



**DEPARTMENT OF
NATURAL RESOURCES**

**OFFICE OF THE
COMMISSIONER OF PUBLIC LANDS**
1111 WASHINGTON ST SE
MS 47001
OLYMPIA, WA 98504-7001

June 29, 2023

The Honorable Bernard Dean
Chief Clerk of the House
338B Legislative Building
Olympia, WA 98504

The Honorable Sarah Bannister
Secretary of the Senate
312 Legislative Building
Olympia, WA 98504

Dear Chief Clerk Dean and Secretary Bannister:

Please accept the enclosed legislative report on the pilot project to improve riparian functions for salmon habitat, submitted on behalf of Department of Natural Resources (DNR), as required in Sec. 310 (39) of the 2022 Supplemental Operating Budget (ESSB 5693). The bill provided \$5 million in funding for DNR to establish a pilot project to improve salmon habitat across the department's aquatic, commercial, industrial, and agricultural lands. The bill also directed DNR to report the cost, monitoring, and effectiveness of these investments to the Office of Financial Management and the appropriate committees of the legislature by June 30, 2023.

Should you have any questions, please contact me at 360-486-3469 or Brian.Considine@dnr.wa.gov.

Sincerely,

Brian Considine
Legislative Director
Office of the Commissioner of Public Lands

Enclosure: Legislative Report – Salmon Habitat Improvement

cc: Members of the Senate Agriculture, Water, Natural Resources, and Parks Committee
Members of the House Rural Development, Agriculture & Natural Resources Committee
Members of the Senate Ways and Means Committee
Members of the House Appropriations Committee
Ruth Musgrave – Senior Policy Advisor, Natural Resources, Office of the Governor
Jim Cahill – Senior Budget Assistant, Natural Resources, Office of Financial Management
Lisa Borkowski – Budget Assistant, Natural Resources, Office of Financial Management

Salmon Habitat Improvement Report to the Legislature

Cost, Monitoring, and Effectiveness of Investments in
Salmon Habitat Improvements Funded in the 2022
Supplemental Operating Budget

Prepared by:
Washington State Department of Natural Resources

Office of the Commissioner of Public Lands, Hilary Franz
June 15th, 2023



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

Table of Contents

Table of Contents.....	2
Background	3
Implementation Overview.....	4
Future Funding Opportunities.....	8
Summaries of Individual Projects	11
Barkley Bear Restoration Project, Methow River	12
Fowler Derelict Structure (Float House) Removal	14
Snohomish River Estuary Piling Removal	18
Yakama Nation “Suspension Reach” Restoration.....	19
McNeil Island – Still Harbor Armor Removal and Shoreline Restoration	21
Bird Island Planting	23
Amazon Creek Slash Barriers.....	25
Lake Kapowsin Shoreline Restoration	28
Beaver Dam Analog Installation Capitol State Forest.....	29
Narcisse Lease Fence	30
Loomis and Sweat Creek Restoration.....	31
Teaway Virtual Fencing	34
McNeil Island – Still Harbor Gravel Yard and Stream Restoration	36
Lakebay Marina Restoration.....	37

Background

The Department of Natural Resources (DNR) manages 5.6 million acres of forest, range, agricultural, aquatic, and commercial lands on behalf of the citizens of Washington State. This puts DNR in a unique position to implement a “Trees to Seas” approach to restoration – from headwaters to healthy forests and riparian zones to urban areas to estuary and nearshore habitats.

During the 2022-2023 legislative session, the Washington State Legislature passed a budget proviso of \$5,000,000 aimed at funding projects that improve salmon habitat on state-owned lands. Of the \$5,000,000 proviso, \$2,000,000 was designated for restoration work on state-owned aquatic lands, and \$3,000,000 for riparian improvements on state-owned uplands. The proviso was included in the final 2022 State Supplemental Operating Budget and reads as follows:

“(39)(a) \$5,000,000 of the general fund—state appropriation for fiscal year 2023 is provided solely for a pilot project to improve salmon habitat across the department's aquatic, commercial, industrial, and agricultural lands. Of the amount provided in this subsection:

(i) \$2,000,000 is provided solely to improve nearshore habitat by accelerating restoration of state-owned aquatic lands; and

(ii) \$3,000,000 is provided solely to improve riparian function, including riparian planting and riparian set-asides on state-owned lands.

(b) The department must consult with federally recognized tribes and partner with relevant state agencies and local governments in implementing this pilot.

(c) The department must provide a report on the cost, monitoring, and effectiveness of investments in salmon habitat improvements to the office of financial management and the appropriate committees of the legislature by June 30, 2023.”

