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	Goodwin Side Channel Implementation
Sponsor	Cascade Fisheries
Primary Contact	Aaron Rosenblum
E-Mail Address	aaron@ccfeg.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.

This proposal is to implement a river restoration project, the Goodwin Side Channel, which is located on the Wenatchee River RM 11.2 - 11.5. The project will address the highest priority limiting factors in the Wenatchee River - Ollala Canyon 01 Reach including Cover-Wood, Off-Channel/Side Channel, Riparian Canopy, Temperature-Rearing, and Floodplain Connectivity. Implementation of this project will improve summer and winter rearing for ESA-listed spring chinook and steelhead, as well as summer chinook and coho. The stated project goals are:
1. Improve rearing habitat in the side channel by increasing connection to groundwater;
2. Enhance the floodplain and side channel habitat functions through improved surface water connection with the river while taking advantage of the benefits provided by groundwater inflow;
3. Promote native woody vegetation cover throughout the floodplain by planting where current non-native, invasive reed canary grass patches exist and preserve existing mature native riparian forest;
4. increase large woody material cover and habitat complexity.

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 will achieve the following objectives upon implementation:
1. Create approximately 1,450 linear feet of new of side channels. New side channels will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
2. Enhance approximately 1,150 of existing side channel habitat. Existing will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
3. Install 82 Wood Habitat Structures (WHS), including two in the mainstem Wenatchee, to improve salmon habitat complexity and cover and to promote geomorphic processes that form and maintain habitat.
4. Install 1 rock inlet structure to promote side channel inlet longevity and promote safe river recreation.
5. Create 35 groundwater connected pools within the floodplain side channels. These pools will be connected to groundwater year-round. They will provide cooler water rearing habitat in the summer and warmer water rearing habitat in the winter.
6. Remove 1 levee to install the new side channel and to improve surface water connectivity to an existing riverine wetland.
7. Increase floodplain inundation 2,850% (from 0.02 acres to 0.64 acres) at the 50% exceedance flow (1,810 CFS)
8. Increase floodplain inundation 70% (from 4.44 acres to 7.50 acres) at the 1.5 year recurrence interval (15,400 CFS)
9. Restore and expand wetland and riparian vegetation communities by planting 3.9 acres in native species.

Budget Request

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

Anticipated Request - SRFB (standard round)	500,000
Tributary Committee - Anticipated or Actual	650,000
Anticipated or Actual Other Funding	1,100,000
Anticipated TOTAL Budget	2,250,000

Other Funding Source(s), please note if funding is anticipated or actual.

BPA - verbally committed

Project Location

Briefly describe the location of the project	This project will occur on the left bank floodplain of the Wenatchee River starting at RM 11.15 and ending at RM 11.5
Latitude (decimal degrees)	47.529739
Longitude (decimal degrees)	-120.498091

Project subbasin	Wenatchee
Wenatchee Assessment Unit(s)	Wenatchee River-Ollala Canyon
Does the proposed project span multiple assessment units?	No
Reach(es) Name	Ollala 01
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/.	Rank 3

Project Information

1. What species will the project benefit?	Spring Chinook Steelhead Summer Chinook coho
2. Select the project's objectives and the associated tracking metrics	Instream Habitat (Includes Floodplain & Off-Channel Reconnection) Riparian Habitat
Instream Habitat: Reporting Code	Miles of off-channel stream created or connected Acres of channel/off-channel connected or added Number of structures placed in channel Pools created through channel structure placement
Riparian Habitat: Reporting Code	Total riparian acres 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

Is the project eligible for Riparian Funding? No

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)? Lower Wenatchee Reach Assessment

9. Which limiting factors does the project propose to address? Cover - Wood; Off-Channel - Floodplain; Off-Channel - Side-Channels; Pool Quantity & Quality; Riparian - Canopy Cover; Temperature - Rearing

10. Which life stages will the proposed project address? 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?

Significant human infrastructure including the Burlington Northern railroad, Highway 2, fruit orchards, homes, and towns along the lower Wenatchee River have severely impaired instream and off-channel habitat (TetraTech 2017). In Reach 5 of the Wenatchee River, where this proposal is located, 54% of the floodplain is disconnected, and there is 0% off-channel habitat. The surrounding reaches are similarly limited: Reach 4 has 66% floodplain disconnected and 4% off channel habitat, while Reach 6 has 62% of floodplain disconnected and 0% off-channel habitat.
The lower Wenatchee is a Major Spawning Area for steelhead, foraging and overwintering habitat for bull trout, a spawning and rearing area for summer Chinook, and migration corridor for sockeye, spring Chinook, summer chinook, coho, steelhead, and bull trout (Table 1) (ibid) (Andonaegui 2001). Juveniles of all three ESA-listed species rear in the lower Wenatchee.

The Goodwin Side Channel (GSC) falls within the Wenatchee River Ollala 01 reach of the Wenatchee River – Ollala Canyon Assessment Unit within the Upper Columbia Salmon Recovery Region's prioritization scheme. This Assessment Unit is listed as a tier 1 priority for Steelhead restoration. At the reach scale, winter rearing is listed as a high priority life stage for both spring chinook and steelhead, while summer rearing is a medium priority life stage for steelhead. The highest-ranking limiting factors for this reach that are addressed by this project are cover-wood, off-channel/side-channel habitat, Riparian canopy cover, and Temperature-rearing, and the second highest ranking limiting factor is floodplain connectivity.

A 15-month assessment of the Goodwin Side Channel (GSC) by Cascade Fisheries staff found the hydrology of the GSC is currently driven by groundwater for most of the year. The side channel is disconnected from Wenatchee River surface water when flows at the Monitor gage are less than 8000 CFS. Surface water levels within the side channel vary throughout the year independent of a surface water input and were strongly correlated with groundwater levels. Frequently, calculated groundwater and surface water elevations were the same for a monitoring well and the adjacent side channel.

Through implementation of this project we will increase the frequency and duration of the connectivity of the side channels to the Wenatchee River. The side channels are designed to be connected to the river at the 50% exceedance interval, which is 1,810 CFS. This will increase the accessibility of the side channel habitat by juvenile salmonids from about 36 days/year on average to about 180 days/year on average.

Importantly, the side channels will not be connected to the Wenatchee River during the hot summer months, but rather will be fed solely by cooler groundwater. During the important winter rearing months, the side channel will be periodically connected by surface water to the river, which will allow rearing fish into the side channels. Then as flows decrease the side channel will again be only connected to groundwater, which is slightly warmer and can provide a metabolic boost to growing juveniles. Habitat quality within the side channel itself will be vastly improved upon implementation of this project. The project will install numerous deep pools and WHS to provide excellent rearing habitat.

A surface water temperature logger installed by CF staff during the GSC Assessment provides important insights to the site potential of a shaded, groundwater-fed side channel. Dense willow (Salix spp.) and dogwood (Cornus sericea) vegetation shaded the area the temperature logger was installed, and surface water temperatures remained in the tolerable range for salmonids throughout the summer, with a maximum value of 17.5° C. By mid to late summer water temperatures in the mainstem Wenatchee were 5° C or more, hotter. These findings suggest that the groundwater-fed GSC, could be a cooler water haven for salmonids through the summer once adequate riparian vegetation is restored and established throughout.

The proposed project will address identified habitat limiting factors for ESA-listed salmonid species and restore watershed processes and functions through creation of new and reactivation of former off-channel habitats, wetlands, and floodplain area, WHS construction, and by maintaining and expanding forested riparian areas. Increased availability off channel habitats and improved floodplain connectivity will increase summer and winter Spring Chinook and steelhead juvenile rearing habitat. Through improved floodplain connection to overbank flows, the project will also increase floodwater attenuation, recharge groundwater storage, and hydrologically improve wetland and riparian functions. These actions will provide increased in-stream cover and velocity refugia and increased length of edge habitat for juvenile salmonids, and an increased frequency of stable wood and potential for retention of mobile wood. Construction of WHS in the side channels and mainstem will create and maintain deep pool habitat with groundwater connection and woody cover.

Implementation of this project will improve wetland and floodplain habitat. Floodplain habitats are highly important for fish and wildlife, and this project will result an increase of 3..06 acres of inundated floodplain at the 1.5-year flow compared to existing conditions. Project implementation will encourage riparian vegetation rehabilitation along the edges of the new and existing side channels, and existing wetlands through both direct planting after construction and natural revegetation over time. Planting and revegetation efforts will be sustained through the creation and expansion of floodplain area with increased access to regular overbank flows as well as increased groundwater availability. The riparian vegetation will assist in creation of channel shade, cover, pool creation, hydraulic complexity, wood recruitment, gravel sorting and retention, and groundwater exchange. As more existing floodplain depressions become reconnected, it is anticipated that the surrounding lower floodplain areas will become wetter, again supporting more moisture tolerant riparian vegetation. The resulting floodplain/wetland mosaic will be structurally complex, providing a number of different habitat niches including breeding areas, escape, cover, and food production.

The project was designed and intended to be beneficial to Endangered Species Act-listed spring chinook, steelhead, and bull trout, as well as summer chinook and coho. The restored floodplain connection will have substantial benefits to ESA-listed salmonids, specifically, juveniles. Juveniles require slow, shallow water, such as that provided by engaged floodplains and riverine wetlands. During spring freshets and other high flow events, juveniles cannot tolerate the velocities and turbulence in the mainstem. Floodplain off-channel habitats provide them an important refuge. In the daytime, chinook and steelhead fry preferentially station over fine substrates with abundant vegetation cover, precisely the type of habitat found in the emergent riverine wetlands that will be made available to them through the implementation of this project. The WHS that will be installed as part of this project will provide essential cover, allowing juveniles to avoid predators that are on the hunt in the mainstem river. This project will provide an important functional lift to high priority life stages of ESA-listed salmonids in the Wenatchee River.

A total of 82 WHS will be installed through project implementation. WHS will maintain excavated pools in which adult salmonids can hold, and create tailouts at the downstream end of pools that would contribute to suitable spawning habitat in terms of water depth, velocity and substrate sizes. The pools and cover created by the WHS would also provide suitable rearing habitat for juvenile salmonids, provide food

resources such as aquatic insects for juvenile salmonids and other fish species. Pools would be maintained by the hydraulic conditions created by the WHS, which will concentrate flows and force scour in their proximity. The WHS would be wetted and provide cover for juvenile salmonids during a range of flow conditions including, low flow.

This project will serve to offset the simplification of aquatic habitats, development of channel incision patterns due to infrastructure development, and disconnection of floodplain habitats resulting from historic actions within the project reach.

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?

Significant human infrastructure has severely impaired watershed processes and functions in the lower Wenatchee River. The natural and artificial confinement in this section of the river limit restoration opportunities and have resulted in a stable channel with limited connection to floodplains and off-channel habitat. The lower Wenatchee Reach Assessment identified the project area in the current proposal as the only geomorphically suitable restoration opportunity in Reach 5, and found that the opportunity "has good potential for improving off-channel habitat in a reach where it is very limited." (TetraTech 2017).

Project elements and actions restore natural geomorphic processes and the large wood cycle at the project scale and are designed to address the current rate of channel incision, low diversity of stream substrates and in-channel habitats, lack of pools and cover, and increase the extent of the riparian forest community. The restoration of the Wenatchee River's hydrologic influence over its floodplain, resulting in changes in water depth and velocity across various existing and new wetland, side channel, and floodplain habitats at typically occurring river flows, will, over time, also support the development and expansion of wetland and riparian forest communities, restoration of the large wood cycle, and improve the floodplain's ability to provide water quality function along this portion of the creek. Over time, the project will result in a net benefit to aquatic resources by restoring the hydraulic and sediment transport processes that form and support a diversity of wetlands and waters in the project area. The project is designed to be self-sustaining through natural processes so that its benefits can be realized well into the future.

The hydrologic rehabilitation of existing wetlands and creation of new floodplain areas that may develop riverine wetland areas overtime within the project boundaries will provide a substantial increase to the hydrologic functions and values provided by the site. The implemented project will create an additional 3.06 acres of inundated floodplain-wetland mosaic at the 1.5-year flood event, representing a 70% increase. This additional acreage of inundated area following project implementation will provide ample space for overbank flood storage during high water events. Riverine floodplains and wetlands play an important role during floods because the plants act to slow water velocities and thereby erosive flows. This reduction in velocity also spreads out the time of peak flows, thereby reducing the maximum flows. The woody trees and shrubs established as part of this project will magnify this improvement in flood flow reduction. This improved function is highly valuable to society as the sub-basin immediately down-gradient of the site has had surface flooding problems that resulted in damage to human or natural resources in the past. From a watershed scale perspective, floodwater attenuation is especially important in the lower Wenatchee where opportunities for improvement are severely limited by infrastructure and development.

Implementation of this project will provide a substantial increase to the water quality functions and values provided by the site. As stated earlier, under existing conditions there is limited overbank flows or floodplain engagement across the project site. Once new side channels are created, and woody and herbaceous wetland/riparian vegetation is established, the engaged floodplain will improve water quality by acting as a filter to trap sediments and associated pollutants. The plants, floodplain WHS, and floodplain roughness features will reduce water velocities causing sediments and pollutants to be deposited, thereby improving water quality. The riparian/wetland floodplain mosaic created by this project is close to the mouth of the Wenatchee River, and thus will have nearly the entire watershed as its contributing basin, providing the maximum potential for these areas to capture incoming pollutants from sources upstream. The Wenatchee River watershed has extensive agricultural and commercial timber harvest land use types, both of which are likely to increase the presence of pollutants in the river. The project area is located in the Wenatchee River, which has TMDLs for fecal coliform and Dissolved Oxygen

and pH. The proposed project provides a substantial increase over existing conditions of site's ability to capture pollutants, providing an increased value to society.

The Wenatchee River is also listed by the Washington Department of Ecology as having a TMDL for temperature. The implementation of this project will result in a drastically increased connection between floodplains, side channels and riverine wetlands with the Wenatchee River. Overall, 7.5 acres of floodplain will be inundated at the annual high flow after the project is implemented. The resulting floodplain wetland mosaic will help to address temperature issues in downstream waters. Floodplain vegetation, once mature, will provide essential shade to the Wenatchee River and side channels, helping to reduce solar insulation and warming. An improved connection between the Wenatchee River and its floodplain will result in an increased amount of surface and groundwater storage and exchange within the floodplain. Water stored within the floodplain will remain cool and will be slowly released back into the river during the summer months providing an important moderating effect to the warming river water. The side channel itself will be entirely groundwater fed in the hot summer months and will act as an important climate refugia for juvenile ESA-listed salmonids.

Side channels are naturally occurring features of a riverscape. However, they are frequently cut off from the river when the channel is artificially confined. Side channels and off-channel areas provide important rearing habitat for target fish species. Martens and Connolly (2014) found higher densities of salmonids in seasonally disconnected, partially connected, and fully connected side channels than in mainstem channels. This project will seek to improve the connection of the existing GSC, that is currently only connected to the mainstem for 36 days per year on average. This action will provide an immediate increase in habitat quantity, complexity, and diversity by reestablishing current mostly inaccessible and under-utilized habitat. Roni et al. (2002) found that projects involving reconnection of existing off-channel habitats had a higher probability of success than projects creating entirely new off-channel habitat. These types of restoration actions might be classified as full restoration because they restore natural processes (Beechie et al. 2010).

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

Less than or equal to 1 year | 1-10 years | 10-25 years

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

10-50 years | 50+ years

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

The project is designed to be self maintaining through riverine/geomorphic processes. Newly installed riparian vegetation will require monitoring and maintenance for the first 3 - 5 years to ensure adequate survival. Beyond this initial period, no long term maintenance is expected.

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

1. Create approximately 1,450 linear feet of new of side channels to increase the quantity of rearing habitat in this reach. New side channels will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
2. Enhance approximately 1,150 of existing side channel habitat to improve the quality and accessibility of rearing habitat in this reach. Existing will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
3. Install 82 Wood Habitat Structures (WHS), including two in the mainstem Wenatchee, to improve salmon habitat complexity and cover and to promote geomorphic processes that form and maintain habitat.
4. Install 1 rock inlet structure to promote side channel inlet longevity and promote safe river recreation.
5. Create 35 groundwater connected pools within the floodplain side channels. These pools will be connected to groundwater year-round. They will provide cooler water rearing habitat in the summer and

warmer water rearing habitat in the winter to improve rearing conditions for high priority life stages and species.
6. Remove 1 levee to install the new side channel and to improve surface water connectivity to an existing riverine wetland which increases floodplain inundation, improves watershed processes, and provides high flow refugia
7. Increase floodplain inundation 2,850% (from 0.02 acres to 0.64 acres) at the 50% exceedance flow (1,810 CFS) to increase floodplain inundation, improve watershed processes, and provide high flow refugia
8. Increase floodplain inundation 70% (from 4.44 acres to 7.50 acres) at the 1.5 year recurrence interval (15,400 CFS) to increase floodplain inundation, improve watershed processes, and provide high flow refugia
9. Restore and expand wetland and riparian vegetation communities by planting 3.9 acres in native species to improve riparian and floodplain function, improve side channel shading, provide nutrient and food input into the side channel, and provide a long-term, self-replacing source of woody material into the side channel.

Assessment Proposals

Protection Proposals

Monitoring Proposals

Project Risk and Economic Benefits

1. What is the landownership? WSDOT

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

Please explain

Yes, we have been working with WSDOT every step of they way. They have been actively reviewing designs and we have had several recent meetings with their staff to discuss access, traffic control and stormwater.

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

Cascade Fisheries will be required to get a general permit issued by WSDOT to implement the project. WSDOT will provide extensive review and will need to approve the final designs and traffic control plans prior to implementation. WSDOT review ensures that our project protects public safety and their infrastructure. Beyond specific design requirements and standards, there is no effect on the project.

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

The Wenatchee River, specifically the section from Leavenworth to Cashmere, is an important river recreation resource for kayakers and rafters throughout the Northwest region. A thriving commercial rafting industry exists on multiple sections of the Wenatchee River, helping expose tens of thousands of people to river recreation every year. The project is located approximately 1,000 feet downstream from a popular river feature called Turkey Shoot (Figure 1). The feature consists of a wave hydraulic that attracts rafters and kayakers to surf and “playboat.” Due to the highly recreated nature of this area, Cascade Fisheries hired a consultant to develop a technical memo that describes the hydrology and hydraulic conditions in the project reach, identify potential risks to river recreational users, and provide recommendations to minimize risk. As a result of this study, we altered our design and are now using a lower risk rock inlet structure at the upstream most side channel inlet, rather than a wood structure. We are also planning an extensive public outreach campaign to make river users aware of the project and view this as an opportunity to build support for salmon recovery projects.

The community at large will be slightly impacted as their will be periodic right lane closures of highway 2

during construction. However, the level of impact and concern should be minimal. Again, this is a good chance to conduct outreach and build awareness of salmon recovery efforts.

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

Cascade Fisheries is responsible for managing and maintaining the project. WSDOT is responsible for all of their infrastructure.

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

No

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

There is a low overall risk of failure of this project. Extensive hydraulic modeling has assessed post-project hydraulic conditions under design flow conditions which have informed channel and floodplain design and assessed site performance in meeting Project objectives. All structures have been designed to withstand anticipated hydraulic forces from design flows. Suitable factors of safety (FOS) have been selected to reduce any uncertainty. Special care was taken in designing the side channel inlets. Under the 2-year event, shear stresses are predicted to increase slightly by ~1 lbf/ft2 at the inlet to the upper side channel and along the existing side channel where the geometry will be graded deeper and with greater longitudinal continuity. This change is expected to provide the necessary “flushing flows” needed to maintain sediment continuity through the side channels and avoid imbalanced deposition. Due to the relatively small flow splits, and the high degree of roughness within the side channels, the risk of the river avulsing through the side channel path is very low.

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

Extensive outreach to river recreation users will be conducted prior to, during, and after implementation. This is a fantastic opportunity to educate the public and river users of the benefits and hazards natural and man-made wood features create. This outreach is also an opportunity to educate river users of the project benefits and other important safety elements for recreating on rivers to de-emphasize the focus on large wood as the primary hazard source. Prior to project implementation CF will host events targeted to river recreation users. One event, planned for May of 2025, will be hosted by Colchuck Consignment, and takes advantage of an already existing and regularly scheduled whitewater group meeting. Another event, potentially hosted at WRI or a local brewery, is planned prior to this project's implementation. Prior to, during, and after implementation we will also post alerts and project updates to the American Whitewater webpage and local whitewater social media pages. Following implementation, informational outreach signage will be placed at the water access site adjacent to the Turkey Shoot play wave.

Prior to implementation general public outreach will be conducted to inform the public about period lane closures on Highway 2 during construction and to inform the public about the benefits of the project. Outreach could include newspaper and radio interviews, and social media posts.

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

This project will provide a WA based contractor with a large construction contract. This contract is expected to support several crew including a foreman, 3-6 heavy equipment operators, 3-4 labors, and 2 truck divers. The local economy will benefit from the sales tax of the project. The project will also support a local design engineering firm, as well as all of the staff involved in project planning and implementation.

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

Cascade Fisheries has been working with WSDOT for years on this project. We have built a strong working relationship and have recently had multiple meetings to discuss the details of access, traffic control, and stormwater features. CF partnered with the HCP Tributary Committees and the BPA during the design portion of this project. Both entities were equal funders and both participated in design review helping to improve the project overall. BPA will be the lead federal agency for Section 106 cultural resource

compliance and ESA compliance. CF partnered with the HCP Tributary Committees and the US BOR to complete the assessment phase of this project. The BOR completed the topographic survey to assist with the design phase. This in-kind contribution is estimated at $15,000. The BOR also committed $30,000 funding to CF staff to support the design development and the progression of this project.

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: 25-1213 REST, GOODWIN SIDE CHANNEL IMPLEMENTATION

Sponsor: Cascade Col Fish Enhance Group Program: Salmon State Projects Status: Application Submitted

Parties to the Agreement

PRIMARY SPONSOR

Cascade Columbia Fisheries Enhancement Group

Address PO Box 3162

City Wenatchee **State** WA **Zip** 98807

Org Type Non-Gov-Reg Fisheries Enhance Group

Vendor # SWV0010742-00

UBI

Date Org created

Org Notes

link to Organization profile

☐ Org data updated

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.

WSDOT is the landowner. We have built a strong working relationship with them and have recently had multiple meetings to discuss the details of access, traffic control, and stormwater features. CF partnered with the HCP Tributary Committees and the BPA during the design portion of this project. Both entities were equal funders and both participated in design review helping to improve the project overall. BPA will be the lead federal agency for Section 106 compliance and ESA compliance.

External Systems

SPONSOR ASSIGNED INFO

Sponsor-Assigned Project Number

Sponsor-Assigned Regions

LINK AN EXISTING SRP PROJECT

Unlink

25-1213, Goodwin Side Channel Implementation, Salmon

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
Aaron Rosenblum Cascade Col Fish Enhance Group	Project Contact	(509) 630-4160	aaron@ccfeg.org
Ariel Edwards Upper Columbia Salmon Rcy Bd L	Lead Entity Contact	(208) 540-2691	ariel.edwards@ucsrb.org

Worksites & Properties

#	Worksite Name
#1	Gooddwin Side Channel

Restoration	Property Name
✓	WSDOT

Project Application Report - 25-1213

Worksite Map & Description

Worksite #1: Gooddwin Side Channel

WORKSITE ADDRESS

Street Address Undefined
City, State, Zip Cashmere WA 98815-1037

Worksite Details

Worksite #1: Gooddwin Side Channel

SITE ACCESS DIRECTIONS

From Wenatchee travel West on Hwy 2 to Hay Canyon rd. Park on Hay Canyon Rd, cross highway on foot, and proceed to work area

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

Reference or source used

UCSRB spawning maps. NOAA 2022 status review

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Lamprey	

Questions

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

MP 109 - MP 110

Project Location

RELATED PROJECTS

Projects in PRISM

PRISM Number	Project Name	Program Name	Current Status	Relationship Type	Notes
22-1510 P	Goodwin Side Channel Design	Salmon State Projects	Wastebasket	Earlier Phase	

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.

This is an off-channel/floodplain habitat project located on the left bank of the Wenatchee River at RM 11.2 - 11.5

#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.

The Goodwin Side Channel (GSC) falls within the Wenatchee River Ollala 01 reach of the Wenatchee River – Ollala Canyon Assessment Unit within the Upper Columbia Salmon Recovery Region's prioritization scheme. This Assessment Unit is listed as a tier 1 priority for Steelhead restoration. At the reach scale, winter rearing is listed as a high priority life stage for both spring chinook and steelhead, while summer rearing is a medium priority life stage for steelhead. The highest-ranking limiting factors for this reach are cover-wood and off-channel/side-channel habitat, and the second highest ranking limiting factor is floodplain connectivity.

https://prioritization.ucsrb.org/

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

No

#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**

Yes

Property Details

Property: WSDOT (Worksite #1: Gooddwin Side Channel)

✓ **Restoration**

LANDOWNER

Name	Department of Transportation (WSDOT)
Address	PO Box 47300
City	Olympia
State	WA Zip 98504-7300
Type	State

CONTROL & TENURE

Instrument Type	Temp. Construction Permit
Timing	Proposed
Term Length	Fixed # of years
# Yrs	3
Expiration Date	
Note	

Project Proposal

Project Description

This proposal is to implement a river restoration project, the Goodwin Side Channel, which is located on the Wenatchee River RM 11.2 - 11.5. The project will address the highest priority limiting factors in the Wenatchee River - Ollala Canyon 01 Reach including Cover-Wood, Off-Channel/Side Channel, Riparian Canopy, Temperature-Rearing, and Floodplain Connectivity. Implementation of this project will improve summer and winter rearing for ESA-listed spring chinook and steelhead, as well as summer chinook and coho. The stated project goals are: 1. Improve rearing habitat in the side channel by increasing connection to groundwater;2. Enhance the floodplain and side channel habitat functions through improved surface water connection with the river while taking advantage of the benefits provided by groundwater inflow; 3. Promote native woody vegetation cover throughout the floodplain by planting where current non-native, invasive reed canary grass patches exist and preserve existing mature native riparian forest; 4. increase large woody material cover and habitat complexity.

Project Questions

#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.

Significant human infrastructure including the Burlington Northern railroad, Highway 2, fruit orchards, homes, and towns along the lower Wenatchee River have severely impaired instream and off-channel habitat (TetraTech 2017). In Reach 5 of the Wenatchee River, where this proposal is located, 54% of the floodplain is disconnected, and there is 0% off-channel habitat. The surrounding reaches are similarly limited: Reach 4 has 66% floodplain disconnected and 4% off channel habitat, while Reach 6 has 62% of floodplain disconnected and 0% off-channel habitat.

The natural and artificial confinement in this section of the river limit restoration opportunities and have resulted in a stable channel with limited connection to floodplains and off-channel habitat. The lower Wenatchee Reach Assessment identified the project area in the current proposal as the only geomorphically suitable restoration opportunity in Reach 5, and found that the opportunity “has good potential for improving off-channel habitat in a reach where it is very limited.” (TetraTech 2017)

The current habitat benefit of the existing side channel is limited by its infrequent surface water connection with the mainstem. From 2000-2020, the side channel was connected (at or above 8,000 CFS) for an average of only 36 days a year. This connection overwhelmingly occurred during spring freshet, and the side channel is inaccessible during the critical summer and winter rearing months. Winter rearing is identified as a high priority life stage for this reach for both spring chinook and steelhead. While designing this project we will seek to increase the frequency that salmonids can access this side-channel habitat, while being sure to maintain the cold-water benefit provided by groundwater in the late summer.

Side channels are naturally occurring features of a riverscape. However, they are frequently cut off from the river when the channel is artificially confined. Side channels and off-channel areas provide important rearing habitat for target fish species. Martens and Connolly (2014) found higher densities of salmonids in seasonally disconnected, partially connected, and fully connected side channels than in mainstem channels. This project will seek to improve the connection of the existing side channel, that is currently only connected to the mainstem for 36 days per year on average.

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

The Goodwin Side Channel (GSC) falls within the Wenatchee River Ollala 01 reach of the Wenatchee River – Ollala Canyon Assessment Unit within the Upper Columbia Salmon Recovery Region's prioritization scheme. This Assessment Unit is listed as a tier 1 priority for Steelhead restoration. At the reach scale, winter rearing is listed as a high priority life stage for both spring chinook and steelhead, while summer rearing is a medium priority life stage for steelhead. The highest-ranking limiting factors for this reach are cover-wood and off-channel/side-channel habitat, and the second highest ranking limiting factor is floodplain connectivity.

The proposed restoration project improves floodplain connectivity and frequency of fish access to the Goodwin Side Channel, which addresses the highest-ranking species, life stages, and limiting factors for this reach of the Wenatchee River.

#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**

1. Improve rearing habitat in the side channel by increasing connection to groundwater;
2. Enhance the floodplain and side channel habitat functions through improved surface water connection with the river while taking advantage of the benefits provided by groundwater inflow;
3. Promote native woody vegetation cover throughout the floodplain by planting where current non-native, invasive reed canary grass patches exist and preserve existing mature native riparian forest;
4. increase large woody material cover and habitat complexity.

