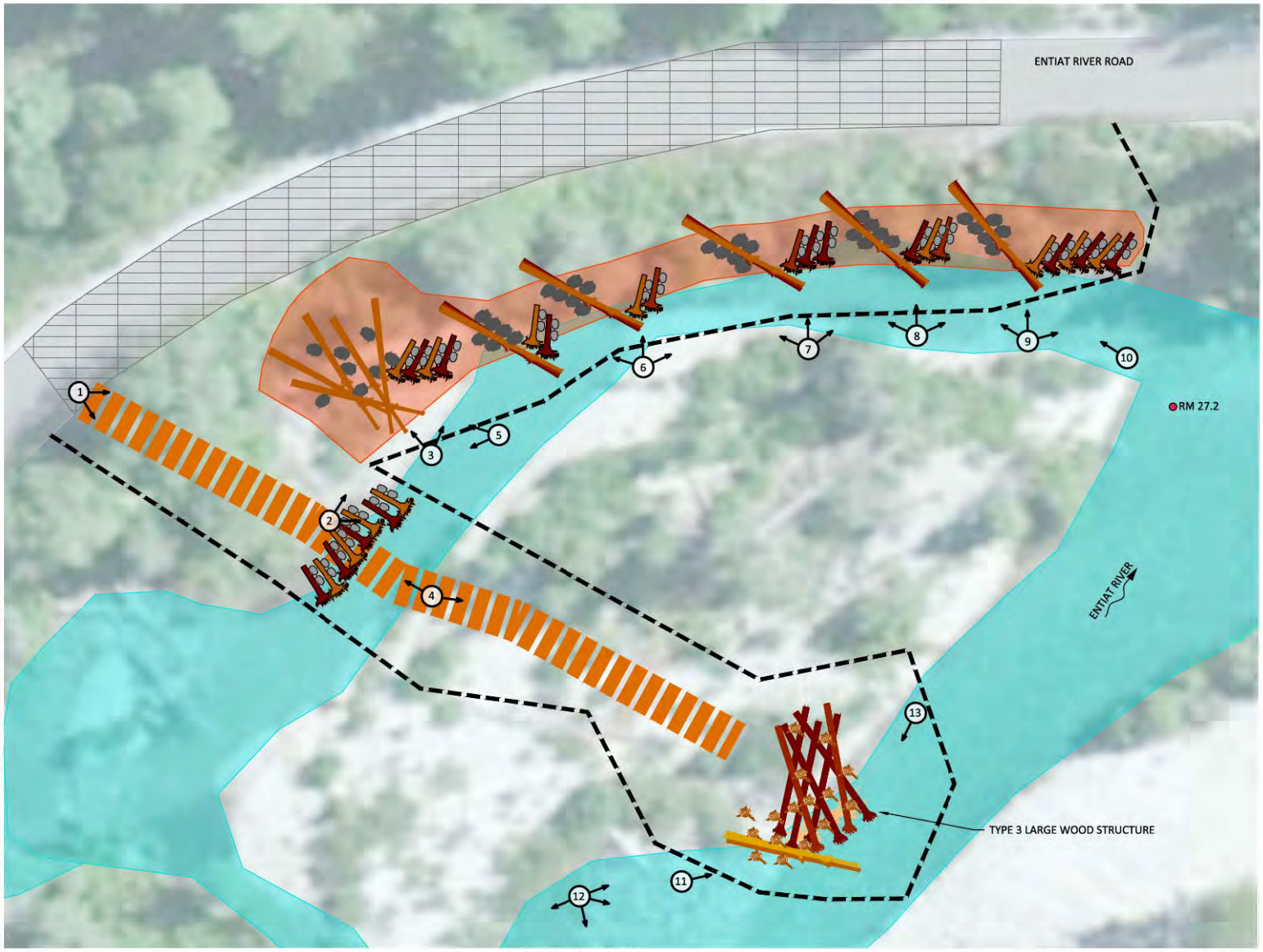
SIGNAL PEAK SIDE CHANNEL
PHOTO POINTS

SHEET 2 OF 5



PLAN VIEW

0 30 60

SCALE IN FEET

LEGEND

- RM 27.2 — RIVER MILE MARKER
- LIMITS OF DISTURBANCE
- ENTIAT RIVER CHANNEL
- LARGE WOOD RIPRAP ENHANCEMENT AREA
- TEMPORARY CONSTRUCTION ACCESS
- APPROX PAVEMENT REPAIR AREA
- SLASH
- RIPRAP ENHANCEMENT WOOD
- BUMPER LOGS
- 1 — PHOTO POINT

NO.	BY	DATE	REVISION DESCRIPTION

NS	GJ, DM, LH	GJ,DM
DRAWN	DESIGNED	CHECKED
DM	10/5/17	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
MONITORING PLAN

