

WETLAND AND STREAM MITIGATION PLAN

SR 970/Teaway River Bank Stabilization Project

Kittitas County, Washington

Work Order: XL5902

**Prepared By
WSDOT South Central Region
Environmental Office**

April 1, 2021



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Executive Summary

The Washington State Department of Transportation (WSDOT) is proposing to stabilize the right bank (project) of the Teanaway River (river) where it is eroding the fill prism of State Route 970 (SR 970), at milepost (MP) 6.1, in Kittitas County, Washington. The project is located approximately six miles east of Cle Elum.

The project will result in impacts to wetlands, wetland buffers, the river below the ordinary high water mark, and the 100-ft shorelines buffer of the river. It is proposed to mitigate for these impacts by planting disturbed areas such that baseline environmental baseline functions and values are maintained.

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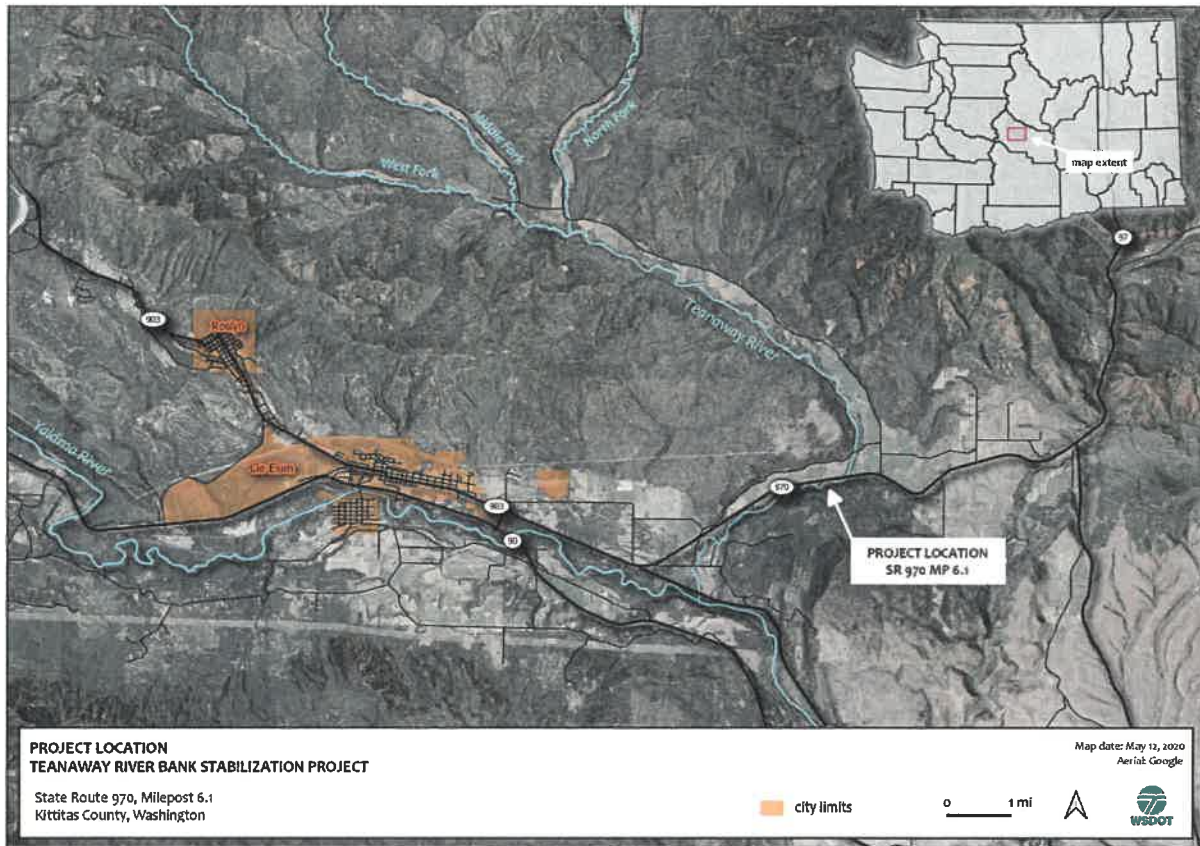
Wetland and Stream Mitigation Plan

1. Introduction

1.1. Project Location

The proposed bank stabilization project (project) is located in Kittitas County, Washington, where State Route 970 (SR 970) crosses the Teanaway River, approximately six miles east of Cle Elum (Figure 1).