Implementation Overview

Throughout the last year, DNR’s Product Sales and Leasing Division and Aquatic Resources Division worked in concert to identify projects that would maximize the use of funds in the one-year proviso period (FY 2023: July 1, 2022 - June 30, 2023). DNR was able to fund a wide range of project types and sizes that provide a variety of benefits to riparian and shoreline ecosystems. In some cases, DNR was able to capitalize on projects that were “shovel ready” (had already undergone planning and permitting) or were already in progress. In others, funds were used for a component or phase of a larger, long-term project. Others were new projects utilizing new technologies to implement impactful measures on the ground. The projects span across the State of Washington and benefit a wide range of forest riparian, wetland, riverine, estuarine, and marine habitats. Their locations are shown generally in Figure 1.

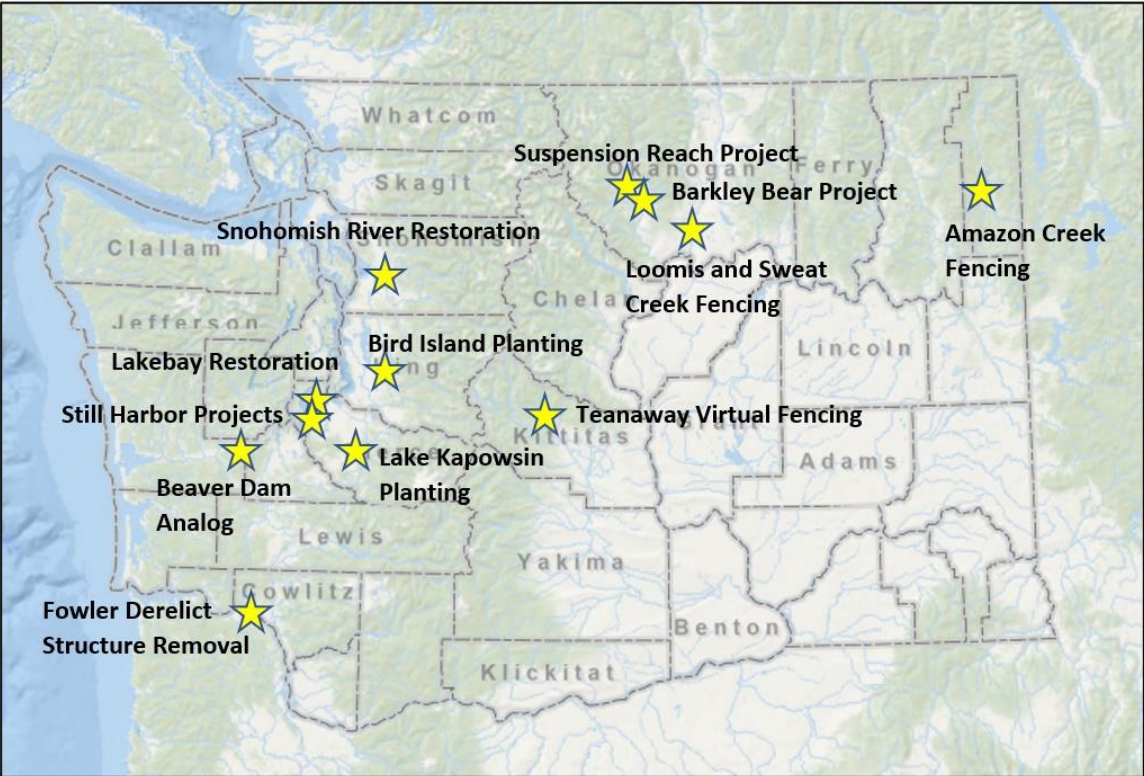


Figure 1. Project Locations.

Upon consultation with our partners, some projects initially identified for funding were determined to be unfeasible, largely due to the tight proviso timeline. However, the conversations were important, and DNR now has a list of potential future projects and partnerships when additional funding is available.

In addition to providing proviso funds, the legislature recognized the importance of consulting with federally recognized Tribes as well as state and local agency partners to assist with identifying effective projects. DNR worked with a number of these important partners on projects, including:

- Confederated Tribes and Bands of the Yakama Nation
- Stillaguamish Tribe of Indians
- Tulalip Tribes
- Muckleshoot Tribe
- Nisqually Indian Tribe
- Squaxin Tribe
- Puyallup Tribe
- South Douglas Conservation District
- Underwood Conservation District
- Kittitas County Cattlemen's Association
- Recreational Boating Association of Washington
- Methow Salmon Restoration Foundation
- Cascade Columbia Fisheries Enhancement Group
- Snohomish County Marine Resources Committee
- Teanaway Community Forest Advisory Committee
- Pierce County
- City of Renton
- Washington Department of Corrections
- Washington Department of Fish and Wildlife
- Washington Department of Social and Health Services
- Washington State Parks

Cost, effectiveness, and monitoring were also key provisions within the proviso language and are therefore, identified and described in the individual project summaries as well as in the Effectiveness Summary in Table 1 and Cost Summary in Table 2 below. Monitoring, to a large extent, has not had time to occur.