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Hood River, OR 97031
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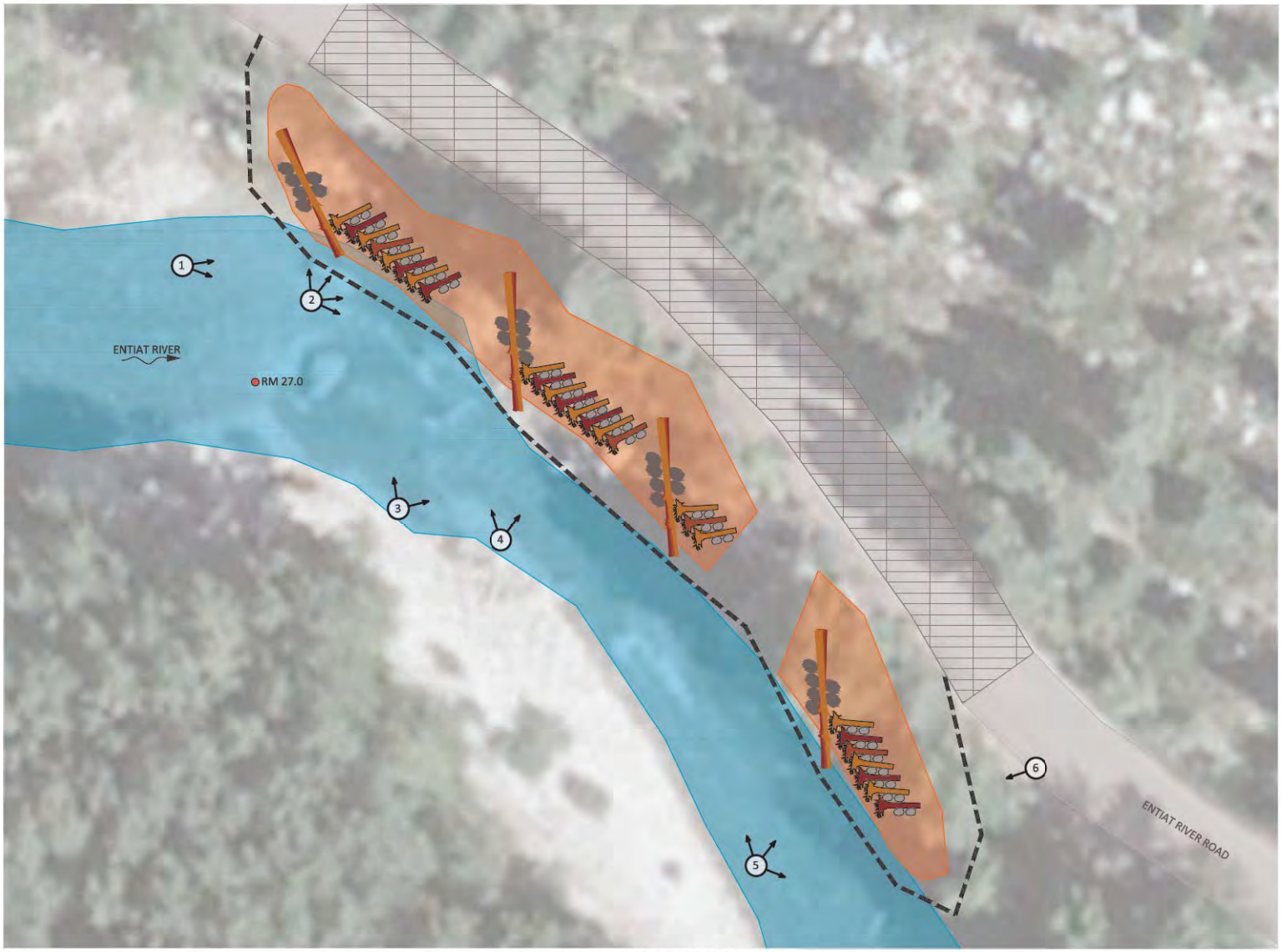
SIGNAL PEAK SITE A
PHOTO POINTS

SHEET 3 OF 5



PLAN VIEW

0 30 60

SCALE IN FEET

LEGEND

- RM 27.0 — RIVER MILE MARKER
- LIMITS OF DISTURBANCE
- ENTIAT RIVER CHANNEL
- LARGE WOOD RIPRAP ENHANCEMENT AREA
- APPROX PAVEMENT REPAIR AREA
- RIPRAP ENHANCEMENT WOOD
- BUMPER LOGS
- 1 — PHOTO POINT

NO.	BY	DATE	REVISION DESCRIPTION

NS	GJ, DM, LH	GJ,DM
DRAWN	DESIGNED	CHECKED
DM	10/5/17	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
MONITORING PLAN