Figure 1. Project Location



Located on the east slope of the Cascade Mountain Range, the project falls within USDA Major Land Resource Area (MLRA) 2, USDA Land Resource Region (LRR) A. Occurring within the southwest quarter of Section 25 of Township 20N and Range 16E, the geospatial center of the project footprint is 47°11'40.20"N, 120°47'23.94"W.

1.2. Project Purpose and Description

The objective of the project is to stabilize the fill prism of SR 970 which also serves as the right bank of the river. The project design solution involves the construction of a 742-foot

long bioengineered revetment (BIER), comprised of rock, large wood, and riparian plantings. The BIER will be incorporated into the existing roadway prism to avoid a rise of surface water elevations within the 100-year floodplain. The design includes a 150-foot crib wall in the center of the BIER where the channel is closest to the paved surface. The BIER will be constructed according to Integrated Streambank Protection Guidelines (ISPG) and will incorporate logs with rootwads positioned at short intervals along its entire length, such that the rootwads remain engaged with the river at all flow levels.

In order to isolate the in-water work zone, the river will be diverted into an existing seasonal side channel (SSC), allowing for fish to be moved away from the work zone and for water quality Best Management Practices (BMPs) to be installed.

Since the SSC is typically dry during summer flows, the inlet will be graded down approximately one foot such that it is engaged at lower flows (200 cfs). In providing fish with additional high-quality, off-channel habitat at lower flows, 0.04 ac of existing wetland vegetation¹ will be cleanly excavated from Wetland 2. Proposed mitigation for this impact is to add 0.04 ac of wetland plants to existing Wetland 3.

Work is scheduled to take place during the authorized in-water work window (July 15 to August 30) in 2022.

1.3. Wetland and Stream Investigation

A wetland and stream investigation was completed within a 26.2-acre (ac) study area, the results of which are presented in **Figure 2**.² The Teanaway River is the only stream in the study area. A description of the river is presented in **Table 1**. A map of the ordinary high water mark (OHWM) is included in **Appendix A**.

1.4. Wetland and Stream Impacts

Although conducted to avoid and minimize impacts to the greatest practicable extent, the project will result in unavoidable impacts to wetlands (**Tables 2, 3**) and streams (**Table 4**). An impact map for each is included in **Appendix A**.

¹ Existing vegetation in this location is limited to saplings less than six feet tall, recruited into large, embedded cobble, comprised of approximately 75% cottonwood and 25% willow. Canopy coverage is estimated at 50%.

² Wetland and Stream Report, dated August 26, 2020 (WSDOT 2020).