#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**

1. Create approximately 1,450 linear feet of new of side channels. New side channels will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
2. Enhance approximately 1,150 of existing side channel habitat. Existing will have a surface water connection with the Wenatchee River at and above the 50% exceedance interval (1,810 CFS).
3. Install 82 Wood Habitat Structures (WHS), including two in the mainstem Wenatchee, to improve salmon habitat complexity and cover and to promote geomorphic processes that form and maintain habitat.
4. Install 1 rock inlet structure to promote side channel inlet longevity and promote safe river recreation.
5. Create 35 groundwater connected pools within the floodplain side channels. These pools will be connected to groundwater year-round. They will provide cooler water rearing habitat in the summer and warmer water rearing habitat in the winter.
6. Remove 1 levee to install the new side channel and to improve surface water connectivity to an existing riverine wetland.
7. Increase floodplain inundation 2,850% (from 0.02 acres to 0.64 acres) at the 50% exceedance flow (1,810 CFS)
8. Increase floodplain inundation 70% (from 4.44 acres to 7.50 acres) at the 1.5 year recurrence interval (15,400 CFS)
9. Restore and expand wetland and riparian vegetation communities by planting 3.9 acres in native species.

#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.

1. **Finalize final design and permitting** (November 2025 - May 2026): CF will be responsible for ensuring all necessary project permits and approvals are in place prior to construction. Permit applications will be submitted in the spring of 2024. Actions under this agreement would include agency coordination and final approval. CF will also work with design consultant Wolf Water Resources to produce stamped, construction ready designs during this time period. This task will also include coordination with project stakeholders including the landowner WSDOT.
2. **Construction Advertisement:** CF will work with W2r and project stakeholders to advertise a formal RFP process to hire a construction contractor. This process will include solicitation, a mandatory onsite pre-bid meeting, bid review, and contract signing.
3. **Construction Implementation:** CF will oversee construction of the project to ensure compliance with project design, specifications, and environmental compliance documentation.
4. **Maintenance**: As funding allows CF will maintain the site to ensure project success. This task includes maintenance for plantings, installing new plantings as needed. noxious weed control, and observation of changed conditions onsite.

#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, and constraints, including river recreation and access off of HWY 2, have been addressed through the design process. Our project addresses physical constraints and limitations at the site scale, but cannot address the large scale impacts to river process found throughout the lower Wenatchee River, as they are found throughout the lower 20 miles of river.

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

CF conducted an 18-assessment of the project area an collected data including groundwater levels; groundwater temperature, surface water levels, surface water temperature, fish use, and habitat. We have incorporated this information into our planning and the designs including: the spatial and temporal extent of the groundwater expression in the existing side channel and excavation required to improve that, the temporal extent of the current surface water connection, and current habitat conditions and fish use within the existing side channel.

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

Three design alternatives were developed that spanned a spectrum of design and implementation complexities and associated ecological benefits to the focal fish species. The design elements were additive from Alternative 1 through Alternative 3, where the simplest design elements were presented as part of Alternative 1, moderate design elements were presented as Alternative 2, and the more complex design elements were presented as Alternative 3. The three alternatives were evaluated through a semi-quantitative process by which key hydrologic, habitat-benefit, and constructability metrics were identified and formatted in a screening matrix. The anticipated responses of each metric to each alternative were described based on changes in site dimensions or quality. Each cell in the matrix was then assigned a “relative-ranking score” based on the anticipated benefit of that alternative’s metric relative to existing conditions as either enhanced, neutral, or diminished.

The three alternative design concepts and their relative-scoring matrices were presented to the Tributary Committees and BPA for their review and selection of a preferred alternative. The reviewers raised questions regarding ecological benefits, long-term sustainability, sedimentation potential, boater safety, and construction costs. Cascade Fisheries with technical support from W2r worked collaboratively with the reviewers to select the preferred alternative. Cascade Fisheries and the reviewers ultimately selected Alternative 3 as the preferred alternative because it provides the greatest biological benefit and provides the highest likelihood of persisting long-term.

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

The Wenatchee River, specifically the section from Leavenworth to Cashmere, is an important
river recreation resource for kayakers and rafters throughout the Northwest region. The section of river that includes the project area supports a thriving commercial rafting industry, exposing tens of thousands of people to river recreation every year.

Knowing this, CF hired a consultant to produce a technical memorandum entitled "Goodwin Side Channel Habitat Restoration Project: Recreational User Impact Study". This memo provides an analysis of the potential impacts of the proposed river engineering
project on recreational user groups. The assessment focuses on the hydraulics around the proposed feature, user groups who may be present, and hydrological conditions that may affect recreational activities. The preparation of the memo included interviews with local river recreationists, including both private citizens and river guides. Through this process we found that there is a river play wave upstream of the project area, and that at high flows, the river's momentum would carry river users from that wave towards the project area. As a result of the analysis and interviews, we changed the design of the inlet to the upstream most side channel - changing it from a wood habitat structure to a rock based inlet structure. The rock structure poses a much lower risk and perceived risk to the river user community. The technical memo is included in the attachments to this application.

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

Yes

Project Application Report - 25-1213

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

Predictions of precipitation and temperature changes in the region indicate a decrease in snowpack as more precipitation will fall as rain (USGCRP 2017, Raymond and Rogers 2022), which will influence timing and magnitude of runoff, possibly shifting the seasonally high flows typical for May and June to earlier in the spring. The project has been designed to be resilient to predicted future conditions. The project will be designed to accommodate and function at predicted future hydrologic conditions, for example, the side channel inundation flow of 1800CFS (50% exceedance flow) will still be optimal under future conditions even if the exceedance percentage increases because flows below this will allow the Wenatchee River water to warm too quickly and potentially negate the cooling effect provided by the groundwater present in the project side channels. Project elements will be designed to be stable with future flood flow conditions in mind by including a minimum factor of safety of 2.

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

Through implementation of this project we will increase the frequency and duration of the connectivity of the side channels to the Wenatchee River. The side channels are designed to be connected to the river at the 50% exceedance interval, which is 1,810 CFS. This will increase the accessibility of the side channel habitat by juvenile salmonids from about 36 days/year on average to about 180 days/year on average. Importantly, the side channels will not be connected to the Wenatchee River during the hot summer months, but rather will be fed solely by cooler groundwater, providing an important thermal refuge in a location of the lower Wenatchee River that is already hot and predicted to get hotter.

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

Cascade Fisheries has managed several large-scale habitat restoration project. Recent examples include Merritt Oxbow Reconnection, Lower Peshastin Restoration, Peshastin 2.5, Chiwakum Creek Restoration, the Silver Side-Channel, and Hancock Springs Restoration.

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

No

Restoration Supplemental

#1: What level of design (per Appendix D) have you completed? Please attach.
Preliminary

#1a: What level of design will be produced prior to construction?
Final

#2: Will (or did) a licensed professional engineer design the project?
Yes

#3: Does the project include measures to stabilize an eroding stream bank?
No

#4: Is the primary activity of the project invasive species removal?
No

#5: Is the primary activity of the project riparian planting?
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.

Invasive plant species including spotted knapweed, Siberian elm, reed canary grass are present within the project area. The project will follow conservation measures and BMPs described in the Aquatic Restoration Biological Opinion (ARBO II) and the HIP Programmatic to minimize the chance of weed species introduction. These measures include: 1) All equipment and vehicles used in the project should be clean of invasive plant seed and dirt (Weed Free) before entering National Forest Lands; 2) All materials such as gravel, rocks, etc. shall be free of invasive plant seed (Weed Free); and 3) Minimize soil disturbance and prevent damage to native vegetation, in and around project activity areas, to the extent possible consistent with project construction diagrams.

Eastern book trout (Salvelinus fontinalis) may be present in the project area. Any brook trout encountered during stream dewatering and fish salvage activities will not be returned to the stream.

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

Cascade Fisheries is responsible for stewarding and maintaining the project in the future. WSDOT is responsible for all of their infrastructure.

Restoration Metrics

Project Application Report - 25-1213

Worksite: Gooddwin Side Channel (#1)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	0.35
Project Identified In a Plan or Watershed Assessment (C.0.c)	Lower Wenatchee Reach Assessment (Terta Tech 2017) - project area 24
Priority in Recovery Plan	Project Area 24 is a Tier 1 project because it addresses the highest ranked limiting factors for the reach and benefits multiple high priority life stages. P.223 Appendix E
Type Of Monitoring (C.0.d.1)	Implementation Monitoring
Monitoring Location (C.0.d.2)	Downstream Onsite Upstream

INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	0.35

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

Total cost for Channel reconfiguration and connectivity	$300,450
Type of change to channel configuration and connectivity (C.4.c.2)	Creation of Instream Pools Creation/Connection to Off-Channel Habitat Levee removal/Alteration
Miles of Stream Treated for channel reconfiguration and connectivity (C.4.c.3)	0.10
Miles of Off-Channel Stream Created or Connected (C.4.c.4)	0.10
Acres Of Channel/Off-Channel Connected Or Added (C.4.c.5)	0.7 **Note:** additional inundated acres at the 1.5 year flow over EC
Instream Pools Created/Added (C.4.c.6)	10

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

Total cost for Channel structure placement	$150,000
Material Used For Channel Structure (C.4.d.2)	Flood Fencing Logs Fastened Together (Logjam) Rocks/Boulders (Unanchored)
Miles of Stream Treated for channel structure placement (C.4.d.3)	0.10
Acres Of Streambed Treated for channel structure placement (C.4.d.4)	
Pools Created through channel structure placement (C.4.d.5)	10
Number of structures placed in channel (C.4.d.7)	10

Plant removal/control (C.4.g.1)

Total cost for Plant removal/control	$4,000
Miles of Stream Treated for plant removal/control (C.4.g.3)	0.05
Acres of Streambed Treated for plant removal/control (C.4.g.4)	0.2
Species Of Plants Removed/Controlled (C.4.g.2)	Spotted Knapweed, Siberian Elm, Reed Canary Grass

RIPARIAN HABITAT PROJECT

Total Riparian Miles Streambank Treated (C.5.b.1)	0.20
Total Riparian Acres Treated (C.5.b.2)	0.5

Planting (C.5.c.1)

Total cost for Planting	$20,000
Species Of Plants planted in riparian (C.5.c.2)	See plans
Acres Planted in riparian (C.5.c.3)	0.5
Miles of streambank planted (C.5.c.4)	
Average Riparian Width	250
Site Potential Tree Height at 200 years (SPTH-200)	100

WETLAND PROJECT

Total Acres Of Wetland Area Treated (C.8.b)	0.2

Wetland improvement/ restoration (C.8.e.1)

Total cost for Wetland improvement/ restoration	$5,000
Acres of wetland Improved/Restored (C.8.e.2)	0.6

PERMITS

Obtain permits

Total cost to Obtain permits	$1,000
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$17,000

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$2,550

Project Application Report - 25-1213

Overall Project Metrics

COMPLETION DATE	
Projected date of completion	12/03/2029

Restoration Cost Estimates

Worksite #1: Gooddwin Side Channel

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$2,550	
Instream Habitat Project	Channel reconfiguration and connectivity (C.4.c.1)	$300,450	
	Channel structure placement (C.4.d.1)	$150,000	
	Plant removal/control (C.4.g.1)	$4,000	
Permits	Obtain permits	$1,000	
Riparian Habitat Project	Planting (C.5.c.1)	$20,000	
Wetland Project	Wetland improvement/ restoration (C.8.e.1)	$5,000	
	Subtotal:	$483,000	
Admin, Architecture, and Engineering		$17,000	
	Total Estimate For Worksite:	$500,000	

Summary

Total Estimated Costs Without AA&E:	$483,000
Total Estimated AA&E:	$17,000
Total Estimated Restoration Costs:	$500,000

Cost Summary

	Estimated Cost	Project %	Admin/AA&E %
Restoration Costs			
Restoration	$483,000		
Admin, Architecture, and Engineering	$17,000		3.54 %
SUBTOTAL	$500,000	100.00 %	
Total Cost Estimate	$500,000	100.00 %	

Funding Request and Match

FUNDING PROGRAM

Salmon State Projects	$500,000	100.000000

SPONSOR MATCH

Questions

#1: Explain how you determined the cost estimates

Cost estimate based on engineer's 60% design. Unit costs on this CE were developed by reviewing and incorporating actual bids received on other local projects of similar scope and scale. CF staff cost estimates are based our work and experience of other recent projects of similar scope and scale. CF staff salaries are expected to increase over time due to step increases and COLA adjustments.

Other Funding

OTHER FUNDING DETAILS

Other Funds: Monetary Funding	Federal Grant	
Amount		$1,100,000
Funding Organization		Bonneville Power Administration (BPA)
Grant Program		Upper Columbia Programmatic
Other Funds: Monetary Funding	Local Grant	
Amount		$653,500
Funding Organization		HCP Tributary Committees
Grant Program		HCP Tributary Committees
	Other Funding Detail Total:	$1,753,500

Cultural Resources

Cultural Resource Areas

Worksite #1: Gooddwin Side Channel

Area: Uploaded 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)

The project will include approximately 14,000 cubic yards (CY) of excavation at various locations throughout the project area to: remove an earthen soil berm, establish a new side channel of about 900 linear feet that will connect to the existing side channel, and excavate/grade the existing side channel to improve habitat and increase floodplain inundation and connectivity. Several engineered log jams (ELJ), wood habitat structures, and floodplain roughness structures will be installed to increase hydraulic diversity, sediment sorting, gravel retention, and maintain pools with cover. Three large ELJs will be installed within the mainstem Wenatchee River – one at each side channel entrance, and one at the side channel exit back into the river. These structures will require extensive excavation and ballast to install. Wood habitat structures will be installed along the length of the side channels. They will be smaller than the mainstem ELJs. Floodplain roughness structures will be installed on the margins of the Wenatchee River in the middle of the project site. They will consist of both harvested tree logs and live vegetation.
Extensive riparian restoration will occur following earthwork. Plants will be installed with a combination of excavators, excavator mounted stinger, handheld gas powered auger, and handheld tools.

#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.

Maximum grading depths are to about 10'. Equipment is expected to be power machinery potentially including an excavator, bulldozer, skid steer, log loader, haul trucks, etc. Details can be found on the plans.

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

None for this project

#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 project area is within the floodplain of the Wenatchee River. A man made feature referred to as the "bermed pond" exists within the project area. It is assumed to have been constructed when HWY 2 was built. It has no known current use.

#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?

USACE, apply in April 2025, receive in Oct 2025

#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.

BPA

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

No

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

No

#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

Area: Uploaded APE - stagging

#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 area to be used for stagging. Expected use is parking of equipment, low boys, haul trucks, etc, not currently in use

#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.

Maximum grading depths are to about 10'. Equipment is expected to be power machinery potentially including an excavator, bulldozer, skid steer, log loader, haul trucks, etc. Details can be found on the plans.

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

None for this project

#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 project area is within the floodplain of the Wenatchee River. A man made feature referred to as the "bermed pond" exists within the project area. It is assumed to have been constructed when HWY 2 was built. It has no known current use.

#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?

USACE, apply in April 2025, receive in Oct 2025

#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.

BPA

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

No

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

No

#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 #
Aquatic Lands Use Authorization	Dept of Nat. Res.				
Cultural Assessment [Section 106]	DAHP	11/04/2024	03/20/2025		DAHP Project 2024-11-0801
Endangered Species Act Compliance [ESA]	US Fish & Wildlife				
Hydraulics Project Approval [HPA]	Dept of Fish & Wildlife				
Nationwide Permit	Army Corps of Eng.				
Water Quality Certification [Section 401]	County/Dept of Ecy.				
Other Required Permits					

Note: Floodplain permit from Chelan County

Permit Questions

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

No

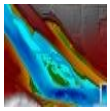
due to presence of endangered spring chinook

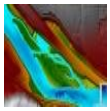
Attachments

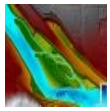
Required Attachments	6 out of 6 done
Applicant Resolution/Authorizations	✓
CCA Tribal Notification	✓
Cost Estimate	✓
Map: Restoration Worksite	✓
Photo	✓
RCO Fiscal Data Collection Sheet	✓

PHOTOS (JPG, GIF)

Photos (JPG, GIF)


666254


666255


666256


666259


666261

PROJECT DOCUMENTS AND PHOTOS

Project Documents and Photos

File Type	Attach Date	Attachment Type	Title	Person	File Name, Number Associations	Shared
	04/17/2025	Cost Estimate	25-1213 Goodwin Side Channel Implementaiton SAL-CostEstimate	AaronR	25-1213 Goodwin Side Channel Implementaiton SAL-CostEstimate.xlsx, 666510	✓
	04/16/2025	Preliminary design report	W2r_CascadeFish-GoodwinSC_60PctPermitDesRpt-DRAFT_20240927.p	AaronR	W2r_CascadeFish-GoodwinSC_60PctPermitDesRpt-DRAFT_20240927.pdf, 666427	✓
	04/16/2025	Application Document	Goodwin-Side-Channel-Implementation_UC Regional app 041825.p	AaronR	Goodwin-Side-Channel-Implementation_UC Regional app 041825.pdf, 666426	✓
	04/16/2025	CCA Tribal Notification	Draft-CCA-TribalNotice.docx	AaronR	Draft-CCA-TribalNotice.docx, 666416	✓
	04/15/2025	Photo	DJI_0756.JPG	AaronR	DJI_0756.jpg, 666261	✓
	04/15/2025	Map: Restoration Worksite	HAWS_EC_georef_v3.pdf	AaronR	HAWS_EC_georef_v3.pdf, 666260	✓
	04/15/2025	Map: Restoration Worksite	Goodwin Side Channel Project Location.jpg	AaronR	Goodwin Side Channel Project Location.jpg, 666259	✓
	04/15/2025	RCO Fiscal Data Collection Sheet	FiscalDataCollectionSheet - Cascade Fisheries - 2025.pdf	AaronR	FiscalDataCollectionSheet - Cascade Fisheries - 2025.pdf, 666258	
	04/15/2025	Applicant Resolution/Authorizations	ApplicantAuthorizationResolution - Cascade Fisheries - 2025.	AaronR	ApplicantAuthorizationResolution - Cascade Fisheries - 2025.pdf, 666257	✓
	04/15/2025	Design document	Depth_PC_Shutoff_1810cfs.jpg	AaronR	Depth_PC_Shutoff_1810cfs.jpg, 666256	✓
	04/15/2025	Design document	Depth_PC_25%ex_4150cfs.jpg	AaronR	Depth_PC_25%ex_4150cfs.jpg, 666255	✓
	04/15/2025	Design document	Depth_PC_1.5yr_15440cfs.jpg	AaronR	Depth_PC_1.5yr_15440cfs.jpg, 666254	✓
	04/15/2025	Design document	GOODWIN-60%-20240926.pdf	AaronR	GOODWIN-60%-20240926.pdf, 666252	✓
	04/15/2025	Cultural Resources: Formal Consultation	APE_Goodwin Side Channel_WA2025012.pdf	AaronR	APE_Goodwin Side Channel_WA2025012.pdf, 666208	
	04/15/2025	Cultural Resources: Cultural Resources Survey	Goodwin Side Channel CRS Report.pdf	AaronR	Goodwin Side Channel CRS Report.pdf, 666207	
	04/15/2025	Cultural Resources: Section 106	Notification - Section 106 Complete.pdf	AaronR	Notification - Section 106 Complete.pdf, 666206	
	04/15/2025	Design document	Goodwin Side Channel - Recreational User Impact Study - 0726	AaronR	Goodwin Side Channel - Recreational User Impact Study - 07262024.pdf, 666169	✓

Project Application Report - 25-1213

Application Status

Application Due Date: 06/23/2025

Status Name	Status Date	Submitted By	Submission Notes
Application Submitted	04/17/2025	Aaron Rosenblum	
Preapplication	04/02/2025		

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. (Aaron Rosenblum, 04/17/2025)

Date of last change: 04/17/2025

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	*Contractor*	1.00	$ 2,100,000.00	$ 2,100,000	$ 444,450	$ -	$ 1,655,550		
Construction supervision	*CF Staff*	1.00	$ 30,000.00	$ 30,000	$ 15,000	$ -	$ 15,000		
Construction supervision	*Design Consultant*	1.00	$ 65,000.00	$ 65,000	$ 20,000	$ -	$ 45,000		
Permits	*Finalize permitting*	1.00	$ 5,000.00	$ 5,000	$ 1,000	$ -	$ 4,000		
Other	*15% indirect*	1.00	$ 2,550.00	$ 2,550	$ 2,550	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 2,202,550**	**$ 483,000**	**$ -**	**$ 1,719,550**		

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	*CF staff oversight, admin, billin*	1.00	$ 17,000.00	$ 17,000.00	$ 17,000	$ -	$ -		
						$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 17,000**	**$ 17,000**	**$ -**	**$ -**		

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	0.000%	$ -	$ -	$ -	$ -	$ -		
	Indirect	0.000%	$ -	$ -	$ -	$ -	$ -		
			STotal	**$ -**	**$ -**	**$ -**	**$ -**		

AA&E Budget Check	
A&E maximum allowed in PRISM	$ *144,900.00*
A&E validation	127,900

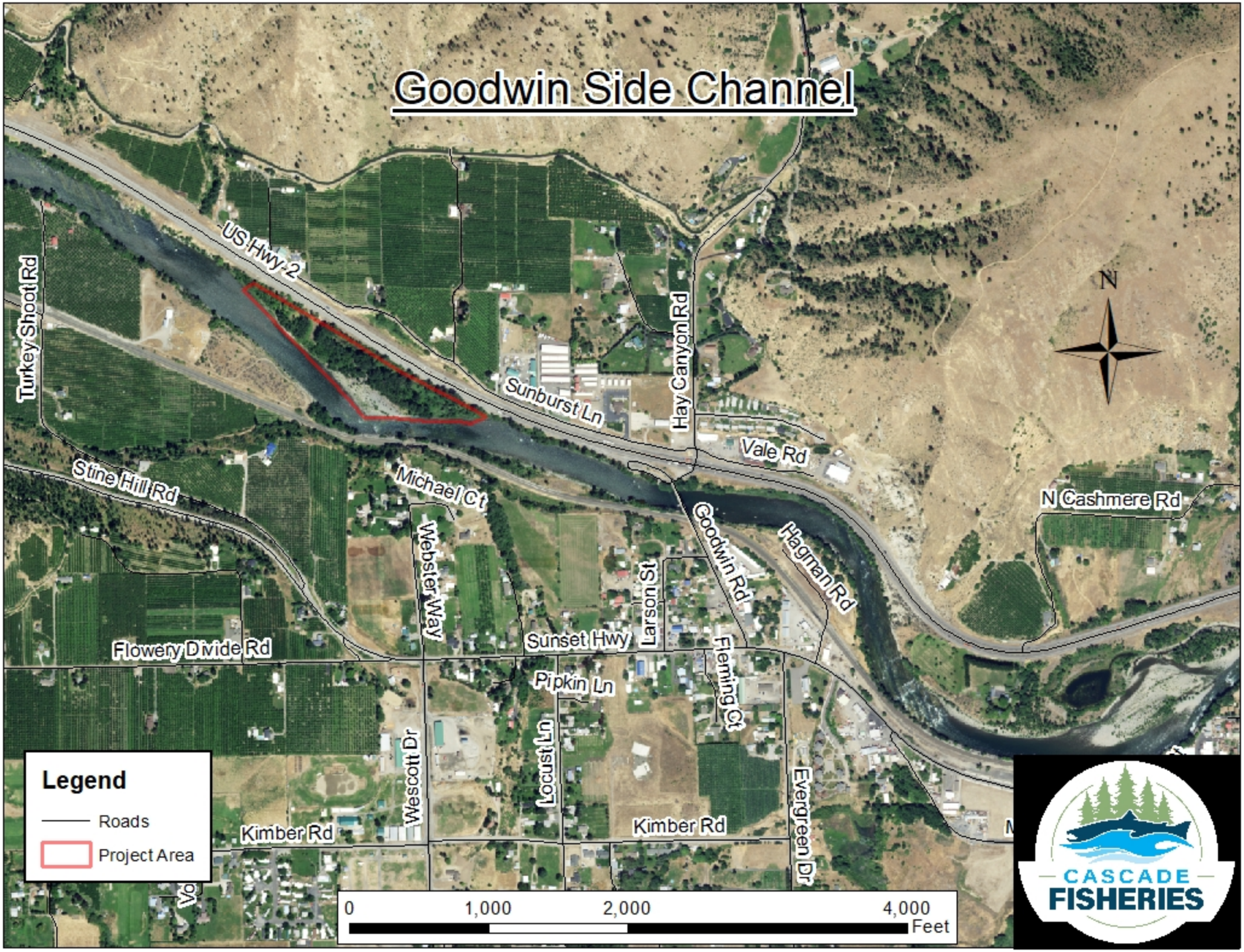
Totals	**$ 2,219,550**	**$ 500,000**	**$ -**	**$ 1,719,550**
		PRISM Project Total	$ 500,000	
		RCO Percentage	**Match Percentage**	
		100.000000%	**0.000000%**	

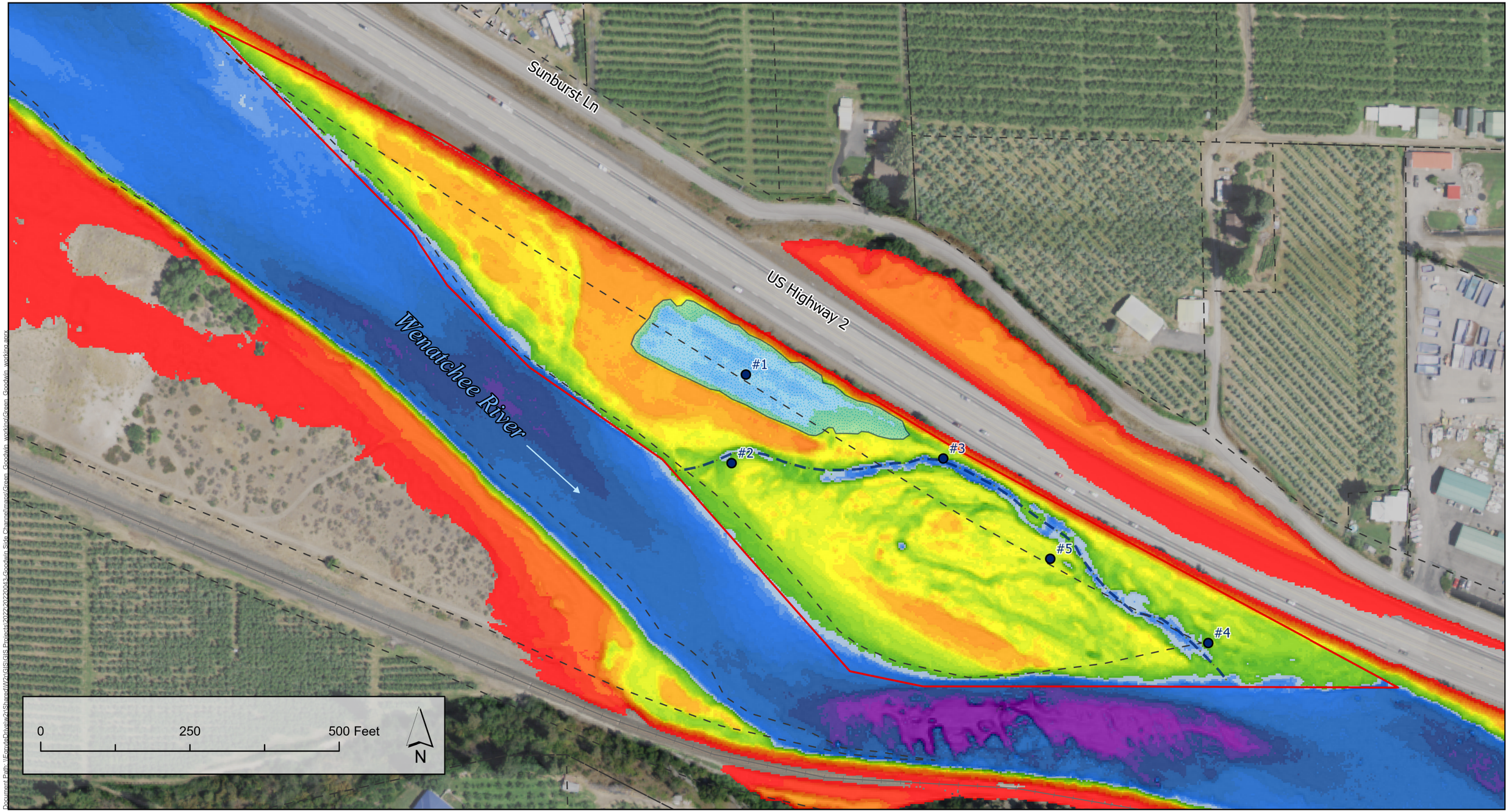
CUMULATIVE TOTALS

This sheet contains automatic calculations

Project Name	Goodwin Side Channel Implementation
SRFB #	25-1213
Sponsor	Cascade Fisheries

	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	$ 2,202,550	$ 483,000	$ -	$ 1,719,550	0
AA&E	$ 17,000	$ 17,000	$ -	$ -	0
Indirect Costs	$ -	$ -	$ -	$ -	
STotal	$ 2,219,550	$ 500,000	$ -	$ 1,719,550	0
Totals	$ 2,219,550	$ 500,000	$ -	$ 1,719,550	0


Goodwin Side Channel
US Hwy 2
Turkey Shoot Rd
Sunburst Ln
Hay Canyon Rd
Vale Rd
N Cashmere Rd
Stine Hill Rd
Michael Ct
Webster Way
Goodwin Rd
Hagman Rd
Larson St
Flowery Divide Rd
Sunset Hwy
Pipkin Ln
Fleming Ct
Wescott Dr
Locust Ln
Evergreen Dr
Kimber Rd
Kimber Rd
N
Legend
Roads
Project Area
0
1,000
2,000
4,000
Feet
CASCADE
FISHERIES