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Hood River, OR 97031
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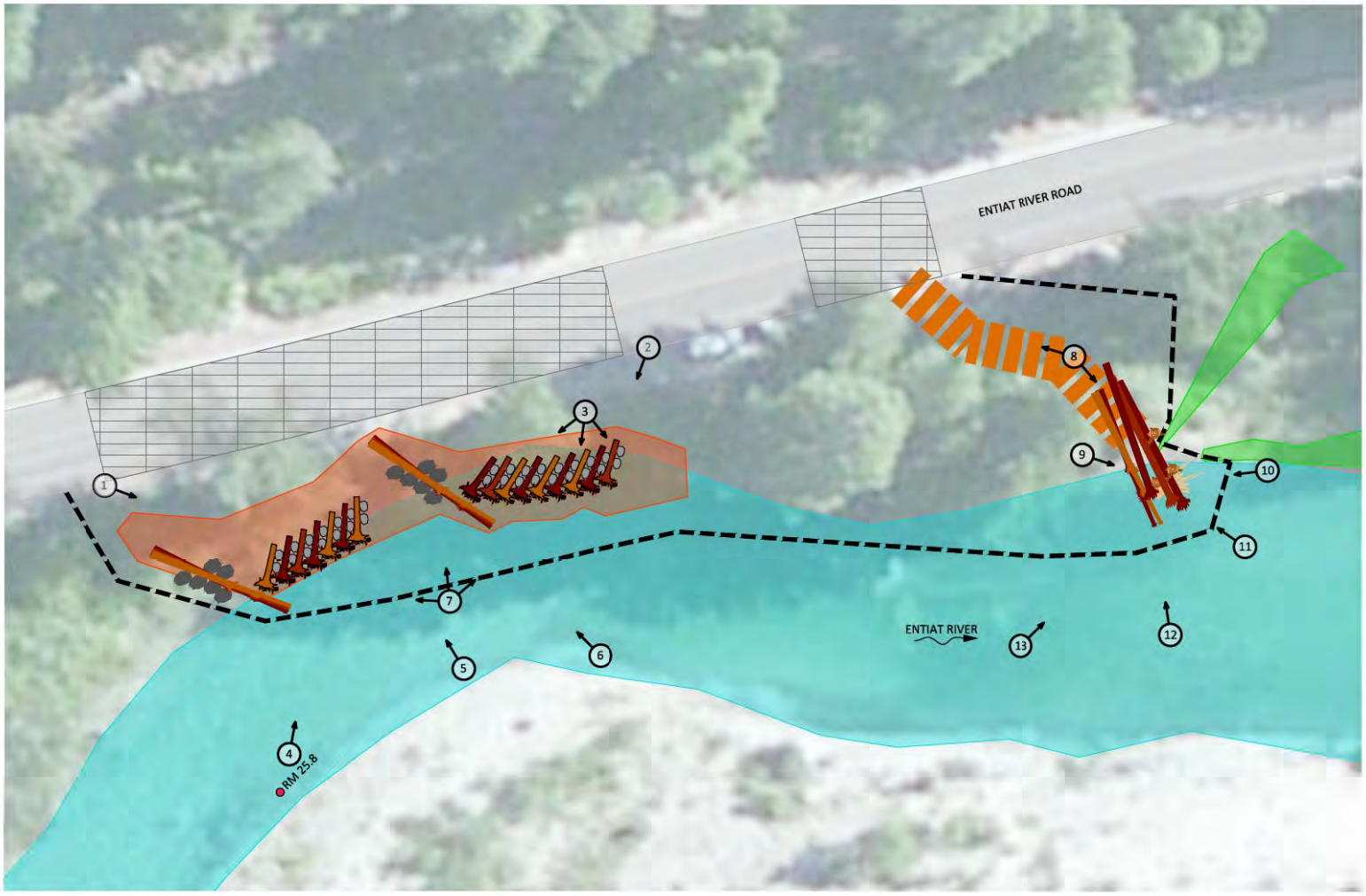
SIGNAL PEAK SITE B
PHOTO POINTS

SHEET 4 OF 5



0 30 60

SCALE IN FEET

LEGEND

- RM 25.8 — RIVER MILE MARKER
- LIMITS OF DISTURBANCE
- ENTIAT RIVER CHANNEL
- LARGE WOOD RIPRAP ENHANCEMENT
- EXISTING WETLANDS
- TEMPORARY CONSTRUCTION ACCESS
- APPROX PAVEMENT REPAIR AREA
- SLASH
- RIPRAP ENHANCEMENT WOOD
- BUMPER LOGS
- TYPE 3 LARGE WOOD STRUCTURE
- 1 — PHOTO POINT