Figure 2. Wetland and Stream Delineation Results

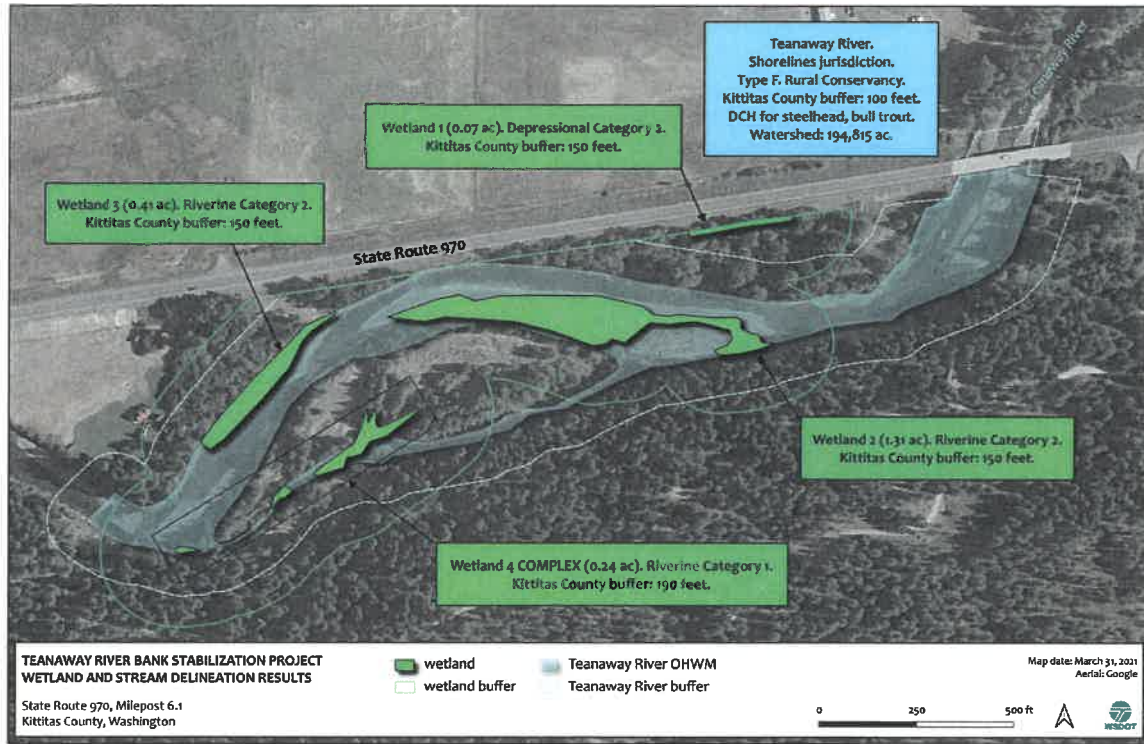


Table 1. Teanaway River

STREAM INFORMATION SUMMARY – TEANAWAY RIVER	
WRIA	Upper Yakima (39)
Local watershed	Teanaway River (12 th HUC 170300010307)
Local Jurisdiction	Kittitas County
Shorelines	Rural Conservancy
DNR Water Type	Type S
Buffer Width	100
Fish Use	Spring Chinook, coho, steelhead, rainbow trout, westslope cutthroat trout, Eastern brook trout, mountain whitefish, Pacific lamprey, and mountain sucker.
Critical Habitat	Mid-Columbia River DPS ³ steelhead and bull trout.
Connectivity	The Teanaway is a left-bank tributary to the Yakima River at river mile (RM) 176.1.
Riparian/Buffer Condition	Riparian vegetation is relatively sparse along the right bank of the main channel, but is fairly extensive along the left bank, including multi-story successional generations of cottonwood, alder, and willow rooted on the floodplain.

³ Distinct Population Segment

Table 2. Wetland impacts and proposed mitigation

Wetland ID	Wetland Impact	
	Impact Type and Description	Proposed Mitigation
Wetland 2	PERMANENT IMPACT (0.04 ac) Cleanly excavate 24 cubic yards (cy) of cobble/gravel, including existing wetland plants. ⁴ No fill.	Enlarge Wetland 3 by 0.04 ac (planting).
Wetland 3	TEMPORARY IMPACT (0.02 ac) Vegetation trimming and equipment access.	Vegetation allowed to resprout (0.02 ac).

Table 3. Wetland buffer impacts and proposed mitigation

Wetland ID	Wetland Buffer Impact	
	Impact Type and Description	Proposed Mitigation
Wetland 2	PERMANENT IMPACT (0.05 ac) 24 cy excavated from Wetland 2 spread onto adjacent, upland cobble bar.	No mitigation proposed. No vegetation will be impacted by the fill, and given that fill is deposited below the OHWM, it will eventually be captured and distributed by high water.
Wetland 3	TEMPORARY IMPACT (1.36 ac) Equipment access and turbid water infiltration.	Turbid water infiltration area (1.11 ac): no mitigation proposed (self-mitigating). Equipment access (0.25 ac): install a native seed mix onto exposed soils.

Table 4. Stream impacts and proposed mitigation

Action	Impact Type and Description	Proposed Mitigation
BIER excavation below OHWM	Excavated area: 0.15 ac (permanent impact).	Plant the BIER per ISPG guidelines (0.23 ac).
	Excavated volume: 2,140 cy (permanent impact)	
SSC disturbance below the OHWM	(24 cy) excavated within Wetland 2 and relocated (fill) below OHWM (permanent)	Enlarge Wetland 3 by 0.04 ac (planting).
Temporary diversion dam below the OHWM	83 cy temporary fill	Remove diversion dam. Self-mitigating.
Riparian buffer disturbance	(0.18 ac) BIER construction (permanent)	Plant the BIER per ISPG guidelines (0.18 ac).
	(100 ft ²) woody vegetation trimming for equipment access to SSC (long-term temporary)	Plants allowed to resprout (100 ft ²)
	(0.17 ac) equipment access route to SSC (short-term temporary)	Plant with native seed mix (0.17 ac).

⁴ Although this impact is characterized as “permanent,” it is nevertheless anticipated that wetland vegetation will recolonize the SSC inlet over time.

