Contact Information

2025 Upper Columbia Regional Project Pre-Application

* Pre-applications (SRFB & Monitoring) due March 12, 2025 (COB)

*Complete SRFB applications due in PRISM April 18, 2025 (COB)

*Complete Monitoring applications due in PRISM May 1, 2025 (COB)

*Revised SRFB proposals due in PRISM May 27, 2025 (COB)

*Final revised SRFB & Monitoring applications due in PRISM June 23, 2025 (noon)

Project Title	Wenatchee Entiat Beaver Project Low-Tech Restoration and Beaver Habitat Protection
Sponsor	Trout Unlimited
Primary Contact	Lisa Foster
E-Mail Address	lisa.foster@tu.org

Project Summary

Please provide a description or summary of the proposed project, including project goals. The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired future condition.

Trout Unlimited (TU) will use Beaver-Powered Restoration to restore approx. 11.5-20.5 mi of streams in the Upper Columbia using beaver coexistence & Low-Tech Process-Based Restoration (LTPBR) techniques. TU will use LTPBR techniques to restore approximately 0.5 miles of high priority stream reaches with prior approval from the RTT. Tillicum Creek, Indian Creek, & Brush Creek rank highly in our models, but if concerns about brook trout or other factors indicate that efforts should be shifted to other streams, TU can use the model to identify other work sites.

TU will work with local landowners on coexistence measures to allow beavers & habitat they create to remain in place on 20 properties in Chelan & Douglas Cty watersheds. Habitat restoration & protection activities will maintain & increase quality pool habitat, arboreal shading, & water quality for salmonids in Upper Columbia watersheds. Using LTPBR techniques, TU will address habitat quality issues by increasing the density & spatial scale of structural elements in the target stream systems, improving conditions for riparian vegetation, & aggrading stream beds to correct incision. Re-establishment of historic stream complexity will jump start natural processes to transition at least 2 stream reaches & 20 coexistence sites to a network of stable, connected habitats with thriving native vegetation & beavers, with increased resilience to disturbance, improved water retention, & enhanced capacity to support fish & wildlife populations.

Salmon- and steelhead-bearing stream habitat conditions in the Wenatchee and Entiat watersheds have been degraded by clear cut logging, road construction, over-grazing, stand replacing wildfire, and removal of beaver populations. Beavers were systematically extirpated from most of the United States during the 1800s and today are commonly perceived as a nuisance animal when their activities come into conflict with human land uses, often resulting in removal by lethal measures. Loss of beaver from regional watersheds reduces salmonid habitat capacity and productivity and diminishes the resilience of human communities with respect to flooding, drought, wildfire, and other natural phenomena that impact economies and ways of life. In all project sites, these impacts have resulted in degraded habitat with few pools, decreased complexity, and disconnected floodplains.

Using LTPBR techniques, Trout Unlimited and partners will address these habitat quality issues by increasing the density and spatial scale of the structural elements in the target stream systems, improving conditions for development of riparian vegetation, and aggrading stream beds to correct incision. Re-establishment of characteristic historic stream complexity will jump start natural processes to transition stream systems to improved ecological conditions with increased resilience to disturbance.

Beavers create, maintain, and improve habitat that supports survival, capacity and/or distribution of salmonid species by creating ponds that store cool water, create rearing habitat, aggrade incised streams, reconnect floodplains, and lower downstream turbidity. Trout Unlimited will protect and improve existing good quality salmonid habitat in streams throughout the Upper Columbia Watershed by working with landowners and public agencies to keep beavers in place using a variety of coexistence methods.

Desired future conditions will consist of two stream reaches and 20 coexistence sites with a network of stable, connected habitats with thriving native vegetation and beavers, improved water retention, and enhanced capacity to support fish and wildlife populations.

What are the project objectives? Objectives support and refine biological goals, breaking them down into small steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). Note: This exact question is included in the PRISM application. Example format: The project seeks to address [specify limiting factor(s)] for [limiting life stage(s)] by [specific actions proposed] to create an estimated [include specific target metrics, as described below] upon implementation in [estimated year].

The project seeks to address in-stream habitat, riparian habitat, and temperature limiting factors for all life stages of steelhead, bull trout, and spring chinook, with a focus on rearing habitat by focusing on the following objectives:

Reconnect floodplains and improve riparian habitat across 0.5 miles of stream using LTPBR techniques.

Maintain and improve riparian habitat across 10-20 miles of stream by working with land managers to keep beavers in place

Monitor and maintain installed in-stream structures and coexistence structures throughout the life of the project

Implementation of the first LTPBR project will take place in 2026 and the second will take place in 2027. Beaver Coexistence work will take place throughout the performance period.

Budget Request

Values MAY be duplicative and do not have to equal TOTAL anticipated budget in pre-application.

Anticipated Request - SRFB (standard round)	349,901
Anticipated Request - SRFB Riparian Funding	349,901

Anticipated TOTAL Budget

349,901

Project Location

Briefly describe the location of the project

TU is interested in identifying LTPBR project sites throughout the course of the agreement that the RTT agrees will have the highest benefit for native fish, especially relative to brook trout. Beaver Coexistence work will take place in rivers and streams throughout Chelan and Douglas Counties. Latitude and longitude provided below are for the TU base of operations at the Leavenworth National Fish Hatchery

Latitude (decimal degrees)

47.557828

Longitude (decimal degrees)

-120.675780

Project subbasin

Multiple Subbasins

Please explain why there are multiple subbasins

TU is interested in identifying LTPBR project sites throughout the course of the agreement that the RTT agrees will have the highest benefit for native fish, especially relative to brook trout. Coexistence work will take place throughout the Wenatchee and Entiat subbasins and small tributaries to the Columbia in Douglas County.

Does the proposed project span multiple assessment units?

Yes

List the additional assessment units directly impacted by this proposal.

LTPBR work may take place within the Tillicum Creek and Lower Chiwawa River Assessment Units. Coexistence work will take place in multiple assessment units which will be identified as landowners call with beaver complaints.

Reach(es) Name

LTPBR work may take place on Tillicum Creek 02, Tillicum Creek 03, and Indian Creek 01. Coexistence work will take place in multiple assessment units which will be identified as landowners call with beaver complaints.

Identify the reach(es) priority/ reach ranking. Note: If the project involves work in multiple reaches, select "Multiple" and include details in the text box that will appear below. Please reference the Prioritization Web Map: https://prioritization.ucsrb.org/.

Multiple reaches (provide details below)

Please detail the reach-ranking of the reaches below

Tillicum Creek 02, Tillicum Creek 03, and Indian Creek 01 are all unranked.

Project Information

1. What species will the project benefit?

Spring Chinook | Steelhead | Bull Trout

2. Select the project's objectives and the associated tracking metrics

Instream Habitat (Includes Floodplain & Off-Channel

	Reconnection)
	Riparian Habitat
Instream Habitat: Reporting Code	Total miles of instream habitat treated
	Number of beavers
	Number of structures placed in channel
	Pools created through channel structure placement
Riparian Habitat: Reporting Code	Total riparian miles streambank treated
4. Does this project already exist in Salmon Recovery Portal or PRISM?	No
5. Has this project been submitted previously for funding through the SRFB and/or other process(es)?	No
6. What category is the project?	Restoration
If applicable, what is the secondary project category?	N/A
Is the project eligible for Riparian Funding?	Yes

Design and Restoration Proposals

7. What project phase(s) are proposed for completion?	Construction
8. Is your project within a completed (or soon-to-be completed) Reach Assessment or other type of assessment (e.g., Rapid Site Assessment, other)?	Unknown
9. Which limiting factors does the project propose to address?	Cover - Wood
	Flow - Summer Base Flow
	Off-Channel - Floodplain
	Pool Quantity & Quality
	Pools - Deep Pools
	Riparian
	Riparian - Canopy Cover
	Riparian - Structure
	Temperature - Adult Holding
	Temperature - Rearing

10. Which life stages will the proposed project address?

Natal Rearing (Bull Trout)

Subadult Rearing (Bull Trout) | Fry

Summer Rearing | Winter Rearing

11. Freshwater Benefits - Describe how your project will improve survival, capacity and/or distribution for target species at the reach scale?

This project will create new and protect and enhance existing pool habitat for rearing salmonids, create cold water refugia, increase invertebrate habitat, increase fry habitat, increase wood loading, and increase canopy cover in and around LTPBR project sites and beaver complexes. The project will also decrease downstream turbidity at these sites. Additionally, the project will address reduced base flow conditions and reconnect floodplains by impounding water and raising water tables. These actions will also increase canopy cover, decreasing stream temperatures by making water more available to riparian trees.

12. Temporal Effect - Briefly describe how and to what extent the project would promote natural stream/watershed process consistent with the geomorphology of the stream?

The project will decrease incision, reconnect floodplains, raise water tables, and increase wood loading across 22 sites. The project will also protect naturally occurring beaver colonies and beaver dam complexes which provide numerous benefits including restoring hydrological, geomorphic, ecological, and biological processes.

13. Temporal Effect - How long will it take for the project to achieve its intended response?

1-10 years

14. Temporal Effect - How long will the restoration action and its benefits persist?

10-50 years

15. Temporal Effect - What level and/or interval of maintenance is anticipated? What is the plan for any anticipated maintenance?

LTPBR projects will be maintained once per year for 5 years after implementation. Land managers with beaver will be contacted periodically to assess any coexistence needs and any coexistence devices will be maintained in cooperation with the land manager. In some cases, the land manager will handle maintenance and TU may assist periodically as needed.

16. Methods - Briefly describe the potential (for design) or proposed restoration methods and how they will achieve project objectives.

Install LTPBR structures to restore 0.5 miles of stream across 2 different streams. Work with landowners on 20 different sites to keep existing beaver colonies in place.

The project involves installation of beaver dam analogs and channel structure placement, as well as beaver coexistence, including but not limited to unanchored log placement, post-assisted log structures, and large woody materials. The project reaches in question have incised channels, disconnected floodplains, and low summer base flows. LTPBR structures can be installed and beaver can be maintained in place to correct these deficits by kicking off processes that support channel aggradation and floodplain reconnection, supporting riparian vegetation and decreasing stream temperatures by making water more available to riparian trees.

17. If the project is eligible and applying for Riparian Funding, does the project have in-stream components? If so, briefly describe those components, how they support riparian plant survival and/or natural regeneration, and why they are necessary for the success of the riparian habitat elements of the project.

Yes. The project involves installation of beaver dam analogs and channel structure placement, as well as

beaver coexistence, including but not limited to unanchored log placement, post-assisted log structures, and large woody materials. LTPBR structures can be installed and beaver can be maintained in place to correct these deficits by kicking off processes that support channel aggradation and floodplain reconnection, supporting riparian vegetation and decreasing stream temperatures by making water more available to riparian trees.

Assessment Proposals

Protection Proposals

Monitoring Proposals

Project Risk and Economic Benefits

1. What is the landownership?

Low-tech process-based restoration activities will occur on United States Forest Service owned land. TU has current agreements with the Forest Service that authorize LTPBR and beaver coexistence projects. Coexistence work will be conducted on private and public land on an as-needed basis and WDFW Landowner Attestation Forms will be signed.

2. Have you secured landowner participation in or acceptance for this project?

Yes

Please explain

TU operates on a Memorandum of Understanding with USFS and collaborates with them on all project planning. Coexistence work will be conducted on private and public land on an as-needed basis with interested landowners seeking TU out. On average, TU currently works with 10 landowners per year on beaver coexistence.

3. Describe any land owner requirements (e.g., design elements, right-of-ways, access agreements, liability waivers, etc.) and if/how they could affect the project

All LTPBR projects will take place in accordance with an existing Memorandum Of Understanding between Trout Unlimited and USFS. Project permitting and implementation is subject to USFS review and approval.

4. Will the project raise potential concerns for interest groups (e.g., recreational users) or the community at large (including upstream/ downstream/ adjacent landowners)?

LTPBR projects are designed, planned, and implemented in communication with USFS. Infrastructure such as roads and culverts are taken into account and appropriate setbacks are observed.
Trout Unlimited provides valuable assistance to local landowners and land managers facing challenges with beavers, including falling orchard trees, causing flooding, damming culverts, and seeks coexistence solutions so that beaver can remain on sites where they provide valuable stream and habitat benefits while mitigating challenges.

5. Who will have the responsibility to manage and maintain the project? What is the responsibility of current or future landowners?

TU will maintain all LTPBR projects. TU will work with land owners and managers to maintain any coexistence measures installed. Either the land owners/managers will maintain structures or TU will complete maintenance as needed.

6. Are other projects being proposed immediately upstream or downstream of worksite?

Yes

7. Please describe the risk of failure associated with this project.

LTPBR projects are designed to use natural stream processes to restore degraded conditions. Structures are installed in cohesive groupings and designed to work together. Any individual structure may blow out or may not impound water as expected. Even so, all structures add material to the stream and increase habitat complexity. The idea is to allow the stream system to make as many decisions as possible. If any one structure fails, it can be repaired at a relatively low cost, and other structures in the system can compensate for any loss in water storage and aggradation.

Beaver coexistence work is contingent on willing landowners. TU has a history of positive collaboration with landowners. Coexistence with beavers is a never-ending process that requires regular adaptive management in most cases. If coexistence is not an option, TU also operates a beaver relocation program. Beavers that must be removed because coexistence solutions cannot be found can be live-trapped and released in different streams where they can have positive habitat benefits.

8. Is there any public outreach planned during and/or after implementation? Does the project build community support for salmon recovery efforts?

For LTPBR projects, TU often works with community volunteers. TU also provides photos of and narratives about completed work to our regional communication team. The communications team writes blogs and social media posts about TU projects which are seen by a national audience.

TU regularly attends community events in Chelan and Douglas Counties to tell the community about important salmon recovery work and educate community members about beaver coexistence as well as the link between beavers and salmon recovery.

Beaver coexistence work requires a constant interface with local communities and working one on one with local landowners. Phone calls and site visits provide ample opportunity to educate community members about beaver coexistence and the importance of beavers on the landscape. Landowners are often eager to engage neighbors who are having conflicts with beavers, thus expanding the program's reach. This outreach and interest in beavers more generally provides opportunities to discuss the interrelated nature of beaver coexistence and salmon recovery with a diverse array of community members.

9. Does the project represent an opportunity for economic benefit? How much benefit does the project create for the dollars invested?

This project represents multiple opportunities for economic benefit. Implementation of LTPBR projects requires materials, including wooden posts purchased from local vendors and weave material which is often sourced from forest thinning projects carried out by local contractors. TU also often hires local contractors to carry out post-project maintenance.

TU provides a free service to landowners such as farmers facing costly infrastructure and agricultural damage from beavers on their property. TU is able to work with them to provide solutions which allow beavers to stay on site without causing damage to infrastructure and crops.

Trout Unlimited provides valuable assistance to local landowners and land managers facing challenges with beavers. TU works with landowners and managers to provide free coexistence services. Landowners or managers typically call TU to address beaver impacts like falling orchard trees, flooding, or damming culverts, among other impacts, potentially causing expensive damage. TU works to find coexistence solutions that allow beavers to remain onsite where they can continue providing ecosystem benefits. As such, this project turns a potential economic burden into a positive force for salmon habitat restoration.

10. Describe any partnerships, their experience, and types of contributions supporting the project.

TU is part of the Coordinated Resource Management (CRM) group. CRM partners collaborate to leverage their unique resources, expertise, and opportunities in pursuit of shared missions and values, with a focus on salmon recovery in and around Chelan County. This formal partnership allows TU to work with Cascadia Conservation District and Cascade Fisheries to complete LTPBR implementation. CRM crews will assist with on-site implementation.

TU works collaboratively with USFS to plan and authorize LTPBR implementation. USFS often provides technicians to assist with implementation.

Beaver coexistence is a requirement of the WDFW Beaver Relocation Program. TU is required to seek coexistence solutions prior to pursuing beaver relocation. WDFW, along with partners such as Methow Beaver Project, Beavers Northwest, and The Beaver Institute provide TU technical assistance as needed regarding challenging coexistence scenarios.

Trout Unlimited is further strengthened by partnerships with various Federal and State agencies that collaborate on project development, design, planning, permitting, and implementation. These agencies include:

Federal

US Bureau of Reclamation

US Forest Service

US Fish and Wildlife Service

National Resources and Conservation Service

Bureau of Land Management

State

WA Department of Fish and Wildlife

WA State Conservation Commission

Department of Ecology

Department of Natural Resources

Optional Section - Preparation for PRISM (SRFB applications only)

The following questions are identical to the questions RCO requires in the PRISM application for SRFB projects. If desired, sponsors can complete associated questions early and copy responses into PRISM during the "Complete Application" phase due on April 18, 2025.
*please note, this section is not applicable for Monitoring proposals

Do you want to review and/or pre-populate PRISM questions?	No

Supporting Documents

Upper Columbia Process Guide 2025

SRFB Manual 18 (2025)

RCO Application Resources (2025)

PROJECT: 25-1228 REST, WENATCHEE ENTIAT BEAVER PROJECT LOW-TECH RESTORATI

Sponsor: Trout Unlimited Inc. Program: Salmon State Riparian Status: Application Submitted

Parties to the Agreement

PRIMARY SPONSOR

Trout Unlimited Inc.
Address 1700 N Moore Street, Suite 2005
City Arlington **State** VA **Zip** 22209
Org Type Non-Gov-Nonprofit
Vendor # SWV0050369-00
UBI 601215617
Date Org created
Org Notes

link to Organization profile
✓Org data updated (by Amee Bahr 04/10/2025)

QUESTIONS - PRIMARY SPONSOR

#1: What date was your organization created?