Table 1. Effectiveness summary. Funding may have contributed to a portion of a larger project.

Projects	Outcomes
Barkley Bear Restoration – Methow Salmon Recovery	Removed concrete gate Regraded 800 feet of river bank Placed 7 large wood habitat structures
Fowler Derelict Structure (Float House) Removal	Removed float house Removed collapsed shed Removed pilings
Snohomish Piling Removal	Removed 476 piling
Yakama Nation "Suspension Reach" Restoration	Placed 11 large wood habitat structures Revegetated river bank
Still Harbor Shoreline Restoration	Removed 1,245 feet of shoreline armor Relocated boat ramp Revegetated 49 acres of marine shoreline and forest Removed 0.5 miles of coastal road to reconnect 4 streams
Bird Island Planting	Monitored and maintained revegetation site
Amazon Creek Slash Barriers	Placed wood barriers to protect creek from cattle
Lake Kapowsin Shoreline Restoration	Controlled invasive species Revegetated 6 acres of freshwater shoreline
Beaver Dam Analog Installation	Installed 4 Beaver Dam Analogues
Narcisee Lease Fence	Installed 13,000 feet of wildlife friendly fence to protect wetlands from cattle
NE Region Fencing	Constructed and repaired cattle control fence Installed 13 cattle troughs
Teaway Virtual Fencing	Implemented virtual fence to protect rivers, creeks, and wetlands from cattle
Still Harbor Gravel Yard Restoration	Regraded former gravel yard Removed road associated with gravel yard Revegetated 1.3 acres of freshwater and marine shoreline
Lakebay Restoration	Removed 165 feet of hard armoring Removed 175 feet of creosote-treated armoring Revegetated 0.18 acres of freshwater and marine shoreline

Table 2. Cost summary. Cost estimates are through May 31, 2023.

Committed Projects	Aquatics	Uplands	Total
Barkley Bear Restoration - Methow Salmon Recovery	\$ 14,000		\$ 14,000
Fowler Derelict Structure (Float House) Removal	\$ 307,500		\$ 307,500
Snohomish Piling Removal	\$ 418,302		\$ 418,302
Yakama Nation "Suspension Reach" Restoration	\$ 500,000		\$ 500,000
Still Harbor Shoreline Restoration	\$ 675,893		\$ 675,893
Bird Island Planting		\$ 2,000	\$ 2,000
Amazon Creek Slash Barriers		\$ 2,186	\$ 2,186
Lake Kapowsin Shoreline Restoration		\$ 5,000	\$ 5,000
Beaver Dam Analog Installation		\$ 6,100	\$ 6,100
Narcisee Lease Fence		\$ 22,000	\$ 22,000
Loomis and Sweat Creek Fencing		\$ 36,487	\$ 36,487
Teaway Virtual Fencing		\$ 154,000	\$ 154,000
Still Harbor Gravel Yard Restoration		\$ 190,000	\$ 190,000
Lakebay Restoration		\$ 499,000	\$ 499,000
Administrative Costs		\$ 127,811	\$ 127,811
TOTAL	\$1,915,695	\$1,044,584	\$ 2,960,278

Future Funding Opportunities

Riparian improvement projects are vital for restoring and preserving the health of riparian ecosystems. These projects aim to enhance water quality, stabilize stream banks, promote biodiversity, and provide habitat for aquatic and terrestrial species. Implementing these projects within a one-year timeline proved to be very challenging and limited the number of projects that could be completed.