1.4.1. Wetlands and Wetland Buffer Impacts

Vegetation in **Wetland 2** will be permanently disturbed (**Table 2**) during the excavation of the SSC inlet. The cobble substrate in this location is colonized by young, woody plants up to six feet tall, comprised of 75% cottonwood and 25% willow. Average canopy coverage is approximately 50%.

Vegetation in **Wetland 3** will be trimmed (**Table 2**) to provide for equipment access onto the riverbed. Woody vegetation is comprised of young cottonwoods, less than 3-ft tall, on a cobble bar below the OHWM and an 8-ft tall band of young willows on the bank at the OHWM.

Wetland buffers will be temporarily disturbed (**Table 3**) by equipment access and staging. Mitigation is limited to hydroseeding with a native seed mix since vegetation in the buffer is dominated by annual grasses and weeds.

1.4.2. Stream Impacts

Construction of the BIER will require excavation only below the OHWM (**Table 4**). Existing riparian vegetation will be grubbed (0.23 ac) during construction of the BIER and trimmed upstream (100 square feet) to allow for equipment access to the SSC. The equipment access route to the SSC will disturb 0.17 ac of grasses and weeds. Excavation of the SSC inlet will require excavation and below the OHWM⁵ (**Table 4**). The total riparian buffer impact is 0.35 ac.⁶

1.5. Proposed Mitigation

In order to mitigate for impacts, the following revegetation plan is proposed.

1.5.1. Wetland Mitigation Proposal

Wetland 2: The impact footprint in Wetland 2 is populated by young cottonwoods and willows, rooted into large, embedded cobbles, adapted to seasonal, shallow, high-velocity inundation. Although it is anticipated that these plants will recolonize the excavated area over time (“self-mitigate”), the unknown duration for this to occur is considered to incur a long-term temporal loss of 0.04 ac of wetland functions. Proposed mitigation is 0.04 ac of wetland creation (1:1 ratio), accomplished through enlargement (planting) existing Wetland 3 (0.04 ac planted).

Wetland 3: Since the root systems of young willows and cottonwoods will remain intact after trimming, they are expected to recover via resprouting after construction (“self-mitigate”). Therefore, no mitigation is proposed.

⁵ 24 cy will be excavated at the SSC inlet and evenly spread onto an adjacent, upland portion of the cobble bar (0.05 ac).

⁶ The SR 970 fill prism is excluded from consideration as river buffer.

Wetland buffers⁷: Buffer impacts are limited to dry, upland areas dominated by grasses and weeds. As such, all disturbed soils will be seeded with a native plant mix once construction is complete.

1.5.2. Stream Mitigation Proposal

To mitigate for riparian vegetation grubbing, a minimum of 0.23 ac of native, woody vegetation will be installed into the constructed revetment and/or alternate areas along the river.

No mitigation is proposed for riparian vegetation trimming. Since the root systems of trimmed cottonwoods will remain intact, they are expected to naturally recover via resprouting after construction.

Riparian buffer disturbance: in buffer areas dominated by grasses and weeds, disturbed soils will be seeded with a native plant mix.

Excavation below the OHWM: the BIER will be planted per ISPG guidelines.

Fill below the OHWM: no mitigation is proposed for SSC fill.

1.6. Mitigation Scope, Schedule, and Monitoring Plan

The scope and schedule of mitigation work, along with a description of subsequent monitoring and management, is outlined in this section. A planting plan map is included in **Appendix B**.

1.6.1. Task 1: Wetland 3 planting (summer 2022)

Native, woody plants, including, but not limited to, willows and cottonwoods, will be added to Wetland 3 within an area totaling 0.04 ac.

1.6.2. Task 2: Wetland and stream buffer planting (fall 2022)

Disturbed upland soils within wetland and/or stream buffer zones (0.42 ac) shall be seeded with a native plant mix.

1.6.3. Task 3: BIER planting, riparian planting (fall 2022)

Install 0.23 ac of woody riparian plants into the BIER and adjacent riparian zones.

1.6.4. Task 4: Weed control (summer 2022 – fall 2025)

Non-desirable vegetation will be managed within all planted areas, as required, via mechanical, manual, barrier, and/or chemical methods.

⁷ Areas regulated as wetland buffer also qualify as river buffer. However, in order to avoid double-counting, such areas are only addressed in this report as wetland buffer.

1.7. Monitoring and Management

Vegetation will be monitored and managed for three years after installation. Monitoring goals and performance standards are outlined below.

1.7.1. Goal 1 – Wetland 3 vegetation establishment

Objective:

Ensure that native, woody hydrophytic plants establish within an area of at least 0.04 ac.