Study area (11.4 acres)
Railroad
Piezometer location
Tax lot
Existing side channel
Bermed pond

**Height-Above-Water-Surface (HAWS) contours show elevations relative to the water surface associated with the 1.5-year recurrence flood of 14,770 cfs. Topographic/bathymetric data from the 2022 Lidar.*

Relative Elevation (ft)*

<-9	-6 - -5	-3 - -2.5	-1 - -0.5	0 - 1	2.5 - 3	4.5 - 5	7 - 8	14 - 16
-9 - -8	-5 - -4	-2.5 - -2	-0.5 - 0	1 - 1.5	3 - 3.5	5 - 5.5	8 - 10	>16
-8 - -7	-4 - -3.5	-2 - -1.5		1.5 - 2	3.5 - 4	5.5 - 6	10 - 12	
-7 - -6	-3.5 - -3	-1.5 - -1		2 - 2.5	4 - 4.5	6 - 7	12 - 14	

Goodwin Side Channel Restoration

HAWS Map

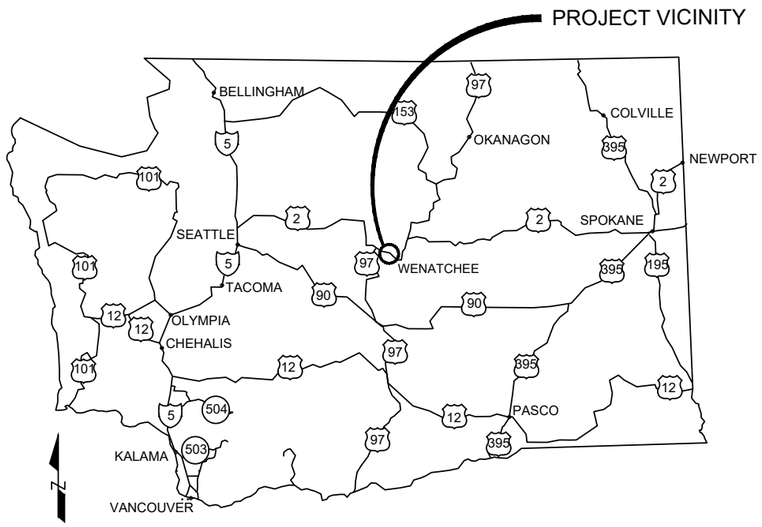
CASCADE FISHERIES

W2 WOLF WATER RESOURCES

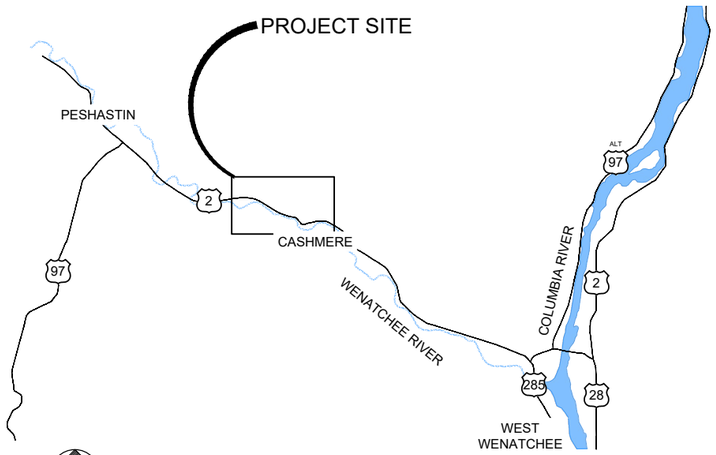
60% DESIGN
SEPTEMBER 2024

GOODWIN SIDE CHANNEL HABITAT RESTORATION PROJECT

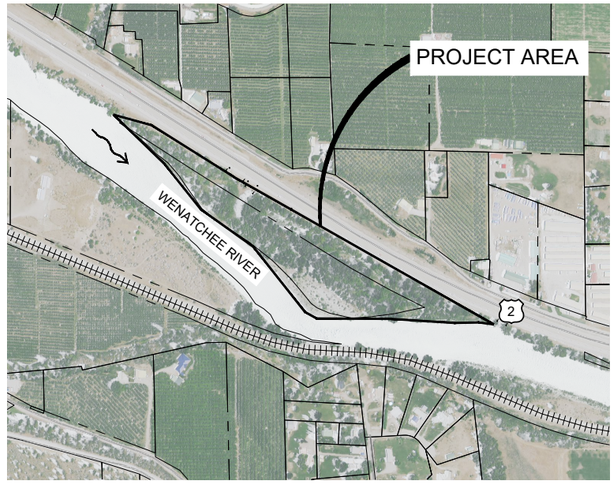
CASCADE FISHERIES
CHELAN COUNTY, WA



REGIONAL MAP
NTS



PROJECT VICINITY
NTS



PROJECT SITE
NTS

PROJECT TEAM

PROJECT CLIENT
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

AARON ROSENBLUM, CERP
aaron@ccfeg.org

ENGINEERING CONSULTANT

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

STEVEN RODRIGUEZ, PE
srodriguez@wolfwaterresources.com

GLEN LEVERICH, LG
gleverich@wolfwaterresources.com

BROOKE BENNETT, EIT
bbennett@wolfwaterresources.com

PROJECT INFO

SPATIAL REFERENCE
HORIZONTAL: WASHINGTON STATE PLANE NORTH, US SURVEY FEET
VERTICAL: NAVD88
LIDAR: 2022 TOPOBATHY

PROJECT SITE LOCATION:
CASHMERE, CHELAN COUNTY, WASHINGTON
LATITUDE: 47.529967
LONGITUDE: -120.498273
WATERBODY: WENATCHEE RIVER

SHEET INDEX

WORK PERIODS:

ALL IN-WATER WORK SHALL BE LIMITED TO WDFW APPROVED IN-WATER WINDOW OF JULY 15TH - SEPTEMBER 30TH.

PRELIMINARY NOT FOR CONSTRUCTION

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

COVER & SHEET INDEX

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE: 0 1"

JOB NO. 20220043

SHEET NO. G1.0

1 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.0 - COVER.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-AERIAL

60% DESIGN
SEPTEMBER 2024

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHY SHOWN IN PLANS IS 2022 TOPOBATHYMETRIC LIDAR PROVIDED BY THE UNITED STATES BUREAU OF RECLAMATION.
2. HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE NORTH, US SURVEY FT.
3. VERTICAL DATUM IS NAVD88, FT.
4. ALL SCALES SHOWN ARE FOR 22" X 34" SHEETS.
5. THERE WILL BE A SCHEDULED TIME FOR INSPECTION OF ALL EQUIPMENT THAT IS MOBILIZED TO THE SITE BY THE ENGINEER OR OWNER'S REPRESENTATIVE.
6. ALL NON-NATIVE MATERIALS ENCOUNTERED DURING EXCAVATION ACTIVITIES SHALL BE REMOVED FROM THE FLOODPLAIN AND HAULED OFFSITE TO AN APPROVED FACILITY WITH THE EXCEPTION OF RIP RAP THAT MAY BE USED AS BURIED LWD BALLAST OR HABITAT BOULDERS IN LIEU OF IMPORTED BOULDERS.
7. ALL WORK SHALL CONFORM TO THE PLANS & SPECIFICATIONS UNLESS INDICATED OTHERWISE BY CONTRACT DOCUMENTS.
8. EARTHWORK QUANTITIES ARE BASED ON BANK VOLUMES BETWEEN EXISTING GRADE AND FINISH GRADE SURFACES. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL COST.
9. DRIVING DIRECTIONS FROM PORTLAND, OREGON:
   FROM WENATCHEE, FOLLOW S MISSION ST AND WA-285N / N WENATCHEE AVE TO US-2W / US-97S FOR APPROX. 3.7 MILES. CONTINUE ON US-2W / US-97N TOWARD CASHMERE FOR APPROX. 12.1 MILES TO TOWN OF DRYDEN. TURN AROUND IN DRYDEN AND TAKE US-2E . US-97N TOWARD CASHMERE FOR APPROX. 3.2 MILES.
   PARK ALONG HIGHWAY SHOULDER AT SITE APPROX. 0.2 MILES WEST OF CASHMERE.

WORK PERIODS:

1. ALL IN-WATER WORK SHALL BE LIMITED TO WDFW APPROVED IN-WATER WINDOW OF JULY 15TH - SEPTEMBER 30TH.

WATER SURFACE ELEVATIONS:

THE 50% DURATION EXCEEDANCE PROBABILITY FLOW WSE (1,810 CFS) SHOWN THROUGHOUT PLANS WAS DERIVED FROM THE EXISTING CONDITIONS HYDRAULIC MODEL.

THE ORDINARY HIGH WATER LINEWORK SHOWN THROUGHOUT PLANS WAS DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

ENGINEERED LOG JAM STRUCTURE SUMMARY TABLE:

DESCRIPTION	QUANTITY
TYPE 1 - APEX LOG JAM	1
TYPE 2 - MARGIN LOG JAM	1
TYPE 3 - SIDE CHANNEL MARGIN JAM	42
TYPE 4 - SIDE CHANNEL APEX JAM	2
TYPE 5 - FLOODPLAIN WOOD	31
TYPE 6 - FLOODFENCE	6

GRADING SUMMARY TABLE:

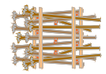
GRADING AREA	CUT VOLUME (CY)	FILL VOLUME (CY)	NET VOLUME (CY)
PROPOSED CHANNEL AND FLOODPLAIN GRADING	19,700	550	19,150 (CUT)
PROPOSED SPOILS GRADING	0	20,700	20,700 (FILL)
TOTALS	19,700	21,250	**1,550 (FILL)**

FUTURE DESIGN PHASES WILL INCLUDE UPDATED GRADING QUANTITIES WITH BALANCED CUT-FILL VOLUMES AS THE DESIGN DETAILS ARE REFINED.

LEGEND AND SYMBOLS

- EX MINOR CONTOUR (2)
- EX MAJOR CONTOUR (10)
- PROP MINOR CONTOUR (1)
- PROP MAJOR CONTOUR (5)
- ORDINARY HIGH WATER EXTENT (OHW)
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS (WET)
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET
- PROPOSED CUT AREA
- PROPOSED FILL AREA
- PROPOSED ROCK INLET
- 150' WATERBODY OFFSET
- TEMPORARY ACCESS ROUTE
- TEMPORARY CONSTRUCTION ENTRANCE
- STAGING AREA
- TEMPORARY COFFER DAM
- TEMPORARY WATTLES

ENGINEERED LOG JAM STRUCTURES


TYPE 1 - APEX JAM


TYPE 2 - MARGIN JAM


TYPE 3 - SIDE CHANNEL MARGIN JAM

TYPE 4 - SIDE CHANNEL APEX JAM

TYPE 5 - FLOODPLAIN WOOD

TYPE 6 - FLOODFENCE

ABBREVIATIONS:

APPROX	APPROXIMATE
APE	APPROXIMATE PROJECT EXTENTS
BMP	BEST MANAGEMENT PRACTICE
BPA	BONNEVILLE POWER ADMINISTRATION
CAR	CONTRACTING AGENCY REPRESENTATIVE
CF	CASCADE FISHERIES
CFS	CUBIC FEET PER SECOND
CHNL	CHANNEL
CL	CENTERLINE
CONSTR	CONSTRUCTION
CWA	CLEAN WATER ACT
CY	CUBIC YARD
DEPT	DEPARTMENT
EG	EXISTING GRADE/GROUND
ELEV, EL	ELEVATION
ELJ	ENGINEERED LOG JAM
ESA	ENDANGERED SPECIES ACT
ESC	EROSION AND SEDIMENT CONTROL
EX, EXIST	EXISTING
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
FG	FINISHED GRADE/GROUND
FT	FEET
GB	GRADE BREAK
HAB	HABITAT
HIP	HABITAT IMPROVEMENT PROGRAM
IN	INCHES
IE	INVERT ELEVATION
IWW	IN WATER WORK
LW	LARGE WOOD
MIN	MINIMUM
NAIP	NATIONAL AGRICULTURE IMAGERY PROGRAM
NAD83	NORTH AMERICAN DATUM (1983)
NAVD88	NORTH AMERICAN VERTICAL DATUM (1988)
NMFS	NATIONAL MARINE FISHERIES SERVICE
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OHWM	ORDINARY HIGH WATER MARK
PROP	PROPOSED
SPCC	SPILL PREVENTION, CONTROL, AND COUNTERMEASURE
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TOB	TOP OF BANK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TYP	TYPICAL
USBR	UNITED STATES BUREAU OF RECLAMATION
USFWS	UNITED STATES FISH AND WILDLIFE SERVICE
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
W2R	WOLF WATER RESOURCES
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WHS	WOOD HABITAT STRUCTURE
WSDOT	WASHINGTON DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RUSSELL LIGHTLE — STATE OF WASHINGTON — 24000 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

GENERAL NOTES & ABBREVIATIONS

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. G1.1
2 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.0 - COVER.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-AERIAL

60% DESIGN
SEPTEMBER 2024

HIP GENERAL CONSERVATION MEASURES APPLICABLE TO ALL ACTIONS

THE ACTIVITIES COVERED UNDER THE HIP ARE INTENDED TO PROTECT AND RESTORE FISH AND WILDLIFE HABITAT WITH LONG-TERM BENEFITS TO ESA-LISTED SPECIES. THE FOLLOWING GENERAL CONSERVATION MEASURES (DEVELOPED IN COORDINATION WITH USFWS AND NMFS) WILL BE APPLIED TO ALL ACTIONS OF THIS PROJECT.

PROJECT DESIGN AND SITE PREPARATION.

1. STATE AND FEDERAL PERMITS.

A. ALL APPLICABLE REGULATORY PERMITS AND OFFICIAL PROJECT AUTHORIZATIONS WILL BE OBTAINED BEFORE PROJECT IMPLEMENTATION.

B. THESE PERMITS AND AUTHORIZATIONS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL ENVIRONMENTAL POLICY ACT, NATIONAL HISTORIC PRESERVATION ACT, THE APPROPRIATE STATE AGENCY REMOVAL AND FILL PERMIT, USACE CLEAN WATER ACT (CWA) 404 PERMITS, CWA SECTION 401 WATER QUALITY CERTIFICATIONS, AND FEMA NO-RISE ANALYSES.

2. TIMING OF IN-WATER WORK.

A. APPROPRIATE STATE (OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE (WDFW), IDAHO DEPARTMENT OF FISH AND GAME (IDFG), AND MONTANA FISH WILDLIFE AND PARKS (MFWP)) GUIDELINES FOR TIMING OF IN-WATER WORK WINDOWS (IWW) WILL BE FOLLOWED.

B. CHANGES TO ESTABLISHED WORK WINDOWS WILL BE APPROVED BY REGIONAL STATE BIOLOGISTS AND BPA'S EC LEAD.

C. BULL TROUT. FOR AREAS WITH DESIGNATED IN-WATER WORK WINDOWS FOR BULL TROUT OR AREAS KNOWN TO HAVE BULL TROUT, PROJECT PROPONENTS WILL CONTACT THE APPROPRIATE USFWS FIELD OFFICE TO INSURE THAT ALL REASONABLE IMPLEMENTATION MEASURES ARE CONSIDERED AND AN APPROPRIATE IN-WATER WORK WINDOW IS BEING USED TO MINIMIZE PROJECT EFFECTS.

D. LAMPREY. WORKING IN STREAM OR RIVER CHANNELS THAT CONTAIN PACIFIC LAMPREY WILL BE AVOIDED FROM MARCH 1 TO JULY 1 FOR REACHES <5,000 FEET IN ELEVATION AND FROM MARCH 1 TO AUGUST 1 FOR REACHES >5,000 FEET. IF EITHER TIMEFRAME IS INCOMPATIBLE WITH OTHER OBJECTIVES, THE AREA WILL BE SURVEYED FOR NESTS AND LAMPREY PRESENCE, AND AVOIDED IF POSSIBLE. IF LAMPREYS ARE KNOWN TO EXIST, THE PROJECT SPONSOR WILL UTILIZE DEWATERING AND SALVAGE PROCEDURES (SEE FISH SALVAGE AND ELECTROFISHING SECTIONS) TO MINIMIZE ADVERSE EFFECTS.

E. THE IN-WATER WORK WINDOW WILL BE PROVIDED IN THE CONSTRUCTION PLANS.

3. CONTAMINANTS.

A. EXCAVATION OF MORE THAN 20 CUBIC YARDS WILL REQUIRE A SITE VISIT AND DOCUMENTED ASSESSMENT FOR POTENTIAL CONTAMINANT SOURCES. THE SITE ASSESSMENT WILL BE STORED WITH PROJECT FILES OR AS AN APPENDIX TO THE BASIS OF DESIGN REPORT.

B. THE SITE ASSESSMENT WILL SUMMARIZE:

1. THE SITE VISIT, CONDITION OF THE PROPERTY, AND IDENTIFICATION OF ANY AREAS USED FOR VARIOUS INDUSTRIAL PROCESSES;
2. AVAILABLE RECORDS, SUCH AS FORMER SITE USE, BUILDING PLANS, AND RECORDS OF ANY PRIOR CONTAMINATION EVENTS;
3. INTERVIEWS WITH KNOWLEDGEABLE PEOPLE, SUCH AS SITE OWNERS, OPERATORS, OCCUPANTS, NEIGHBORS, OR LOCAL GOVERNMENT OFFICIALS; AND
4. THE TYPE, QUANTITY, AND EXTENT OF ANY POTENTIAL CONTAMINATION SOURCES.

4. SITE LAYOUT AND FLAGGING.

A. CONSTRUCTION AREAS TO BE CLEARLY FLAGGED PRIOR TO CONSTRUCTION.

B. AREAS TO BE FLAGGED WILL INCLUDE:

1. SENSITIVE RESOURCE AREAS, SUCH AS AREAS BELOW ORDINARY HIGH WATER, SPAWNING AREAS, SPRINGS, AND WETLANDS;
2. EQUIPMENT ENTRY AND EXIT POINTS;
3. ROAD AND STREAM CROSSING ALIGNMENTS;
4. STAGING, STORAGE, AND STOCKPILE AREAS; AND
5. NO-SPRAY AREAS AND BUFFERS.

5. TEMPORARY ACCESS ROADS AND PATHS.

A. EXISTING ACCESS ROADS AND PATHS WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER AND LENGTH OF TEMPORARY ACCESS ROADS AND PATHS THROUGH RIPARIAN AREAS AND FLOODPLAINS WILL BE MINIMIZED.

B. VEHICLE USE AND HUMAN ACTIVITIES, INCLUDING WALKING, IN AREAS OCCUPIED BY TERRESTRIAL ESA-LISTED SPECIES WILL BE MINIMIZED.

C. TEMPORARY ACCESS ROADS AND PATHS WILL NOT BE BUILT ON SLOPES WHERE GRADE, SOIL, OR OTHER FEATURES SUGGEST A LIKELIHOOD OF EXCESSIVE EROSION OR FAILURE. IF SLOPES ARE STEEPER THAN 30%, THEN THE ROAD WILL BE DESIGNED BY A CIVIL ENGINEER WITH EXPERIENCE IN STEEP ROAD DESIGN.

D. THE REMOVAL OF RIPARIAN VEGETATION DURING CONSTRUCTION OF TEMPORARY ACCESS ROADS WILL BE MINIMIZED. WHEN TEMPORARY VEGETATION REMOVAL IS REQUIRED, VEGETATION WILL BE CUT AT GROUND LEVEL (NOT GRUBBED).

E. AT PROJECT COMPLETION, ALL TEMPORARY ACCESS ROADS AND PATHS WILL BE OBLITERATED, AND THE SOIL WILL BE STABILIZED AND REVEGETATED. ROAD AND PATH OBLITERATION REFERS TO THE MOST COMPREHENSIVE DEGREE OF DECOMMISSIONING AND INVOLVES DECOMPACTING THE SURFACE AND DITCH, PULLING THE FILL MATERIAL ONTO THE RUNNING SURFACE, AND RESHAPING TO MATCH THE ORIGINAL CONTOUR.

F. HELICOPTER FLIGHT PATTERNS WILL BE ESTABLISHED IN ADVANCE AND LOCATED TO AVOID TERRESTRIAL ESA-LISTED SPECIES AND THEIR OCCUPIED HABITAT DURING SENSITIVE LIFE STAGES.

6. TEMPORARY STREAM CROSSINGS.

A. EXISTING STREAM CROSSINGS OR BEDROCK WILL BE PREFERENTIALLY USED WHENEVER REASONABLE, AND THE NUMBER OF TEMPORARY STREAM CROSSINGS WILL BE MINIMIZED.

B. TEMPORARY BRIDGES AND CULVERTS WILL BE INSTALLED TO ALLOW FOR EQUIPMENT AND VEHICLE CROSSING OVER PERENNIAL STREAMS DURING CONSTRUCTION. TREATED WOOD SHALL NOT BE USED ON TEMPORARY BRIDGE CROSSINGS OR IN LOCATIONS IN CONTACT WITH OR DIRECTLY OVER WATER.

C. FOR PROJECTS THAT REQUIRE EQUIPMENT AND VEHICLES TO CROSS IN THE WET:

1. THE LOCATION AND NUMBER OF ALL WET CROSSINGS SHALL BE APPROVED BY THE BPA EC LEAD AND DOCUMENTED IN THE CONSTRUCTION PLANS;
2. VEHICLES AND MACHINERY SHALL CROSS STREAMS AT RIGHT ANGLES TO THE MAIN CHANNEL WHENEVER POSSIBLE;
3. NO STREAM CROSSINGS WILL OCCUR 300 FEET UPSTREAM OR 100 FEET DOWNSTREAM OF AN EXISTING REDD OR SPAWNING FISH; AND
4. AFTER PROJECT COMPLETION, TEMPORARY STREAM CROSSINGS WILL BE OBLITERATED AND BANKS RESTORED.

7. STAGING, STORAGE, AND STOCKPILE AREAS.

A. STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) WILL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND. STAGING AREAS CLOSER THAN 150 FEET WILL BE APPROVED BY THE EC LEAD.

B. NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, GRAVEL, AND BOULDERS, MAY BE STAGED WITHIN 150 FEET IF CLEARLY INDICATED IN THE PLANS THAT AREA IS FOR NATURAL MATERIALS ONLY.

C. ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION WILL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.

D. ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, WILL BE DISPOSED OF OUTSIDE THE 100-YEAR FLOODPLAIN.

8. EQUIPMENT.

A. MECHANIZED EQUIPMENT AND VEHICLES WILL BE SELECTED, OPERATED, AND MAINTAINED IN A MANNER THAT MINIMIZES ADVERSE EFFECTS ON THE ENVIRONMENT (E.G., MINIMALLY-SIZED, LOW PRESSURE TIRES; MINIMAL HARD-TURN PATHS FOR TRACKED VEHICLES; TEMPORARY MATS OR PLATES WITHIN WET AREAS OR ON SENSITIVE SOILS).

B. EQUIPMENT WILL BE STORED, FUELED, AND MAINTAINED IN AN CLEARLY IDENTIFIED STAGING AREA THAT MEETS STAGING AREA CONSERVATION MEASURES.

C. EQUIPMENT WILL BE REFUELED IN A VEHICLE STAGING AREA OR IN AN ISOLATED HARD ZONE, SUCH AS A PAVED PARKING LOT OR ADJACENT, ESTABLISHED ROAD (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS).

D. BIODEGRADABLE LUBRICANTS AND FLUIDS WILL BE USED ON EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.

E. EQUIPMENT WILL BE INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND.

F. EQUIPMENT WILL BE THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

9. EROSION CONTROL.

A. TEMPORARY EROSION CONTROL MEASURES INCLUDE:

1. TEMPORARY EROSION CONTROLS WILL BE IN PLACE BEFORE ANY SIGNIFICANT ALTERATION OF THE ACTION SITE AND APPROPRIATELY INSTALLED DOWNSLOPE OF PROJECT ACTIVITY WITHIN THE RIPARIAN BUFFER AREA UNTIL SITE REHABILITATION IS COMPLETE;
2. IF THERE IS A POTENTIAL FOR ERODED SEDIMENT TO ENTER THE STREAM, SEDIMENT BARRIERS WILL BE INSTALLED AND MAINTAINED FOR THE DURATION OF PROJECT IMPLEMENTATION;
3. TEMPORARY EROSION CONTROL MEASURES MAY INCLUDE SEDGE MATS, FIBER WATTLES, SILT FENCES, JUTE MATTING, WOOD FIBER MULCH AND SOIL BINDER, OR GEOTEXTILES AND GEOSYNTHETIC FABRIC;
4. SOIL STABILIZATION UTILIZING WOOD FIBER MULCH AND TACKIFIER (HYDRO-APPLIED) MAY BE USED TO REDUCE EROSION OF BARE SOIL IF THE MATERIALS ARE NOXIOUS WEED FREE AND NONTOXIC TO AQUATIC AND TERRESTRIAL ANIMALS, SOIL MICROORGANISMS, AND VEGETATION;
5. SEDIMENT WILL BE REMOVED FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL; AND
6. ONCE THE SITE IS STABILIZED AFTER CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES WILL BE REMOVED.

B. EMERGENCY EROSION CONTROLS. THE FOLLOWING MATERIALS FOR EMERGENCY EROSION CONTROL WILL BE AVAILABLE AT THE WORK SITE:

1. A SUPPLY OF SEDIMENT CONTROL MATERIALS; AND
2. AN OIL-ABSORBING FLOATING BOOM WHENEVER SURFACE WATER IS PRESENT.

10. DUST ABATEMENT.

A. THE PROJECT SPONSOR WILL DETERMINE THE APPROPRIATE DUST CONTROL MEASURES BY CONSIDERING SOIL TYPE, EQUIPMENT USAGE, PREVAILING WIND DIRECTION, AND THE EFFECTS CAUSED BY OTHER EROSION AND SEDIMENT CONTROL MEASURES.

B. WORK WILL BE SEQUENCED AND SCHEDULED TO REDUCE EXPOSED BARE SOIL SUBJECT TO WIND EROSION.

C. DUST-ABATEMENT ADDITIVES AND STABILIZATION CHEMICALS (TYPICALLY MAGNESIUM CHLORIDE, CALCIUM CHLORIDE SALTS, OR LIGNINSULFONATE) WILL NOT BE APPLIED WITHIN 25 FEET OF WATER OR A STREAM CHANNEL AND WILL BE APPLIED SO AS TO MINIMIZE THE LIKELIHOOD THAT THEY WILL ENTER STREAMS. APPLICATIONS OF LIGNINSULFONATE WILL BE LIMITED TO A MAXIMUM RATE OF 0.5 GALLONS PER SQUARE YARD OF ROAD SURFACE, ASSUMING MIXED 50:50 WITH WATER.

D. APPLICATION OF DUST ABATEMENT CHEMICALS WILL BE AVOIDED DURING OR JUST BEFORE WET WEATHER, AND AT STREAM CROSSINGS OR OTHER AREAS THAT COULD RESULT IN UNFILTERED DELIVERY OF THE DUST ABATEMENT MATERIALS TO A WATERBODY (TYPICALLY THESE WOULD BE AREAS WITHIN 25 FEET OF A WATERBODY OR STREAM CHANNEL; DISTANCES MAY BE GREATER WHERE VEGETATION IS SPARSE OR SLOPES ARE STEEP).

E. SPILL CONTAINMENT EQUIPMENT WILL BE AVAILABLE DURING APPLICATION OF DUST ABATEMENT CHEMICALS.

F. PETROLEUM-BASED PRODUCTS WILL NOT BE USED FOR DUST ABATEMENT.

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LEVESQUE — STATE OF WASHINGTON — 24000 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

HIP CONSERVATION NOTES 1

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ
SCALE: 0 — 1"

JOB NO. 20220043

SHEET NO. G1.2
3 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.X - HIP NOTES.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024

PROJECT DESIGN AND SITE PREPARATION (CONTINUED).

11. SPILL PREVENTION, CONTROL, AND COUNTER MEASURES.

A. A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.

B. WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.

C. SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.

D. WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

E. ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPAULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

F. PUMPS USED ADJACENT TO WATER SHALL USE SPILL CONTAINMENT SYSTEMS.

12. INVASIVE SPECIES CONTROL.

A. PRIOR TO ENTERING THE SITE, ALL VEHICLES AND EQUIPMENT WILL BE POWER WASHED, ALLOWED TO FULLY DRY, AND INSPECTED TO MAKE SURE NO PLANTS, SOIL, OR OTHER ORGANIC MATERIAL ADHERES TO THE SURFACE.

B. WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

C. WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES UNLESS DECONTAMINATION PROCEDURES HAVE BEEN APPROVED BY THE EC LEAD.

WORK AREA ISOLATION AND FISH SALVAGE.

1. WORK AREA ISOLATION.

A. ANY WORK AREA WITHIN THE WETTED CHANNEL WILL BE ISOLATED FROM THE ACTIVE STREAM WHENEVER ESA-LISTED FISH ARE REASONABLY CERTAIN TO BE PRESENT, OR IF THE WORK AREA IS LESS THAN 300-FEET UPSTREAM FROM KNOWN SPAWNING HABITATS.