1. **Planning and Design:** A crucial phase of riparian improvement projects is the planning and design stage. This involves conducting assessments, developing project goals, mapping the riparian area, and designing appropriate restoration measures. Within a one-year timeline, limited time is available for planning and design. Most valuable projects can take from 2-4 years for proper planning and design to ensure long-term success. Many of the projects funded by the proviso had already undergone planning and design as well as permitting.
2. **Permitting and Regulatory Compliance:** Obtaining necessary permits and ensuring compliance with environmental regulations is another time-consuming aspect of riparian improvement projects. The permitting process often involves coordination with multiple regulatory agencies, public consultations, and fulfilling specific requirements. A one-year timeline poses challenges in navigating the permitting process effectively and limits potential projects to those with a smaller scope.
3. **Stakeholder Engagement:** Engaging stakeholders is crucial for successful riparian improvement projects and was a requirement in the proviso. Stakeholders may include landowners, community members, tribal and governmental agencies, and non-profit organizations. Building relationships and addressing concerns require adequate time and effort. A compressed one-year timeline made comprehensive stakeholder engagement and consensus building challenging, affecting project support and long-term success.
4. **Resource Availability:** Implementing riparian improvement projects involves securing necessary resources such as funding, equipment, materials, and skilled labor. Within a one-year timeframe, resource availability and procurement are constrained. Delays in acquiring resources hindered project progress and limited the scope of work within the given timeframe.
5. **Seasonal Limitations:** Riparian restoration often requires working with natural processes and specific seasonal considerations. Planting vegetation or conducting in-stream work needs to align with appropriate seasons for optimal success. In addition, some work within or adjacent to fish habitat has timing restrictions for avoiding impacts to important

fish species. A one-year timeline restricts the ability to work within these seasonal work windows, impacting project effectiveness by completing projects in suboptimal conditions or simply being unable to complete projects within timing restrictions.

Undertaking riparian improvement projects within a one-year timeline was a challenge that limited the number of projects and type of projects that could be completed. This important work would benefit from sustainable funding with a longer timeline that, in turn, would increase DNR's ability to examine and implement all types of projects and develop longer-term partnerships.

While some projects could not be completed due to the factors laid out above, DNR used this funding to identify opportunities for future riparian projects should additional funding be made available. Some of these projects include:

- A beaver dam analog (BDA) project along Foster Creek with the Douglas County Conservation District. The outlet of the creek is a known salmon spawning ground and currently sediment deposition from Foster Creek are degrading the water quality. The BDA's would help slow the water, thus slowing erosion, and limiting sedimentation downstream.
- A thinning and replanting project with Yakama Nation Fisheries would have invasive hawthorns removed from the Blockhouse Creek reach and replaced with native flora. Woody debris from the hawthorns would have then been deposited into Blockhouse Creek to combat incising of the creek bank, slow erosion, provide nutrients, and fish habitat.
- Several areas along Texas Creek in Okanogan County were identified as candidates for hardened creek crossing for cattle. The areas have been degraded by cattle crossing, and rock was planned to be deposited to armor the creek banks and prevent hoof shear and erosion. The permitting required to conduct this in water work was not feasible to be completed within the year timeline.
- Cascade Fisheries in Chelan County sought funds for a culvert replacement on two driveways that cross DNR land. The plan would grant easements for the driveway owners and update the driveways with acceptable fish passage. The permitting, engineering, and work for this project would have been extensive and required multiple years to complete.
- A fish habitat enhancement project on the North Fork Lewis River would be a partnership between WDFW, Cowlitz Conservation District, and neighboring landowners. The project includes placing large wood structures along the riverbank to create pockets of slower currents, and grading and planting a highly erosive bank. Slowing the current

would protect a productive salmon spawning area from scour, and slower currents with habitat complexity will create protective habitat for juvenile and out-migrating salmon. Additionally, the project would remove an abandoned wellhead in the middle of the river that is a hazard to navigation and personal safety.

- Lake Union Waterway has been identified as a potential restoration site. The area is currently highly impacted and presents an opportunity to remove shoreline armoring and debris and plant native vegetation. The project would improve salmon habitat and provide public access opportunities.
- Hidden Beach provides a shovel ready restoration project, pending access from an adjacent private landowner. The project would remove shoreline armoring and debris including an estimated 725 cubic yards of large rock, 54 cubic yards of treated wood consisting of 26 piles, and 920 linear feet of railroad ties.
- The Keystone Preserve shoreline restoration project would be an opportunity to partner with Whidbey Camano Land Trust. The project would remove shoreline armoring and provide new public access to 3,500 feet of state-owned shoreline.

DNR is appreciative of the funding provided in the Riparian Proviso. DNR accomplished many significant projects as noted in this report. In addition, DNR used the opportunity to hold valuable conversations with stakeholders and partners to identify projects to implement in future biennia. DNR looks forward to more opportunities to continue this important work.