Performance Measures

Year 1 (fall 2023): Survival of the installed plants shall be 100 percent. Installation of new plants to achieve this threshold is acceptable in meeting the performance measure. Native plants that volunteer within the planting zone will count toward survivorship.

Year 2 (fall 2024): Survival of the installed plants shall be 75 percent. Installation of new plants to achieve this threshold is acceptable in meeting the performance measure. Native plants that volunteer within the planting zone will count toward survivorship.

Year 3 (fall 2025): Survival of the installed plants will achieve 50 percent survival or 50 percent average aerial cover across the planted zone. Installation of new plants to achieve either of these thresholds is acceptable in meeting the performance measure. Native plants that volunteer within the planting zone will count toward survivorship and aerial cover.

1.7.2. Goal 2 – Wetland 3 vegetation recovery

Objective:

Allow trimmed, riparian plants to resprout within the impacted area (0.02 ac).

Performance Measures

Years 1 – 3 (fall 2023 – fall 2025): Photo-document the progress of regrowth of the trimmed woody vegetation.

1.7.3. Goal 3 – Wetland and stream buffer restoration

Objective:

Ensure that native herbs and/or grasses establish within an area of at least 0.42 ac.

Performance Measures

Years 1 – 3 (fall 2023 – fall 2025): Ensure that vegetation is dominated by native grasses and/or forbs. Photo-document the progress of plant growth from several perspectives.

1.7.4. Goal 4 – Riparian vegetation restoration

Objective:

Ensure that 0.23 ac of planted native, woody vegetation establishes in the BIER and/or adjacent areas.

Performance Measures

Year 1 (fall 2023): Survival of the installed plants shall be 100 percent. Installation of new plants to achieve this threshold is acceptable in meeting the performance measure. Native shrubs or trees that volunteer within the planted zones will count toward survivorship.

Year 2 (fall 2024): Survival of the installed plants shall be 75 percent. Installation of new plants to achieve this threshold is acceptable in meeting the performance measure. Native shrubs or trees that volunteer within the planted zones will count toward survivorship.

Year 3 (fall 2025): Survival of the installed plants will achieve 50 percent survival or 25 percent average aerial cover across the planted zone. Installation of new plants to achieve either of these thresholds is acceptable in meeting the performance measure. Native shrubs or trees that volunteer within the enhancement zones will count toward survivorship and aerial cover.

1.7.5. Goal 5 – Riparian woody vegetation recovery

Objective:

Allow native, trimmed, woody vegetation to resprout within a 100 ft² area.

Performance Measures

Years 1 – 3 (fall 2023 – fall 2025): Photo-document the progress of regrowth of the trimmed woody vegetation.

1.7.6. Goal 6 – Weed control

Objective:

Control the establishment and spread of noxious weeds within planted areas and areas where resprouting will be documented.

Performance Measures

Years 1 – 3 (summer 2022 – fall 2025): Kittitas County Class A-C noxious weeds⁸ will be controlled. All other non-desirable plants will be managed such that Goals 1-7 are achieved.

As-built and Monitoring Reports

An **as-built report** including the constructed/planted baseline condition of all planted zones will be submitted to the Corps, Ecology, and Kittitas County within 30 days of the completion of work (fall 2022).

⁸ Kittitas County Noxious Weed Control Board (2020). Available online at: <https://www.co.kittitas.wa.us/noxious-weeds/list.aspx>

A **monitoring report**, describing the site's progress toward meeting the annual performance measures for Goals 1-6 will be submitted by January 1 of the year following the monitoring efforts for Years 1-3.

Adaptive Management

Should mitigation or recovery not perform on a trajectory to meet the performance measures for Year 3, adaptive management may include, but is not limited to, one or more of the following:

1. Installation of additional plants.
2. Modified weed control methods.
3. Lengthened monitoring period.
4. Alternate planting area(s).

Adaptive management measures that are implemented shall be included in the annual monitoring report.