1959

#2: Is your organization registered as a non-profit with the Washington Secretary of State?

Yes

#2a: Please confirm the Unified Business Identifier (UBI) shown above is correct or provide if blank.

602 988 374

#3: How long has your organization been involved in salmon and habitat conservation?

>30 years

#4: Do your organizational documents (charter, bylaws, or articles of incorporation) include the authority for the protection or enhancement of natural resources or related activities?

Yes

Yes, Trout Unlimited's mission to bring together diverse interests to care for and recover rivers and streams so our children can experience the joy of wild and native trout and salmon

#5: Do your organizational documents (charter, bylaws, or articles of incorporation) provide for an equivalent successor organization in case the nonprofit dissolves?

Yes

Yes, Trout Unlimited's Bylaws state: Upon the dissolution of the Corporation or the winding up of its affairs, the assets of the Corporation remaining after payment, or provision for payment, of all debts and liabilities shall be distributed exclusively to one or more charitable, religious, scientific, testing for public safety, literary, or educational organizations

SECONDARY SPONSORS

No records to display

MANAGING AGENCY

Recreation and Conservation Office

LEAD ENTITY

Upper Columbia Salmon Rcy Bd L

QUESTIONS

#1: List project partners and their role and contribution to the project.

This list of partners provides technical expertise, time, space, feedback, permits, and labor support.
United States Forest Service
United States Fish and Wildlife Service
Washington Department of Fish and Wildlife
Cascadia Conservation District
Cascade Fisheries
The Beaver Institute
Washington State Beaver Working Group
Methow-Okanogan Beaver Project - Methow Salmon Recovery Foundation
Beavers Northwest

External Systems

SPONSOR ASSIGNED INFO

Sponsor-Assigned Project Number

Sponsor-Assigned Regions

LINK AN EXISTING SRP PROJECT

Unlink

25-1228, Wenatchee Entiat Beaver Project Low-Tech Res

Project Contacts

Contact Name Primary Org	Project Role	Work Phone	Work Email
Amee Bahr Rec. and Conserv. Office	Project Manager	(360) 867-8585	Amee.Bahr@rco.wa.gov
Lisa Foster Trout Unlimited Inc.	Project Contact	(509) 888-0970	lisa.foster@tu.org
Ryan Lefler Trout Unlimited Inc.	Alt Project Contact		ryan.lefler@tu.org
Theo Burgoon Trout Unlimited-WA Water Proj	Alt Project Contact	(509) 630-6858	theo.burgoon@tu.org
Ariel Edwards Upper Columbia Salmon Rcy Bd L	Lead Entity Contact	(208) 540-2691	ariel.edwards@ucsrb.org

Worksites & Properties

#	Worksite Name
#1	Indian Creek

Restoration	Property Name
✓	US Forest Service Indian Creek

#2 Tillicum Creek

Restoration	Property Name
✓	US Forest Service Tillicum Creek

#3 Beaver Coexistence sites

Restoration	Property Name
✓	Icicle Creek

Worksite Map & Description

Worksite #1: Indian Creek

WORKSITE ADDRESS

Street Address

City, State, Zip

Worksite #2: Tillicum Creek

WORKSITE ADDRESS

Street Address

City, State, Zip

Worksite #3: Beaver Coexistence sites

WORKSITE ADDRESS

Street Address 12790 Fish Hatchery Rd

City, State, Zip Leavenworth WA 98826

Worksite Details

Worksite #1: Indian Creek

SITE ACCESS DIRECTIONS

47.74017, -120.45317
From Highway 97A, drive west on Entiat River Rd for 15 miles. Turn left on NF-5800 and drive 14 miles. Turn right on NF-5808-410

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Steelhead-Upper Columbia River, Entiat River, Threatened			✓	Declining

Reference or source used

SWIFD, UCSRB spawning redds by year, UCSRB Prioritization map, NOAA 2022 status review

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Cutthroat	
Rainbow	

Questions

#1: Give street address or road name and mile post for this worksite if available.

USFS road 5808-410

Worksite #2: Tillicum Creek

SITE ACCESS DIRECTIONS

47.72962, -120.43235
From Highway 97A, drive west on Entiat River Rd for 15 miles. Turn left on NF-5800 and drive 14 miles.

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Chinook-Upper Columbia River Spring, Entiat River, Endangered		✓	✓	Declining
Steelhead-Upper Columbia River, Entiat River, Threatened	✓	✓	✓	Declining

Reference or source used

SWIFD, UCSRB spawning redds by year, UCSRB Prioritization map, NOAA 2022 status review, USFWS - Tracy Bowerman

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Cutthroat	
Rainbow	
Bull Trout	FMO (foraging/migration/overwintering). No known rearing at present, although spawning was documented historically.

Questions

#1: Give street address or road name and mile post for this worksite if available.

USFS road 5800

Worksite #3: Beaver Coexistence sites

SITE ACCESS DIRECTIONS

Coexistence sites will be identified as landowner calls come in over the course of the agreement. The identified work site is one for which we currently have active coexistence work which may result in project work if funded.

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Chinook-Upper Columbia River Spring, Wenatchee River, Endangered		✓	✓	Declining
Steelhead-Upper Columbia River, Wenatchee River, Threatened		✓	✓	Declining
Chinook-Upper Columbia River Summer/Fall, Not Warranted	✓	✓	✓	Declining

Reference or source used

SWIFD, UCSRB prioritization map, NOAA 2022 status review

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Bull Trout	
Rainbow	

Questions

#1: Give street address or road name and mile post for this worksite if available.

Icicle Road, near Snow Creek Trailhead
Coexistence sites will be identified as landowner calls come in over the course of the agreement. The identified work site is one for which we currently have active coexistence work which may result in project work if funded.

Project Location

RELATED PROJECTS

Project Application Report - 25-1228

Projects in PRISM

PRISM Number	Project Name	Program Name	Current Status	Relationship Type	Notes
No related project selected					

Related Project Notes

Questions

#1: Project location. Describe the geographic location, water bodies or habitat types, and the location of the project in the watershed, i.e. nearshore, tributary, main-stem, off-channel, etc.

LTPBR sites will be selected in collaboration w/ RTT. Several high priority potential LTPBR sites were identified through analysis considering beaver habitat suitability (stream gradient, vegetation, Beaver Restoration Assessment Tool (BRAT)), fisheries restoration potential (current distribution, intrinsic potential), feasibility (land ownership, road access, permitting constraints) & field verification. Below are the top2 identified LTPBR sites:
1.Tillicum Ck
2.Indian Ck
Tillicum & Indian Creeks have been identified as potential project sites, but TU is interested in identifying project sites throughout the course of the agreement that have the highest benefit for native fish. Tillicum Creek (Reaches 2 & 3) is a tributary to the Mad River. Indian Creek (River miles 1 & 2) is a tributary to Tillicum Creek.
Beaver Coexistence locations will be identified as landowner calls come in throughout the course of the agreement, mostly on private land & public rights-of-way where beaver exist.

#2: How does this project fit within your regional recovery plan and/or local lead entity's strategy to restore or protect salmonid habitat? Cite section and page number.

LTPBR activities address the "In- stream Structures" habitat action class (Upper Columbia Salmon Recovery Plan, Table 5.9, Page 235) which will increase pool formation, habitat diversity, and channel roughness, as well as slow water velocity and increase sediment retention.

Beaver coexistence supports long-term priority actions including "Protect and maintain stream and riparian habitats within Category 1 assessment units" (Upper Columbia Salmon Recovery Plan, Recovery Actions section, pages 208 and 211). "Encourage beaver re-population" is also listed as a potential habitat action under the Water Quantity Restoration and Large Woody Debris Restoration Habitat Action Classes (Upper Columbia Salmon Recovery Plan, Recovery Actions section, pages 238 and 241). Coexistence work supports this action by allowing the persistence of existing beaver populations to feed natural reintroduction into priority streams.
Restoration actions support this action by making those streams more favorable habitat for beaver colonization.

#3: Is this project part of a larger overall project?

Yes

#3a: How does this project fit into the sequencing of the larger project?

Beaver-powered restoration through beaver relocation & coexistence, & LTPBR techniques has been a priority TU effort in the Upper Columbia for the past 7 years. LTPBR activities on Indian & Tillicum Creeks are part of a collaborative effort between Coordinated Resource Management partners Cascade Fisheries & Cascadia Conservation District involving LTPBR projects, AOP barrier removal, & road decommissioning that will be implemented concurrently on these sites in coordination with the US Forest Service. This project is a component that supports adjacent projects by capturing sediment, increasing summer base flows & floodplain connectivity, & increasing off-channel/side-channel habitat & pool quantity & quality.
Beaver coexistence is an ongoing project that has been supporting landowners facing challenges coexisting with beavers since 2018. The Wenatchee-Entiat Beaver Project conducts outreach to landowners & community members and provides technical assistance & education.

#4: Is the project on State Owned Aquatic Lands? Please contact the Washington State Department of Natural Resources to make a determination. **Aquatic Districts and Managers**

No

Property Details

Property: US Forest Service Indian Creek (Worksite #1: Indian Creek)

✓ **Restoration**

LANDOWNER

Name	US Department of Agriculture Forest Serv
Address	101B Sun Ave NE - RACA
City	Albuquerque
State	NM Zip 87109
Type	Federal

CONTROL & TENURE

Instrument Type	Landowner Agreement
Timing	Existing
Term Length	Fixed # of years
# Yrs	2
Expiration Date	05/05/2027
Note	Intend to extend this agreement

Property: US Forest Service Tillicum Creek (Worksite #2: Tillicum Creek)

✓ **Restoration**

LANDOWNER

Name	US Department of Agriculture Forest Serv
Address	101B Sun Ave NE - RACA
City	Albuquerque
State	NM Zip 87109
Type	Federal

CONTROL & TENURE

Instrument Type	Landowner Agreement
Timing	Existing
Term Length	Fixed # of years
# Yrs	2
Expiration Date	05/05/2027
Note	Intend to extend this agreement

Property: Icicle Creek (Worksite #3: Beaver Coexistence sites)

✓ **Restoration**

LANDOWNER

Name	US Department of Agriculture Forest Serv
Address	101B Sun Ave NE - RACA
City	Albuquerque
State	NM Zip 87109
Type	Federal

CONTROL & TENURE

Instrument Type	Landowner Agreement
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# Yrs	2
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Project Proposal

Project Description

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TU will work with local landowners on coexistence measures to allow beavers & habitat they create to remain in place on 20 properties in Chelan & Douglas Cty watersheds. Habitat restoration & protection activities will maintain & increase quality pool habitat, arboreal shading, & water quality for salmonids in Upper Columbia watersheds. Using LTPBR techniques, TU will address habitat quality issues by increasing the density & spatial scale of structural elements in the target stream systems, improving conditions for riparian vegetation, & aggrading stream beds to correct incision. Re-establishment of historic stream complexity will jump start natural processes to transition at least 2 stream reaches & 20 coexistence sites to a network of stable, connected habitats with thriving native vegetation & beavers, with increased resilience to disturbance, improved water retention, & enhanced capacity to support fish & wildlife.

Project Questions

Project Application Report - 25-1228

#1: Problem statement. What are the problems your project seeks to address? Include the source and scale of each problem. Describe the site, reach, and watershed conditions. Describe how those conditions impact salmon populations. Include current and historic factors important to understand the problems.

Salmon- and steelhead-bearing stream habitat conditions in the Wenatchee and Entiat watersheds have been degraded by clear cut logging, road construction, over-grazing, stand replacing wildfire, and removal of beaver populations. Beavers were systematically extirpated from most of the United States during the 1800s and today are commonly perceived as a nuisance animal when their activities come into conflict with human land uses, often resulting in removal by lethal measures. Loss of beaver from regional watersheds reduces salmonid habitat capacity and productivity and diminishes the resilience of human communities with respect to flooding, drought, wildfire, and other natural phenomena that impact economies and ways of life. In all project sites, these impacts have resulted in degraded habitat with few pools, decreased complexity, and disconnected floodplains.
As a result of these factors, many streams in the Upper Columbia suffer degraded conditions, especially including disconnected floodplains, lack of wood cover, riparian canopy cover and structure, low summer baseflows, lack of off-channel, side channel, and pool habitat, and increased temperatures. Indian Creek has a 303(d) listing for temperature and is ranked Unacceptable for off-channel- side-channels and At Risk for summer base flow and floodplain connectivity. Reaches 1-4 in Tillicum Creek are ranked At Risk for large wood cover, At Risk for floodplain connectivity, Unacceptable for off-channel/side-channel habitat, and Unacceptable for pool quantity and quality according to the UCSRB Prioritization Web Map.
Elevated stream temperatures impact spawning and migration behaviors, potentially affect prey availability, and hold less dissolved oxygen than colder water, which can lead to respiratory stress and reduced growth rates. Cold water is crucial for salmon survival.
Off-channel and side-channel habitats, like floodplains and side channels, are crucial for salmon survival, particularly during the juvenile and overwintering stages. They provide refuge from high flows, offer foraging and rearing opportunities, and can even provide warmer water during the winter, supporting growth and metabolism.
Reduced summer base flow can lead to warmer water, lower water levels, and decreased habitat availability, negatively impacting salmon populations.
Disconnected floodplains decrease essential rearing habitat for juvenile salmon, limiting protection from predators, increasing competition for food, and impeding growth.
Lack of large wood cover in streams can negatively impact salmon by reducing the availability of shelter and rearing habitat, potentially increasing predation and decreasing survival rates, especially for juvenile fish. Large wood creates pools and provides cover, offering protection from predators and high flows, and also helps maintain water quality and sediment transport.
A lack of sufficient, high-quality pools in salmon habitats significantly impacts their survival, primarily affecting spawning, smolt migration, and overall water quality. Insufficient pools can reduce spawning success, hinder smolt migration, and lead to increased water temperatures and reduced dissolved oxygen, stressing salmon populations.

#2: Describe the limiting factors, and/or ecological concerns, and limiting life stages (by fish species) that your project expects to address.

The project seeks to address limiting factors including disconnected floodplains, lack of wood cover, riparian canopy cover and structure, low summer baseflows, lack of off-channel, side channel, and pool habitat, and increased water temperatures. LTPBR and beaver coexistence will address limiting factors by recruiting woody material increasing water availability to riparian plant species by reconnecting floodplains, creating pool and side channel habitat to increase summer baseflows, raising water tables, increasing groundwater infiltration, decreasing stream temperatures, and impounding sediment. All life stages, including egg development, juvenile rearing and holding, adult holding, spawning, and migration for Chinook and Steelhead will be impacted by both LTPBR and beaver coexistence activities.
Warmer water can negatively impact egg development and lead to decreased survival rates, especially for juvenile salmon, and can disrupt migration and spawning behavior. High temperatures can lead to pre-spawning mortality, especially in spring-run Chinook. Warmer water can favor food sources that are less nutritious for juvenile salmon, affecting their growth and survival.
Off-channel and side-channel habitats are crucial for salmon survival, particularly during the juvenile and overwintering stages. They provide refuge from high flows, offer foraging and rearing opportunities, and can even provide warmer water during the winter, supporting growth and metabolism.
Summer base flow significantly affects salmon by influencing water temperature, habitat availability, and migration pathways. Reduced summer flows can lead to warmer water, which stresses salmon and reduces the quality of their habitat. Lower water levels also make it harder for salmon to migrate upstream, potentially creating barriers to spawning and survival.
Healthy floodplains provide essential rearing habitat for juvenile salmon, offering protection from predators, reduced competition for food, and opportunities for faster growth. By improving floodplain access and connectivity, salmon populations can be supported and their overall survival enhanced.
Large wood cover is crucial for salmon habitat, providing essential cover, spawning areas, and rearing grounds. It helps stabilize stream banks, creates pools and riffles, and directs water flow, all of which are important for salmon survival. Large wood also contributes to the aquatic food web by trapping organic matter and providing habitat for invertebrates, which in turn are food for salmon.
Sufficient, high-quality pools are essential for spawning, rearing, and overall survival of salmon throughout their life cycle.

#3: What are the project goals? The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired future condition. Include which species and life stages will benefit from the outcome, and the time of year the benefits will be realized. **Example Goals and Objectives**

Using LTPBR and beaver coexistence techniques, Trout Unlimited and partners will address habitat quality issues by maintaining and increasing the density and spatial scale of the structural elements in the target stream systems, improving conditions for development of riparian vegetation, and aggrading stream beds to correct incision. Re-establishment of characteristic historic stream complexity and maintaining beavers through coexistence methods will jump start natural processes to transition stream systems to improved ecological conditions with increased resilience to disturbance.