B. WORK AREA ISOLATION AND FISH SALVAGE ACTIVITIES WILL COMPLY WITH THE IN-WATER WORK WINDOW.

C. DESIGN PLANS WILL INCLUDE ALL ISOLATION ELEMENTS AND AREAS (COFFER DAMS, PUMPS, DISCHARGE AREAS, FISH SCREENS, FISH RELEASE AREAS, ETC.).

D. WORK AREA ISOLATION AND FISH CAPTURE ACTIVITIES WILL OCCUR DURING PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE, NORMALLY EARLY IN THE MORNING VERSUS LATE IN THE DAY, AND DURING CONDITIONS APPROPRIATE TO MINIMIZE STRESS AND DEATH OF SPECIES PRESENT.

2. FISH SALVAGE.

A. MONITORING AND RECORDING WILL TAKE PLACE FOR DURATION OF SALVAGE. THE SALVAGE REPORT WILL BE COMMUNICATED TO AGENCIES VIA THE PROJECT COMPLETION FORM (PCF).

B. SALVAGE ACTIVITIES SHOULD TAKE PLACE DURING CONDITIONS TO MINIMIZE STRESS TO FISH SPECIES, TYPICALLY PERIODS OF THE COOLEST AIR AND WATER TEMPERATURES WHICH OCCUR IN THE MORNING VERSUS LATE IN THE DAY.

C. SALVAGE OPERATIONS WILL FOLLOW THE ORDERING, METHODS, AND CONSERVATION MEASURES SPECIFIED BELOW:

1. SLOWLY REDUCE WATER FROM THE WORK AREA TO ALLOW SOME FISH TO LEAVE VOLITIONALLY.

2. BLOCK NETS WILL BE INSTALLED AT UPSTREAM AND DOWNSTREAM LOCATIONS AND MAINTAINED IN A SECURED POSITION TO EXCLUDE FISH FROM ENTERING THE PROJECT AREA.

3. BLOCK NETS WILL BE SECURED TO THE STREAM CHANNEL BED AND BANKS UNTIL FISH CAPTURE AND TRANSPORT ACTIVITIES ARE COMPLETE. BLOCK NETS MAY BE LEFT IN PLACE FOR THE DURATION OF THE PROJECT TO EXCLUDE FISH AS LONG AS PASSAGE REQUIREMENTS ARE MET.

4. NETS WILL BE MONITORED HOURLY DURING IN-STREAM DISTURBANCE.

5. IF BLOCK NETS REMAIN IN PLACE MORE THAN ONE DAY, THE NETS WILL BE MONITORED AT LEAST DAILY TO ENSURE THEY ARE SECURED AND FREE OF ORGANIC ACCUMULATION. IF BULL TROUT ARE PRESENT, NETS ARE TO BE CHECKED EVERY 4 HOURS FOR FISH IMPINGEMENT.

6. CAPTURE FISH THROUGH SEINING AND RELOCATE TO STREAMS.

7. WHILE DEWATERING, ANY REMAINING FISH WILL BE COLLECTED BY HAND OR DIP NETS.

8. SEINES WITH A MESH SIZE TO ENSURE CAPTURE OF THE RESIDING ESA-LISTED FISH WILL BE USED.

9. MINNOW TRAPS WILL BE LEFT IN PLACE OVERNIGHT AND USED IN CONJUNCTION WITH SEINING.

10. ELECTROFISH TO CAPTURE AND RELOCATED FISH NOT CAUGHT DURING SEINING PER ELECTROFISH CONSERVATION MEASURES.

11. CONTINUE TO SLOWLY DEWATER STREAM REACH.

12. COLLECT ANY REMAINING FISH IN COLD-WATER BUCKETS AND RELOCATED TO THE STREAM.

13. LIMIT THE TIME FISH ARE IN A TRANSPORT BUCKET.

14. MINIMIZE PREDATION BY TRANSPORTING COMPARABLE SIZES IN BUCKETS.

15. BUCKET WATER TO BE CHANGED EVERY 15 MINUTES OR AERATED.

16. BUCKETS WILL BE KEPT IN SHADED AREAS OR COVERED.

17. DEAD FISH WILL NOT BE STORED IN TRANSPORT BUCKETS, BUT WILL BE LEFT ON THE STREAM BANK TO AVOID MORTALITY COUNTING ERRORS.

D. SALVAGE GUIDELINES FOR BULL TROUT, LAMPREY, MUSSELS, AND NATIVE FISH.

1. CONDUCT SITE SURVEY TO ESTIMATE SALVAGE NUMBERS.

2. PRE-SELECT SITE(S) FOR RELEASE AND/OR MUSSEL BED RELOCATION.

3. SALVAGE OF BULL TROUT WILL NOT TAKE PLACE WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.

4. IF DRAWDOWN LESS THAN 48 HOURS, SALVAGE OF LAMPREY AND MUSSELS MAY NOT BE NECESSARY IF TEMPERATURES SUPPORT SURVIVAL IN SEDIMENTS.

5. SALVAGE MUSSELS BY HAND, LOCATING BY SNORKELING OR WADING.

6. SALVAGE LAMPREY BY ELECTROFISHING (SEE ELECTROFISHING FOR LARVAL LAMPREY SETTINGS AND LARVAL LAMPREY DRY SHOCKING SETTINGS).

7. SALVAGE BONY FISH AFTER LAMPREY WITH NETS OR ELECTROFISHING (SEE ELECTROFISHING FOR APPROPRIATE SETTINGS).

8. REGULARLY INSPECT DEWATERED SITE SINCE LAMPREY LIKELY TO EMERGE AFTER DEWATERING AND MUSSELS MAY BECOME VISIBLE.

9. MUSSELS MAY BE TRANSFERRED IN COOLERS.

10. MUSSELS WILL BE PLACED INDIVIDUALLY TO ENSURE ABILITY TO BURROW INTO NEW HABITAT.

3. ELECTROFISHING.

A. INITIAL SITE SURVEY AND INITIAL SETTINGS.

1. IDENTIFY SPAWNING ADULTS AND ACTIVE REDDS TO AVOID.

2. RECORD WATER TEMPERATURE. ELECTROFISHING WILL NOT OCCUR WHEN WATER TEMPERATURES ARE ABOVE 18 DEGREES CELSIUS.

3. IF POSSIBLE, A BLOCK NET WILL BE PLACED DOWNSTREAM AND CHECKED REGULARLY TO CAPTURE STUNNED FISH THAT DRIFT DOWNSTREAM.

4. INITIAL SETTINGS WILL BE 100 VOLTS, PULSE WIDTH OF 500 MICRO SECONDS, AND PULSE RATE OF 30 HERTZ.

5. RECORDS FOR CONDUCTIVITY, WATER TEMPERATURE, AIR TEMPERATURE, ELECTROFISHING SETTINGS, ELECTROFISHER MODEL, ELECTROFISHER CALIBRATION, FISH CONDITIONS, FISH MORTALITIES, AND TOTAL CAPTURE RATES WILL BE INCLUDED IN THE SALVAGE LOG BOOK.

B. ELECTROFISHING TECHNIQUE.

1. SAMPLING SHOULD BEGIN USING STRAIGHT DC. POWER WILL REMAIN ON UNTIL THE FISH IS NETTED WHEN USING STRAIGHT DC. GRADUALLY INCREASE VOLTAGE WHILE REMAINING BELOW MAXIMUM LEVELS.

2. MAXIMUM VOLTAGE WILL BE 1100 VOLTS WHEN CONDUCTIVITY IS <100 MILLISECONDS, 800 VOLTS WHEN CONDUCTIVITY IS BETWEEN 100 AND 300 MILLISECONDS, AND 400 VOLTS WHEN CONDUCTIVITY IS >300 MILLISECONDS.

3. IF FISH CAPTURE IS NOT SUCCESSFUL USING STRAIGHT DC, THE ELECTROFISHER WILL BE SET TO INITIAL VOLTAGE FOR PDC. VOLTAGE, PULSE WIDTH, AND PULSE FREQUENCY WILL BE GRADUALLY INCREASED WITHIN MAXIMUM VALUES UNTIL CAPTURE IS SUCCESSFUL.

4. MAXIMUM PULSE WIDTH IS 5 MILLISECONDS. MAXIMUM PULSE RATE IS 70 HERTZ

5. ELECTROFISHING WILL NOT OCCUR IN ONE AREA FOR AN EXTENDED PERIOD.

6. THE ANODE WILL NOT INTENTIONALLY COME INTO CONTACT WITH FISH. THE ZONE FOR POTENTIAL INJURY OF 0.5 M FROM THE ANODE WILL BE AVOIDED.

7. SETTINGS WILL BE LOWERED IN SHALLOWER WATER SINCE VOLTAGE GRADIENTS LIKELY TO INCREASE.

8. ELECTROFISHING WILL NOT OCCUR IN TURBID WATER WHERE VISIBILITY IS POOR (I.E. UNABLE TO SEE THE BED OF THE STREAM).

9. OPERATIONS WILL IMMEDIATELY STOP IF MORTALITY OR OBVIOUS FISH INJURY IS OBSERVED. ELECTROFISHING SETTINGS WILL BE REEVALUATED.

C. SAMPLE PROCESSING.

1. FISH SHALL BE SORTED BY SIZE TO AVOID PREDATION DURING CONTAINMENT.

2. SAMPLERS WILL REGULARLY CHECK CONDITIONS OF FISH HOLDING CONTAINERS, AIR PUMPS, WATER TRANSFERS, ETC.

3. FISH WILL BE OBSERVED FOR GENERAL CONDITIONS AND INJURIES

4. EACH FISH WILL BE COMPLETELY REVIVED BEFORE RELEASE. ESA-LISTED SPECIES WILL BE PRIORITIZED FOR SUCCESSFUL RELEASE.

D. BULL TROUT ELECTROFISHING.

1. ELECTROFISHING FOR BULL TROUT WILL ONLY OCCUR FROM MAY 1 TO JULY 31. NO ELECTROFISHING WILL OCCUR IN ANY BULL TROUT OCCUPIED HABITAT AFTER AUGUST 15. IN FMO HABITATS ELECTROFISHING MAY OCCUR ANY TIME.

2. ELECTROFISHING OF BULL TROUT WILL NOT OCCUR WHEN WATER TEMPERATURES EXCEED 15 DEGREES CELSIUS.

E. LARVAL LAMPREY ELECTROFISHING.

1. PERMISSION FROM EC LEAD WILL BE OBTAINED IF LARVAL LAMPREY ELECTROFISHER IS NOT ONE OF FOLLOWING PRE-APPROVED MODELS: ABP-2 "WISCONSIN", SMITH-ROOT LR-24, OR SMITH-ROOT APEX BACKPACK.

2. LARVAL LAMPREY SAMPLING WILL INCORPORATE 2-STAGE METHOD: "TICKLE" AND "STUN".

3. FIRST STAGE: USE 125 VOLT DC WITH A 25 PERCENT DUTY CYCLE APPLIED AT A SLOW RATE OF 3 PULSES PER SECOND. IF TEMPERATURES ARE BELOW 10 DEGREES CELSIUS, VOLTAGE MAY BE INCREASED GRADUALLY (NOT TO EXCEED 200 VOLTS). BURSTED PULSES (THREE SLOW AND ONE SKIPPED) RECOMMENDED TO INCREASE EMERGENCE.

4. SECOND STAGE (OPTIONAL FOR EXPERIENCED NETTERS): IMMEDIATELY AFTER LAMPREY EMERGE, USE A FAST PULSE SETTING OF 30 PULSES PER SECOND.

5. USE DIP NETS FOR VISIBLE LAMPREY. SIENES AND FINE MESH NET SWEEPS MAY BE USED IN POOR VISIBILITY.

6. SAMPLING WILL OCCUR SLOWLY (>60 SECONDS PER METER) STARTING AT UPSTREAM AND WORKING DOWNSTREAM.

7. MULTIPLE SWEEPS TO OCCUR WITH 15 MINUTES BETWEEN SWEEPS.

8. POST-DRAWDOWN "DRY-SHOCKING" WILL BE APPLIED IF LARVAL LAMPREY CONTINUE TO EMERGE. ANODES TO BE PLACED ONE METER APART TO SAMPLE ONE SQUARE METER AT A TIME FOR AT LEAST 60 SECONDS. FOR TEMPERATURES LESS THAN 10 DEGREES CELSIUS, MAXIMUM VOLTAGE MAY BE GRADUALLY INCREASED TO 400 VOLTS (DRY-SHOCKING ONLY).

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

HIP
CONSERVATION
NOTES 2

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ
SCALE: 0 1"

JOB NO. 20220043

SHEET NO. G1.3

4 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.X - HIP NOTES.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024

WORK AREA ISOLATION AND FISH SALVAGE (CONTINUED).

4. DEWATERING.

A. DEWATERING WILL OCCUR AT A RATE SLOW ENOUGH TO ALLOW SPECIES TO NATURALLY MIGRATE OUT OF THE WORK AREA.

B. WHERE A GRAVITY FEED DIVERSION IS NOT POSSIBLE, A PUMP MAY BE USED. PUMPS WILL BE INSTALLED TO AVOID REPETIVE DEWATERING AND REWATERING.

C. WHEN FISH ARE PRESENT, PUMPS WILL BE SCREENED IN ACCORDANCE WITH NMFS FISH SCREEN CRITERIA. NMFS ENGINEERING REVIEW AND APPROVAL WILL BE OBTAINED FOR PUMPS EXCEEDING 3 CUBIC FEET PER SECOND.

D. DISSIPATION OF FLOW ENERGY AT THE BYPASS OUTFLOW WILL BE PROVIDED TO PREVENT DAMAGE TO THE STREAM CHANNEL AND RIPARIAN VEGETATION.

E. SEEPAGE WATER WILL BE PUMPED TO A TEMPORARY STORAGE AND TREATMENT SITE OF INTO UPLAND AREAS TO ALLOW WATER TO PERCOLATE THROUGH SOIL AND VEGETATION PRIOR TO REENTERING THE STREAM CHANNEL.

CONSTRUCTION AND POST CONSTRUCTION CONSERVATION MEASURES.

1. FISH PASSAGE.

A. FISH PASSAGE WILL BE PROVIDED FOR ADULT AND JUVENILE FISH LIKELY TO BE PRESENT DURING CONSTRUCTION UNLESS PASSAGE DID NOT EXIST BEFORE CONSTRUCTION, THE STREAM IS NATURALLY IMPASSABLE, OR PASSAGE WILL NEGATIVELY IMPACT ESA-LISTED SPECIES OR THEIR HABITAT.

B. FISH PASSAGE ALTERNATIVES WILL BE APPROVED BY THE BPA EC LEAD UNDER ADVISEMENT BY THE NMFS HABITAT BIOLOGIST.

2. CONSTRUCTION AND DISCHARGE WATER.

A. SURFACE WATER MAY BE DIVERTED TO MEET CONSTRUCTION NEEDS ONLY IF DEVELOPED SOURCES ARE UNAVAILABLE OR INADEQUATE.

B. DIVERSIONS WILL NOT EXCEED 10% OF THE AVAILABLE FLOW.

C. CONSTRUCTION DISCHARGE WATER WILL BE COLLECTED AND TREATED TO REMOVE DEBRIS, NUTRIENTS, SEDIMENT, PETROLEUM HYDROCARBONS, METALS, AND OTHER POLLUTANTS.

3. TIME AND EXTENT OF DISTURBANCE.

A. EARTHWORK REQUIRING IN-STREAM MECHANIZED EQUIPMENT (INCLUDING DRILLING, EXCAVATION, DREDGING, FILLING, AND COMPACTING) WILL BE COMPLETED AS QUICKLY AS POSSIBLE.

B. MECHANIZED EQUIPMENT WILL WORK FROM TOP OF BANK UNLESS WORK FROM ANOTHER LOCATION WILL RESULT IN LESS HABITAT DISTURBANCE (TURBIDITY, VEGETATION DISTURBANCE, ETC.).

4. CESSATION OF WORK.

A. PROJECT OPERATIONS WILL CEASE WHEN HIGH FLOW CONDITIONS MAY RESULT IN INUNDATION OF THE PROJECT AREA (FLOOD EFFORTS TO DECREASE DAMAGES TO NATURAL RESOURCES PERMITTED).

B. WATER QUALITY LEVELS EXCEEDED. SEE CWA SECTION 401 WATER QUALITY CERTIFICATION AND TURBIDITY MEASURES.

5. SITE RESTORATION.

A. DISTURBED AREAS, STREAM BANKS, SOILS, AND VEGETATION WILL BE CLEANED UP AND RESTORED TO IMPROVED OR PRE-PROJECT CONDITIONS.

B. PROJECT-RELATED WASTE WILL BE REMOVED.

C. TEMPORARY ACCESS ROADS AND STAGING WILL BE DECOMPACTED AND RESTORED. SOILS WILL BE LOOSENED IF NEEDED FOR REVEGETATION OR WATER INFILTRATION.

D. THE PROJECT SPONSOR WILL RETAIN THE RIGHT OF REASONABLE ACCESS TO THE SITE TO MONITOR AND MAINTAIN THE SITE OVER THE LIFE OF THE PROJECT.

6. REVEGETATION.

A. PLANTING AND SEEDING WILL OCCUR PRIOR TO OR AT THE BEGINNING OF THE FIRST GROWING SEASON AFTER CONSTRUCTION.

B. A MIX OF NATIVE SPECIES (INVASIVE SPECIES NOT ALLOWED) APPROPRIATE TO THE SITE WILL BE USED TO REESTABLISH VEGETATION, PROVIDE SHADE, AND REDUCE EROSION. REESTABLISHED VEGETATION SHOULD BE AT LEAST 70% OF PRE-PROJECT CONDITIONS WITHIN THREE YEARS.

C. VEGETATION SUCH AS WILLOWS, SEDGES, OR RUSH MATS WILL BE SALVAGED FROM DISTURBED OR ABANDONED AREAS TO BE REPLANTED.

D. SHORT-TERM STABILIZATION MEASURE MAY INCLUDE THE USE OF NON-NATIVE STERILE SEED MIX (WHEN NATIVE NOT AVAILABLE), WEED-FREE CERTIFIED STRAW, OR OTHER SIMILAR TECHNIQUES.

E. SURFACE FERTILIZER WILL NOT BE APPLIED WITHIN 50 FEET OF ANY STREAM, WATE BODY, OR WETLAND.

F. FENCING WILL BE INSTALLED AS NECESSARY TO PREVENT ACCESS TO REVEGETATED SITES BY LIVESTOCK OR UNAUTHORIZED PERSONS.

G. INVASIVE PLANTS WILL BE REMOVED OR CONTROLLED UNTIL NATIVE PLANT SPECIES ARE WELL ESTABLISHED (TYPICALLY THREE YEARS POST-CONSTRUCTION).

7. SITE ACCESS AND IMPLEMENTATION MONITORING.

A. THE PROJECT SPONSOR WILL PROVIDE CONSTRUCTION MONITORING DURING IMPLEMENTATION TO ENSURE ALL CONSERVATION MEASURES ARE ADEQUATELY FOLLOWED, EFFECTS TO LISTED SPECIES ARE NOT GREATER THAN PREDICTED, AND INCIDENTAL TAKE LIMITATIONS ARE NOT EXCEEDED.

B. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL SUBMIT THE PROJECT COMPLETION FORM (PCF) WITHIN 30 DAYS OF PROJECT COMPLETION.

8. CWA SECTION 401 WATER QUALITY CERTIFICATION.

A. THE PROJECT SPONSOR OR DESIGNATED REPRESENTATIVE WILL COMPLETE AND RECORD WATER QUALITY OBSERVATIONS (SEE TURBIDITY MONITORING) TO ENSURE IN-WATER WORK IS NOT DEGRADING WATER QUALITY.

B. DURING CONSTRUCTION, WATER QUALITY PROVISIONS PROVIDED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHINGTON DEPARTMENT OF ECOLOGY, IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE FOLLOWED.

STAGED REWATERING PLAN.

A. WHEN REINTRODUCING WATER TO DEWATERED AREAS AND NEWLY CONSTRUCTED CHANNELS, A STAGED REWATERING PLAN WILL BE APPLIED.

B. THE FOLLOWING WILL BE APPLIED TO ALL REWATERING EFFORTS. COMPLEX REWATERING EFFORTS MAY REQUIRE ADDITIONAL NOTES OR A DEDICATED SHEET IN THE CONSTRUCTION DETAILS.

1. TURBIDITY MONITORING PROTOCOL WILL BE APPLIED TO REWATERING EFFORTS.

2. PRE-WASH THE AREA BEFORE REWATERING. TURBID WASH WATER WILL BE DETAINED AND PUMPED TO THE FLOODPLAIN OR SEDIMENT CAPTURE AREAS RATHER THAN DISCHARGING TO FISH-BEARING STREAMS.

3. INSTALL SEINE NETS AT UPSTREAM END TO PREVENT FISH FROM MOVING DOWNSTREAM UNTIL 2/3 OF TOTAL FLOW IS RESTORED TO THE CHANNEL.

4. STARTING IN EARLY MORNING INTRODUCE 1/3 OF NEW CHANNEL FLOW OVER PERIOD OF 1-2 HOURS.

5. INTRODUCE SECOND THIRD OF FLOW OVER NEXT 1 TO 2 HOURS AND BEGIN FISH SALVAGE OF BYPASS CHANNEL IF FISH ARE PRESENT.

6. REMOVE UPSTREAM SEINE NETS ONCE 2/3 FLOW IN REWATERED CHANNEL AND DOWNSTREAM TURBIDITY IS WITHIN ACCEPTABLE RANGE (LESS THAN 40 NTU OR LESS THAN 10% BACKGROUND).

7. INTRODUCE FINAL THIRD OF FLOW ONCE FISH SALVAGE EFFORTS ARE COMPLETE AND DOWNSTREAM TURBIDITY VERIFIED TO BE WITHIN ACCEPTABLE RANGE.

8. INSTALL PLUG TO BLOCK FLOW INTO OLD CHANNEL OR BYPASS. REMOVE ANY REMAINING SEINE NETS.

9. IN LAMPREY SYSTEMS, LAMPREY SALVAGE AND DRY SHOCKING MAY BE NECESSARY.

TURBIDITY MONITORING.

A. RECORD THE READING, LOCATION, AND TIME FOR THE BACKGROUND READING APPROXIMATELY 100 FEET UPSTREAM OF THE PROJECT AREA USING A RECENTLY CALIBRATED TURBIDIMETER OR VIA VISUAL OBSERVATION (SEE THE HIP HANDBOOK TURBIDITY MONITORING SECTION FOR A VISUAL OBSERVATION KEY).

B. RECORD THE TURBIDITY READING, LOCATION, AND TIME AT THE MEASUREMENT COMPLIANCE LOCATION POINT.

1. 50 FEET DOWNSTREAM FOR STREAMS LESS THAN 30 FEET WIDE.

2. 100 FEET DOWNSTREAM FOR STREAMS BETWEEN 30 AND 100 FEET WIDE.

3. 200 FEET DOWNSTREAM FOR STREAMS GREATER THAN 100 FEET WIDE.

4. 300 FEET FROM THE DISCHARGE POINT OR NONPOINT SOURCE FOR LOCATIONS SUBJECT TO TIDAL OR COASTAL SCOUR.

C. TURBIDITY SHALL BE MEASURED (BACKGROUND LOCATION AND COMPLIANCE POINTS) EVERY 4 HOURS WHILE WORK IS BEING IMPLEMENTED.

D. IF THERE IS A VISIBLE DIFFERENCE BETWEEN A COMPLIANCE POINT AND THE BACKGROUND, THE EXCEEDANCE WILL BE NOTED IN THE PROJECT COMPLETION FORM (PCF). ADJUSTMENTS OR CORRECTIVE MEASURES WILL BE TAKEN IN ORDER TO REDUCE TURBIDITY.

E. IF EXCEEDANCES OCCUR FOR MORE THAN TWO CONSECUTIVE MONITORING INTERVALS (AFTER 8 HOURS), THE ACTIVITY WILL STOP UNTIL THE TURBIDITY LEVEL RETURNS TO BACKGROUND. THE BPA EC LEAD WILL BE NOTIFIED OF ALL EXCEEDANCES AND CORRECTIVE ACTIONS AT PROJECT COMPLETION.

F. IF TURBIDITY CONTROLS (COFFER DAMS, WADDLES, FENCING, ETC.) ARE DETERMINED INEFFECTIVE, CREWS WILL BE MOBILIZED TO MODIFY AS NECESSARY. OCCURRENCES WILL BE DOCUMENTED IN THE PROJECT COMPLETION FORM (PCF).

G. FINAL TURBIDITY READINGS, EXCEEDANCES, AND CONTROL FAILURES WILL BE SUBMITTED TO THE BPA EC LEAD USING THE PROJECT COMPLETION FORM (PCF).

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RAY LEWIS — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

HIP
CONSERVATION
NOTES 3

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

SCALE 0 1"

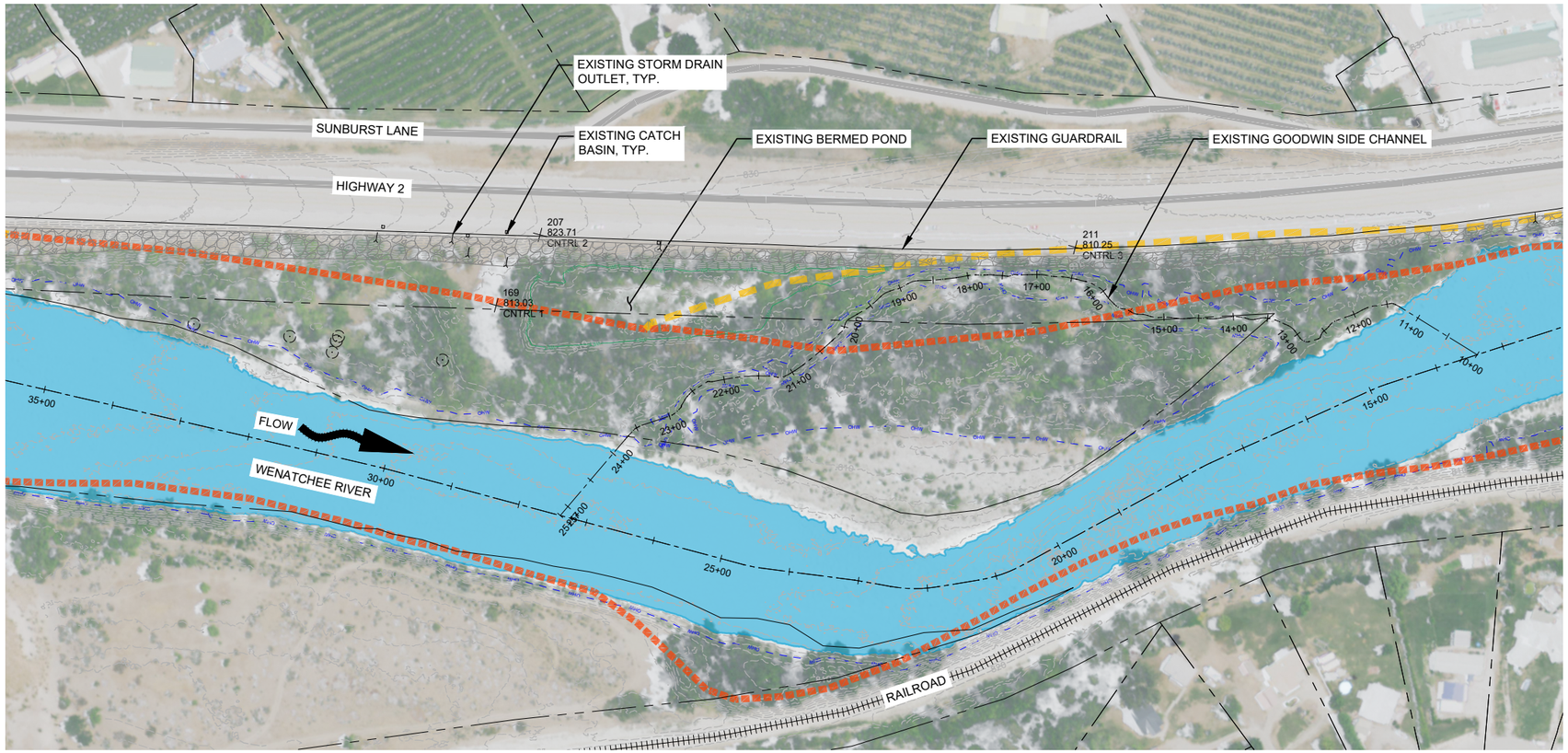
JOB NO. 20220043

SHEET NO. G1.4

5 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\G1.X - HIP NOTES.dwg USER: bbennett
DATE: Sep 26, 2024 2:15pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024



NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

LEGEND:

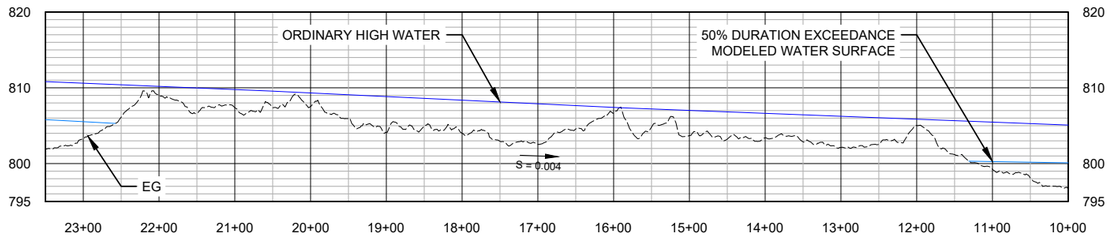
- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET

SCALE
100 0 50 100 200
SCALE FEET

EXISTING CONDITIONS PLAN

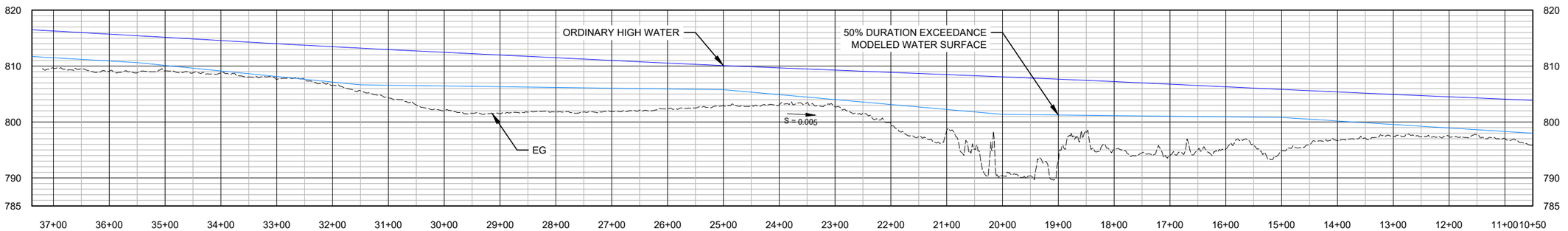
SCALE: 1"=100"

CONTROL POINTS				
POINT #	DESCRIPTION	ELEVATION	NORTHING	EASTING
169	CNTRL 1	813.026	193806.5173	1722775.4770
207	CNTRL 2	823.707	193862.6338	1722880.4320
211	CNTRL 3	810.254	193463.2259	1723536.5070



EXISTING GOODWIN SIDE CHANNEL PROFILE

HORIZONTAL SCALE: 1"=100"
VERTICAL SCALE: 1"=10'



EXISTING WENATCHEE RIVER PROFILE

HORIZONTAL SCALE: 1"=100"
VERTICAL SCALE: 1'=10'

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RAY ROSE
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

EXISTING CONDITIONS PLAN & PROFILE

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024
Designed By: SR, GL
Drawn By: BB
Checked By: AJ
SCALE: 0 1"

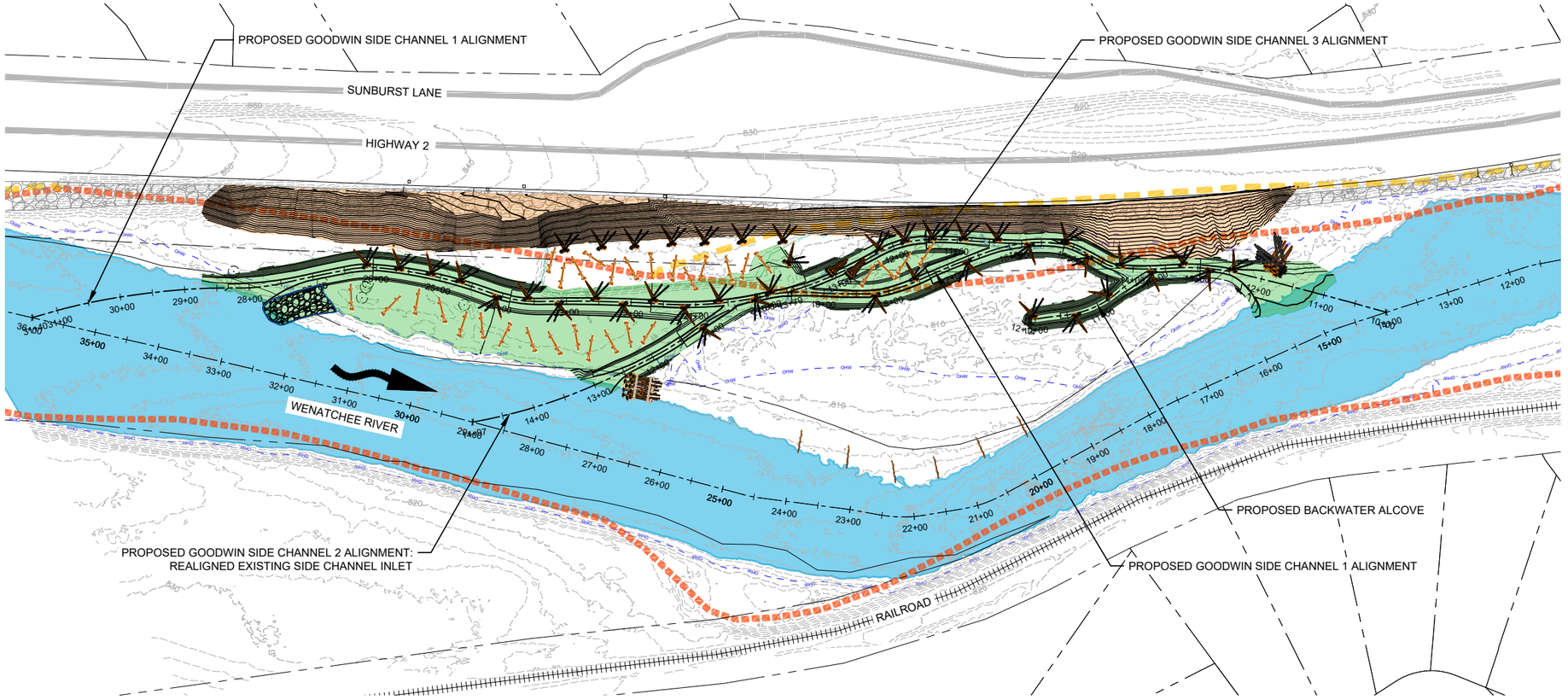
JOB NO. 20220043

SHEET NO. C1.0

6 OF 21

DWG: Z:\Share\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C1.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:16pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-LEGEND GSC-X-FEMA GSC-X-OHW GSC-X-AERIAL

60% DESIGN
SEPTEMBER 2024



PROPOSED CONDITIONS OVERVIEW

SCALE: 1"=100"

PROPOSED CONDITIONS NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.
7. FOR ACCESS, STAGING, TEMP EROSION AND SEDIMENTATION CONTROL, SEE SHEETS C5.0 - C5.2.
8. CONSTRUCT CHANNELS PER PLANS, PROFILES, AND SECTIONS ON SHEETS C2.1, C2.2, AND C3.0.
9. CONSTRUCT ENGINEERED LOG JAMS PER PLANS ON SHEETS C2.1 AND C2.2, AND DETAILS ON SHEETS C4.0 - C4.4.
10. REVEGETATE SITE PER SHEET C6.1.
11. AVOID DISTURBANCE TO AREAS OF EXISTING VEGETATION IDENTIFIED BY CAR. PRESERVE EXISTING TREES/VEGETATION IN EXCAVATION, FILL, HAULING, AND STAGING AREAS. WHERE DISTURBANCE TO EXISTING VEGETATION IS UNAVOIDABLE, SALVAGE AND RE-USE FOR SITE RESTORATION AT DIRECTION OF CAR.
12. SALVAGE AND STOCKPILE BOULDERS ENCOUNTERED DURING FLOODPLAIN AND CHANNEL EXCAVATION FOR REUSE AS BACKFILL IN ENGINEERED LOG JAMS, OR FOR INCORPORATION IN RESTORATION ELEMENTS AS DIRECTION BY THE CAR.
13. SALVAGE AND STOCKPILE LARGE WOOD PIECES 6 INCHES OR GREATER DBH AND/OR 10 FEET OR GREATER IN LENGTH ENCOUNTERED DURING SITE CLEARING AND FLOODPLAIN AND CHANNEL EXCAVATION. REUSE IN ENGINEERED LOG JAMS AS RACKING, OR IN SITE RESTORATION, AS DIRECTED BY THE CAR.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA ISOLATION AND/OR STREAM DIVERSIONS. TEMPORARY COFFER DAMS SHOWN IN THESE PLANS ARE CONCEPTUAL ONLY. THE CONTRACTOR SHALL ASSESS CONDITIONS IN THE FIELD TO DETERMINE OPTIMAL WATER MANAGEMENT TECHNIQUES AND SEQUENCING.

LEGEND:

- EX MINOR CONTOUR
- EX MAJOR CONTOUR
- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- FEMA FLOODWAY EXTENTS
- FEMA 100-YEAR FLOODPLAIN EXTENTS
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN
- EXISTING STORM DRAIN OUTLET
- PROPOSED CUT AREA
- PROPOSED FILL AREA
- PROPOSED ROCK INLET

ENGINEERED LOG JAM STRUCTURES

- TYPE 1 - APEX JAM
- TYPE 2 - MARGIN JAM
- TYPE 3 - SIDE CHANNEL MARGIN JAM
- TYPE 4 - SIDE CHANNEL APEX JAM
- TYPE 5 - FLOODPLAIN WOOD
- TYPE 6 - FLOODFENCE

SCALE

100 0 50 100 200

SCALE FEET

PRELIMINARY NOT FOR CONSTRUCTION

STEVEN ROBERT LEVESQUE — STATE OF WASHINGTON — 24000 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES GOODWIN SIDE CHANNEL

CHELAN COUNTY, WA

PROPOSED CONDITIONS OVERVIEW

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024
Designed By: SR, GL
Drawn By: BB
Checked By: AJ

SCALE 0 1"

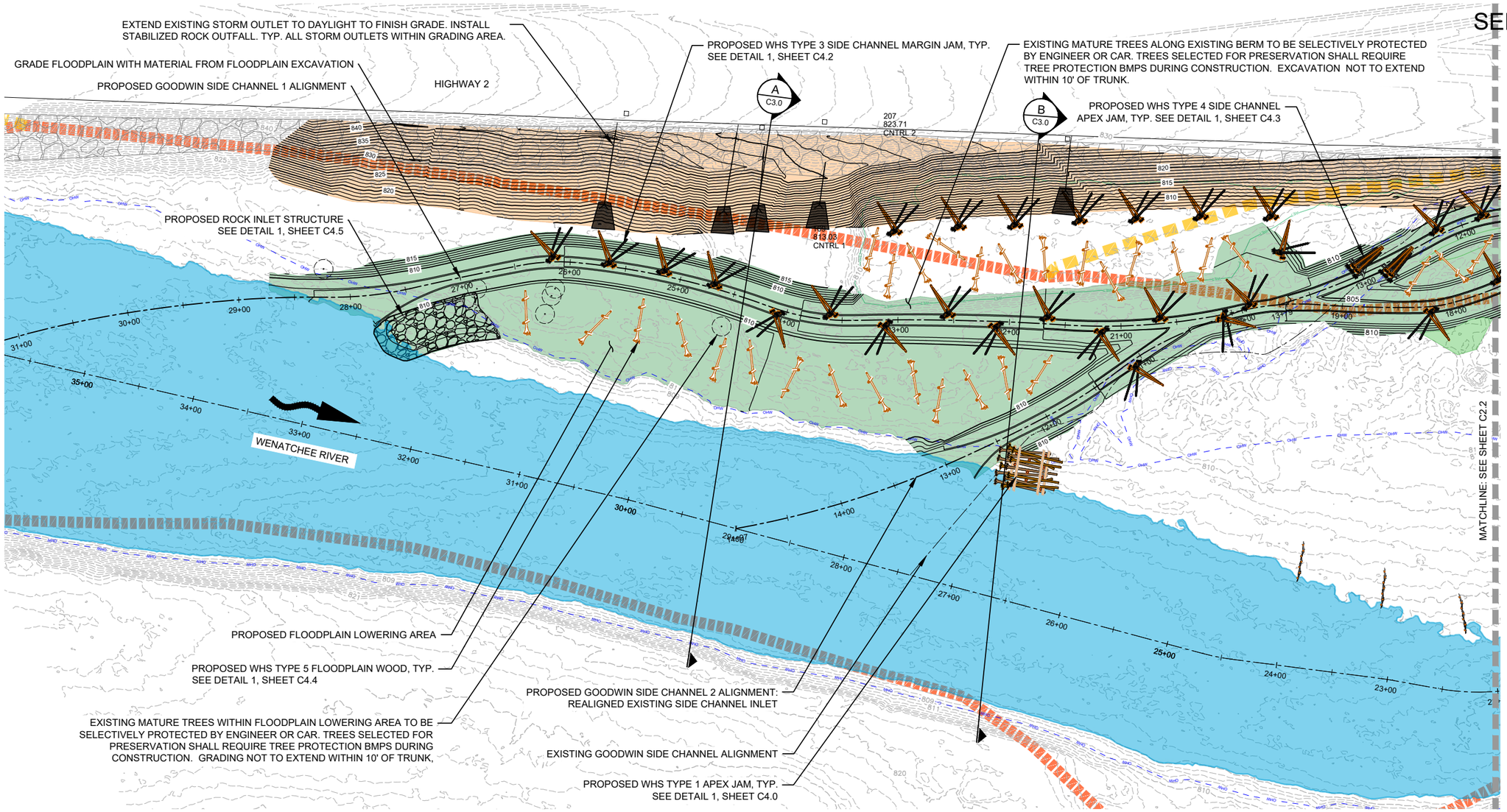
JOB NO. 20220043

SHEET NO. C2.0

7 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C2.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:17pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-LEGEND GSC-X-FEMA GSC-X-OHW GSC-X-DESIGN GSC-X-WOOD-60%

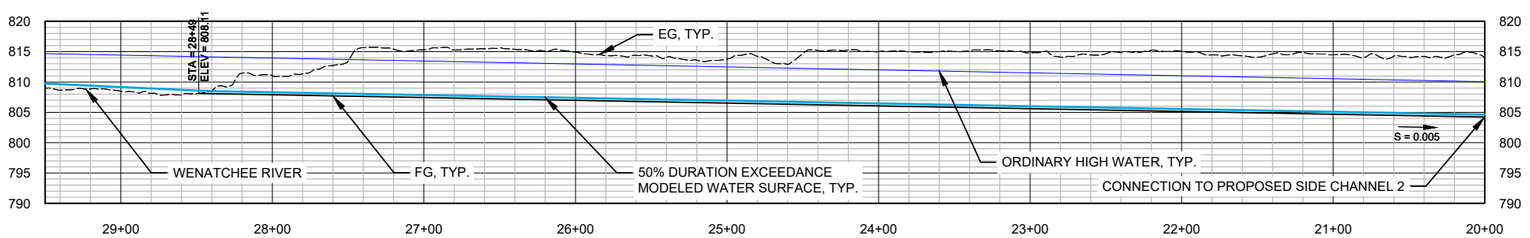
60% DESIGN
SEPTEMBER 2024



PROPOSED CONDITIONS PLAN

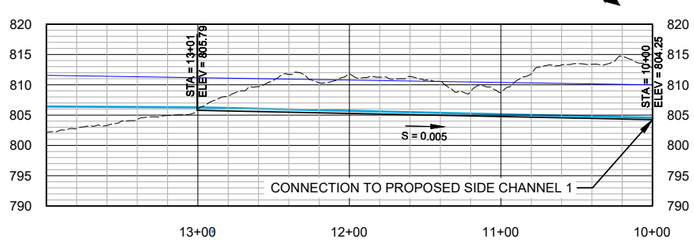
SCALE: 1"=50"

SCALE
50 0 25 50 100
SCALE FEET



PROPOSED GOODWIN SIDE CHANNEL 1 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'



PROPOSED GOODWIN SIDE CHANNEL 2 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'

PRELIMINARY NOT FOR CONSTRUCTION

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED CONDITIONS PLAN & PROFILE 1

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C2.1

8 OF 21

DWG: Z:\Shared\2\r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C2.1-C2.2.dwg USER: bbennett
DATE: Sep 26, 2024 2:18pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-FEMA GSC-X-LEGEND GSC-X-WOOD GSC-X-OHW GSC-X-DESIGN GSC-X-WOOD-60%

60% DESIGN
SEPTEMBER 2024

NO GRADING PROPOSED ON HIGHWAY EMBANKMENT

PROPOSED WHS TYPE 5 FLOODPLAIN WOOD, TYP. SEE DETAIL 1, SHEET C4.4

NO GRADING WITHIN HIGHWAY EMBANKMENT. PLACE WHS IN THIS AREA RIVERWARD OF EMBANKMENT. BACKFILL ABOVE EXISTING GRADE WITH COMPACTED NATIVE ALLUVIUM SALVAGED FROM GRADING ACTIVITIES.

PROPOSED GOODWIN SIDE CHANNEL 3 ALIGNMENT

HIGHWAY 2

PROPOSED WHS TYPE 2 MARGIN JAM, TYP. SEE DETAIL 1, SHEET C4.1 STRUCTURE WILL BE PARTIALLY BURIED.

C C3.0

D C3.0

211 810.25 CNTRL 2

PROPOSED WHS TYPE 3 SIDE CHANNEL MARGIN JAM, TYP. SEE DETAIL 1, SHEET C4.2

PERFORM TARGETED FLOODPLAIN GRADING TO IMPROVE CONNECTIVITY TO SECONDARY FLOODPLAIN CHANNELS.

MATCHLINE: SEE SHEET C2.1

WENATCHEE RIVER

EXCAVATE ALCOVE AT SIDE CHANNEL OUTLET

PROPOSED GOODWIN SIDE CHANNEL 1 ALIGNMENT

PROPOSED WHS TYPE 6 FLOODFENCE, TYP. SEE DETAIL 2, SHEET C4.4

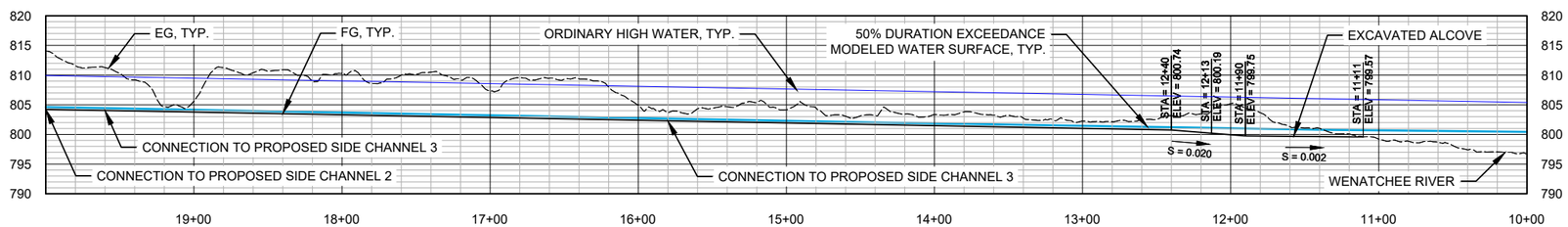
PROPOSED FLOODPLAIN ALCOVE. FIELD FIT ALCOVE ALIGNMENT BY ENGINEER OR CAR TO FOLLOW EXISTING FLOW PATH AND MINIMIZE VEGETATION IMPACTS.

RAILROAD

PROPOSED CONDITIONS PLAN

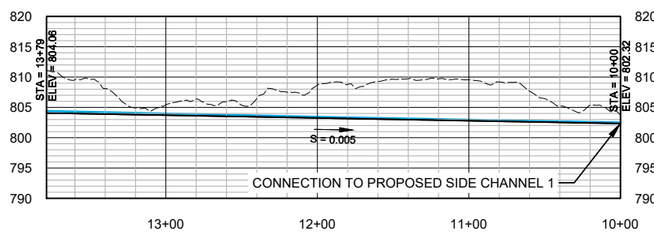
SCALE: 1"=50"

SCALE
50 0 25 50 100
SCALE FEET



PROPOSED GOODWIN SIDE CHANNEL 1 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'



PROPOSED GOODWIN SIDE CHANNEL 3 PROFILE

HORIZONTAL SCALE: 1"=50"
VERTICAL SCALE: 1"=12.5'

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RUSH
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED CONDITIONS PLAN & PROFILE 2

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

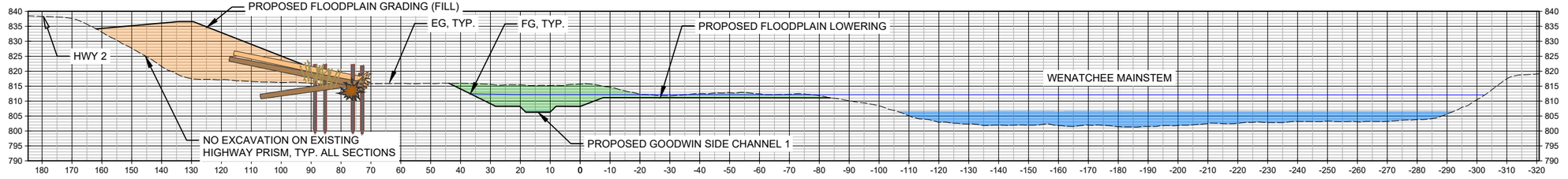
SCALE 0 1"

JOB NO. 20220043

SHEET NO. C2.2

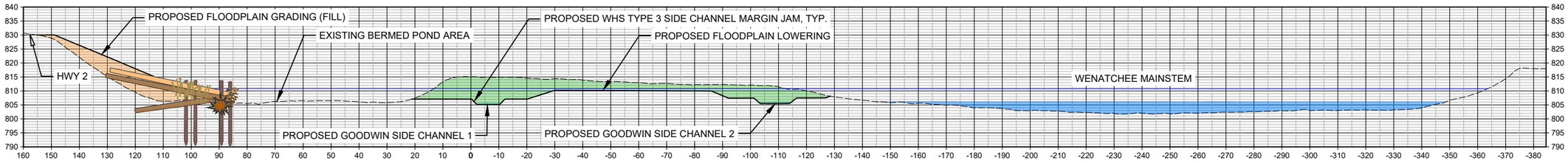
9 OF 21

DWG: Z:\Shared\W2\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C2.1-C2.2.dwg USER: bbennett
DATE: Sep 26, 2024 2:18pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-FEMA GSC-X-LEGEND GSC-X-WOOD GSC-X-DHW GSC-X-DESIGN GSC-X-WOOD-60%



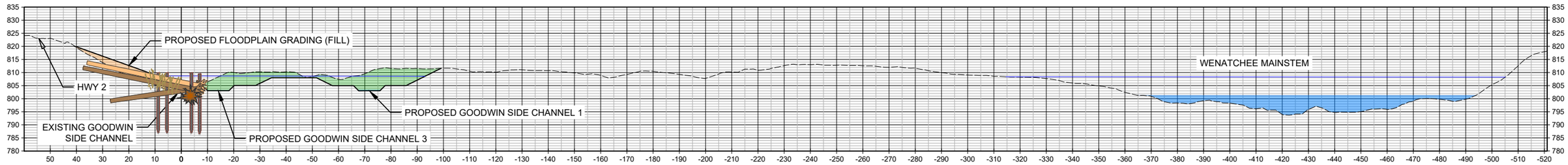
A C3.0 FLOODPLAIN SECTION A (GOODWIN SC STA 24+50)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'



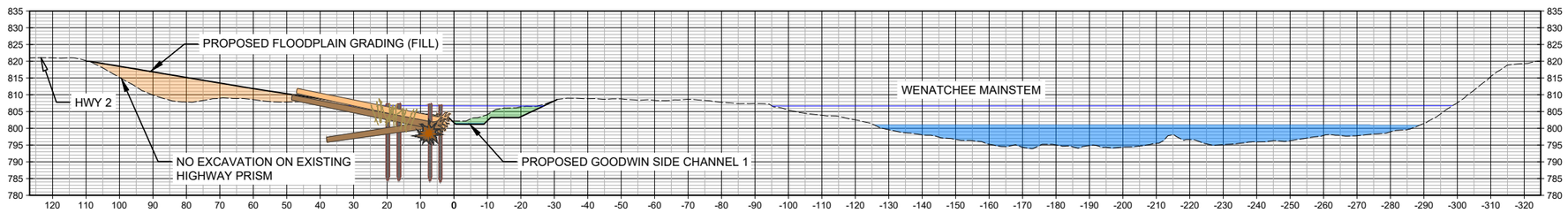
B C3.0 FLOODPLAIN SECTION B (GOODWIN SC STA 22+00)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'



C C3.0 FLOODPLAIN SECTION C (GOODWIN SC STA 17+50)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'

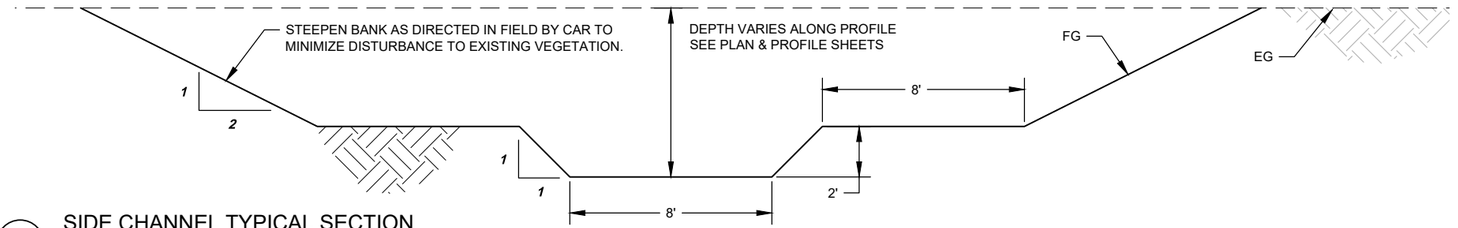


D C3.0 FLOODPLAIN SECTION D (GOODWIN SC STA 13+50)

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 20'

LEGEND:

- EXISTING CONDITIONS ORDINARY HIGH WATER SURFACE
- EXISTING CONDITIONS 50% DURATION EXCEEDANCE MODELED WATER SURFACE (1,810 CFS)
- PROPOSED CUT AREA
- PROPOSED FILL AREA



1 SIDE CHANNEL TYPICAL SECTION

NOT TO SCALE

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION

STEVEN RAY BLUE — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES

GOODWIN SIDE CHANNEL

CHELAN COUNTY, WA

FLOODPLAIN SECTIONS

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

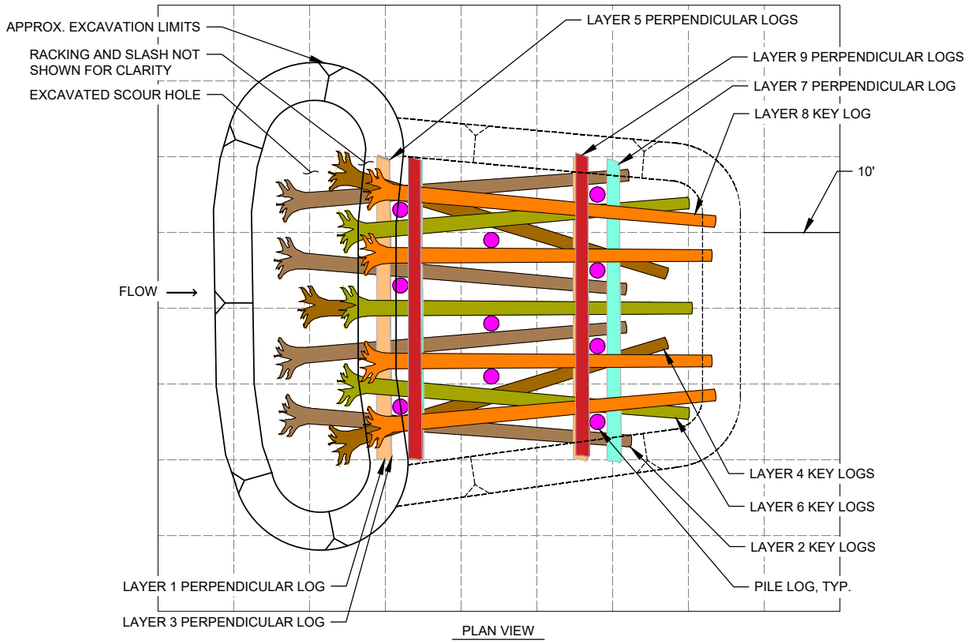
SCALE 0 1"

JOB NO. 20220043

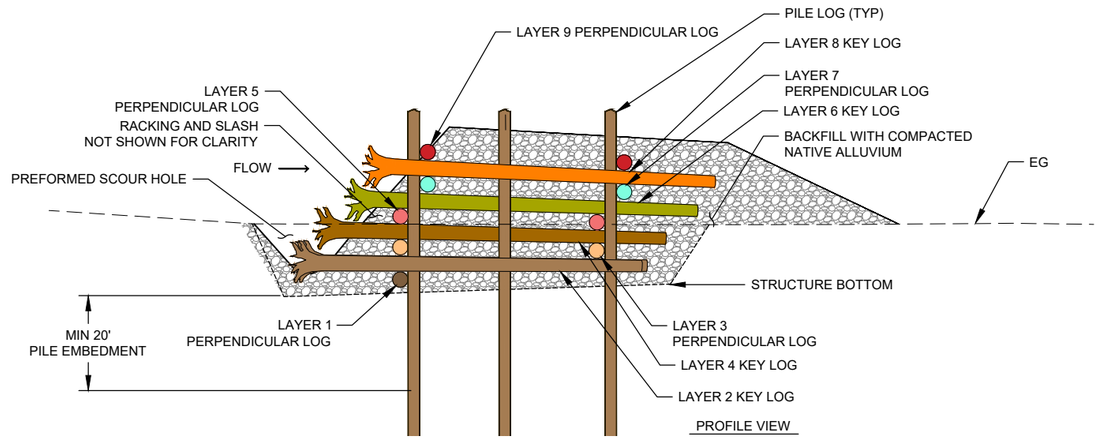
SHEET NO. C3.0

10 OF 21

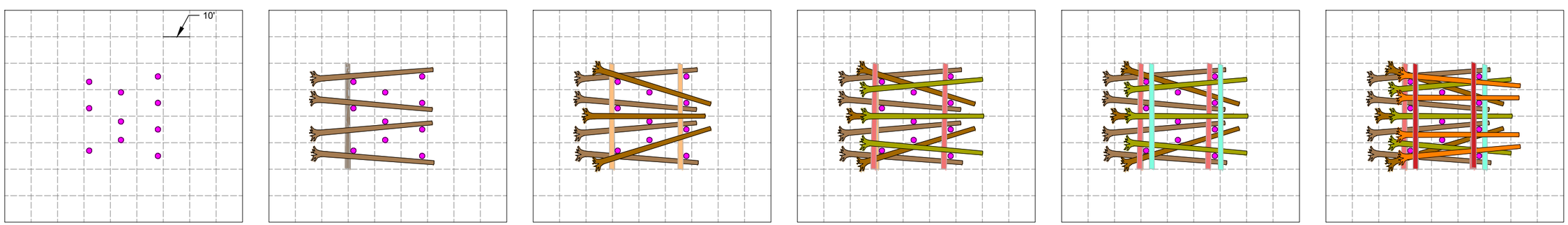
DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C3.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2x-22x34 GSC-X-LEGEND GSC-X-WOOD-60%