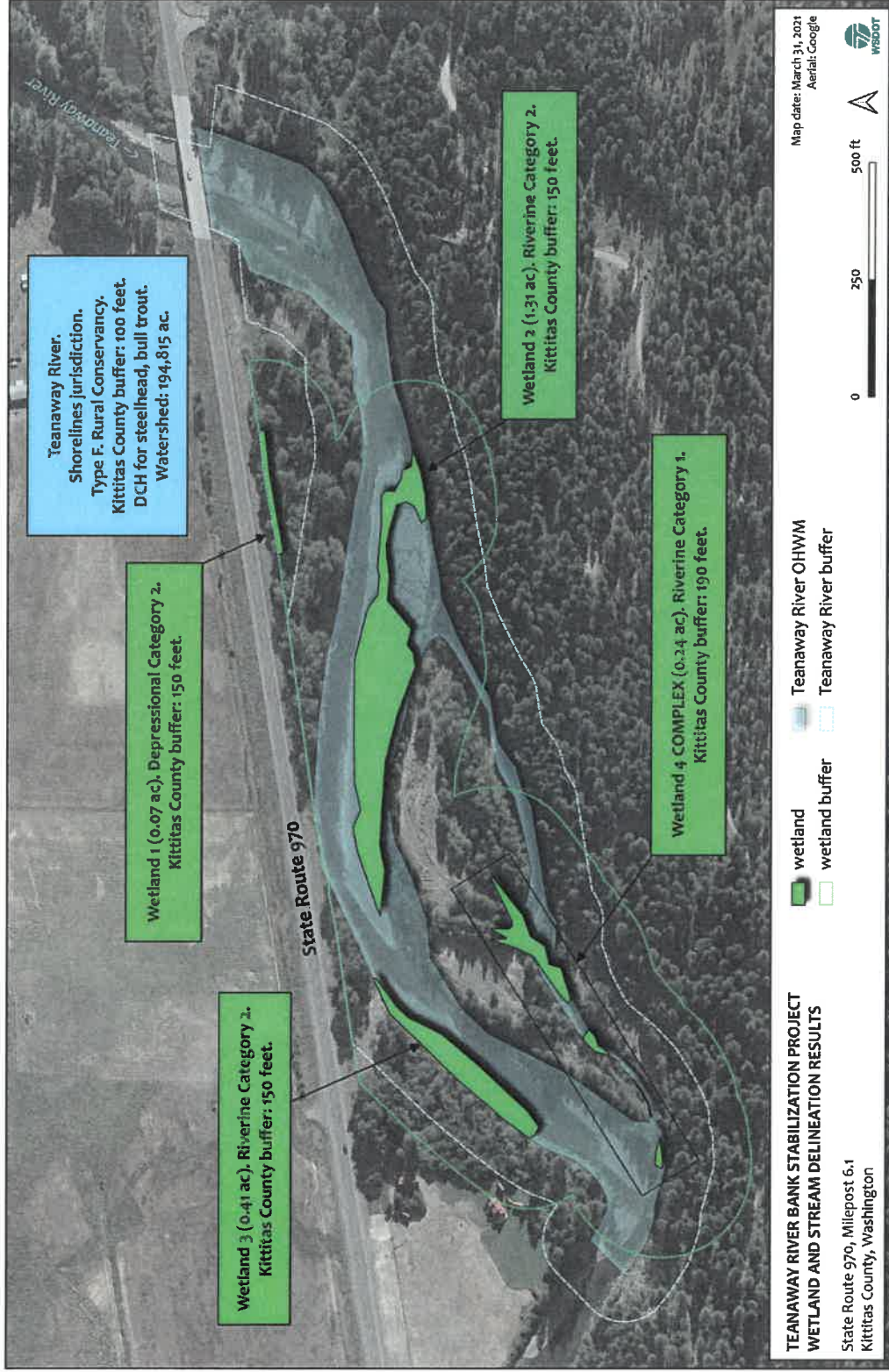
2. References

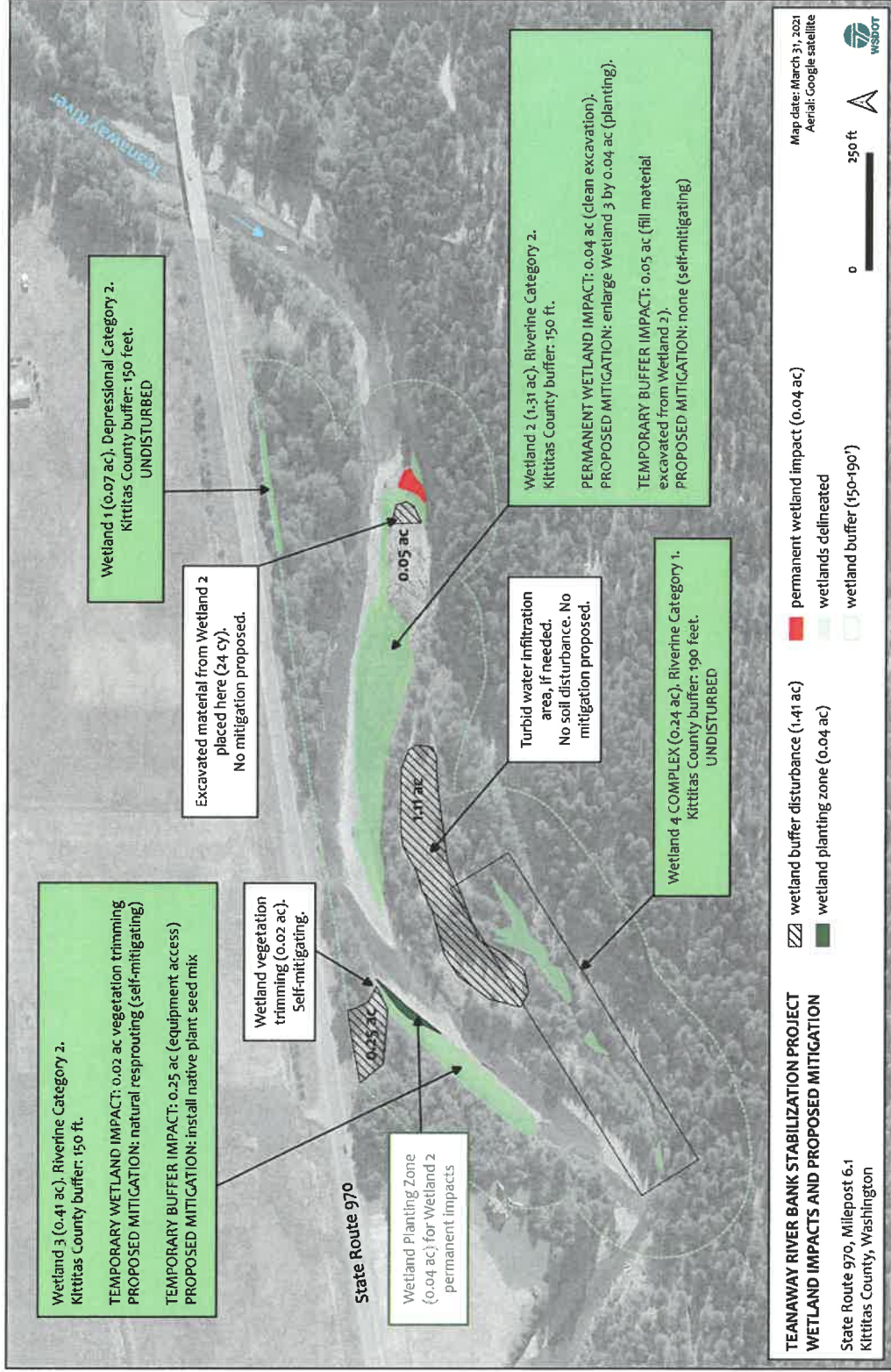
Kittitas County. 2020. Kittitas County Code, Title 17B | Shorelines [Internet]. Available online at: <https://www.co.kittitas.wa.us/boc/countycode/title17b.aspx>

WSDOT. 2020. Wetland and Stream Assessment Report. SR 970 Teanaway River Bank Stabilization Project. August 26, 2020.