LTPBR and beaver coexistence would add large wood and create pools, impounding sediment behind structures and beaver dams and storing groundwater, which will reduce stream temperatures and turbidity for downstream spawning habitat. The project would increase stream complexity and provide important refugia habitat. LTPBR and beaver coexistence would increase stream complexity and store water behind structures and beaver dams, slowly releasing it throughout the summer for increased base flow conditions later in the season. The project would increase stream complexity and reconnect floodplains. LTPBR and beaver coexistence would add large wood to provideing essential cover, spawning areas, and rearing grounds. LTPBR and beaver coexistence would increase pool habitat essential for spawning, rearing, and overall survival of salmon throughout their life cycle.

#4: What are the project objectives? Objectives support and refine biological goals, breaking them down into smaller steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). **Example Goals and Objectives**

The project seeks to address in-stream habitat, riparian habitat, and temperature limiting factors for all life stages of steelhead, bull trout, and spring chinook, with a focus on rearing habitat by focusing on the following objectives:

- Reconnect floodplains and improve riparian habitat across 0.50 miles of stream using LTPBR techniques.
- Maintain and improve riparian habitat across 10-20 miles of stream by working with land owners and managers to keep beavers in place
- Monitor and maintain installed in-stream structures and coexistence structures throughout the life of the project

Implementation of the LTPBR projects will take place in 2027. Beaver Coexistence work will take place throughout the performance period.

#5: Scope of work and deliverables. Provide a detailed description of each project task/element. With each task/element, identify who will be responsible for each, what the deliverables will be, and the schedule for completion.

The project will have two major elements: LTPBR and Beaver Coexistence. Permitting and necessary pre-project clearances will be obtained in tandem for LTPBR projects. NHPA Section 106 cultural resource clearance has been obtained for Tillicum and Indian Creeks, and the projects have been submitted to the USFS Entiat Ranger District for their Program of Work. Trout Unlimited will pursue all necessary permits and USFS authorizations upon funding award and will obtain all such documentation by July 2027. Project implementation will take place for both streams in the summer of 2027. Adaptive management will take place starting in the summer of 2028 and continuing through the life of the project. Deliverables will be miles of stream restored through LTPBR methods.

Beaver Coexistence work will take place upon funding award and through the life of the project. Trout Unlimited receives calls and works with landowners throughout the year with most activity taking place between May and October. Trout Unlimited staff work closely with WDFW habitat biologists to obtain permits for coexistence structures once it is determined they are required. Deliverables include miles of stream habitat maintained and increased due to beavers being allowed to remain on site through work with landowners.

#6: What are the assumptions and physical constraints that could impact whether you achieve your objectives? Assumptions and constrains are external conditions that are not under the direct control of the project, but directly impact the outcome of the project. These may include ecological and geomorphic factors, land use constraints, public acceptance of the project, delays, or other factors. How will you address these issues if they arise?

Assumptions & constraints associated with LTPBR include peak streamflow conditions, wildfire, beaver re-population, & USFS capacity. The project may be impacted by wildfire or USFS capacity. The period of performance allows for any potential delays resulting from an inability to obtain timely USFS authorizations or implementation shut-downs due to wildfire. Implementation could occur in 2028 if necessary. Post-implementation, project structures may be affected high flows, which could cause structures to fail or partially blow out, requiring adaptive management to repair structures. LTPBR is intended to allow the stream to make decisions on future conditions, so the blow out of a particular structure will not necessarily impact the goals of the project as a whole, & will often lead to reinforcement of other structures. With necessary adaptive management, project goals will still be achieved. Ideally, LTPBR structures will attract beavers, which will take over management of habitat benefits. If this does not happen, project goals can still be achieved with necessary adaptive management. An intended purpose of installed structures is to impound water, spreading it out on floodplains & aggrading incised channels. Project goals will be achieved whether or not beavers re-populate the site, & aggraded channels may attract beavers on a longer time scale.

Beaver Coexistence requires landowner engagement. TU conducts outreach & pursues beaver coexistence to address beaver conflict situations. Occasionally, property constraints may make coexistence with beavers impractical, & the only viable solution is trapping & relocation. TU works with an average of 10 landowners per yr to allow beavers to remain in place. If landowner engagement were to be insufficient to facilitate coexistence on 20 properties, TU could conduct coexistence with public agency partners like WSDOT, USFS, irrigation districts, & public utility districts on sites where they typically remove beavers.

#7: How have lessons learned from completed projects or monitoring studies informed this project?

The Trout Unlimited Wenatchee Entiat Beaver Project has been doing LTPBR and beaver coexistence work since 2018. In that time, LTPBR has changed from mostly post-line wicker weave type structures acting as individual sediment impoundment devices to building many structures that look and act more like the beaver pond and dam complexes after which they were designed. These structures require less maintenance, rely less on the integrity of any one structure, store more water for longer, and are better vehicles for creating and improving salmon habitat.

Past projects have demonstrated that LTPBR is compatible with infrastructure like roads and culverts if sited and implemented thoughtfully. Appropriate setbacks from culverts are observed to avoid clogging them and structures are sited in locations where the resulting ponds will not flood roads.

Past beaver coexistence projects have successfully allowed beavers to remain on site. However, implemented beaver coexistence devices, such as culvert fences and pond levelers, have demonstrated the need for maintenance and monitoring in the long term. As such, Trout Unlimited works to secure funding for maintenance in the short and medium term, and to engage with landowners to agree on maintenance responsibility in the long term.

#8: Describe the alternatives considered and why the preferred was chosen.

Alternative 1: No Action – If no action is taken, stream & habitat conditions will likely continue to degrade. For example, channel incision will continue to worsen in Indian & Tillicum Creeks. High water temperatures in Indian Creek will continue to influence Tillicum Creek as a cold water input to the Entiat River. Pool habitat & wood cover on Tillicum & Indian Creeks will continue to be impaired for steelhead & spring chinook. Beavers will continue to be lethally trapped out of Chelan & Douglas counties & the habitat they create will degrade over time. Beaver re-population in salmon-bearing streams will be impaired due to a lack of beaver presence on private land & near public rights-of-way.
Alternative 2: Multi-phase restoration in 3 tributaries in Wenatchee & Entiat subbasins – The alternative originally submitted in our pre-application included work in Brush Creek in the Wenatchee subbasin. TU is no longer proposing this work due to concerns about the potential benefits to brook trout in addition to native fish species.

Alternative 3: Preferred Alternative – LTPBR in 2 tributaries in the Entiat and/or Wenatchee subbasins determined to have the most benefit to native fish species, as well as beaver coexistence presents the most cost-effective way to restore anadromous tributaries. For example, Tillicum Creek is a significant input of cold water to the Entiat River. Indian Creek is a tributary to Tillicum Creek & has a 303(d) listing for temperature. As such, restoration on Tillicum & Indian Creeks will have an outsized impact on Entiat River temperatures. This project is being planned in conjunction with an AOP barrier correction, road decommissioning, & other LTPBR projects planned in the area. Beaver coexistence is an important step in reestablishing beaver in anadromous streams. A relatively small investment can achieve a cascade of benefits by allowing beaver populations to develop & grow, expanding habitat benefits.

#9: How were stakeholders consulted in the development of this project? Identify the stakeholders, their concerns or feedback, and how those concerns were addressed.

LTPBR projects on USFS land are codeveloped with USFS, WDFW, & USFWS. TU holds monthly meetings & conducts site visits w/ USFS & USFWS staff to develop project concepts & designs and address concerns. USFS has expressed concerns about future capacity, to which TU has responded with offers of support & proposals to streamline processes. The RTT, PRCC, & Habitat Tributary committees have expressed concerns about restoration benefits to brook trout in the streams in which they reside. TU has switched from proposing LTPBR on 3 specific sites to 2 project sites which will be submitted for approval over the course of the agreement. Concerns were also expressed related to perceived admin costs relative to implementation costs. TU does not hire contractors for this work & TU staff at all program levels will be involved in project implementation.
Beaver coexistence involves landowners facing challenges with beaver contacting TU staff who engage in conversations, conduct site visits, & work with landowners to develop coexistence solutions to allow beavers to remain in place. Concerns are addressed & influence project development & designs. WDFW provides training, inspections, technical assistance, & relocation permits. Potential pathogen transmission concerns are addressed by annual facility inspections, treatment of field gear & facility, & WDFW approval of cross watershed relocations.
Yakama Nation & Colville Confederated Tribes are consulted as part of the Section 106 process.

#10: Does your project address or accommodate the anticipated effects of climate change?

Yes

#10a: How will your project be climate resilient given future conditions?

LTPBR is designed to work with changing climate conditions. Future streams will have lower base flows, & higher peak flows, which will create risks of dry channels in the summer & destructive pulse flow events in the winter & spring. LTPBR & beaver re-population both work to attenuate high flows & increase summer base flows. By placing many structures in close proximity, LTPBR projects are able to mitigate risk from high flows & attenuate flows on a large scale. Additionally, LTPBR projects spread water on floodplains, feeding greater riparian plant communities, which shade streams, reducing instream temperatures, & create fire breaks which can limit the spread of wildfires. Similarly, beavers create complexes of dams, ponds, & excavated channels to hold water in the stream in the summer & attenuate high flows in the winter & spring, providing similar habitat & fire break benefits to LTPBR projects.

#10b: How will your project increase habitat and species adaptability?

LTPBR & natural beaver dams both increase summer base flows by keeping water on the landscape during dry periods & raising water tables. Additionally, both LTPBR & natural beaver dams lower stream temperatures by creating cold water refugia & providing increased surface water for riparian cover development. These improvements in water quality & quantity increase habitat & species adaptability by creating a buffer against changing climate & habitat destruction. Cold water refugia & increased summer baseflows allow salmon at all life stages to grow throughout increasingly warm & dry summers.

#11: Describe the sponsor's experience managing this type of project. Describe other projects where the sponsor has successfully used a similar approach.

The TU Wenatchee Entiat Beaver Project has been implementing successful LTPBR projects & working with landowners to facilitate coexistence with beavers since 2018. To date, the program has installed 5 projects on 4 sites in the Wenatchee subbasin, 5 projects on 2 sites in the Entiat subbasin, & 5 projects on 2 sites in Douglas County, including installing over 70 structures at a single site in one season, obtaining all necessary permits & approvals, hiring & managing a seasonal field crew, & successfully coordinating with partners & landowners.
The WEBP has assisted over 50 landowners, an average of 10/year, with beaver concerns in North Central WA since 2018 & has installed a number of beaver coexistence devices & fences. All WEBP staff participate in training & obtain WDFW beaver relocation permits. Staff are participating in The Beaver Institute's BeaverCorps training to learn coexistence best practices & join a cohort of beaver practitioners sharing beaver BMPs at a national scale

#12: Will veterans (including the veterans conservation corps) be involved in the project? If yes, please describe.

No

Restoration Supplemental

#1: Is the primary activity of the project riparian planting?

No

#2: Does the project include measures to stabilize an eroding stream bank?

No

#3: Does the project include side channel reconnection or floodplain re-grading worktypes?

Yes

#3a: Explain why the side channel reconnection or floodplain regrading is necessary and secondary to accomplish the riparian restoration.

Side channels and floodplains will be reconnected through LTPBR and beaver coexistence and will facilitate increased riparian vegetation across wider areas.

#4: Does the project include an instream structure placement worktype?

Yes

#4a: Explain why the instream structure placement is necessary and secondary to accomplish the riparian restoration.

LTPBR projects involve the placement of instream structures to reconnect floodplains and water riparian vegetation.

#5: Is the primary activity of the project invasive species removal?

No

#6: Describe the steps you will take to minimize the introduction of invasive species during construction and restoration. Consider how you will use un-infested materials and clean equipment entering and leaving the project area.

Gear is treated with Virkon when moving between watersheds.
Equipment is cleaned and inspected for mud, seeds, etc.
Untreated wood posts and weave material is collected as locally as possible.
Beavers are closely monitored and quarantined at the acclimation facility prior to relocation to ensure they are not spreading diseases or pathogens throughout the population or to introduced stream systems. Cross watershed relocations require approval of WDFW wildlife biologists and veterinarians.

#7: Describe the long-term stewardship and maintenance obligations for the project.

LTPBR projects involve annual maintenance to continue yielding maximum benefits. Unmaintained structures can yield benefits but may do so in other areas than where they were placed.
Beaver coexistence involves ongoing relationships with landowners and installed structures may require maintenance to continue functioning properly. TU maintains contact with landowners and works with them to develop maintenance plans.

Restoration Metrics

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Worksite: Indian Creek (#1)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	0.25
Project Identified In a Plan or Watershed Assessment (C.0.c)	Upper Columbia Salmon Recovery Plan
Priority in Recovery Plan	LTPBR activities address the “In- stream Structures” habitat action class (Upper Columbia Salmon Recovery Plan, Table 5.9, Page 235) which will increase pool formation, habitat diversity, and channel roughness, as well as slow water velocity and increase sediment retention.
Type Of Monitoring (C.0.d.1)	Implementation Monitoring
Monitoring Location (C.0.d.2)	Onsite

INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	0.25

Channel structure placement (C.4.d.1)

Total cost for Channel structure placement	$79,539
Material Used For Channel Structure (C.4.d.2)	Other Engineered Structures
Miles of Stream Treated for channel structure placement (C.4.d.3)	0.25
Acres Of Streambed Treated for channel structure placement (C.4.d.4)	
Pools Created through channel structure placement (C.4.d.5)	12
Number of structures placed in channel (C.4.d.7)	15

RIPARIAN HABITAT PROJECT

Total Riparian Miles Streambank Treated (C.5.b.1)	0.25
Total Riparian Acres Treated (C.5.b.2)	2.5

PERMITS

Obtain permits

Total cost to Obtain permits	$5,971
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$16,516

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$7,953

Worksite: Tillicum Creek (#2)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	0.25
Project Identified In a Plan or Watershed Assessment (C.0.c)	Upper Columbia Salmon Recovery Plan
Priority in Recovery Plan	LTPBR activities address the “In- stream Structures” habitat action class (Upper Columbia Salmon Recovery Plan, Table 5.9, Page 235) which will increase pool formation, habitat diversity, and channel roughness, as well as slow water velocity and increase sediment retention.
Type Of Monitoring (C.0.d.1)	Implementation Monitoring None
Monitoring Location (C.0.d.2)	No monitoring completed Downstream Onsite Upslope Upstream

ESTUARINE / NEARSHORE PROJECT

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INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	0.25

Channel reconfiguration and connectivity (C.4.c.1)

Channel structure placement (C.4.d.1)

Total cost for Channel structure placement	$84,327
Material Used For Channel Structure (C.4.d.2)	Deflectors/Barbs Flood Fencing Gabions Individual Logs (Anchored) Individual Logs (Unanchored) Logs Fastened Together (Logjam) None Other Engineered Structures Rocks/Boulders (Fastened Or Anchored) Rocks/Boulders (Unanchored) Stumps With Roots Attached (Rootwads) Weirs
Miles of Stream Treated for channel structure placement (C.4.d.3)	0.25
Acres Of Streambed Treated for channel structure placement (C.4.d.4)	
Pools Created through channel structure placement (C.4.d.5)	12
Number of structures placed in channel (C.4.d.7)	15

Streambank stabilization (C.4.e.1)

PRE-RESTORATION ACQUISITIONS AND NURSERY OPERATIONS PROJECT

RIPARIAN HABITAT PROJECT

Total Riparian Miles Streambank Treated (C.5.b.1)	0.25
Total Riparian Acres Treated (C.5.b.2)	2.5

Debris/structures removal (C.5.j.1)

Fencing (C.5.d.1)

Forestry practices / stand management (C.5.i.1)

Planting (C.5.c.1)

Riparian Plant removal / control (C.5.h.1)

Water gap development (C.5.f.1)

SITE STEWARDSHIP PROJECT

CULTURAL RESOURCES

PERMITS

Obtain permits

Total cost to Obtain permits	$5,972
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$16,518

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$8,432

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Worksite: Beaver Coexistence sites (#3)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	15.00
Project Identified In a Plan or Watershed Assessment (C.0.c)	Upper Columbia Salmon Recovery Plan
Priority in Recovery Plan	Beaver coexistence supports long-term priority actions including “Protect and maintain stream and riparian habitats within Category 1 assessment units” (Upper Columbia Salmon Recovery Plan, Recovery Actions section, pages 208 and 211). “Encourage beaver re-population” is also listed as a potential habitat action under the Water Quantity Restoration and Large Woody Debris Restoration Habitat Action Classes (Upper Columbia Salmon Recovery Plan, Recovery Actions section, pages 238 and 241).
Type Of Monitoring (C.0.d.1)	Implementation Monitoring None **Note:** We maintain contact with landowners and monitor and conduct maintenance on beaver coexistence sites as needed to ensure structures remain functional and benefits continue to be realized by beavers while mitigating landowner concerns.
Monitoring Location (C.0.d.2)	No monitoring completed Downstream Onsite Upslope Upstream