PLAN VIEW



PROFILE VIEW



SEQUENCING
1" = 20'

1 WHS TYPE 1 - APEX JAM
1" = 10'

LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. EXCAVATED NATIVE ALLUVIUM TO BE STOCKPILED FOR USE IN STRUCTURE BACKFILL. TOPSOIL, SAND, NATIVE COBBLES, AND BOULDERS SHALL BE STOCKPILED IN SEPARATE PILES. NATIVE COBBLES SHALL BE PRIORITIZED FOR USE IN STRUCTURE BACKFILL. TOPSOIL AND SAND SHALL BE USED FOR TOPDRESSING OF BACKFILL MOUND. BOULDERS GREATER THAN 24" DIA. ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND PLACED AS DIRECTED BY ENGINEER.
4. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
5. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH EXTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

WHS TYPE 1

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	40'	NO	1
2	18" - 24"	45'	YES	4
3	18" - 24"	40'	NO	2
4	18" - 24"	45'	YES	3
5	18" - 24"	40'	NO	2
6	18" - 24"	45'	YES	3
7	18" - 24"	40'	NO	2
8	18" - 24"	45'	YES	4
9	18" - 24"	40'	NO	2
PILES	18" - 21"	45'	NO	10
RACKING	6" - 12"	20'	OPTIONAL	80
SLASH (CY)	1" - 6"	6'	-	50
LIVE STAKES	1.5" - 3"	10' - 15'	-	50

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RAY LEWIS — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

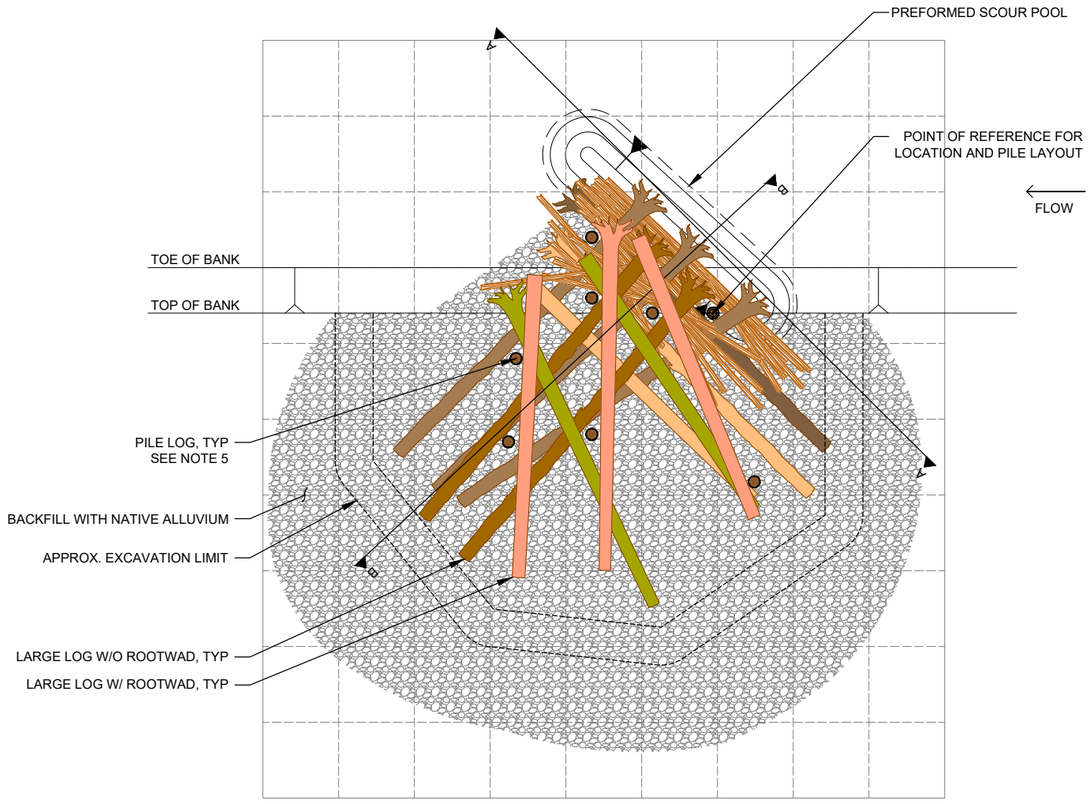
WOOD HABITAT STRUCTURE DETAILS 1

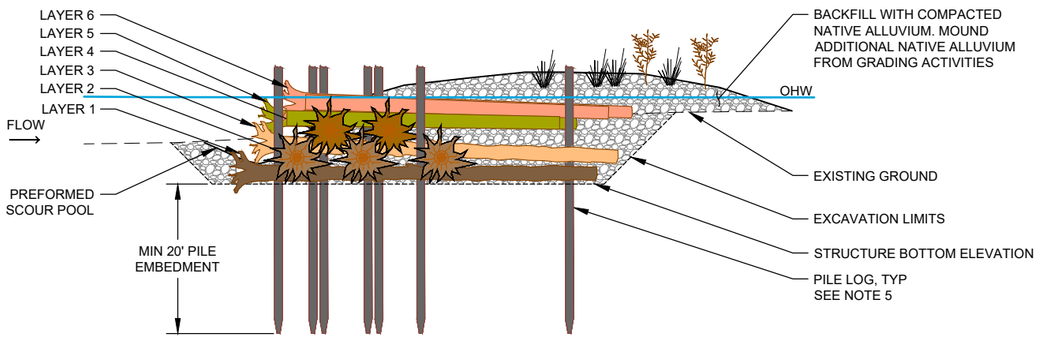
REVISION NUMBER

No.	Date	Revision

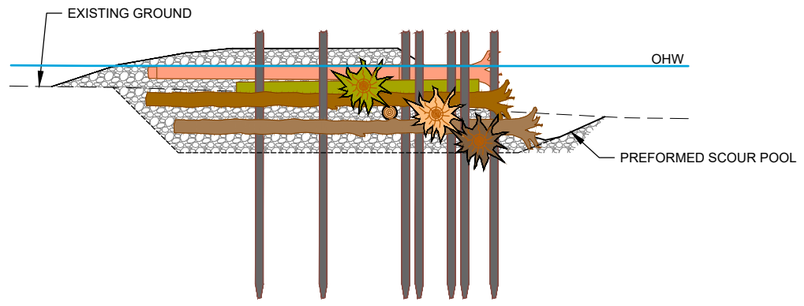
Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ
SCALE 0 1"
JOB NO. 20220043
SHEET NO. C4.0
11 OF 21

DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34





SECTION A



SECTION B

1 WHS TYPE 2 - MARGIN JAM

1" = 10'

LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. EXCAVATED NATIVE ALLUVIUM TO BE STOCKPILED FOR USE IN STRUCTURE BACKFILL. TOPSOIL, SAND, NATIVE COBBLES, AND BOULDERS SHALL BE STOCKPILED IN SEPARATE PILES. NATIVE COBBLES SHALL BE PRIORITIZED FOR USE IN STRUCTURE BACKFILL. TOPSOIL AND SAND SHALL BE USED FOR TOPDRESSING OF BACKFILL MOUND. BOULDERS GREATER THAN 24" DIA. ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND PLACED AS DIRECTED BY ENGINEER.
4. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
5. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH EXTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

WHS TYPE 2

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
2	18" - 24"	45'	YES	3
3	18" - 24"	45'	YES	1
3	18" - 24"	45'	NO	1
4	18" - 24"	45'	YES	2
5	18" - 24"	45'	YES	1
5	18" - 24"	45'	NO	1
6	18" - 24"	45'	YES	1
6	18" - 24"	45'	NO	2
PILES	18" - 21"	45'	NO	8
RACKING	6" - 12"	30'	OPTIONAL	60
SLASH (CY)	1" - 6"	6'	-	40
LIVE STAKES	1.5" - 3"	10' - 15'	-	50

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LEWIS
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 2

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

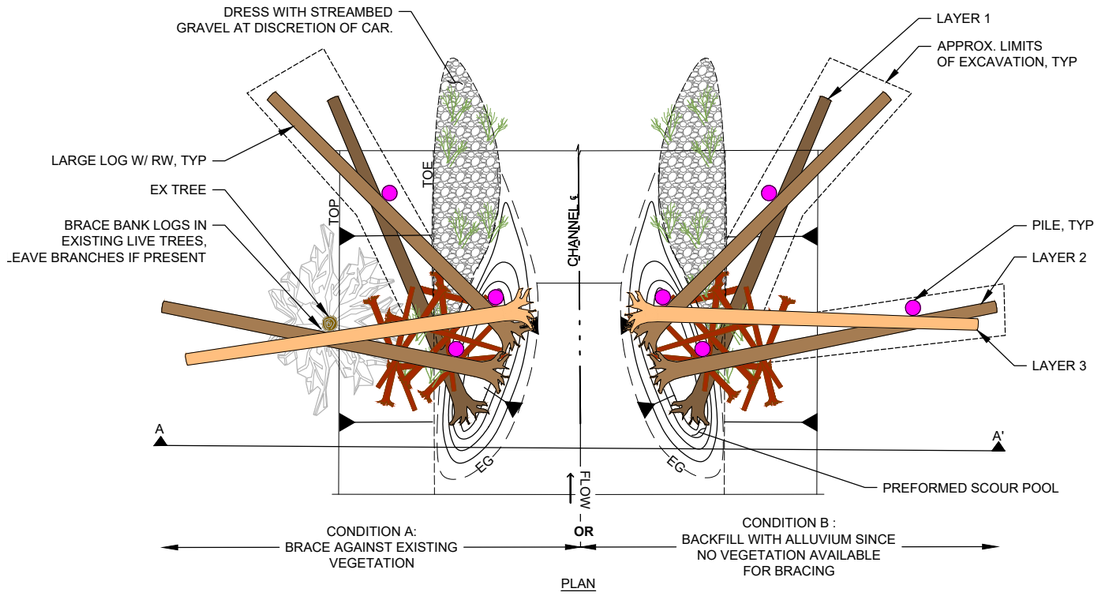
SCALE 0 1"

JOB NO. 20220043

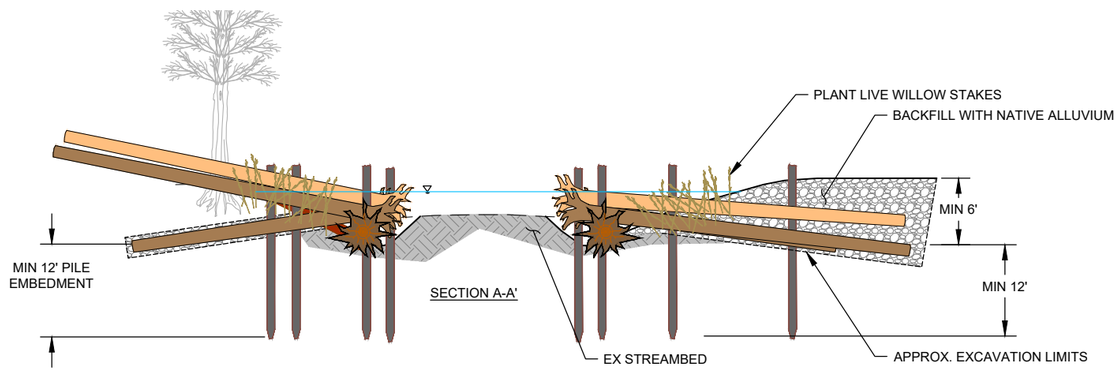
SHEET NO. C4.1

12 OF 21

DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.1-4.3.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34



PLAN



1 WHS TYPE 3 - SIDE CHANNEL MARGIN JAM
1" = 5'

WHS TYPE 3

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
2	18" - 24"	45'	YES	2
3	18" - 24"	45'	YES	1
PILES	12" - 15"	25'	NO	4
RACKING	6" - 12"	20'	OPTIONAL	10
SLASH (CY)	1" - 6"	6'	-	20
LIVE STAKES	1.5" - 3"	10' - 15'	-	20

LOG INSTALLATION NOTES:

1. NATIVE STREAMBED BACKFILL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO FIRM UNYIELDING CONDITION.
2. CONTRACTOR TO COORDINATE LOG PLACEMENT WITH ENGINEER PRIOR TO CONSTRUCTION. PLACEMENT CAN BE FIELD FIT, BUT THE ENGINEER OR CAR SHALL APPROVE FINAL STRUCTURE ORIENTATION AND LOCATION BEFORE COMPLETION. WHERE POSSIBLE, LOGS PROTRUDING FROM BANK SHALL BE PLACED CANTILEVERED BETWEEN EXISTING LIVE TREES. THE SUPPORTING TREE NEAREST TO THE BANK SHALL BE ON THE DOWNSTREAM SIDE OF THE LOGS.
3. EMBEDDED LOGS SHALL BE INSTALLED BY EXCAVATING A TRENCH, PLACING THE LOG, BACKFILLING, AND MACHINE COMPACTING BACKFILL PER SPECIFICATIONS. WHERE EXCAVATION IS NOT POSSIBLE LOG ENDS SHALL BE TIED INTO NATIVE MATERIAL AND BURIED WITH NATIVE MATERIAL PER SPECIFICATIONS.
4. FOR BURIED KEYED LOGS EMBED A MINIMUM OF ⅔ THE TOTAL LENGTH OF THE LOG. MIN 6' COVER AT STEM TIP (MEASURED FROM EG).
5. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE CHANNEL. BACKFILL AROUND ROOTWAD WITH NATIVE STREAMBED MATERIAL.
6. SEE SPECIFICATIONS FOR TREE SPECIES. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.
7. PRIOR TO PLACING BACKFILL IN STRUCTURES, LAY LIVE WILLOW CUTTINGS IN CREVASSES BETWEEN LOGS OR OPEN TRENCH IN CONTACT WITH UNDERLYING SUBSTRATE AND GROUNDWATER, IF OBSERVED.

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LEVESQUE STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 3

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE 0 1"

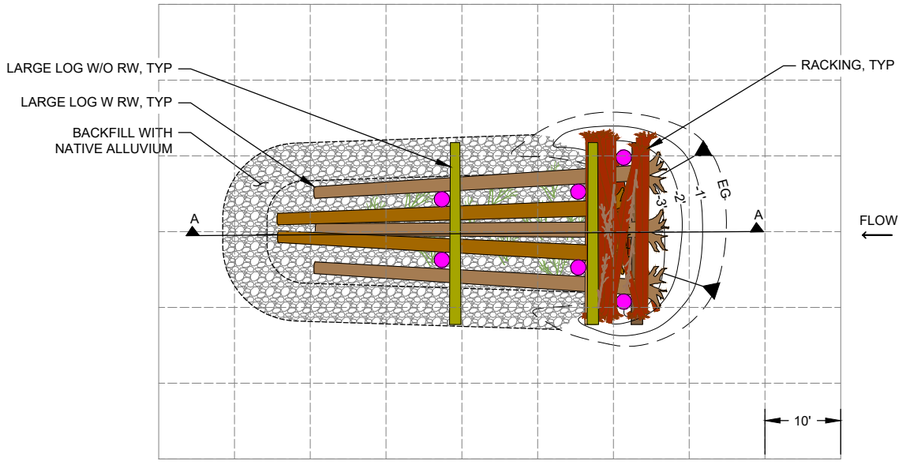
JOB NO. 20220043

SHEET NO. C4.2

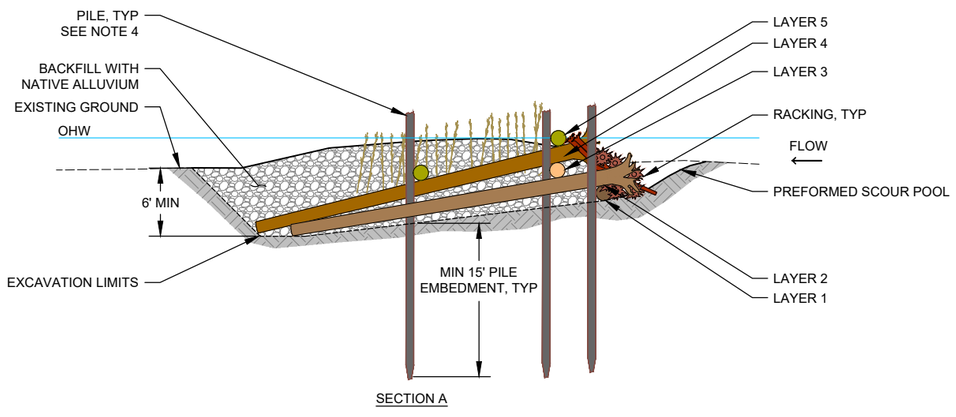
13 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.1-4.3.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024



PLAN



SECTION A

1 WHS TYPE 4 - SIDE CHANNEL APEX JAM

1" = 10'

LOG INSTALLATION NOTES:

1. COORDINATE FINAL STRUCTURE LOCATION IN FIELD WITH ENGINEER AND CAR.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER SEQUENCING SHEETS (TO BE ADDED AT FINAL DESIGN).
3. CONTRACTOR SHALL INSTALL PILES AS THE PRIMARY STRUCTURAL ELEMENT OF THE ELJ. LOG MEMBERS SECURED TO ELJ WITH STRUCTURAL CONNECTIONS.
4. PILES TO BE DRIVEN TO MINIMUM DEPTH SHOWN IN PLANS. IF MINIMUM EMBEDMENT CANNOT BE MET BY PILE DRIVING, CONTRACTOR SHALL OVER EXCAVATE AS NEEDED TO ACHIEVE MINIMUM EMBEDMENT. IF OVER EXCAVATION IS REQUIRED TO ACHIEVE MINIMUM EMBEDMENT DEPTH, PILE SHALL CONSIST OF ROOTWAD POST.
5. BOULDERS GREATER THAN 24" DIA ENCOUNTERED DURING STRUCTURE EXCAVATION SHALL BE SALVAGED AND STOCKPILED FOR PLACEMENT AS DIRECTED BY ENGINEER.
6. INSTALL RACKING LOGS AND SLASH WITH EACH LAYER PLACEMENT TO ENSURE SLASH ECTENDS THROUGH STRUCTURE, FILL VOIDS BETWEEN LOGS AND IS PINNED IN PLACE BY SUBSEQUENT LAYERS.
7. BACKFILL STRUCTURE WITH COMPACTED MIX OF COMPACTED NATIVE ALLUVIUM AND SALVAGED BOULDERS.
8. POINT OF REFERENCE FOR LOCATION AND PILE LAYOUT SHALL BE UTILIZED FOR PLACEMENT OF STRUCTURES. POINT FILE SHALL BE PROVIDED TO CONTRACTOR PRIOR TO CONSTRUCTION.
9. REFER TO PLAN SHEETS FOR TOP OF STRUCTURE ELEVATION. FINAL STRUCTURE TOP ELEVATION TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED FOR STACKING ARRANGEMENT.

WHS TYPE 4

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	25	NO	1
2	18" - 24"	45	YES	3
3	18" - 24"	25	NO	1
4	18" - 24"	45	YES	2
5	18" - 24"	25	NO	2
PILES	12" - 15"	25'	NO	6
RACKING	6" - 12"	20'	OPTIONAL	20
SLASH (CY)	1" - 6"	6'	-	20
LIVE WILLOW STAKES	1.5" - 3"	10' - 15'	-	25

PRELIMINARY NOT FOR CONSTRUCTION

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 4

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE 0 1"

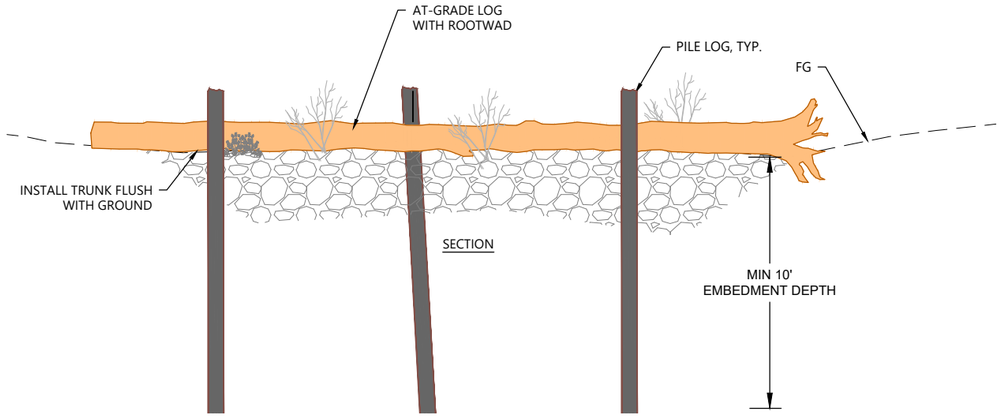
JOB NO. 20220043

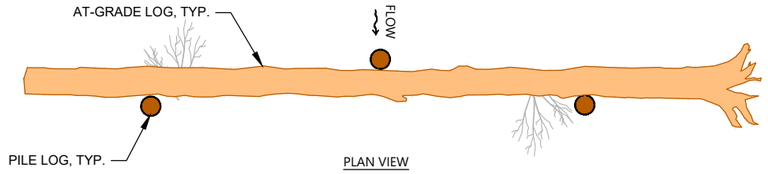
SHEET NO. C4.3

14 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.1-4.3.dwg USER: bbennett
DATE: Sep 26, 2024 2:19pm XREFS:GSC-X-TB-W2r-22x34

60% DESIGN
SEPTEMBER 2024



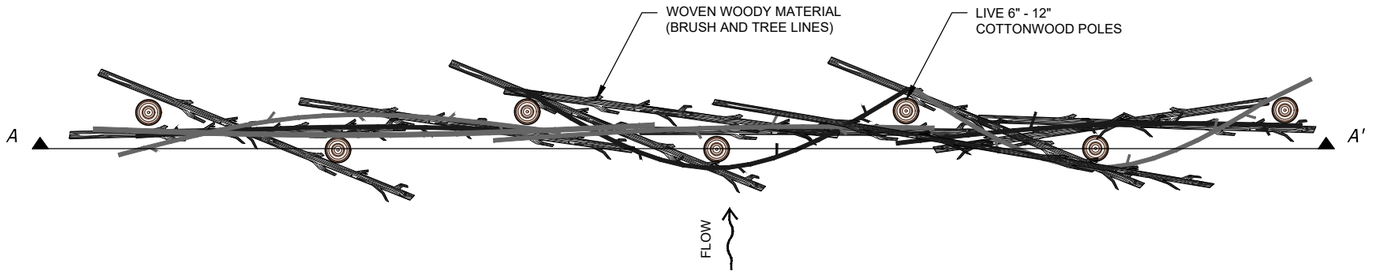


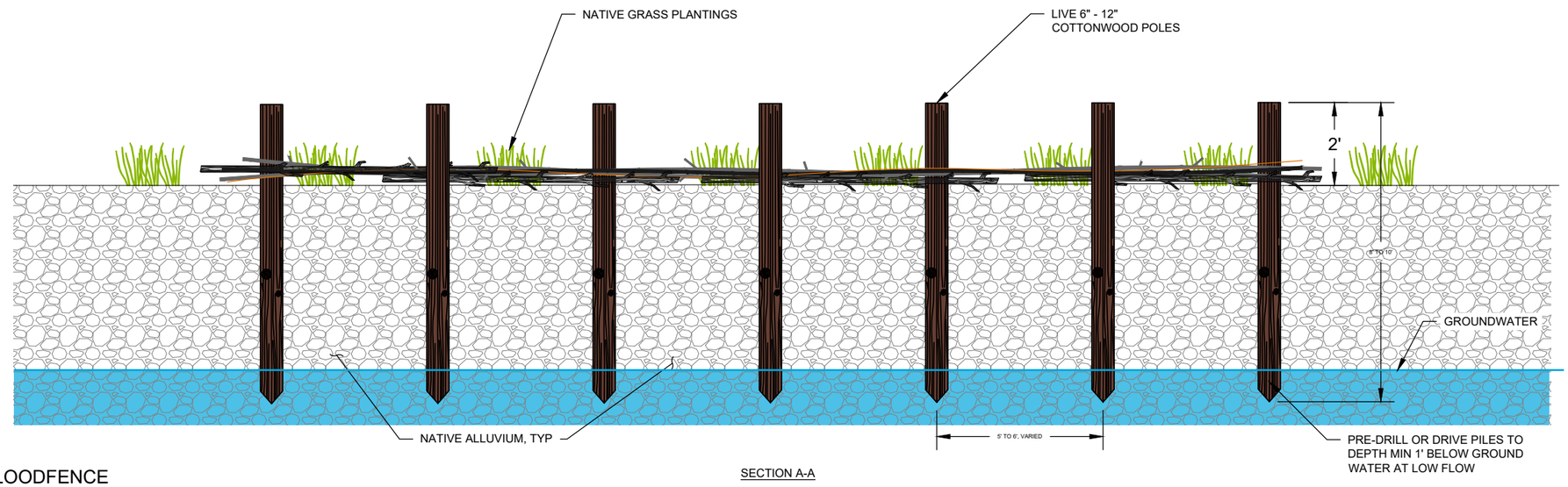
1 WHS TYPE 5 - FLOODPLAIN WOOD

NOT TO SCALE

WHS TYPE 5

Piece Summary				
LAYER	SIZE (DBH)	MIN LENGTH (FT)	ROOTWAD	QUANTITY
1	18" - 24"	45'	YES	1
PILES	12" - 15"	15'	NO	3





2 WHS TYPE 6 - FLOODFENCE

NOT TO SCALE

WHS TYPE 6

Piece Summary				
LOG TYPE	DIAMETER (IN)	MIN LENGTH (FT)	BRANCHES	QUANTITY
POST	6" - 12"	10'	NO	7
WOVEN SLASH	1" - 3"	10 ' - 15'	OPTIONAL	30

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LOFTUS
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

WOOD HABITAT STRUCTURE DETAILS 5

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024
Designed By: SR, GL
Drawn By: BB
Checked By: AJ

SCALE 0 1"