Appendix A. Maps

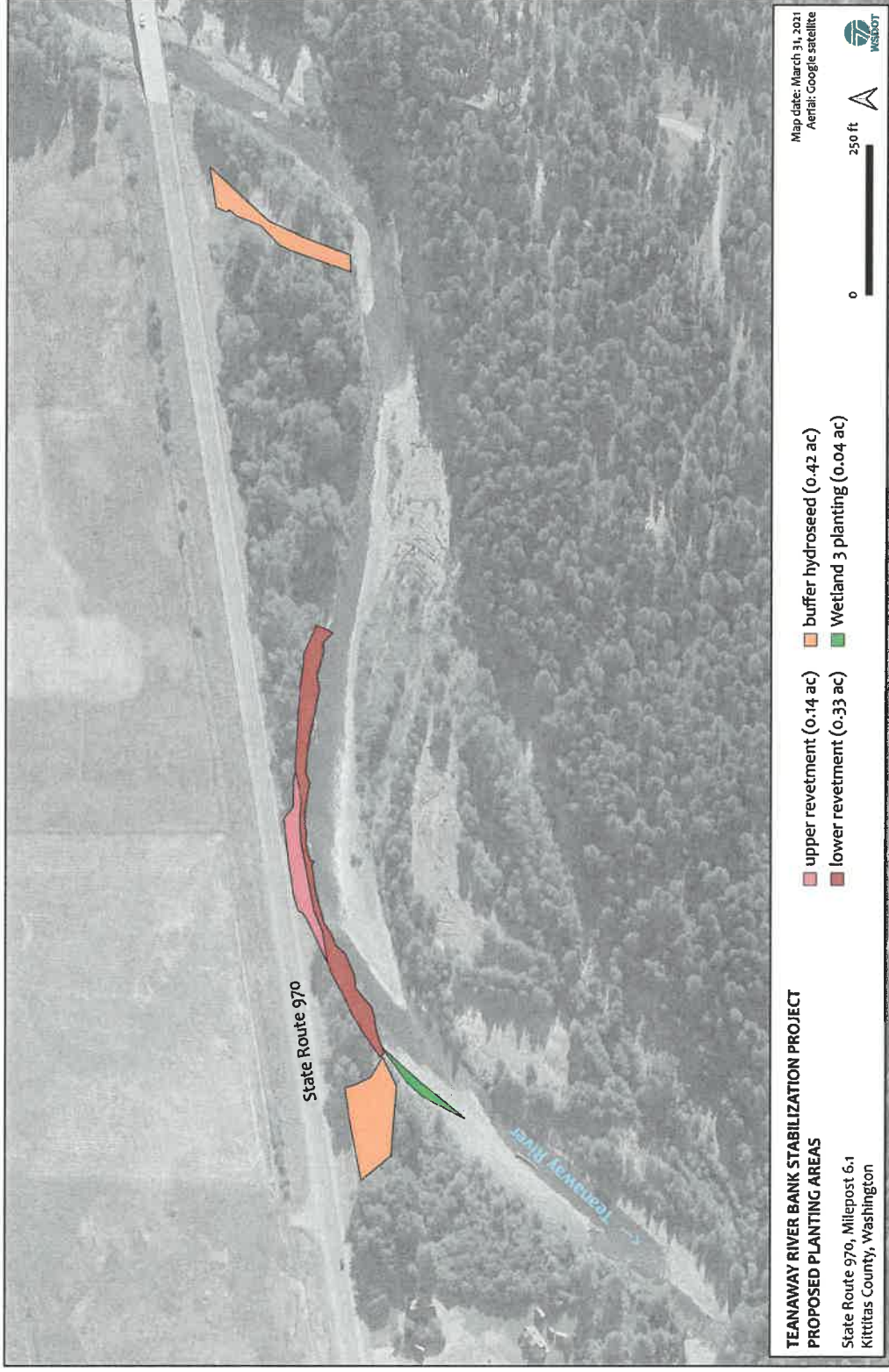
The project is not a public utility.





Appendix B. Planting Plan

100% of the project area is within the wetlands.



PLANTING AREA			
SYMBOL	COMMON NAME	BOTANICAL NAME	CONDITION
LOWER REVETMENT MIX - 1' O.C. SPACING			
	BLACK COTTONWOOD	POPULUS TRICHOCARPA	LIVE POLE
	SCOULDERS WILLOW	SALIX SCOULERIANA	LIVE POLE
UPPER REVETMENT MIX - 5' O.C. SPACING			
	COMMON SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL
	GOLDEN CURRANT	RIBES AUREUM	1 GAL
	WOODS ROSE	ROSA WOODSII	1 GAL
	NOOTKA ROSE	ROSA NUTKANA	1 GAL
WETLAND MIX - 8' O.C. SPACING PLANTED IN CLUSTERS			
	BLACK COTTONWOOD	POPULUS TRICHOCARPA	LIVE POLE*
*1 GAL PLANT MAY BE SUBSTITUTED			
BUFFER MIX - 5' O.C. SPACING SHRUBS, 20' O.C. SPACING TREES			
	DOUGLAS FIR	PSUEDOTSUGA MENZESII	1 GAL
	PONDEROSA PINE	PINUS PONDEROSA	1 GAL
	COMMON SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL
	GOLDEN CURRANT	RIBES AUREUM	1 GAL
	WOODS ROSE	ROSA WOODSII	1 GAL
	NOOTKA ROSE	ROSA NUTKANA	1 GAL
	NATIVE GRASS SEED WITH POLLINATORS AND RABBIT BRUSH		