ESTUARINE / NEARSHORE PROJECT

INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	11.00

Channel reconfiguration and connectivity (C.4.c.1)

Total cost for Channel reconfiguration and connectivity	$92,897
Type of change to channel configuration and connectivity (C.4.c.2)	Channel Bed Restored Creation of Instream Pools Creation/Connection to Off-Channel Habitat Levee removal/Alteration Meanders Added None **Note:** This will be accomplished through beaver coexistence.
Miles of Stream Treated for channel reconfiguration and connectivity (C.4.c.3)	11.00
Miles of Off-Channel Stream Created or Connected (C.4.c.4)	0
Acres Of Channel/Off-Channel Connected Or Added (C.4.c.5)	0
Instream Pools Created/Added (C.4.c.6)	0

Channel structure placement (C.4.d.1)

Streambank stabilization (C.4.e.1)

PRE-RESTORATION ACQUISITIONS AND NURSERY OPERATIONS PROJECT

RIPARIAN HABITAT PROJECT

Total Riparian Miles Streambank Treated (C.5.b.1)	11.00
Total Riparian Acres Treated (C.5.b.2)	11.0

Debris/structures removal (C.5.j.1)

Fencing (C.5.d.1)

Forestry practices / stand management (C.5.i.1)

Planting (C.5.c.1)

Riparian Plant removal / control (C.5.h.1)

Riparian Plant Removal/ Control (C.5.m.2)

Water gap development (C.5.f.1)

SITE STEWARDSHIP PROJECT

CULTURAL RESOURCES

PERMITS

Obtain permits

Total cost to Obtain permits	$5,971
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$16,516

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$9,289

Overall Project Metrics

COMPLETION DATE	
Projected date of completion	12/31/2030

Restoration Cost Estimates

Worksite #1: Indian Creek

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$7,953	
Instream Habitat Project	Channel structure placement (C.4.d.1)	$79,539	
Permits	Obtain permits	$5,971	
	Subtotal:	$93,463	
Admin, Architecture, and Engineering		$16,516	
	Total Estimate For Worksite:	$109,979	

Worksite #2: Tillicum Creek

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$8,432	
Instream Habitat Project	Channel structure placement (C.4.d.1)	$84,327	
Permits	Obtain permits	$5,972	
	Subtotal:	$98,731	
Admin, Architecture, and Engineering		$16,518	
	Total Estimate For Worksite:	$115,249	

Worksite #3: Beaver Coexistence sites

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$9,289	
Instream Habitat Project	Channel reconfiguration and connectivity (C.4.c.1)	$92,897	
Permits	Obtain permits	$5,971	
	Subtotal:	$108,157	
Admin, Architecture, and Engineering		$16,516	
	Total Estimate For Worksite:	$124,673	

Summary

Total Estimated Costs Without AA&E:	$300,351
Total Estimated AA&E:	$49,550
Total Estimated Restoration Costs:	$349,901

Cost Summary

	Estimated Cost	Project %	Admin/AA&E %
Restoration Costs			
Restoration	$300,351		
Admin, Architecture, and Engineering	$49,550		18.04 %
SUBTOTAL	$349,901	100.00 %	
Total Cost Estimate	$349,901	100.00 %	

Funding Request and Match

FUNDING PROGRAM

FUNDING PROGRAM

Salmon State Riparian	$349,901	100.000000

SPONSOR MATCH

Questions

#1: Explain how you determined the cost estimates

Since 2019, TU has implemented LTPBR projects throughout the Wenatchee, Entiat, Foster Creek, and Moses Coulee watersheds. Project costs are based on experience developed through successful implementation of these projects. TU has been working with landowners to facilitate beaver coexistence since 2018 with several site visits conducted each year, an average of 10 calls handled per year, and multiple coexistence devices installed. Cost estimates are based on annual operation of the program.

Other Funding

OTHER FUNDING DETAILS

Other Funds: Monetary Funding	Federal Grant
Amount	$10,000
Funding Organization	US Forest Service (USFS)
Grant Program	Central Washington Initiative
Other Funding Detail Total:	$10,000

Cultural Resources

Cultural Resource Areas

Worksite #1: Indian Creek

Area: Indian Creek APE

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

For this example of a LTPBR site, project actions would include parking vehicles, cutting paths through vegetation to access structure locations, staging wooden posts and weaving material, including tree branches and limbs, pounding posts into the ground using a hydraulic post pounder, dragging material into the stream, and placing material. Project activities would also include hand digging mud and fines from the streambed and banks and incorporating it into the structures.

#2: Describe all ground disturbing activities (length, width and depth of disturbance and equipment utilized) that will take place in the Area of Potential Effect (APE). Include the location of any construction staging or access roads associated with your project that will involve ground disturbance.

Ground disturbance will consist of driving 3-inch wide posts 3 feet into the ground with a hydraulic post pounder for each structure. Additionally, shovels will be used to pull mud and fines from the streambed and banks to incorporate into the structures. Staging sites will be carefully selected sites with previous impacts and will vary based on selected project locations. Access will be through established roads.

#3: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

None

#4: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

LTPBR project sites are on National Forest Land which have been degraded by clear cut logging, road construction, over-grazing, stand replacing wildfire, & removal of beaver populations. Beaver coexistence sites are typically on private land in which streams are impacted by nearby infrastructure.

#5: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

Yes

#5a: List the agency that will be issuing the permit and the date you anticipate applying for and receiving the permit. Will the federal permit cover ALL proposed ground disturbing activities included in the project?

TU conducts LTPBR projects under a Memorandum of Understanding with the Forest Service. Application through their ARBO process will commence upon funding award and agreement with SRFB to pursue each site. Federal permitting is expected to be received by spring of 2027. NHPA Section 106 clearance for Tillicum and Indian Creeks has already been completed, but new consultations will proceed if other project sites are selected.
WDFW issues beaver relocation permits as well as HPAs as needed for coexistence structures. TU permanent staff maintains relocation permits on an annual basis and seasonal staff are permitted each spring. HPAs are quickly obtained on an as needed basis.

#6: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

Yes

#6a: Please list the federal agency and funding sources.

USFS agreement funding

#6b: Does the federal funding you are utilizing as match require you to receive state funding?

No match is being used

#7: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

Yes

#7a: Summarize the previous cultural resource review; including lead agency and date of review, reference name and numbers, etc. If RCO, include the prior phase grant number. NOTE: Do not provide any site-specific information considered confidential. Attach previous surveys or other reference documents.

Heritage review for Tillicum and Indian Creeks was completed by the US Forest Service as lead agency in 2024. USFS Heritage Program Manager Karina Bryan determined that this project does fit into Appendix A and is exempt from needing a project-specific cultural resource inventory.
Beaver coexistence typically does not require cultural resource review.

#8: Is the worksite located within an existing park, wildlife refuge, natural area preserve, or other recreation or habitat site?

Yes

#8a: Please name the area and specify when the site was established.

Wenatchee National Forest was established in 1908

#9: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

No

Worksite #2: Tillicum Creek

Area: Tillicum Creek APE

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

For this example of a LTPBR site, project actions would parking vehicles, cutting paths through vegetation to access structure locations, staging wooden posts and weaving material, including tree branches, limbs, and logs, pounding posts into the ground using a hydraulic post pounder, dragging material into the stream, and placing material. Project activities would also include hand digging mud and fines from the streambed and banks and incorporating it into the structures.

#2: Describe all ground disturbing activities (length, width and depth of disturbance and equipment utilized) that will take place in the Area of Potential Effect (APE). Include the location of any construction staging or access roads associated with your project that will involve ground disturbance.

Ground disturbance will consist of driving 3-inch wide posts 3 feet into the ground with a hydraulic post pounder for each structure. Additionally, shovels will be used to pull mud and fines from the streambed and banks to incorporate into the structures. Staging sites will be carefully selected sites with previous impacts and will vary based on selected project locations. Access will be through established roads.

#3: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

None

#4: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

LTPBR project sites are on National Forest Land which have been degraded by clear cut logging, road construction, over-grazing, stand replacing wildfire, & removal of beaver populations.

#5: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

Yes

#5a: List the agency that will be issuing the permit and the date you anticipate applying for and receiving the permit. Will the federal permit cover ALL proposed ground disturbing activities included in the project?

TU conducts LTPBR projects under a Memorandum of Understanding with the Forest Service. Application through their ARBO process will commence upon funding award and agreement with SRFB to pursue each site. Federal permitting is expected to be received by spring of 2027. NHPA Section 106 clearance for Tillicum and Indian Creeks has already been completed, but new consultations will proceed if other project sites are selected.

#6: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

Yes

#6a: Please list the federal agency and funding sources.

USFS agreement funding

#6b: Does the federal funding you are utilizing as match require you to receive state funding?

No match is being used

#7: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

Yes

#7a: Summarize the previous cultural resource review; including lead agency and date of review, reference name and numbers, etc. If RCO, include the prior phase grant number. NOTE: Do not provide any site-specific information considered confidential. Attach previous surveys or other reference documents.

Heritage review for Tillicum and Indian Creeks was completed by the US Forest Service as lead agency in 2024. USFS Heritage Program Manager Karina Bryan determined that this project does fit into Appendix A and is exempt from needing a project-specific cultural resource inventory.

#8: Is the worksite located within an existing park, wildlife refuge, natural area preserve, or other recreation or habitat site?

Yes

#8a: Please name the area and specify when the site was established.

Wenatchee National Forest was established in 1908

#9: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

No

Worksite #3: Beaver Coexistence sites

Area: Beaver Coexistence site, ongoing coexistence

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

This site is an example of an ongoing coexistence site. Project actions at this site include regular site visits to assess beaver activity and landowner concerns

#2: Describe all ground disturbing activities (length, width and depth of disturbance and equipment utilized) that will take place in the Area of Potential Effect (APE). Include the location of any construction staging or access roads associated with your project that will involve ground disturbance.

No ground disturbance is planned for this site.

#3: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

none

#4: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

The indicated project area is a creek with a paved road along it with a nearby irrigation diversion and dam. Beaver coexistence sites are typically on private land in which streams are impacted by nearby infrastructure.

#5: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

No

WDFW issues beaver relocation permits as well as HPAs as needed for coexistence structures. TU permanent staff maintains relocation permits on an annual basis and seasonal staff are permitted each spring. HPAs are quickly obtained on an as needed basis.

#6: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

Yes

#6a: Please list the federal agency and funding sources.

USFS agreement funding

#6b: Does the federal funding you are utilizing as match require you to receive state funding?

No match is being used

#7: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

No

The USFS determined that no heritage review would be necessary for beaver coexistence or relocation due to no ground disturbing work being performed.

#8: Is the worksite located within an existing park, wildlife refuge, natural area preserve, or other recreation or habitat site?

No

#9: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

No

Project Permits

Permits and Reviews	Issuing Organization	Applied Date	Received Date	Expiration Date	Permit #
Cultural Assessment [Section 106]	DAHP				
		Note: Heritage is complete. Report dates and numbers will be added by final application due date.			
Endangered Species Act Compliance [ESA]	US Fish & Wildlife				
		Note: Will be covered by USFS MOU			
Hydraulics Project Approval [HPA]	Dept of Fish & Wildlife				
		Note: Will be covered by USFS MOU			
NEPA	Federal Agencies				
US Army Corps of Engineers					
		Note: Will be covered by USFS MOU			
Other Required Permits					
		Note: WDFW beaver relocation permit			

Permit Questions

#1: Are you planning on using the federal permit streamlining process? **Limit 8**

Yes

Attachments

Required Attachments	8 out of 8 done
Applicant Resolution/Authorizations	✓
CCA Tribal Notification	✓
Cost Estimate	✓
Landowner acknowledgement form	✓
Map: Restoration Worksite	✓
Photo	✓
RCO Fiscal Data Collection Sheet	✓
Riparian Enhancement Plan	✓

PHOTOS (JPG, GIF)

Photos (JPG, GIF)


666728


666730


666731


666733


666735

PROJECT DOCUMENTS AND PHOTOS

Project Documents and Photos

Project Application Report - 25-1228

File Type	Attach Date	Attachment Type	Title	Person	File Name, Number Associations	Shared
	05/27/2025	Application Document	Jot form updated 5-4-25.pdf	LisaF	Jot form updated 5-4-25.pdf, 670527	✓
	05/27/2025	Landowner acknowledgement form	TU_LandownerAcknowledgement ET.pdf	LisaF	20250424TU_LandownerAcknowledge… ET.pdf, 670472	
	05/04/2025	Riparian Enhancement Plan	Tillicum Creek Riparian Enhancement Plan 1-5.docx	LisaF	Tillicum Creek Riparian Enhancement Plan 1-5.docx, 668692	✓
	05/04/2025	Riparian Enhancement Plan	Indian Creek Riparian Enhancement Plan 1-5.docx	LisaF	Indian Creek Riparian Enhancement Plan 1-5.docx, 668691	✓
	04/18/2025	Project Application Report	Project Application Report, 25-1228R (sub 04/18/25 16:00:38)	LisaF	Project Application Report - 25-1228 (submitted 04-18-2025_16-00-38).pdf, 666820	✓
	04/18/2025	Design document	LTPBR Structure Schematics.pdf	LisaF	LTPBR Structure Schematics.pdf, 666802	✓
	04/18/2025	Photo	Peshastin Ck tree caging	LisaF	PXL_20241003_170432343.jpg, 666735	✓
	04/18/2025	Photo	IMG_0282.JPG	LisaF	IMG_0282.jpg, 666733	✓
	05/27/2025	Photo	Mill ck culvert beaver coex.jpg	LisaF	Mill ck culvert beaver coex.jpg, 666731	✓
	04/18/2025	Photo	Tillicum confluence.JPG	LisaF	Tillicum confluence.jpg, 666730	✓
	04/18/2025	Photo	Indian Ck roadside incision	LisaF	IMG_1996.jpg, 666728	✓
	04/18/2025	Cost Estimate	SAL-CostEstimate TU.xlsx	LisaF	SAL-CostEstimate TU.xlsx, 666724	✓
	04/18/2025	Cultural Resources: Correspondence	Heritage completion for Tillicum Indian USFS email.pdf	LisaF	Heritage completion for Tillicum Indian USFS email.pdf, 666722	
	04/18/2025	RCO Fiscal Data Collection Sheet	WARCO FiscalDataCollectionSheet TU.pdf	LisaF	WARCO FiscalDataCollectionSheet TU.pdf, 666670	
	04/18/2025	Applicant Resolution/Authorizations	2025_ApplicantAuthorizationResolution_Fi TU.pdf	LisaF	2025_ApplicantAuthorizationResolutio… TU.pdf, 666666	✓
	04/18/2025	Map: Multi-site and geographic envelope	Potential Beaver Coexistence Sites	LisaF	Beaver Coexistence Site Map.pdf, 666633	✓
	04/18/2025	Map: Area of Potential Effect (APE)	Potential LTPBR Sites Tillicum Indian Cks APE	LisaF	LTPBR Tillicum Indian APE.pdf, 666632	✓
	04/18/2025	Map: Restoration Worksite	Potential LTPBR Sites Map Tilicum Indian Cks	LisaF	LTPBR Site Map.pdf, 666631	✓
	04/18/2025	Map: Multi-site and geographic envelope	Potential LTPBR Project Sites	LisaF	LTPBR Potential Project Sites.pdf, 666630	✓
	04/18/2025	CCA Tribal Notification	TU-CCA Tribal Notification Letter YN.pdf	LisaF	TU-CCA Tribal Notification Letter YN.pdf, 666625	✓
	04/18/2025	CCA Tribal Notification	TU-CCA Tribal Notification Letter CCT.pdf	LisaF	TU-CCA Tribal Notification Letter CCT.pdf, 666623	✓
	04/18/2025	Landowner acknowledgement form	LandownerAckForm USFS_PW.pdf	LisaF	LandownerAckForm USFS_PW.pdf, 666603	
	04/17/2025	Project Review Comments	Project Review Comments Report, 25-1228R (04/17/25 10:22:58)	AmeeB	Project Review Comments Report - 25-1228 (04-17-2025_10-22-58).pdf, 666503	✓
	04/17/2025	Project Application Report	Project Application Report, 25-1228R (04/17/25 10:22:58)	AmeeB	Project Application Report - 25-1228 (04-17-2025_10-22-58).pdf, 666502	✓
	04/10/2025	Project Review Comments	Project Review Comments Report, 25-1228R (04/10/25 13:19:06)	AmeeB	Project Review Comments Report - 25-1228 (04-10-2025_13-19-06).pdf, 665660	✓
	04/10/2025	Project Application Report	Project Application Report, 25-1228R (04/10/25 13:19:04)	AmeeB	Project Application Report - 25-1228 (04-10-2025_13-19-04).pdf, 665659	✓
	04/10/2025	Project Review Comments	Project Review Comments Report, 25-1228C (04/10/25 07:55:02)	AmeeB	Project Review Comments Report - 25-1228 (04-10-2025_07-55-02).pdf, 665593	✓
	04/10/2025	Project Application Report	Project Application Report, 25-1228C (04/10/25 07:54:17)	AmeeB	Project Application Report - 25-1228 (04-10-2025_07-54-17).pdf, 665592	✓