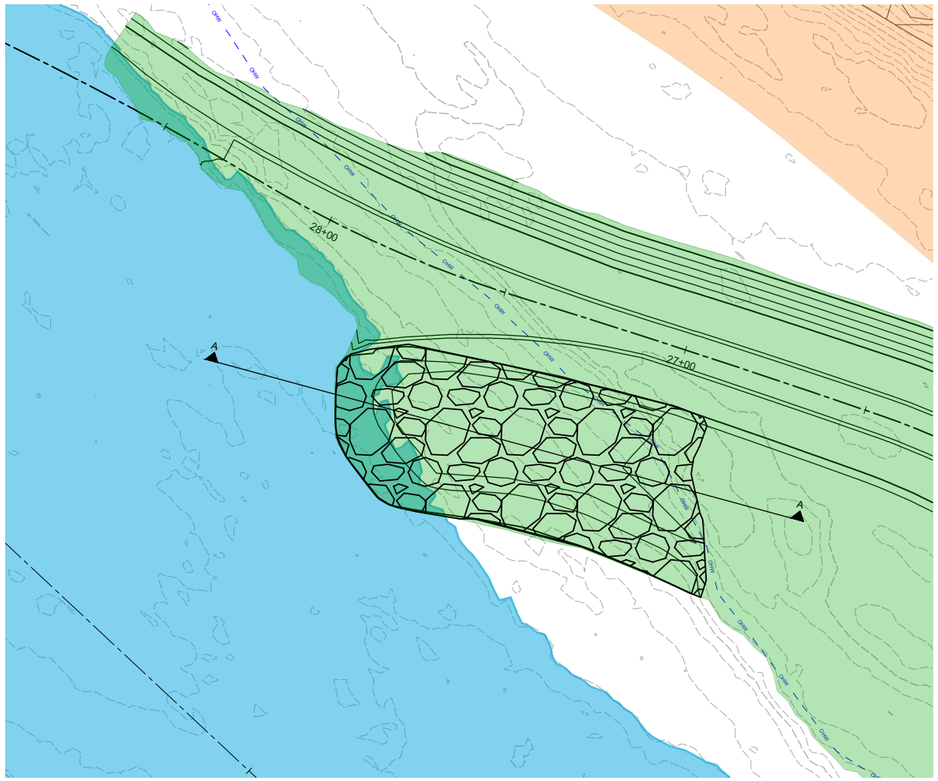
JOB NO. 20220043

SHEET NO. C4.4

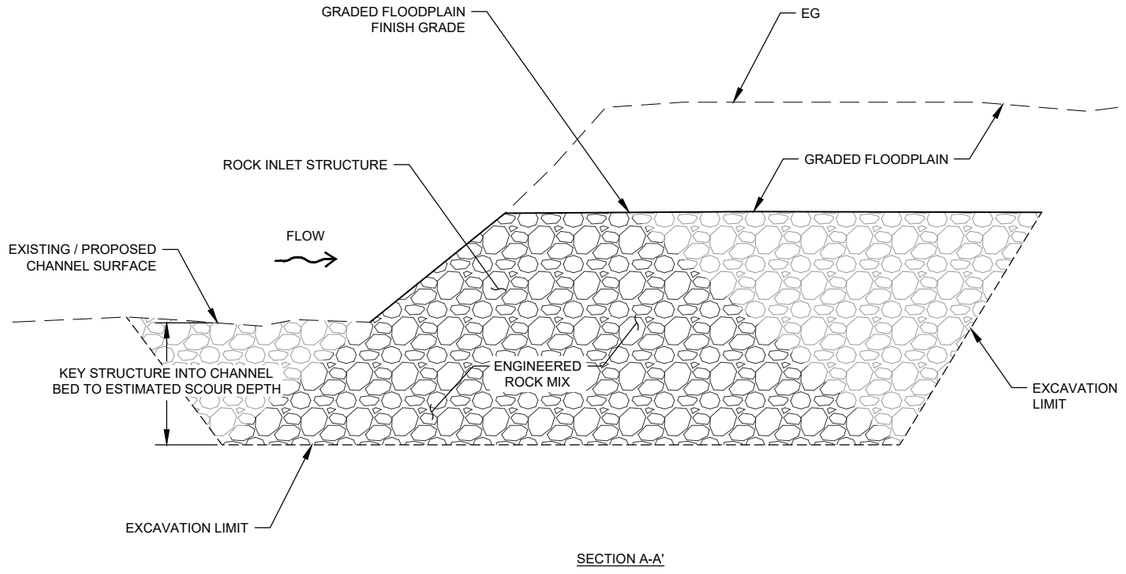
15 OF 21

DWG: Z:\Shared\W2x\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.4.dwg USER: bbennett
DATE: Sep 26, 2024 2:21pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-DESIGN GSC-X-PLANIMETRICS GSC-X-OHW

60% DESIGN
SEPTEMBER 2024



PLAN VIEW



SECTION A-A'

1 ROCK INLET STRUCTURE DETAIL
NOT TO SCALE

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT LOFTUS — STATE OF WASHINGTON — 24000 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

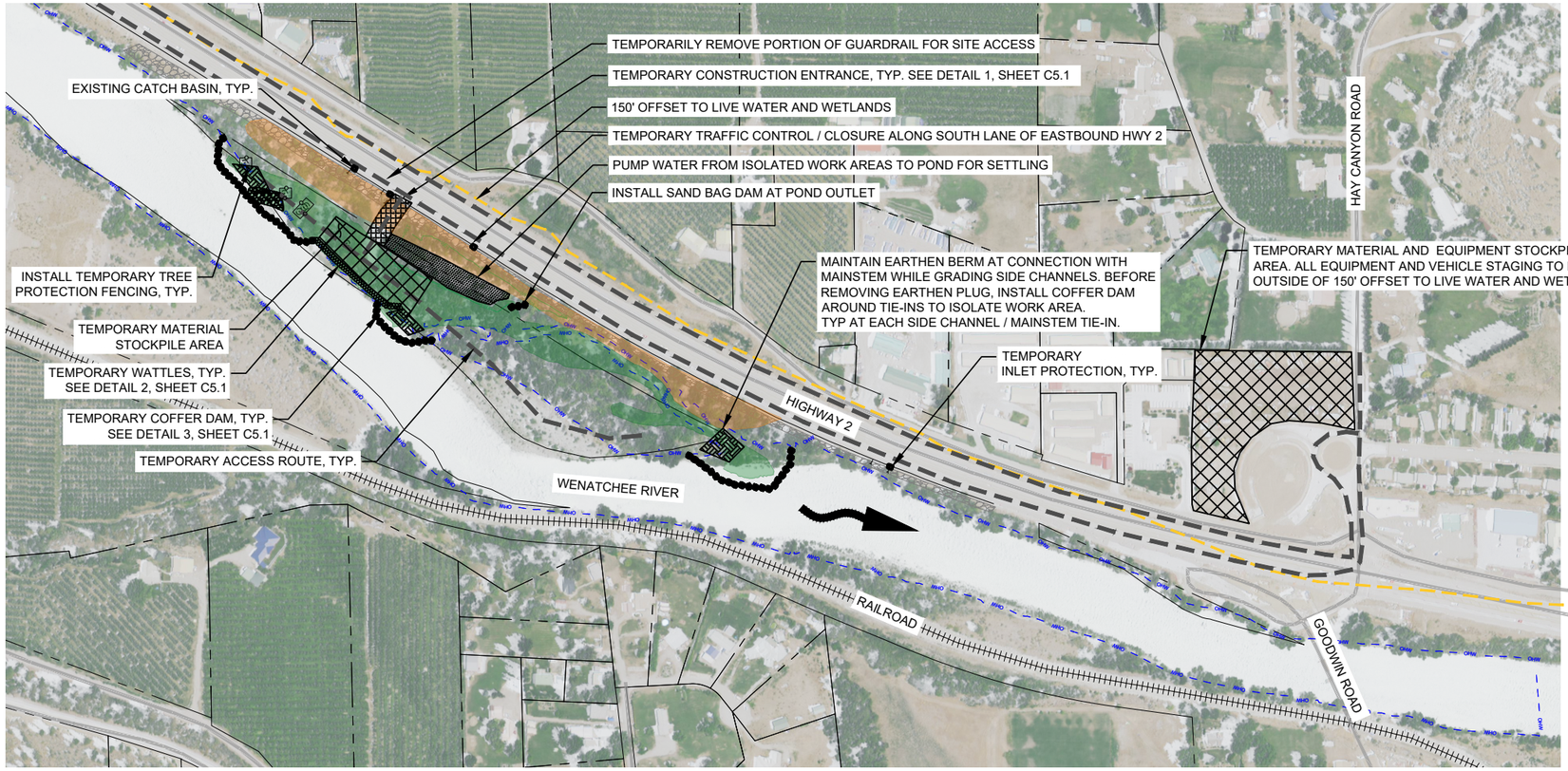
ROCK INLET STRUCTURE DETAIL

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ
SCALE 0 1"
JOB NO. 20220043
SHEET NO. C4.4
16 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C4.4.dwg USER: bbennett
DATE: Sep 26, 2024 2:21pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-DESIGN GSC-X-PLANIMETRICS GSC-X-OHW



ACCESS, STAGING, AND TESC PLAN

SCALE: 1"=200"

TEMPORARY EROSION, SEDIMENT, AND POLLUTANT CONTROL (TESC) NOTES:

1. EROSION, SEDIMENT AND POLLUTANT CONTROL IS REQUIRED FOR THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.
2. PREPARE A TEMPORARY EROSION AND SEDIMENT CONTROL PLAN (TESC) BEFORE BEGINNING WORK. KEEP A COPY OF THE TESC ON SITE AT ALL TIMES DURING THE PROJECT.
3. PREPARE A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN PRIOR TO ANY CONSTRUCTION ACTIVITY, KEEP THIS ON SITE AT ALL TIMES.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR THE ANTICIPATED SITE AND SEASONAL CONDITIONS. UPGRADE THESE FACILITIES TO ADDRESS CHANGING WORK OR WEATHER CONDITIONS.
5. INSTALL, MONITOR, REPLACE AND UPGRADE AS NECESSARY ALL FACILITIES AND MEASURES. PERFORM MAINTENANCE TO ENSURE CONTINUED FUNCTIONING FOR ENTIRETY OF CONSTRUCTION.
6. THE TESC PLAN FACILITIES AND MEASURES MUST BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTION.
7. COMPLETE AN EROSION CONTROL MONITORING FORM AFTER EACH INSPECTION. INCLUDE THE INSPECTION DATE AND TIME. RETAIN THESE COMPLETED FORMS ON SITE AND PROVIDE THEM UPON REQUEST.
8. NO VISIBLE AND MEASURABLE SEDIMENT OR POLLUTANT SHALL EXIT THE SITE, ENTER A PUBLIC RIGHT-OF-WAY OR BE DEPOSITED INTO ANY WATER BODY OR STORM DRAINAGE SYSTEM.
9. FOLLOWING A STORM EVENT, INSPECT AND ADJUST, REPAIR, IMPROVE OR REPLACE ALL DEFICIENT OR FAILING FACILITIES AND MEASURES.
10. PROTECT ALL FUNCTIONING STORM WATER INLETS AND CATCH BASINS FROM RECEIVING UNFILTERED, SEDIMENT-LADEN RUNOFF.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING A VEHICLE/EQUIPMENT STAGING AREA DESIGNATED FOR ALL REFUELING, EQUIPMENT MAINTENANCE, EQUIPMENT STORAGE AND PARKING. THE VEHICLE/EQUIPMENT STAGING AREA SHALL BE LOCATED OUTSIDE THE 150' OFFSET FROM ANY LIVE WATER OR WETLANDS. CONTRACTOR SHALL INSTALL APPROPRIATE TEMPORARY BMPS TO CONTAIN ANY POTENTIAL POLLUTANTS FROM LEAVING THE VEHICLE/EQUIPMENT STAGING AREA THROUGHOUT THE DURATION OF THE PROJECT.

CONSTRUCTION ACCESS & TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL SUBMIT AN ACCESS, STAGING , AND STOCKPILE PLAN TO CAR FOR APPROVAL MINIMUM 3 WEEKS PRIOR TO MOBILIZATION.
2. CONSTRUCTION STAGING/STOCKPILE AREAS SHALL BE LIMITED TO EXISTING AREAS OF DISTURBANCE, TO GREATEST EXTENTS POSSIBLE. VEHICLE/EQUIPMENT STAGING SHALL BE LIMITED TO AREAS MINIMUM 150' FROM ANY LIVE WATER OR WETLANDS.
3. ACCESS TO/ALONG ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
4. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO CAR FOR APPROVAL MINIMUM 3 WEEKS PRIOR TO MOBILIZATION.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL OR ACCESS PERMITS.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.
7. ALL EQUIPMENT, MATERIALS, AND PERSONNEL SHALL REMAIN WITHIN THE WORK AREA BOUNDARY.
8. THE CONTRACTOR SHALL KEEP THE WORK AREAS IN NEAT CONDITION, FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.
9. CONTRACTOR SHALL IMPLEMENT MEASURES TO CONTROL AND MINIMIZE WIND BLOWN DUST FROM THE SITE.
10. ACCESS ROUTES OTHER THAN ESTABLISHED ROADS SHALL NOT BE CLEARED OR GRADED.
11. ALL DISTURBED AREAS INCLUDING ROADS, DRIVEWAYS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. AREAS SHALL BE DECOMPACTED, ROUGHENED WITH SLASH AT CAR'S DIRECTION, AND REVEGETATED PER PLANS.
12. ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

WATER MANAGEMENT NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AREA ISOLATION FOR THE PURPOSES OF WATER QUALITY PROTECTION, TURBIDITY CONTROL, AND PROTECTION OF AQUATIC LIFE AND HABITAT DURING CONSTRUCTION.
2. MAINTAIN EARTHEN BERM AT SIDE CHANNEL CONNECTIONS TO WENATCHEE RIVER UNTIL AFTER BEGINNING OF IN WATER WORK WINDOW (JULY 15) AND INSTALLATION OF COFFER DAMS AND PUMPS TO ISOLATE WORK AREA IS COMPLETE.
3. MAINTAIN BERMED POND DURING IN WATER WORK FOR DISCHARGE AND SETTLING OF DEWATERING PUMPS.
4. COORDINATE TIMING OF WORK AREA ISOLATION WITH CAR TO ALLOW FOR NECESSARY FISH REMOVAL FROM ISOLATED WORK AREAS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES WITHIN ISOLATED AREAS.

CONSTRUCTION SEQUENCING NOTES:

1. FLAG AREAS FOR CLEARING AND PRESERVATION. INSTALL TEMPORARY BMPS. ESTABLISH ACCESS AND STAGING TO SITE PER NOTES THIS SHEET.
2. PERFORM SITE CLEARING AND DEMO.
3. PERFORM FLOODPLAIN AND CHANNEL GRADING AND INSTALL FLOODPLAIN HABITAT STRUCTURES. PRESERVE BERMED POND FOR USE IN WATER MANAGEMENT DURING IN WATER WORK WINDOW. PRESERVE SEPARATION FROM LIVE WATER.

IN WATER WORK JULY 15TH - SEPTEMBER 30TH:

4. INSTALL COFFER DAMS AT SIDE CHANNEL INLETS AND OUTLET. PERFORM FISH SALVAGE IN ISOLATED WORK AREAS.
5. INSTALL HABITAT STRUCTURES AND PERFORM CHANNEL GRADING AT SIDE CHANNEL INLETS AND OUTLETS.
6. REMOVE COFFER DAM SLOWLY AND RETURN FLOWS TO ISOLATED AREAS.
7. COMPLETE REMAINING FLOODPLAIN AND CHANNEL GRADING, AND HABITAT STRUCTURE INSTALLATIONS. DECOMMISSION ALL ACCESS ROUTES AND STAGING AREAS. PERFORM FINAL SITE RESTORATION ACTIVITIES AND DEMOBILIZE.

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RAY LOVELL — STATE OF WASHINGTON — 24000 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

ACCESS, STAGING, AND TESC PLAN

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

SCALE 0 1"

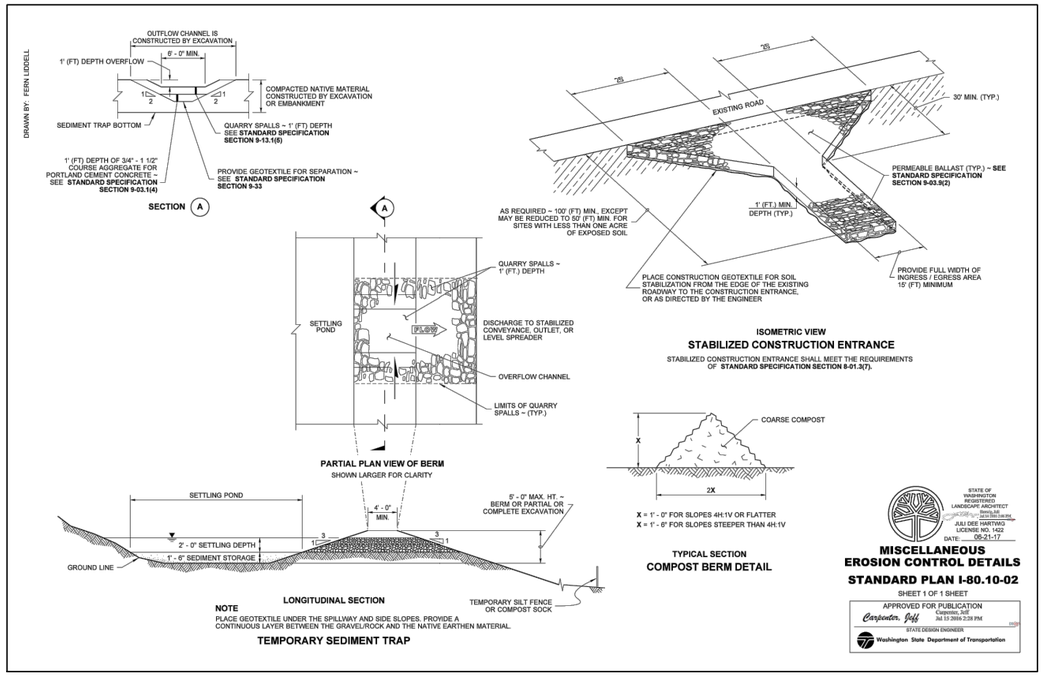
JOB NO. 20220043

SHEET NO. C5.0

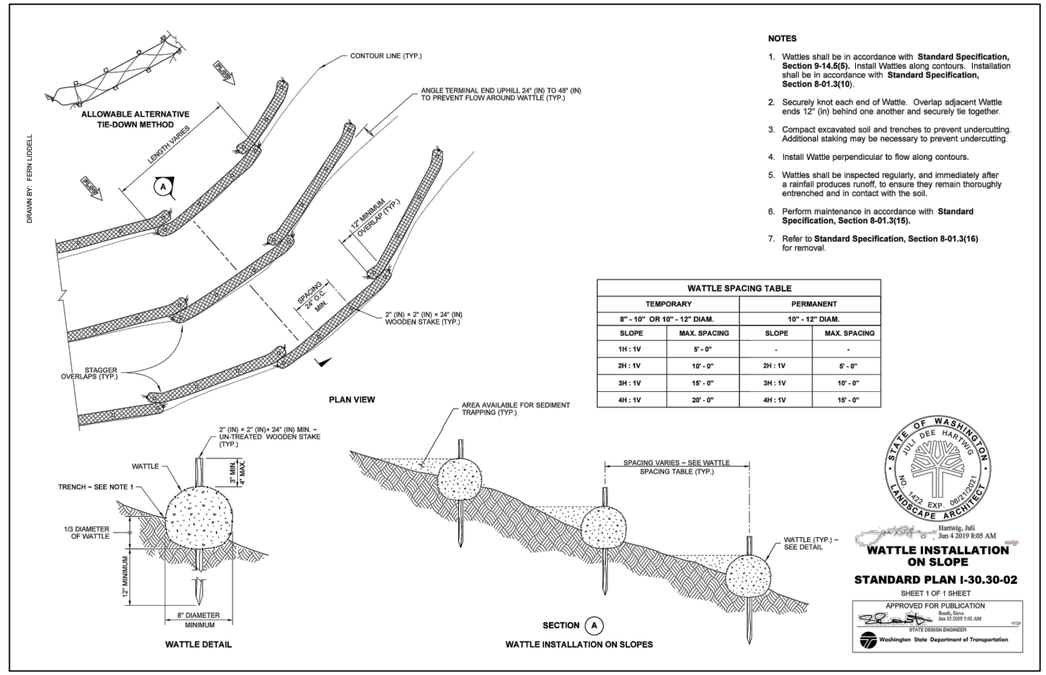
17 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETSC\C5.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:21pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN GSC-X-AERIAL

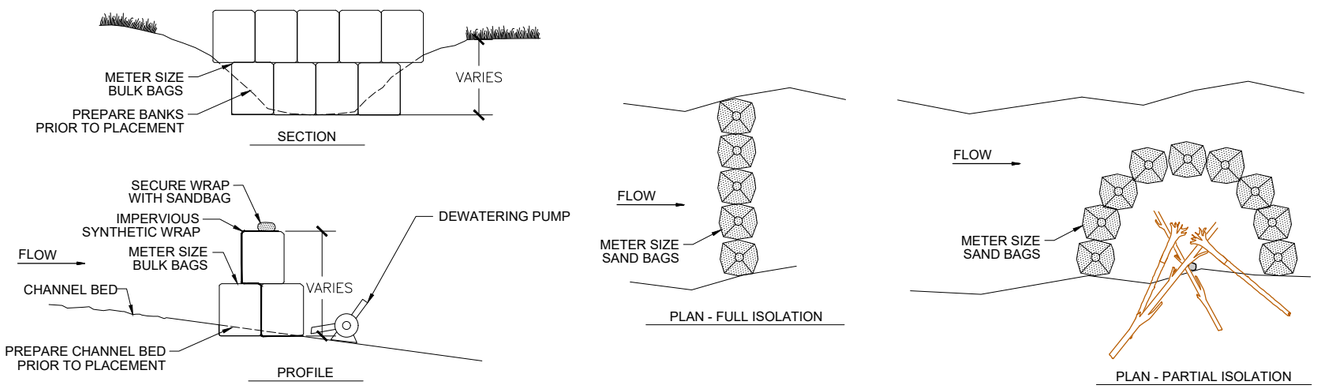
60% DESIGN
SEPTEMBER 2024



1 C5.1 TEMPORARY CONSTRUCTION ENTRANCE
NTS



2 C5.1 TEMPORARY WATTLES
NTS



NOTE:
1. CONSTRUCTION CREWS SHALL INSTALL BULK BAG COFFER DAMS AS SHOWN ON PLAN TO ISOLATE THE EXCAVATION AREAS.
2. IN ADDITION TO BULK BAGS, USE AN IMPERVIOUS SYNTHETIC LINER TO REDUCE PERMEABILITY OF BLUK BAG COFFER DAM.
3. HEIGHT OF THE BULK BAG COFFER DAMS SHALL BE HIGH ENOUGH TO PREVENT BYPASS FLOWS FROM ENTERING THE ISOLATED WORK AREA. DAM HEIGHTS AND MATERIALS SHALL BE INCLUDED IN THE CONTRACTOR'S WORK CONTAINMENT AND DEWATERING PLAN.
4. INSTALL DEWATERING PUMP AS NECESSARY.

3 C5.1 TEMPORARY COFFER DAM
NTS

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

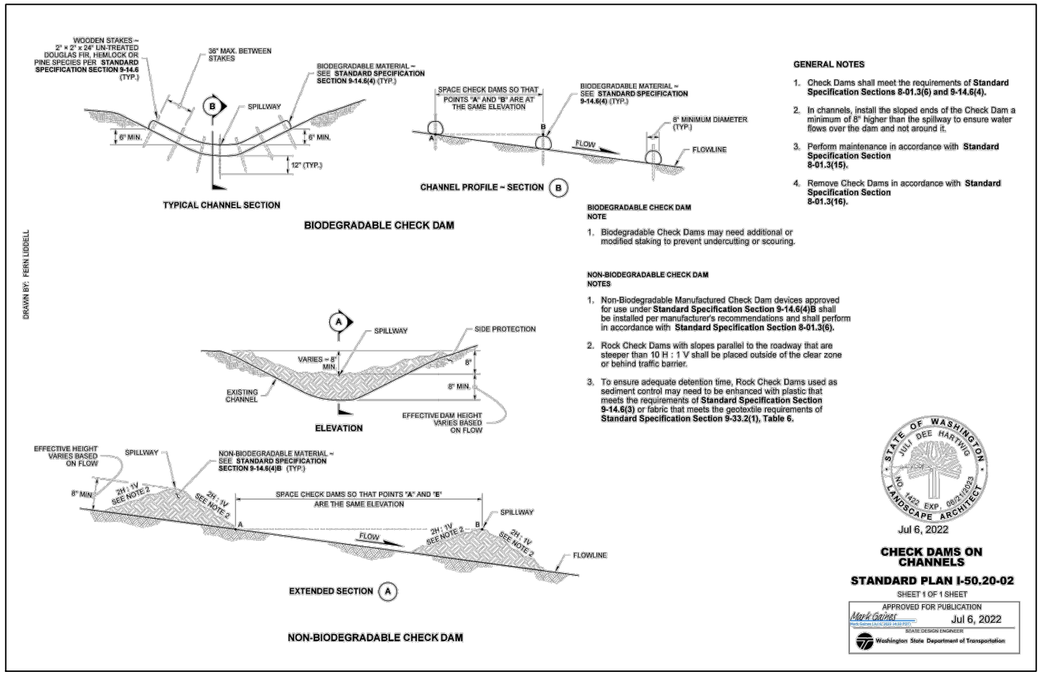
TESC AND WATER MANAGEMENT DETAILS 1

REVISION NUMBER

No.	Date	Revision

Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ
SCALE 0 1"
JOB NO. 20220043
SHEET NO. C5.1
17 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C5.1.dwg USER: bbennett
DATE: Sep 26, 2024 2:22pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLAN|METRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN



GENERAL NOTES

1. Check Dams shall meet the requirements of **Standard Specification Sections 8-01.3(6) and 9-14.6(4).**
2. In channels, install the sloped ends of the Check Dam a minimum of 8" higher than the spillway to ensure water flows over the dam and not around it.
3. Perform maintenance in accordance with **Standard Specification Section 8-01.3(15).**
4. Remove Check Dams in accordance with **Standard Specification Section 8-01.3(16).**

BIODEGRADABLE CHECK DAM NOTE

1. Biodegradable Check Dams may need additional or modified staking to prevent undercutting or scouring.

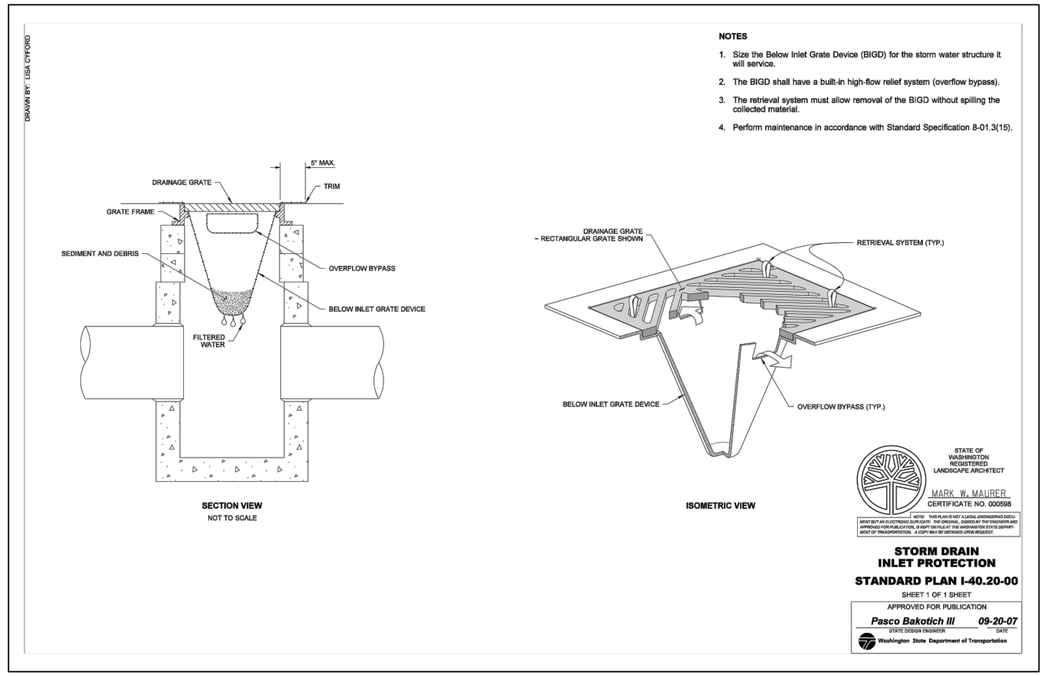
NON-BIODEGRADABLE CHECK DAM NOTES

1. Non-Biodegradable Manufactured Check Dam devices approved for use under **Standard Specification Section 9-14.6(4)B** shall be installed per manufacturer's recommendations and shall perform in accordance with **Standard Specification Section 8-01.3(6).**
2. Rock Check Dams with slopes parallel to the roadway that are steeper than 10 H : 1 V shall be placed outside of the clear zone or behind traffic barrier.
3. To ensure adequate detention time, Rock Check Dams used as sediment control may need to be enhanced with plastic that meets the requirements of **Standard Specification Section 9-14.6(3)** or fabric that meets the geotextile requirements of **Standard Specification Section 9-33.2(1), Table 6.**

STATE OF WASHINGTON JULIE DEE HARTWIG No. 1403 EXP. 09/21/2023 LANDSCAPE ARCHITECT
Jul 6, 2022

CHECK DAMS ON CHANNELS
STANDARD PLAN I-50.20-02
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Mark Gardner Jul 6, 2022
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

1 C5,2 TEMPORARY CHECK DAMS
NTS



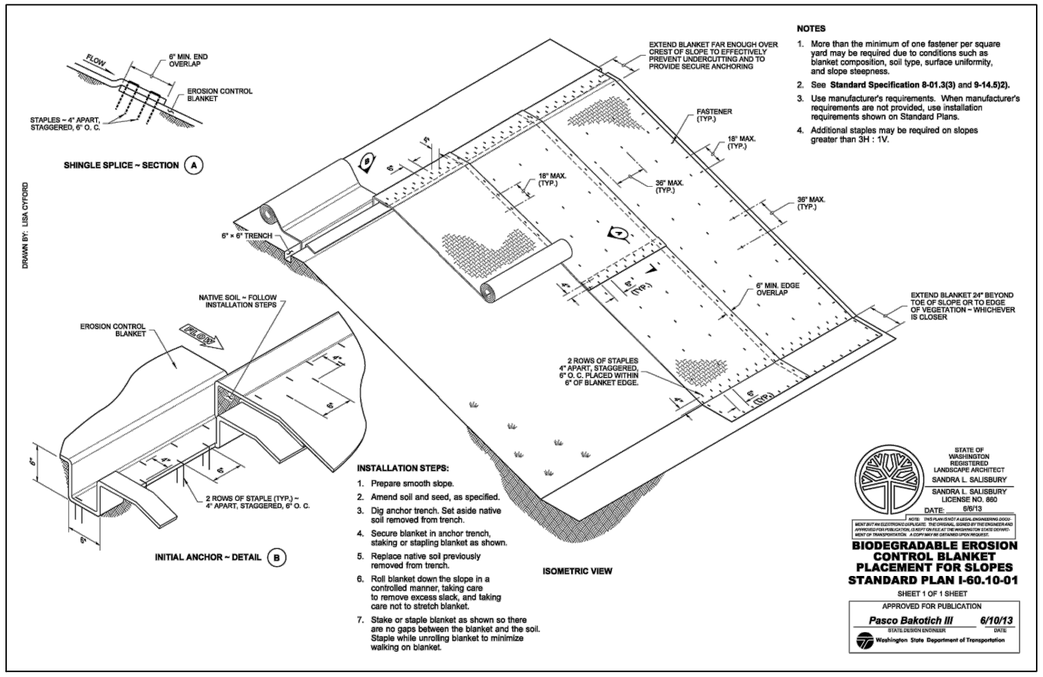
NOTES

1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it will service.
2. The BIGD shall have a built-in high-flow relief system (overflow bypass).
3. The retrieval system must allow removal of the BIGD without spilling the collected material.
4. Perform maintenance in accordance with Standard Specification 8-01.3(15).