PLAN VIEW

NO.	BY	DATE	REVISION DESCRIPTION

NS	GJ, DM, LH	GJ,DM
DRAWN	DESIGNED	CHECKED
DM	10/5/17	140205
APPROVED	DATE	PROJECT

YAKAMA NATION FISHERIES
ENTIAT UPPER STILLWATERS
MONITORING PLAN

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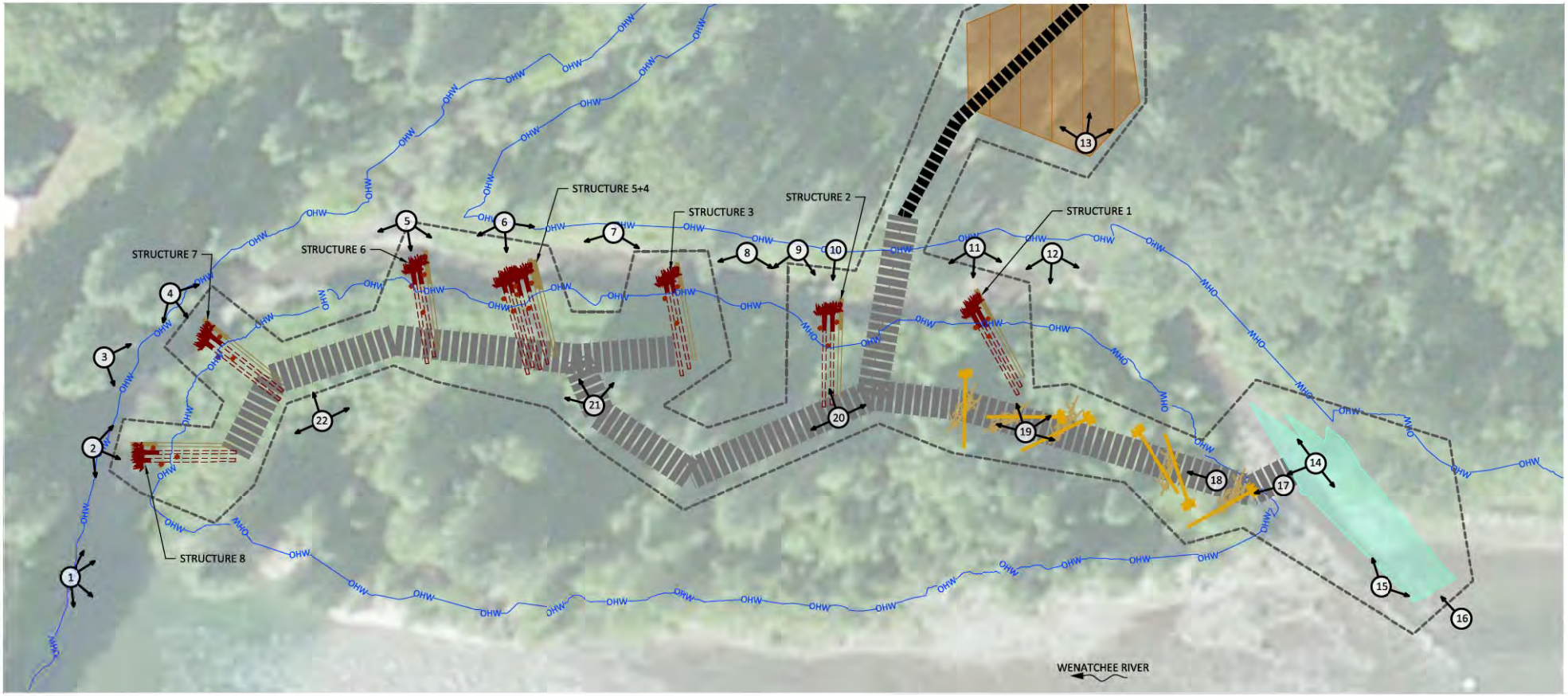
UPPER BURNS SITE C
PHOTO POINTS

SHEET 5 OF 5



LEGEND

- TEMPORARY CONSTRUCTION ACCESS
- TRAIL
- ORDINARY HIGH WATER
- LIMITS OF DISTURBANCE
- TEMPORARY CONSTRUCTION STAGING AREA
- SIDE CHANNEL INLET EXCAVATION AREA
- HABITAT ENHANCEMENT LARGE WOOD
- FLOODPLAIN ROUGHNESS WOOD
- PHOTO POINT

0 40 80
SCALE IN FEET

NO.	BY	DATE	REVISION DESCRIPTION

NS	DM, LH	DM
DRAWN	DESIGNED	CHECKED
DM	10/4/17	150218
APPROVED	DATE	PROJECT

CONFEDERATED TRIBES AND BANDS OF YAKAMA NATION
UPPER WENATCHEE RIVER, MEACHAM FLATS
MONITORING PLAN

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Hood River, OR 97031
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PHOTO POINT LOCATIONS

SHEET 1 OF 1

G:\W_P\PostImplementationMonitoring_2016_160248\Drawings\Fig1_Meacham_Monitoring.dwg — nsmith — 10/4/17