Application Status

Project Application Report - 25-1228

Application Due Date: 06/23/2025

Status Name	Status Date	Submitted By	Submission Notes
Application Submitted	04/18/2025	Lisa Foster	
Preapplication	04/03/2025		

I certify that to the best of my knowledge, the information in this application is true and correct. Further, all application requirements due on the application due date have been fully completed to the best of my ability. I understand that if this application is found to be incomplete, it will be rejected by RCO. I understand that I may be required to submit additional documents before evaluation or approval of this project and I agree to provide them. (Lisa Foster, 04/18/2025)

Date of last change: 05/27/2025

RESTORATION

				OVERALL PROJECT	GRANT REQUEST	MATCH			
				Budget must account for all costs to complete the project	*Enter only the amount of the grant request*	*The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.*			
				Amount	Grant Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Construction									
Category (choose one)	**Task Description**	**Qty**	**Rate**						
Construction labor	*Program Manager*	656.00	$ 61.16	$ 40,121	$ 40,121	$ -	$ -		
Construction labor	*Project Managers*	1,521.00	$ 50.80	$ 77,267	$ 77,267	$ -	$ -		
Construction labor	*Seasonal Field Crew*	1,345.00	$ 23.23	$ 31,244	$ 31,244	$ -	$ -		
Construction labor	*CRM Partner crews*	2.00	$ 15,000.00	$ 30,000	$ 30,000	$ -	$ -		
Permits	*Program Manager*	160.00	$ 61.16	$ 9,786	$ 9,786	$ -	$ -		
Permits	*Project Managers*	160.00	$ 50.80	$ 8,128	$ 8,128	$ -	$ -		
Materials	*Wooden posts*	1,000.00	$ 7.00	$ 7,000	$ 7,000	$ -	$ -		
Materials	*Structure weaving material*	120.00	$ 150.00	$ 18,000	$ 18,000	$ -	$ -		
Materials	*Equipment fuel, hand tools, equipment repair, etc. - LTPBR*	1.00	$ 1,000.00	$ 1,000	$ 1,000	$ -	$ -		
Materials	*Coexistence measure construction materials*	1.00	$ 24,000.00	$ 24,000	$ 24,000	$ -	$ -		
Other	*Seasonal Crew Truck Rental*	9.00	$ 2,500.00	$ 22,500	$ 22,500	$ -	$ -		
Other	*Personal Vehicle Mileage*	778.00	$ 0.77	$ 599	$ 599	$ -	$ -		
Other	*Seasonal Crew Truck Fuel*	34.00	$ 100.00	$ 3,400	$ 3,400	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 273,045**	**$ 273,045**	**$ -**	**$ -**		

Administrative, Architechtural & Engineering				Amount	Grant amount	Match in PRISM	Funding not reported in PRISM	Match Source	Match Type (federal, state, local)
Category	**Task Description**	**Qty**	**Rate**						
Administrative	*Program Manager*	320.00	$ 61.16	$ 19,571.20	$ 19,571	$ -	$ -		
Administrative	*TU State Accounting*	69.00	$ 51.97	$ 3,585.93	$ 3,586	$ -	$ -		
Administrative	*Project Managers*	320.00	$ 50.80	$ 16,256.00	$ 16,256	$ -	$ -		
Other	*TU Communications Team Support*	1.00	$ 2,544.85	$ 2,544.85	$ 2,545	$ -	$ -		
Other	*TU Science Team Support*	1.00	$ 3,088.85	$ 3,088.85	$ 3,089	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 45,047**	**$ 45,047**	**$ -**	**$ -**		

Indirect Costs				Amount	Grant amount	Match in PRISM	Funding not reported in PRISM	Match Source	Match Type (federal, state, local)
	Description	**Approved Rate**	**Total Project Base**						
	Indirect	10.000%	$ 318,091.60	$ 31,809	$ 31,809	$ -	$ -		
	Indirect	0.000%	$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 31,809**	**$ 31,809**	**$ -**	**$ -**		

AA&E Budget Check	
A&E maximum allowed in PRISM	*$ 81,913.43*
A&E validation	36,867

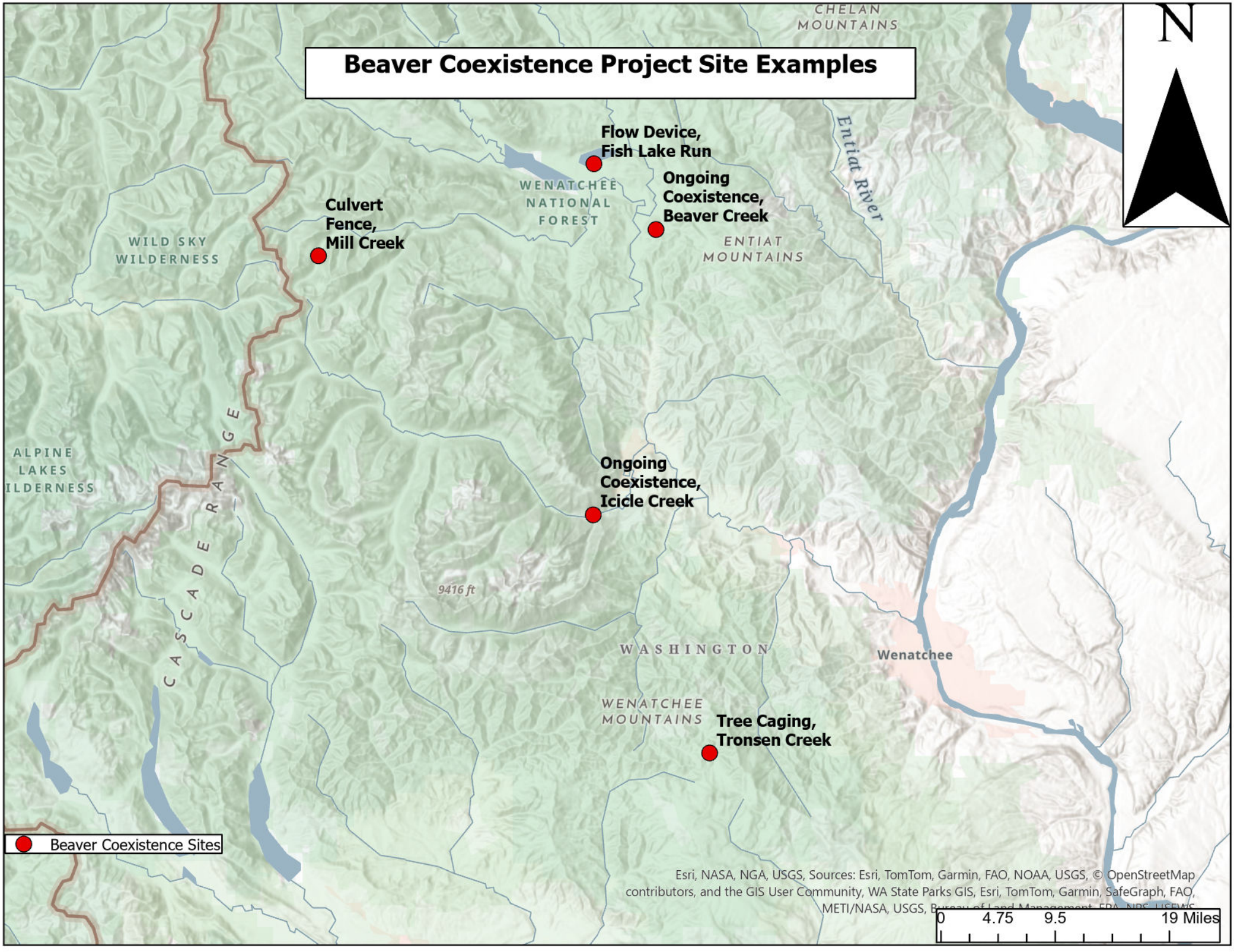
Totals	**$ 349,901**	**$ 349,901**	**$ -**	**$ -**
		PRISM Project Total	$ 349,901	
		RCO Percentage	**Match Percentage**	
		100.000000%	**0.000000%**	

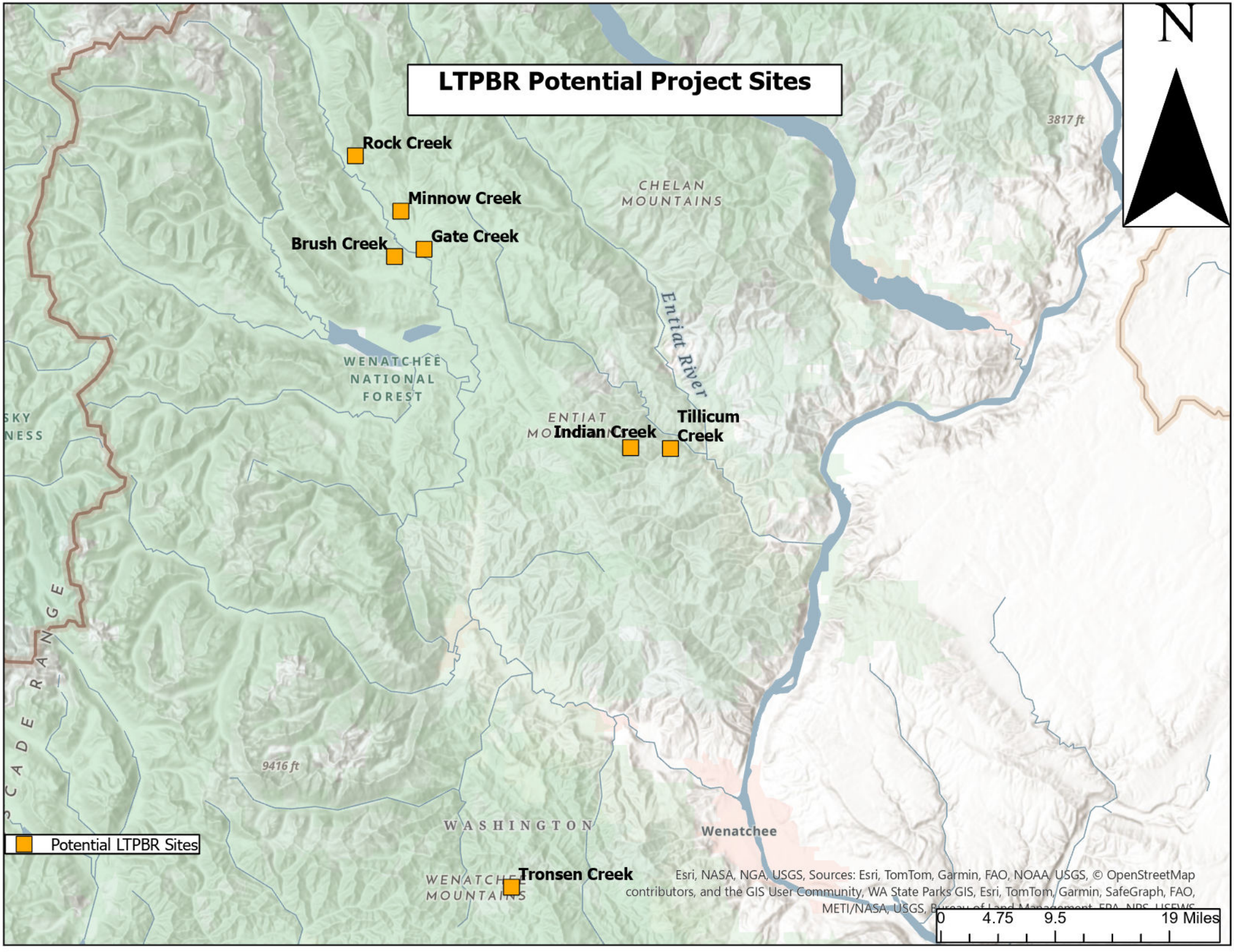
CUMULATIVE TOTALS

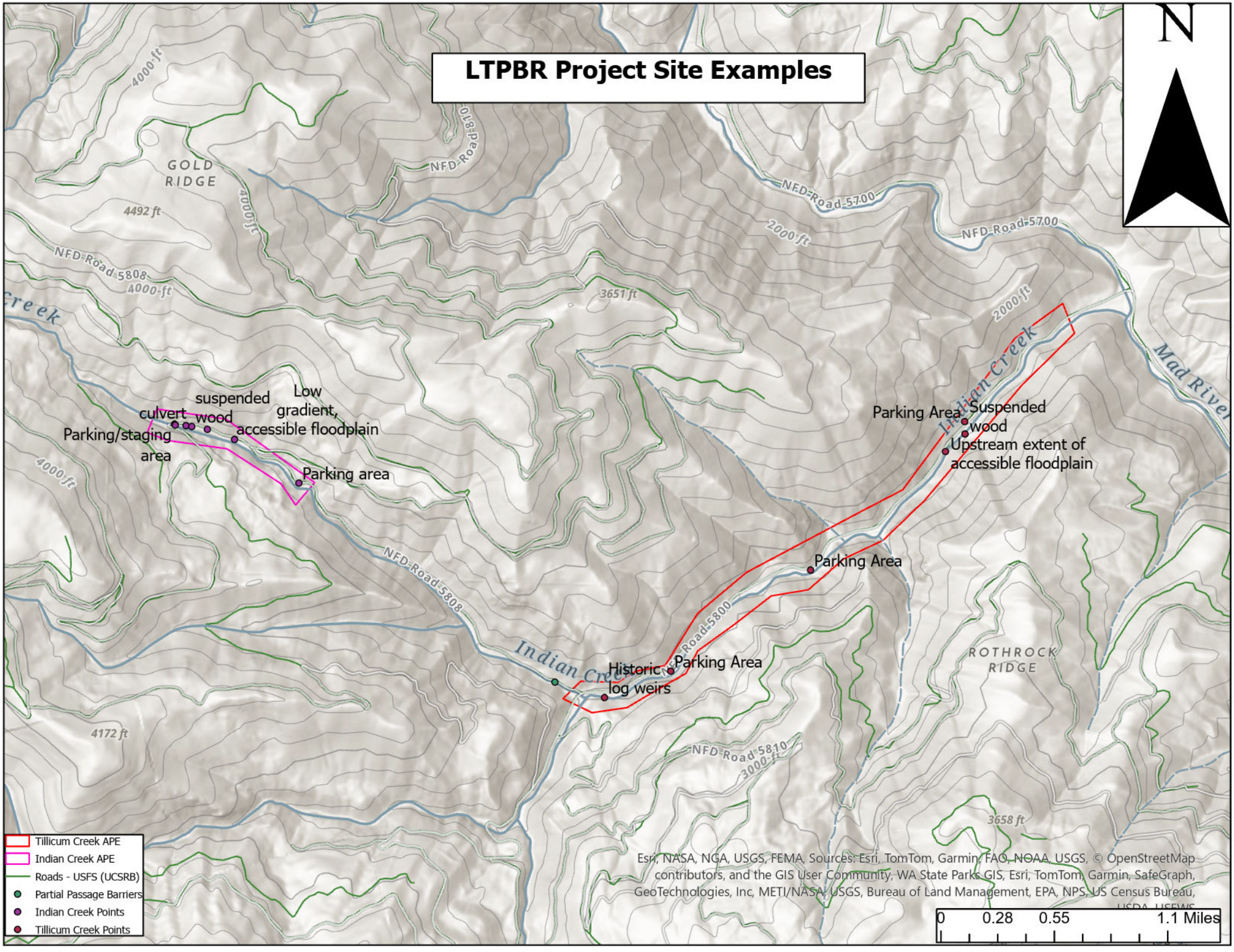
This sheet contains automatic calculations