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
MARK W. MAURER
CERTIFICATE NO. 000598

STORM DRAIN INLET PROTECTION
STANDARD PLAN I-40.20-00
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Pasco Bakotich III *09-20-07*
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

2 C5.2 TEMPORARY STORM DRAIN INLET PROTECTION
NTS



NOTES

1. More than the minimum of one fastener per square yard may be required due to conditions such as blanket composition, soil type, surface uniformity, and slope steepness.
2. See **Standard Specification 8-01.3(3)** and **9-14.5)2).**
3. Use manufacturer's requirements. When manufacturer's requirements are not provided, use installation requirements shown on Standard Plans.
4. Additional staples may be required on slopes greater than 3H : 1V.

INSTALLATION STEPS:

1. Prepare smooth slope.
2. Amend soil and seed, as specified.
3. Dig anchor trench. Set aside native soil removed from trench.
4. Secure blanket in anchor trench, staking or stapling blanket as shown.
5. Replace native soil previously removed from trench.
6. Roll blanket down the slope in a controlled manner, taking care to remove excess slack, and taking care not to stretch blanket.
7. Stake or staple blanket as shown so there are no gaps between the blanket and the soil. Staple while unrolling blanket to minimize walking on blanket.

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
SANDRA L. SALISBURY
LICENSE NO. 660
DATE: 6/6/13

BIODEGRADABLE EROSION CONTROL BLANKET PLACEMENT FOR SLOPES
STANDARD PLAN I-60.10-01
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Pasco Bakotich III *6/10/13*
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

3 C5.2 BIODEGRADABLE EROSION CONTROL BLANKET
NTS

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN ROBERT GARDNER STATE OF WASHINGTON 24810 REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

TESC AND WATER MANAGEMENT DETAILS 2

REVISION NUMBER

No.	Date	Revision

Date	Designed By
9/26/2024	SR, GL
Drawn By	Checked By
BB	AJ

SCALE 0 1"

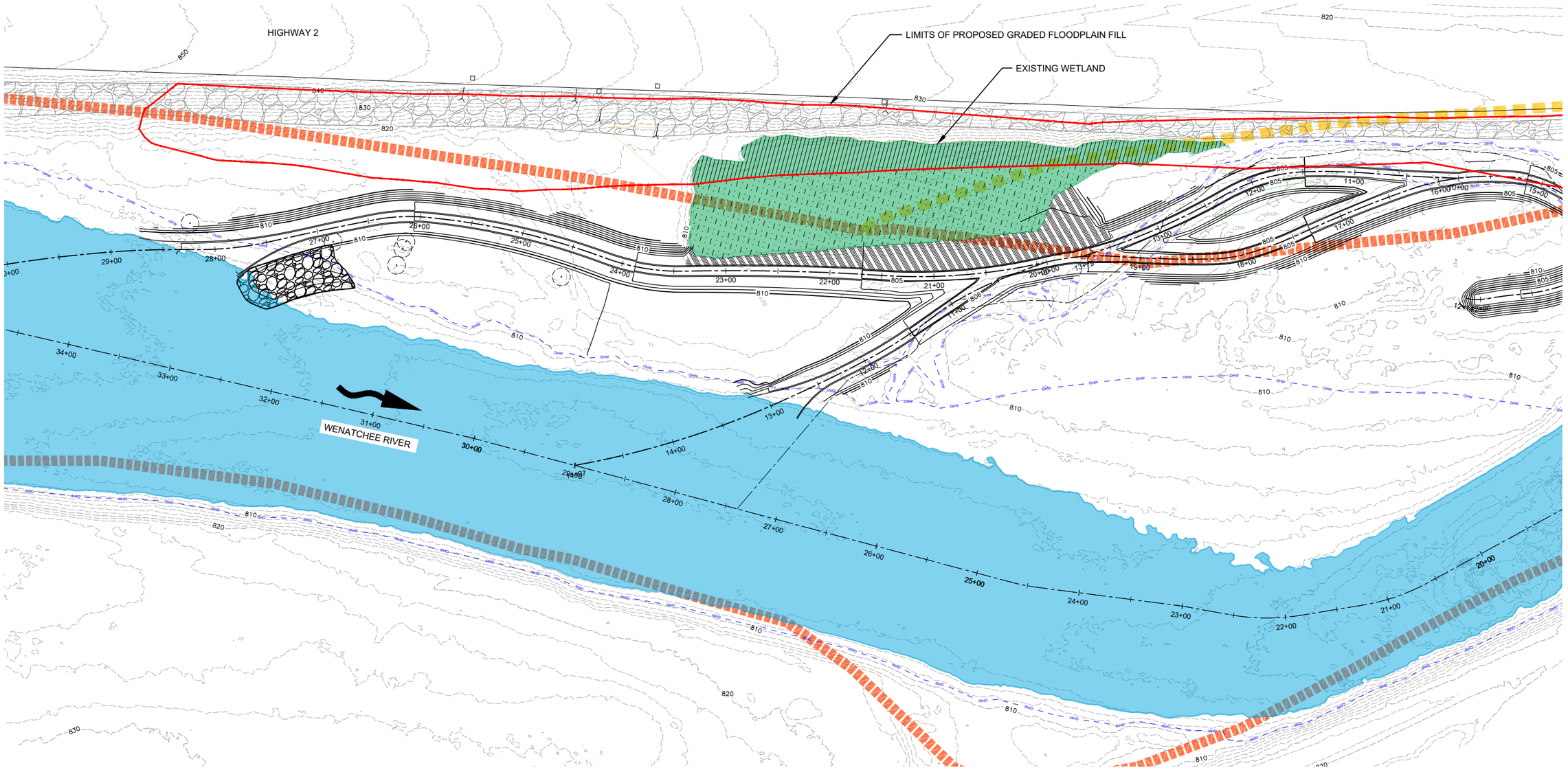
JOB NO. 20220043

SHEET NO. C5.2

19 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C5.1.dwg USER: bbennett
DATE: Sep 26, 2024 2:22pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN

60% DESIGN
SEPTEMBER 2024



PROPOSED WETLAND IMPACTS PLAN

SCALE: 1"=50"

PROPOSED WETLAND IMPACTS			
		AREA (S.F.)	AREA (AC.)
EXISTING WETLAND		37,500	0.86
PROPOSED WETLAND FILL		12,200	0.28
PROPOSED WETLAND ENHANCEMENT		25,200	0.58
PROPOSED WETLAND CREATION **		9,500	0.22

** PROPOSED WETLAND CREATION AREA SUBJECT TO CHANGE AS DESIGN IS REFINED.

SCALE
50 0 25 50 100
SCALE FEET

PRELIMINARY NOT FOR CONSTRUCTION
STEVEN RUSH — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

PROPOSED WETLAND IMPACTS OVERVIEW

REVISION NUMBER

No.	Date	Revision

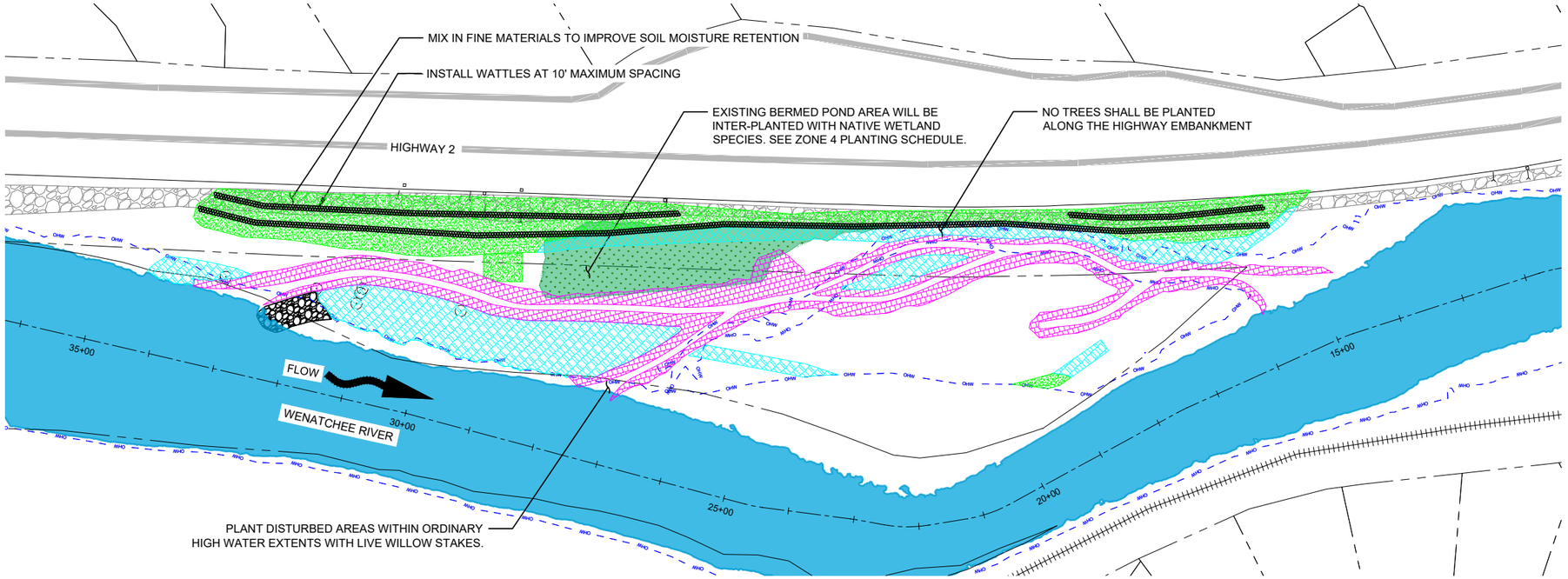
Date 9/26/2024 | Designed By SR, GL
Drawn By BB | Checked By AJ

SCALE 0 1"

JOB NO. 20220043

SHEET NO. C6.0
20 OF 21

DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\FIGURES\GSC-PROPOSED-WETLAND-BERM.dwg USER: bbennett
DATE: Sep 26, 2024 2:22pm XREFS:GSC-X-PLANIMETRICS GSC-X-TB-W2r-22x34 GSC-X-FEMA GSC-X-LEGEND GSC-X-WOOD GSC-X-OHW GSC-X-DESIGN GSC-X-DESIGN



SITE RESTORATION AND PLANTING PLAN

SCALE: 1"=100"

ZONE 1 - CHANNEL BANK PLANT SCHEDULE (1.7 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*SALIX ANYGDALOIDES*	PEACHLEAF WILLOW	10%	116	8' TYP. SPACING
	POPULUS TRICHOCARPA	BLACK COTTONWOOD	20%	231	8' TYP. SPACING
SHRUB	*SALIX EXIGUA*	COYOTE WILLOW	25%	741	5' TYP. SPACING
	SALIX LASIANDRA	PACIFIC WILOW	25%	741	5' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	20%	592	5' TYP. SPACING
WETLAND SOD	*CAREX NEBRASCENSIS*	NEBRASKA SEDGE	WETLAND SOD COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION. WETLAND SOD COMPOSITION TO BE FINALIZED AT FUTURE DESIGN PHASE.		
	JUNCUS ARCTICUS	ARCTIC RUSH			
	CAREX UTRICULATA	BEAKED SEDGE			

ZONE 3 - UPLAND PLANT SCHEDULE (2.0 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*PINUS PONDEROSA*	PONDEROSA PINE	5%	19	15' TYP. SPACING
SHRUB	*MAHONIA AQUIFOLIUM*	TALL OREGON GRAPE	15%	523	5' TYP. SPACING
	PURSHIA TRIDENTATA	BITTERBRUSH	5%	174	5' TYP. SPACING
	ROSA WOODSII	WOODS ROSE	15%	363	6' TYP. SPACING
	PHILADELPHUS LEWISII	MOCKORANGE	20%	272	8' TYP. SPACING
	RIBES CEREUM	WAX CURRANT	10%	136	8' TYP. SPACING
	RHUS GLABRA	SMOOTH SUMAC	20%	272	8' TYP. SPACING
	ERICAMERIA NAUSEOSA	GRAY RABBITBRUSH	10%	348	5' TYP. SPACING
SEED	*BROMUS SITCHENSIS VAR. MARGINATUS*	MOUNTAIN BROME	2%	SEED MIX COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION.	
	PSUEDOROEGNERIA SPICATA	BLUEBUNCH WHEATGRASS	20%		
	FESTUCA IDAHOENSIS	IDAHO FESCUE	20%		
	KOELERIA MACRANTHA	PRAIRIE JUNEGRASS	10%		
	POA SECUNDA	SANDBERG BLUEGRASS	10%		
	ELYMUS GLAUCUS	BLUE WILDRYE	20%		

ZONE 2 - RIPARIAN PLANT SCHEDULE (1.8 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*POPULUS TRICHOCARPA*	BLACK COTTONWOOD	15%	111	10' TYP. SPACING
	SALIX ANYGDALOIDES	PEACHLEAF WILLOW	5%	37	10' TYP. SPACING
SHRUB	*ROSA WOODSII*	WOOD'S ROSE	15%	227	7' TYP. SPACING
	PHILADELPHUS LEWISII	MOCKORANGE	15%	227	7' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	10%	151	7' TYP. SPACING
	ROSA NUTKANA	NOOTKA ROSE	10%	151	7' TYP. SPACING
	PRUNUS VIRGINIANA	CHOKECHERRY	15%	227	7' TYP. SPACING
	CORNUS SOLONIFERA	REDOSIER DOGWOOD	15%	227	7' TYP. SPACING
SEED	*BROMUS SITCHENSIS VAR. MARGINATUS*	MOUNTAIN BROME	15%	SEED MIX COMPOSITION SEPARATE FROM TREE AND SHRUB PLANTING COMPOSITION.	
	DESCHAMPSIA ELONGATA	SLENDER HAIRGRASS	25%		
	ELYMUS CANADENSIS	CANADA WILDRYE	20%		
	ELYMUS GLAUCUS	BLUE WILDRYE	25%		
	BLYCERIA STRIATA	FOWL MANAGRASS	15%		

ZONE 4 - BERMED POND INFILL PLANT SCHEDULE (0.4 AC)

STOCK TYPE	SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION	QUANTITY	NOTES
TREE	*SALIX ANYGDALOIDES*	PEACHLEAF WILLOW	10%	14	15' TYP. SPACING
	POPULUS TRICHOCARPA	BLACK COTTONWOOD	30%	41	15' TYP. SPACING
SHRUB	*CORNUS SOLONIFERA*	REDOSIER DOGWOOD	25%	76	10' TYP. SPACING
	SALIX PROLIXA	MACKENZIE WILLOW	20%	61	10' TYP. SPACING
	SALIX BEBBIANA	BEBB'S WILLOW	25%	76	10' TYP. SPACING

NOTES:

1. EXISTING TOPOGRAPHY DERIVED FROM 2022 TOPOBATHY LIDAR DEVELOPED BY USBR.
2. FLOODWAY AND FLOODPLAIN LINEWORK DOWNLOADED FROM FEMA FLOOD MAP SERVICE CENTER.
3. RAILROAD, ROADWAY, AND TAXLOT LINEWORK DOWNLOADED FROM CHELAN COUNTY GIS.
4. EXISTING WETLAND EXTENTS APPROXIMATELY DELINEATED BY W2R IN 2023.
5. WATER EXTENTS SHOWN ARE FROM THE EXISTING CONDITIONS HYDRAULIC MODEL FOR THE 50% DURATION EXCEEDENCE FLOW (1,810 CFS).
6. ORDINARY HIGH WATER EXTENTS SHOWN ARE DERIVED FROM FIELD SURVEY DATA AND DESKTOP DELINEATION ANALYSIS PERFORMED BY W2R IN 2023.

LEGEND:

- ORDINARY HIGH WATER EXTENT
- MODELED WATER EXTENT (1,810 CFS)
- TAXLOTS
- EXISTING WETLANDS
- EXISTING RAILROAD
- EXISTING ROADWAY
- EXISTING RIP RAP
- EXISTING PONDEROSA PINE
- EXISTING CATCH BASIN

SCALE

100 0 50 100 200

SCALE FEET

60% DESIGN
SEPTEMBER 2024

PRELIMINARY NOT FOR CONSTRUCTION

STEVEN RAY LEVESQUE — STATE OF WASHINGTON — 22400 — REGISTERED PROFESSIONAL ENGINEER

WOLF WATER RESOURCES, INC.
1001 SE WATER AVE, SUITE #180
PORTLAND, OR 97214
503.207.6688

CASCADE FISHERIES
25 N WENATCHEE AVE, SUITE #203
WENATCHEE, WA 98801
509.476.3444

CASCADE FISHERIES
GOODWIN SIDE CHANNEL
CHELAN COUNTY, WA

SITE RESTORATION AND PLANTING PLAN

REVISION NUMBER

No.	Date	Revision

Date: 9/26/2024 | Designed By: SR, GL
Drawn By: BB | Checked By: AJ

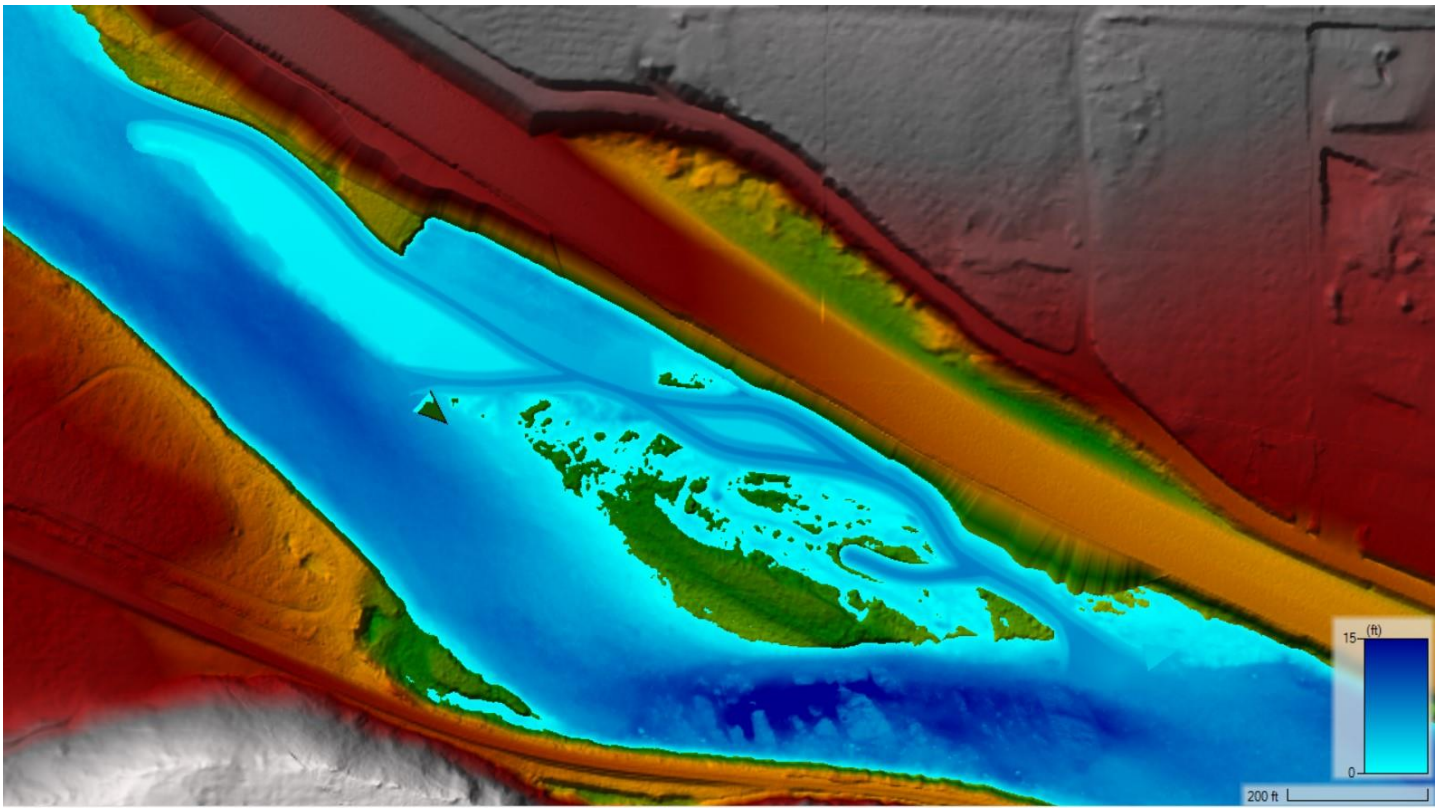
SCALE 0 1"

JOB NO. 20220043

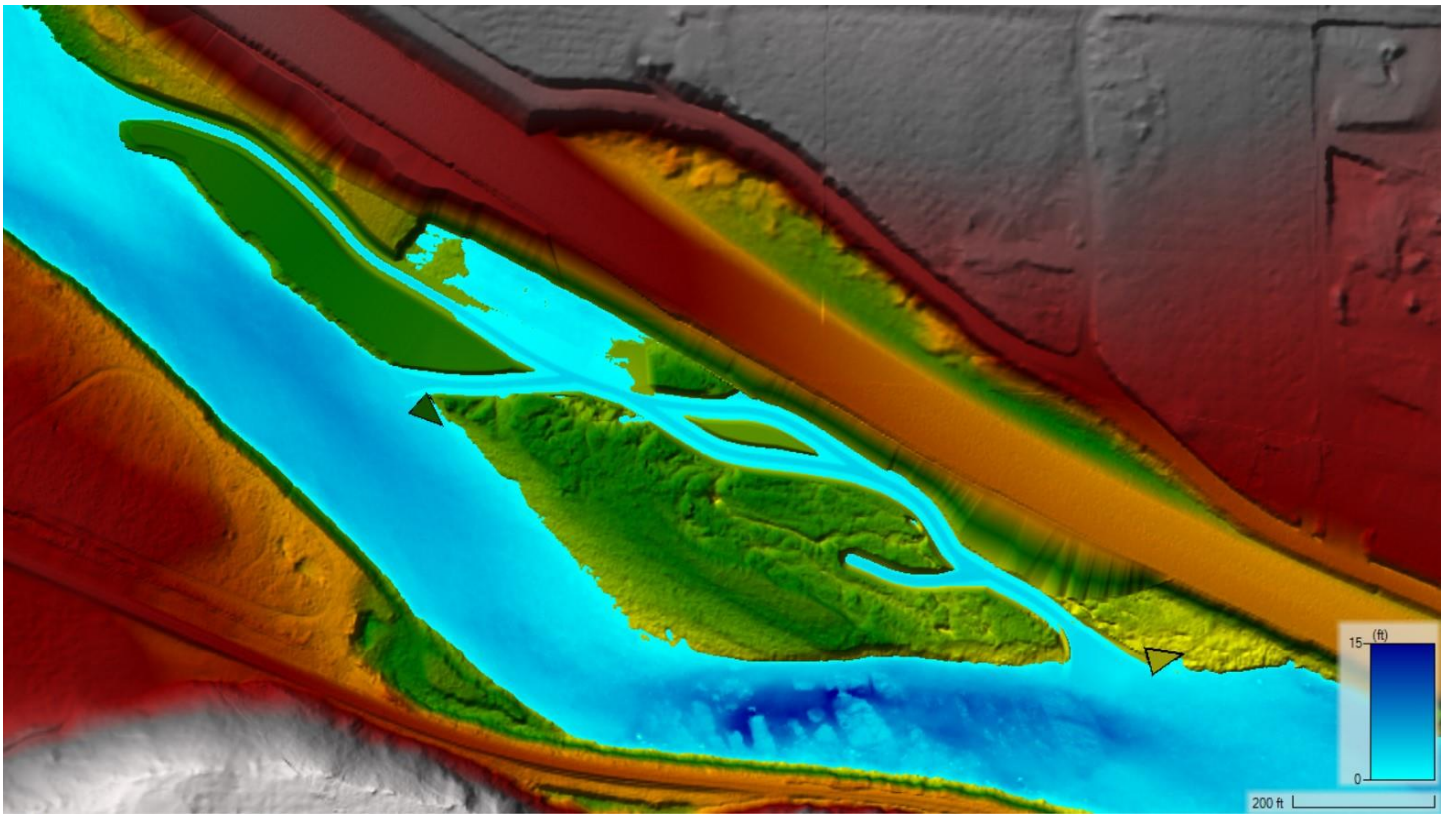
SHEET NO. C6.1

21 OF 21

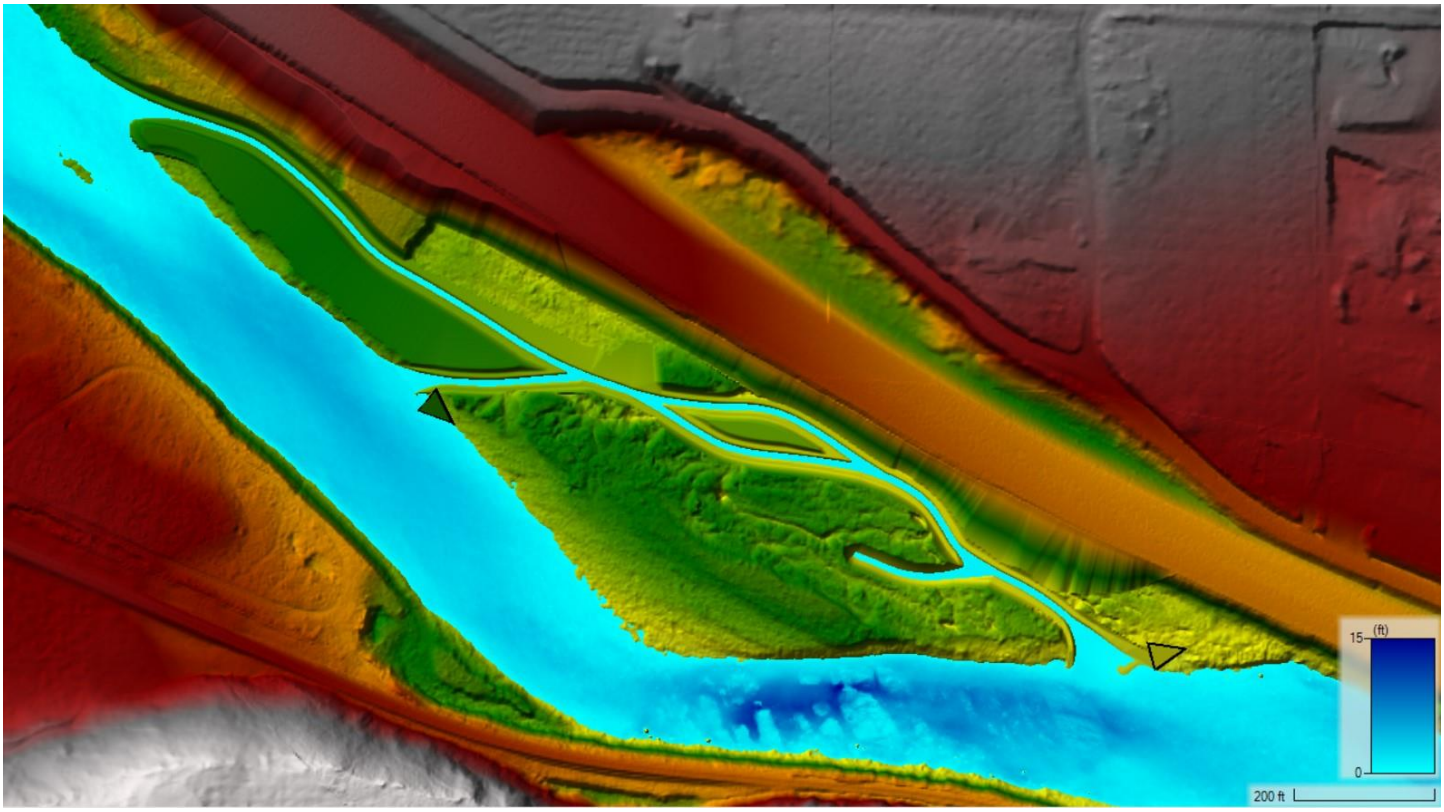
DWG: Z:\Shared\W2r\CAD\20220043-Goodwin Side Channel\DWG\SHEETS\C6.0.dwg USER: bbennett
DATE: Sep 26, 2024 2:23pm XREFS:GSC-X-TB-W2r-22x34 GSC-X-PLANIMETRICS GSC-X-LEGEND GSC-X-OHW GSC-X-DESIGN



Depth PC 1.5yr 15440cfs



Depth PC 25% 4150cfs



Depth PC Shutoff 1810cfs