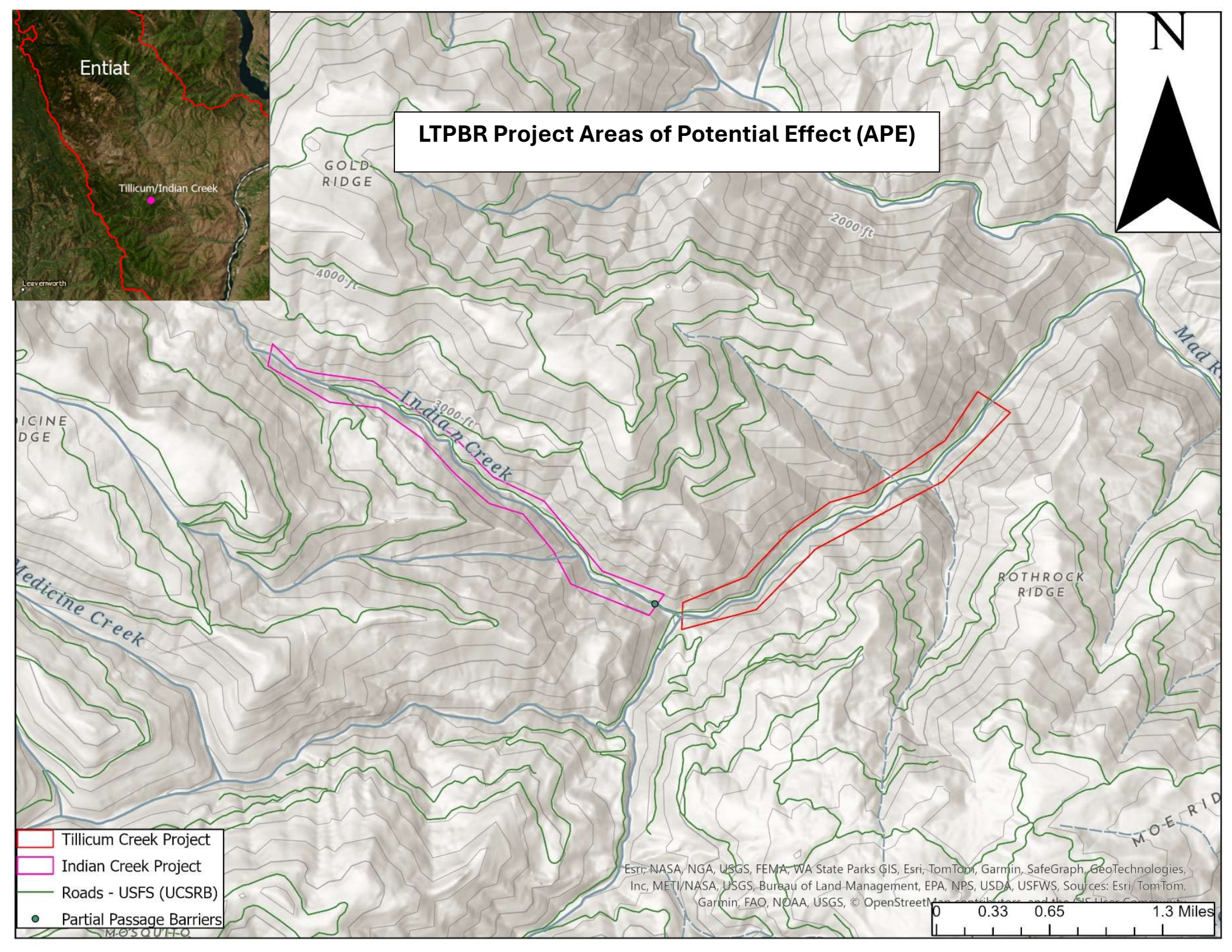
Project Name	Wenatchee Entiat Beaver Project Low-Tech Restoration
SRFB #	25-1228
Sponsor	Trout Unlimited

	OVERALL PROJECT Cost	GRANT REQUEST Amount	PRISM MATCH Amount	MATCH NOT IN PRISM Amount	*Budget Check*
Sheet #1 Acquisition					
Property Costs	$ -	$ -	$ -	$ -	0
Incidental Costs	$ -	$ -	$ -	$ -	0
Administrative Costs	$ -	$ -	$ -	$ -	0
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ -	$ -	$ -	$ -	0
Sheet #2 Design					
Design Costs	$ -	$ -	$ -	$ -	
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ -	$ -	$ -	$ -	0
Sheet #3 Restoration					
Construction Costs	$ 273,045	$ 273,045	$ -	$ -	0
AA&E	$ 45,047	$ 45,047	$ -	$ -	0
Indirect Costs	$ 31,809	$ 31,809	$ -	$ -	
STotal	$ 349,901	$ 349,901	$ -	$ -	0
Totals	$ 349,901	$ 349,901	$ -	$ -	0


Beaver Coexistence Project Site Examples
CHELAN MOUNTAINS
N
Flow Device, Fish Lake Run
Ongoing Coexistence, Beaver Creek
Culvert Fence, Mill Creek
WENATCHEE NATIONAL FOREST
Entiat River
ENTIAT MOUNTAINS
WILD SKY WILDERNESS
ALPINE LAKES WILDERNESS
CASCADE RANGE
Ongoing Coexistence, Icicle Creek
9416 ft
WASHINGTON
Wenatchee
WENATCHEE MOUNTAINS
Tree Caging, Tronsen Creek
Beaver Coexistence Sites
Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, FPA, NPS, USFWS
0 4.75 9.5 19 Miles


LTPBR Potential Project Sites
N
Rock Creek
Minnow Creek
Brush Creek
Gate Creek
Indian Creek
Tillicum Creek
Tronsen Creek
CHELAN MOUNTAINS
WENATCHEE NATIONAL FOREST
ENTIAT MOUNTAINS
Entiat River
WENATCHEE MOUNTAINS
WASHINGTON
Wenatchee
3817 ft
9416 ft
CASCADE RANGE
Potential LTPBR Sites
Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, FPA, NPS, USFWS
0 4.75 9.5 19 Miles


LTPBR Project Site Examples
N
GOLD RIDGE
4492 ft
4000 ft
NFD-Road-5808
NFD-Road-5700
NFD-Road-5800
NFD-Road-5810
3651 ft
2000 ft
3000 ft
4172 ft
3658 ft
ROTHROCK RIDGE
Indian Creek
Mad River
Parking/staging area
culvert
suspended wood
Low gradient, accessible floodplain
Parking area
Parking Area
Suspended wood
Upstream extent of accessible floodplain
Parking Area
Historic log weirs
Parking Area
Tillicum Creek APE
Indian Creek APE
Roads - USFS (UCSRB)
Partial Passage Barriers
Indian Creek Points
Tillicum Creek Points
Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau,
0 0.28 0.55 1.1 Miles


LTPBR Project Areas of Potential Effect (APE)
Entiat
Tillicum/Indian Creek
Leavenworth
N
GOLD RIDGE
2000 ft
4000 ft
3000 ft
India n Creek
Medicine Creek
ROTHROCK RIDGE
Tillicum Creek Project
Indian Creek Project
Roads - USFS (UCSRB)
Partial Passage Barriers
Esri, NASA, NGA, USGS, FEMA, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
0 0.33 0.65 1.3 Miles

Tillicum Confluence

Indian Creek Roadside Incision

Peshastin Creek - Tree Caging

Mill Creek Culvert – Beaver Coexistence

Culvert – Beaver Coexistence

Indian Creek Riparian Enhancement Plan

Tillicum Creek is a tributary to Mad River and then the Entiat River located on U.S. Forest Service property in Chelan County, WA. Tillicum Creek provides important habitat for summer steelhead spawning, bull trout rearing, and spring chinook.

Table of Contents

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8. Adaptive Management 9
9. As-Built Documentations 10
10. Stewardship Activity Report 10

1. Existing Conditions Assessment

Overview:

Tillicum Creek is a tributary to Mad River and then the Entiat River located on U.S. Forest Service property in Chelan County, WA. Tillicum Creek provides important habitat for summer steelhead spawning, bull trout rearing, and spring chinook.

Tillicum Creek has been identified as having limited large wood inputs, off-channel-side-channels, and floodplain connectivity resulting in a need for channel complexity restoration, channel modification, and riparian restoration and management. Low-tech process-based restoration is proposed with goals of increasing habitat diversity and complexity, pool habitat, floodplain access, water retention and baseflows, and channel length through meander formation and braiding.

Target species: The species of concern in Tillicum Creek basin is steelhead (*O. mykiss*), bull trout, and spring chinook. Washington Department of Fish and Wildlife Statewide Washington Integrated Fish Distribution data shows documented steelhead spawning and rearing in Tillicum Creek.

Environmental Setting:

The Tillicum Creek watershed is in the Ponderosa Pine Zone bordering the eastern Washington steppe. Douglas-fir and grand fir species consistent with the floodplain soils (Burnscreek stony sandy loam) are bitterbrush (*Purshia tridentata*) and bluebunch wheatgrass (*Pseudoroegneria* spicata). Other observed species noted as common in the middle reach of the project area are red osier dogwood (*Cornus stolonifera*), mountain alder (*Alnus incana*), black cottonwood (*Populus trichocarpa*), blue elderberry (*Sambucus cerulea*), horsetail (*Equisetum arvense*), and willow *(Salix* spp.).

Land use:

Most of the watershed is within USFS boundaries. There are road crossings and forest roads that run in close proximity throughout much of the lower portion of the stream.

Soils: U.S. Department of Agriculture (1989) mapped soils as Ardenvoir stony fine sandy loam, 60 to 90 percent slopes and Ardenmont coarse sandy loam, 60 to 90 percent slopes, and Swakane-Rock outcrop complex, 45 to 90 percent slopes through this section of the Tillicum Creek floodplain. Ardenvoir stony fine sandy loam consists of well-drained residuum and colluvium weathered from gneiss and schist mixed in the surface with loess and volcanic ash. Ardenmont coarse sandy loam are well drained residuum and colluvium weathered from schist mixed with volcanic ash and loess.

Hydrology/Water Quality:

Tillicum Creek is a snow dominated watershed, with primarily snowmelt feeding multiple tributaries from higher elevations. The floodplain portion of the site is subject to occasional brief periods of flooding from November through April.

A tributary to Tillicum Creek, Indian Creek has a 303 (d) list for temperature. The Entiat River is listed on the 303 (d) list for temperature, however it is a category 4, and progress is managed through the Entiat Watershed Management Plan (not through a Total Maximum Daily Load, TMDL).

Site Constraints: The primary enhancement challenges include preserving native plants during the dry summers, and trying to improve species diversity, especially including species preferred by beavers – Willow, aspen, alder, cottonwood. Long term stewardship will increase available groundwater and spread water on the floodplain to aid vegetation establishment and self-sustaining riparian communities.

2. Restoration Objectives

The goal of this restoration plan is to enhance and restore self-sustaining functioning riparian habitat that supports Endangered Species Act listed Threatened Upper Columbia summer steelhead and bull trout and ESA listed Endangered spring chinook.

The objective is to improve juvenile steelhead, bull trout and chinook rearing habitat conditions in Tillicum Creek, specifically by implementing LTPBR to reduce summer stream temperatures and to recruit trees for large wood complexity that will increase in-stream habitat. The specific objectives of this project include:

1. Implement LTPBR project to reduce stream downstream temperatures, reduce incision, and inundate the floodplain to recruit more riparian vegetation.

2. Maintain installed LTPBR structures on an annual basis to continue accruing original project benefits.

    a. Obtain weave material through nearby forest thinning projects if possible.

    b. Plug holes in structures and establish a strong seal to ensure water only flows over the top of the structure, creating the largest possible pools, while maintaining fish passage and accruing sediment to correct incision.

3. Adaptively manage the project site

    a. Identify developing site conditions through regular monitoring.

    b. Provide a source of large woody materials from dying or flood-recruited trees on site that will add to in-stream habitat complexity along or downstream of this reach, to benefit adult steelhead and chinook spawning and passage.

    c. Add structures as needed.

    d. Encourage side channel formation.

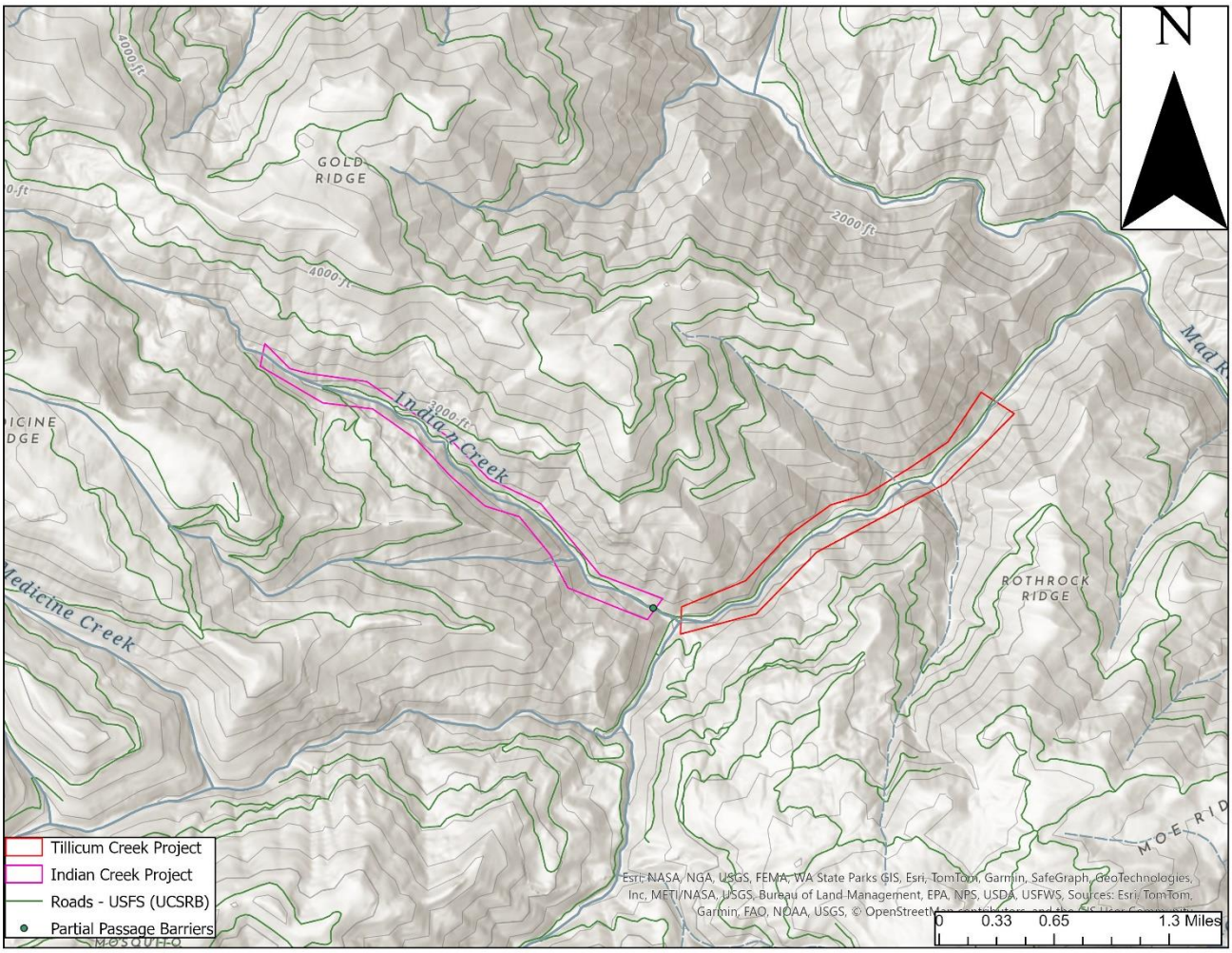
4. Encourage beaver reintroduction or relocate beavers to the site if possible.

    a. Beavers can maintain and enhance site conditions much more quickly than humans, and often build on LTPBR structures, effectively providing free maintenance.

    b. If the site can provide adequate habitat and beavers are available, relocate them to the project site.

5. Track performance of enhancement efforts through monitoring in years one, three, five, seven, and ten as outlined in monitoring plan found in section 6.

3. Plan Maps


N
GOLD RIDGE
4000 ft
2000 ft
Indian Creek
Medicine Creek
ROTHROCK RIDGE
Tillicum Creek Project
Indian Creek Project
Roads - USFS (UCSRB)
Partial Passage Barriers
Esri, NASA, NGA, USGS, FEMA, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap
0 0.33 0.65 1.3 Miles

4. Site Preparation Methods

The sponsor will secure funding and hire, supervise, and work with field crews to complete site preparation work. The sponsor will secure any permits and licenses needed to complete work.

Site preparation for the LTPBR project involves regular meetings with USFS staff to coordinate projects, permitting, hiring a seasonal crew, purchasing untreated wood posts, coordinating logistics, obtaining weave material, and coordinating with partners.

5. Riparian Planting Methods

No planting is proposed at this time.

Indian Creek Riparian Enhancement Plan

Indian Creek is a tributary to Tillicum Creek which is a tributary to Mad River and then the Entiat River located primarily on U.S. Forest Service property in Chelan County, WA. The Indian Creek watershed is comprised of USFS public lands, with a sliver of WA State owned land. Indian Creek provides important habitat for *O. mykiss* and contributes to habitat for summer steelhead spawning, bull trout rearing, and spring chinook in Tillicum Creek.

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1. Existing Conditions Assessment

Overview:

Indian Creek is a tributary to Tillicum Creek which is a tributary to Mad River and then the Entiat River located primarily on U.S. Forest Service property in Chelan County, WA. Indian Creek provides important habitat for O. mykiss and contributes to habitat for summer steelhead spawning, bull trout rearing, and spring chinook in Tillicum Creek.

Indian Creek has been identified as having limited large wood inputs, off-channel-side-channels, and floodplain connectivity resulting in a need for channel complexity restoration, channel modification, and riparian restoration and management. Low-tech process-based restoration is proposed with goals of increasing habitat diversity and complexity, pool habitat, floodplain access, water retention and baseflows, and channel length through meander formation and braiding.

Target species: The species of concern in Indian Creek basin is steelhead (*O. mykiss*), bull trout, and spring chinook. Washington Department of Fish and Wildlife Statewide Washington Integrated Fish Distribution data shows documented steelhead spawning and rearing in Tillicum Creek immediately downstream.

Environmental Setting:

The Tillicum Creek watershed is in the Ponderosa Pine Zone bordering the eastern Washington steppe. Douglas-fir and grand fir species consistent with the floodplain soils (Burnscreek stony sandy loam) are bitterbrush (*Purshia tridentata*) and bluebunch wheatgrass (*Pseudoroegneria* spicata). Other observed species noted as common in the middle reach of the project area are red osier dogwood (*Cornus stolonifera*), mountain alder (*Alnus incana*), black cottonwood (*Populus trichocarpa*), blue elderberry (*Sambucus cerulea*), horsetail (*Equisetum arvense*), and willow *(Salix* spp.).

Land use:

Most of the watershed is within USFS boundaries, with a sliver of State-owned land. There are road crossings and forest roads that run in close proximity throughout much of the lower portion of the stream.

Soils: U.S. Department of Agriculture (1989) mapped soils as Ardenvoir stony fine sandy loam, 60 to 90 percent slopes and Ardenmont coarse sandy loam, 60 to 90 percent slopes through this section of the Indian Creek floodplain. Ardenvoir stony fine sandy loam consists of well-drained residuum and colluvium weathered from gneiss and schist mixed in the surface with loess and volcanic ash. Ardenmont coarse sandy loam are well drained residuum and colluvium weathered from schist mixed with volcanic ash and loess.

Hydrology/Water Quality:

Indian Creek is a snow dominated sub-watershed, with primarily snowmelt feeding Entiat River from higher elevations. The floodplain portion of the site is subject to occasional brief

periods of flooding from November through April.

Indian Creek has a 303 (d) list for temperature. The Entiat River is listed on the 303 (d) list for temperature, however it is a category 4, and progress is managed through the Entiat Watershed Management Plan (not through a Total Maximum Daily Load, TMDL).

Site Constraints: The primary enhancement challenges include preserving native plants during the dry summers, and trying to improve species diversity, especially including species preferred by beavers – Willow, aspen, alder, cottonwood. Long term stewardship will increase available groundwater and spread water on the floodplain to aid vegetation establishment and self-sustaining riparian communities.

2. Restoration Objectives

The goal of this restoration plan is to enhance and restore self-sustaining functioning riparian habitat that supports Endangered Species Act listed Threatened Upper Columbia summer steelhead and bull trout and ESA listed Endangered spring chinook.

The objective is to improve juvenile steelhead, bull trout and chinook rearing habitat conditions downstream in Tillicum Creek, specifically by implementing LTPBR to reduce summer stream temperatures and to recruit trees for large wood complexity that will increase in-stream habitat. The specific objectives of this project include:

1. Implement LTPBR project to reduce stream downstream temperatures, reduce incision, and inundate the floodplain to recruit more riparian vegetation.

2. Maintain installed LTPBR structures on an annual basis to continue accruing original project benefits.

    a. Obtain weave material through nearby forest thinning projects if possible.

    b. Plug holes in structures and establish a strong seal to ensure water only flows over the top of the structure, creating the largest possible pools, while maintaining fish passage and accruing sediment to correct incision.

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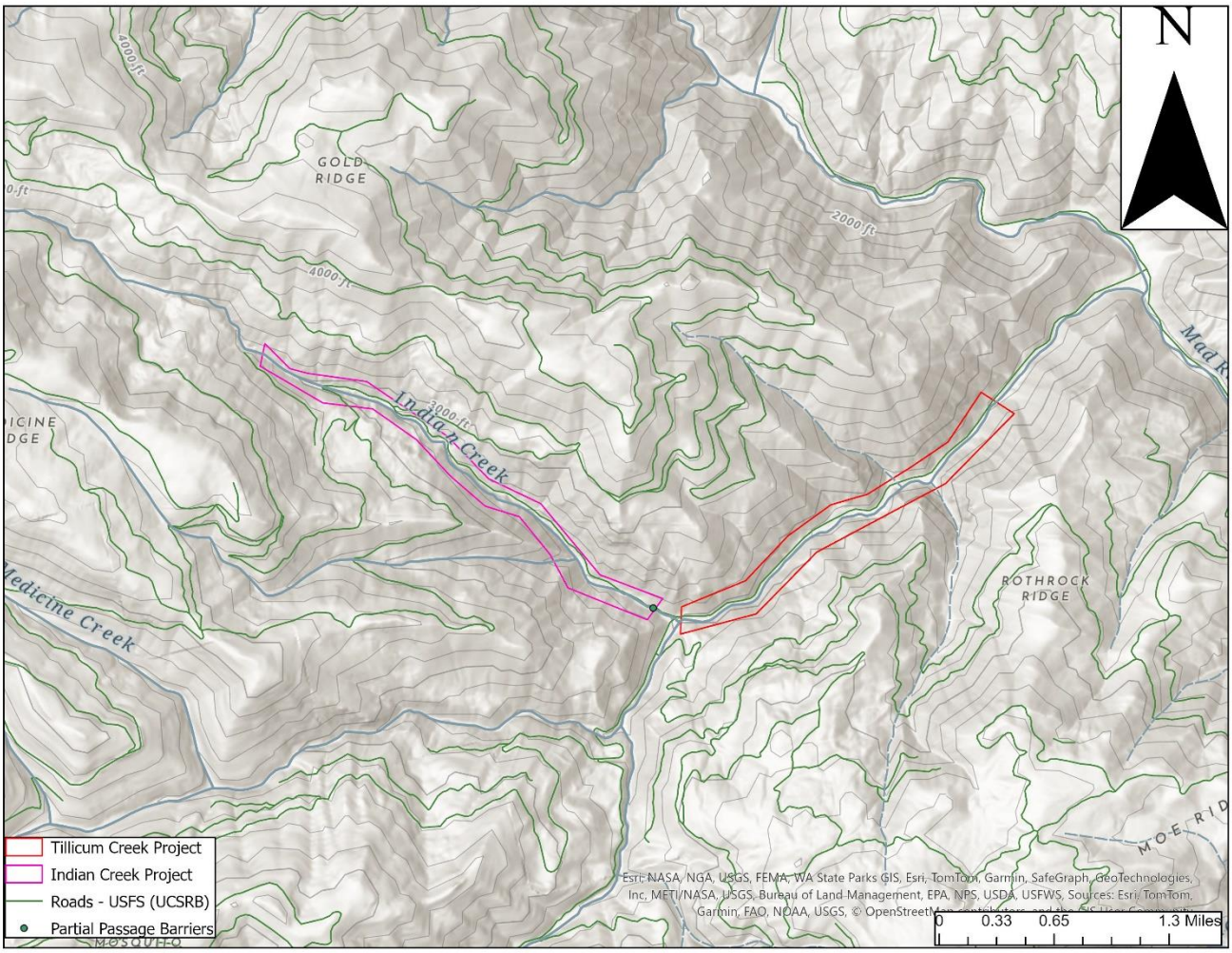
N
GOLD RIDGE
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Indian Creek Project
Roads - USFS (UCSRB)
Partial Passage Barriers
Esri, NASA, NGA, USGS, FEMA, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap
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4. Site Preparation Methods

The sponsor will secure funding and hire, supervise, and work with field crews to complete site preparation work. The sponsor will secure any permits and licenses needed to complete work.

Site preparation for the LTPBR project involves regular meetings with USFS staff to coordinate projects, permitting, hiring a seasonal crew, purchasing untreated wood posts, coordinating logistics, obtaining weave material, and coordinating with partners.

5. Riparian Planting Methods

No planting is proposed at this time.

Low-Tech Process-Based Restoration Structure Type Details, and Schematics

This section outlines the different structure types, how different structure types should be used to promote specific hydraulic and geomorphic responses, and design schematics for Beaver Dam Analogs (BDA), Post-Assisted Log Structures (PALS), and Strategic Wood Placements. More details can be found in Wheaton et al. 2019.

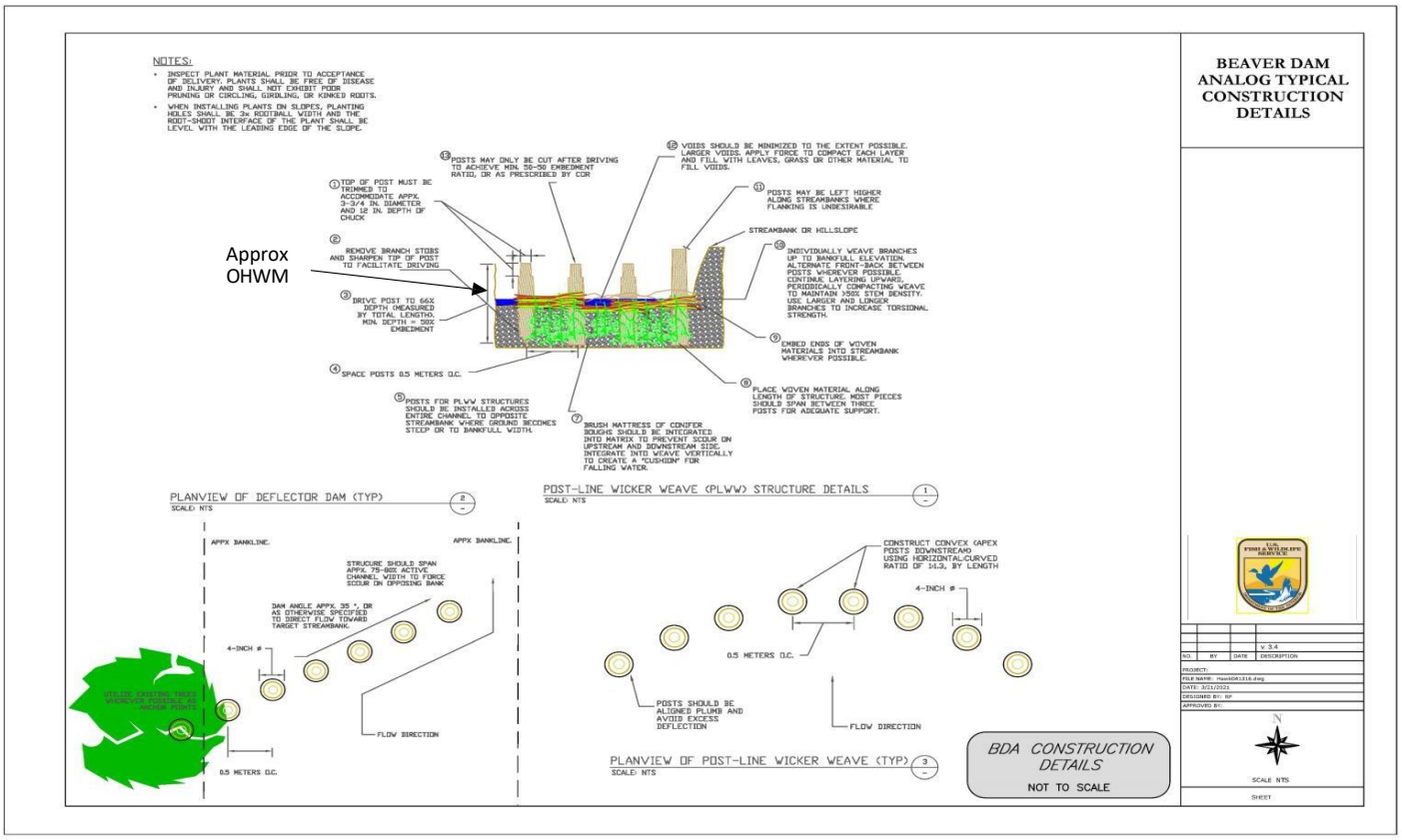
All proposed Beaver Dam Analogues/Post Assisted Log structures will be either:

1. A channel-spanner designed to retain sediment, encourage pool development, or similar.
2. A deflector dam designed to change flow direction to encourage meandering, braiding, or channel migration away from a specified feature.

Activities will not deviate from Aquatic Habitat Guidelines. It is the intention of the project to improve habitat conditions in the short-term as well as make the project area more robust to long-term challenges associated with succession, land use, and climate impacts.

Following are additional typical schematics and plans for BDAs, PALS, and Strategic Wood Placements.

BDA Structure Types and Schematic



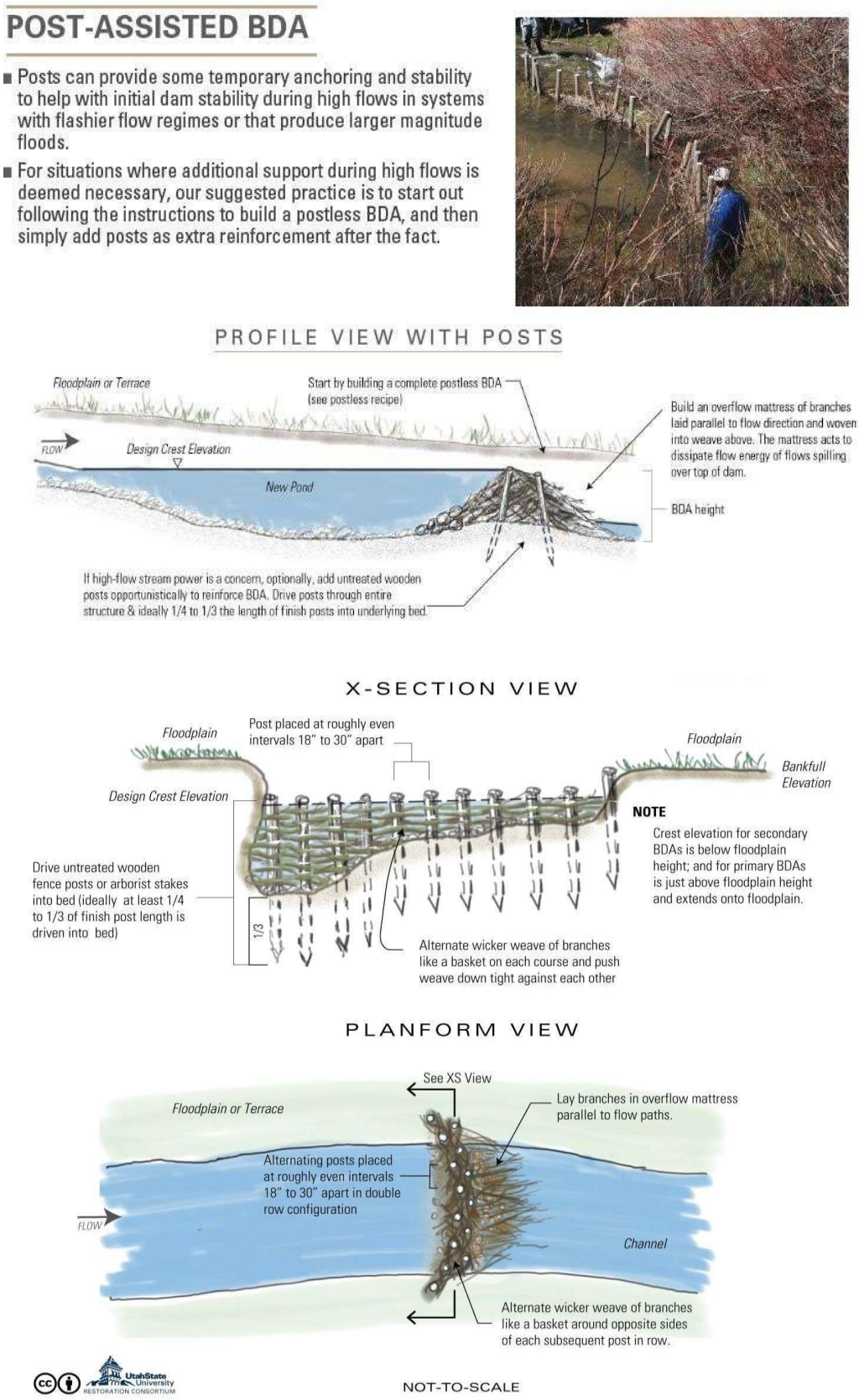


Figure 5. Profile schematic of post-assisted BDA. Given the potential flashy hydrograph within Foster and East Foster Creek, BDAs will primarily be reinforced with posts. From Chapter 4 of Wheaton et al. (2019: http://lowtechpbr.restoration.usu.edu).

PALS Structure Types and Schematics

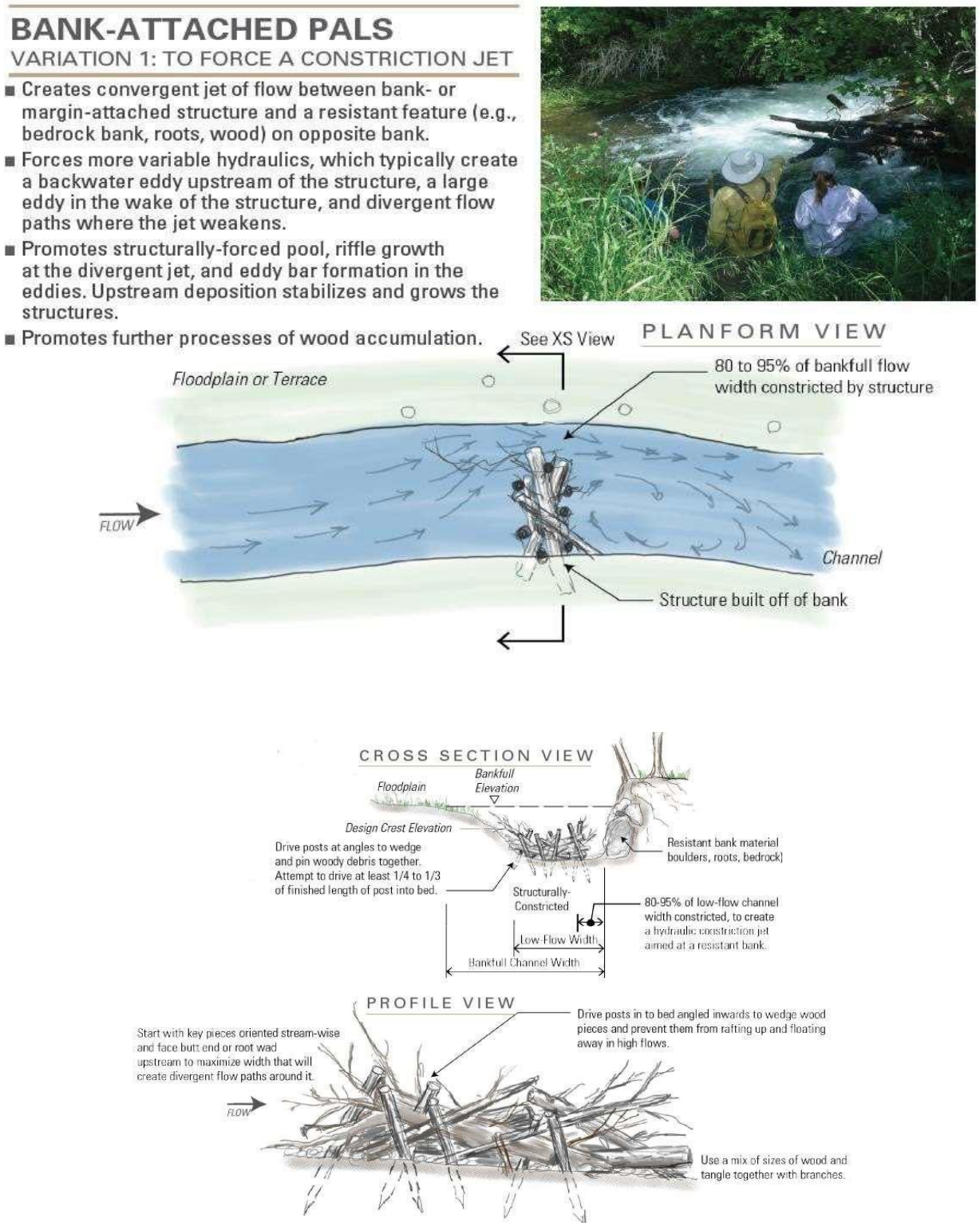


Figure 1 – Typical schematic sketches of a bank-attached PALS intended to cause lateral channel migration through deposition of material on point and diagonal bars and erosion of high bank features. From Chapter 4 of Wheaton et al. (2019: http://lowtechpbr.restoration.usu.edu).

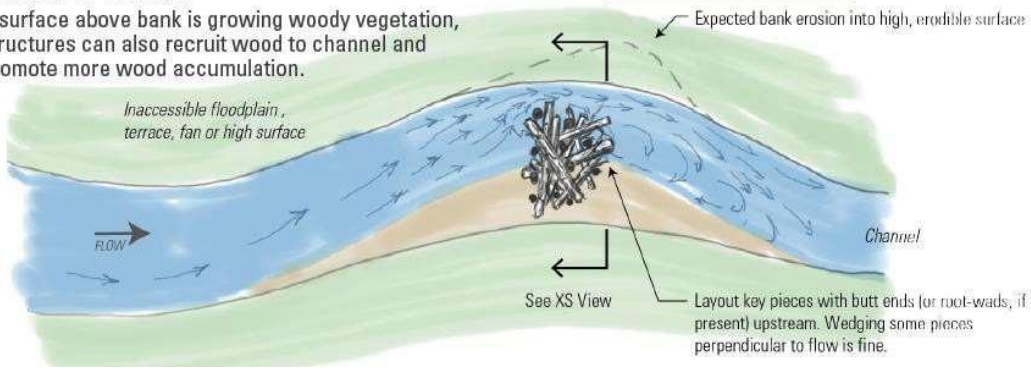
PALS Structure Types and Schematics

BANK-ATTACHED PALS:

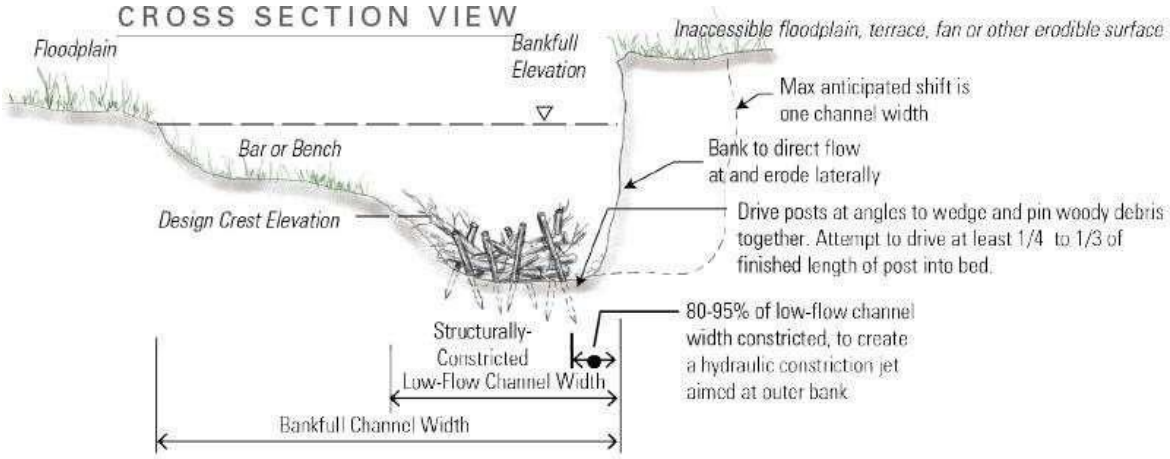
VARIATION 2: BANK BLASTER

- Accelerates lateral widening via bank erosion of an erodible bank opposite of the structure.
- Shunting of flow forces more variable hydraulics, which typically create a backwater eddy upstream of the structure, an eddy downstream of structure, and temporary jet aimed at opposite erodible bank.
- Leads to lateral shift of channel (no more than one channel width typically). Further lateral migration occurs if bar growth continues on inside bend, further natural woody debris accumulates on structure, or subsequent treatment is extended off structure.
- If surface above bank is growing woody vegetation, structures can also recruit wood to channel and promote more wood accumulation.

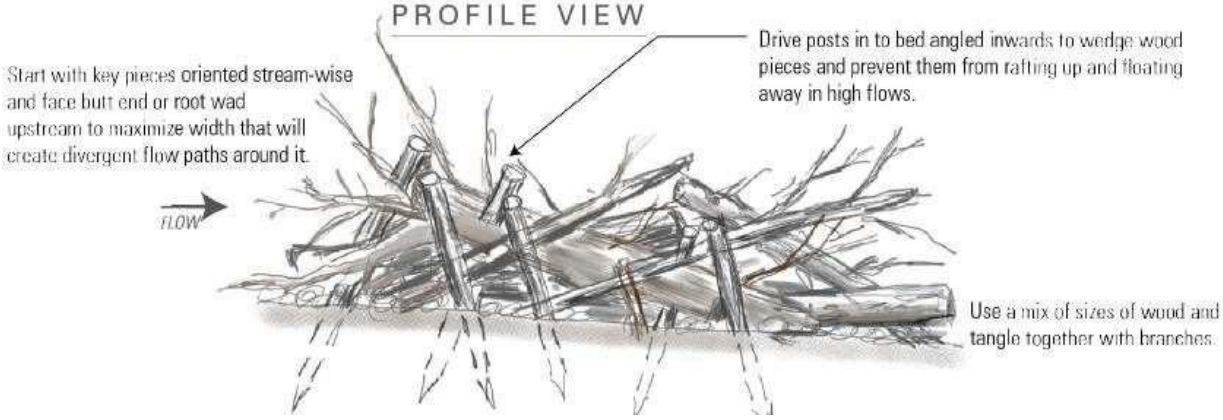
PLANFORM VIEW



CROSS SECTION VIEW



PROFILE VIEW



PALS Structure Types and Schematics

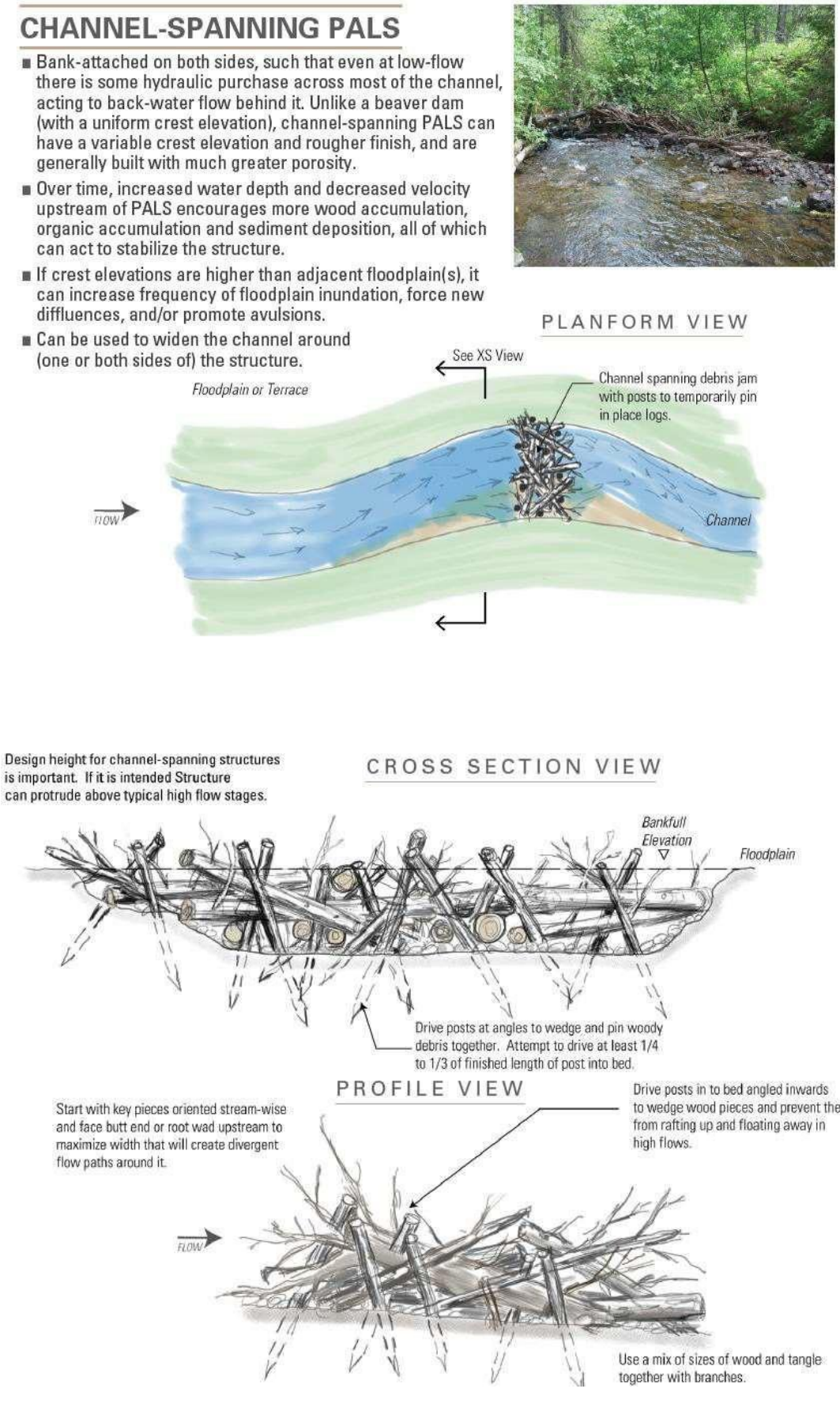
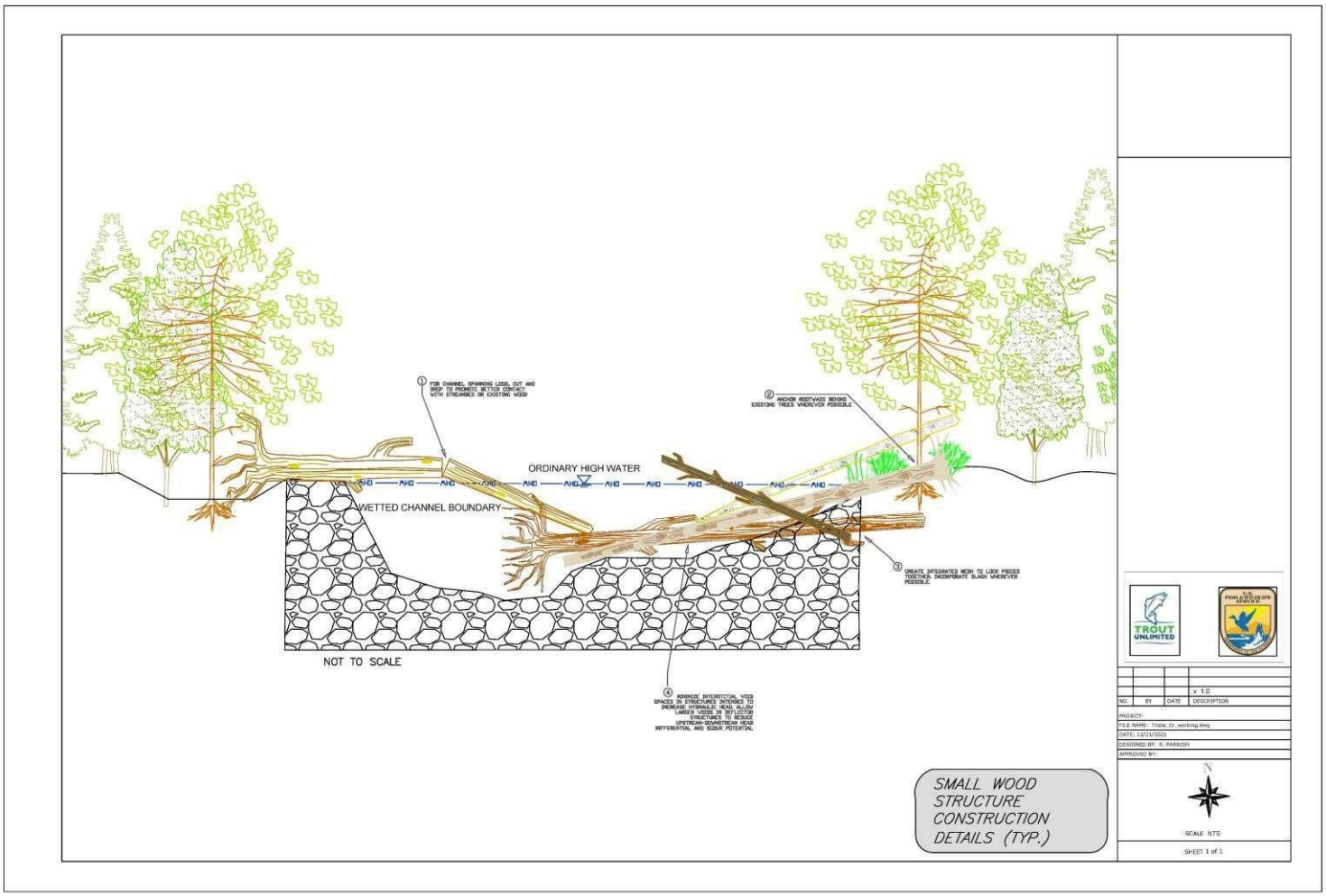


Figure 3. Typical schematics of a channel-spanning PALS. Channel spanning PALS are designed to be passable by fish at all flows. From Chapter 4 of Wheaton et al. (2019: http://lowtechpbr.restoration.usu.edu).

PALS Structure Types and Schematics

Figure 4. Example of PALS evolution over the course of one year promoting processes of wood accumulation. A and B show a mid-channel PALS becoming a bank-attached PALS, C and D show a bank-attached PALS becoming a debris jam, and E and F show a bank-attached PALS becoming a mid-channel PALS. The geomorphic changes imposed by the presence of the PALS in each example shows clear alterations to the channel bed and hydraulics. From Chapter 4 of Wheaton et al. (2019: http://lowtechpbr.restoration.usu.edu).

Strategic Wood Placements Schematic



TU will utilize already downed wood onsite that is either perched above or adjacent to the channel. Key pieces will be strategically placed to ensure stability. Work will be completed entirely with hand tools, including but not limited to chainsaws, grip hoist, winch, and shovels. No large equipment will be used, and ground disturbance will be minimal.