Summaries of Individual Projects

The cumulative benefit of the projects funded by the 2022 State Supplemental Operating Budget are significant. The proviso funds will have contributed towards the:

- Installation of over 13,000 feet of wildlife friendly fence to protect riparian areas and streams,
- Installation of virtual fencing for over 36,000 acres to control 380 cattle on DNR leases,
- Protection of 5,000 feet of stream from cattle using natural barriers,
- Fencing and protection of over 8 acres of wetlands from cattle in DNR leases,
- Installation of 13 cattle troughs,
- Placement of 18 large wood habitat structures in riverine environments,
- Revegetation of over 56 acres of forest, riparian, and shoreline habitat,
- Removal of 485 pilings,
- Removal of 1,585 feet of shoreline armoring,
- Removal of a collapsed float house and shed, and
- Restoration of a former gravel yard.

The following pages contain summaries of the projects including photos and maps, details of work, benefits to salmon habitat, partnerships, and costs.

Barkley Bear Restoration Project, Methow River

Project Summary:

DNR provided \$14,000 of funding to the Methow Salmon Restoration Foundation (MSRF) for the Barkley Bear Restoration Project. MSRF restored and enhanced in-channel, riparian and floodplain habitat along more than 3,000 linear feet of Methow River habitat on and adjacent to DNR's state-owned aquatic lands. In this final phase of restoration, the MSRF removed a concrete head gate, graded 800 feet of bank including the channel inlet, installed large woody material and rocks to mimic original bank contours for bank stabilization, and completed final site restoration (cleanup). These actions were necessary to restore floodplain connection and increase habitat resilience for salmonids.

Cost: \$14,000.

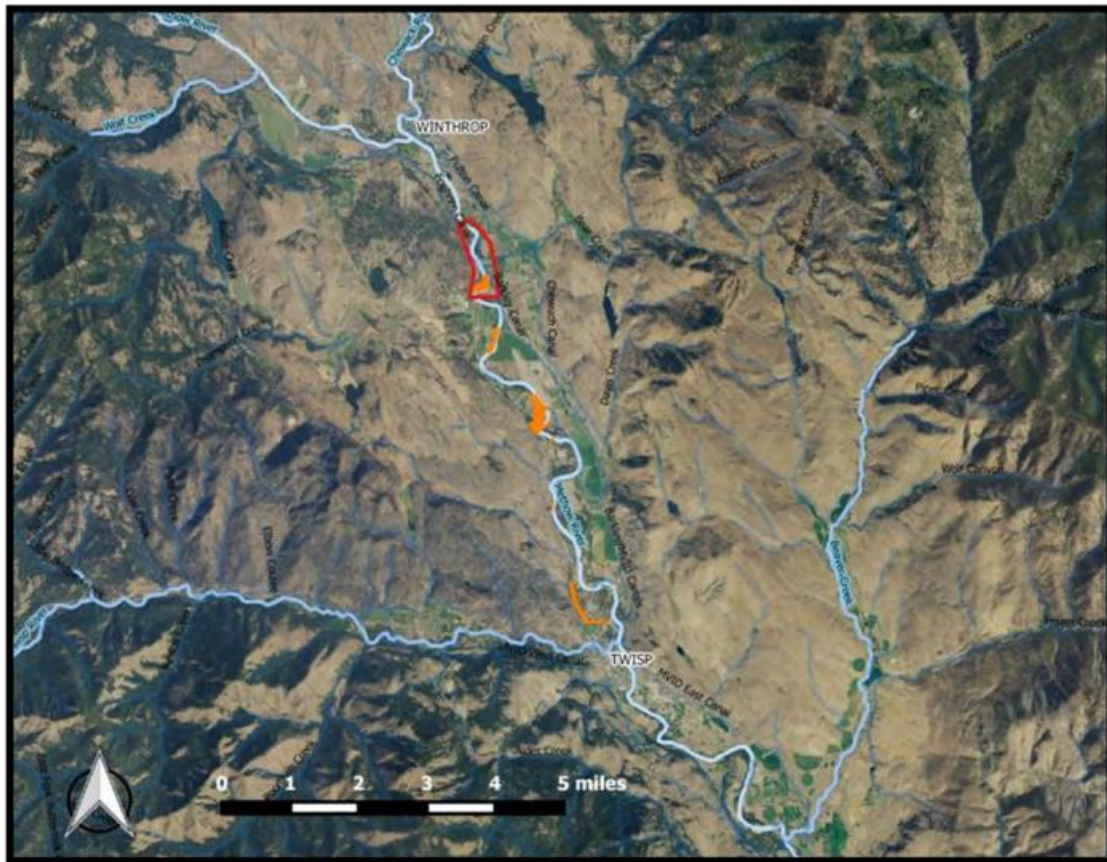


Figure 1. Location of the project between Winthrop and Twisp (Photo from MSRF).



Figure 2. Aerial view of the project site.



Figure 3. Photo of the installed large woody material and rocks.

Fowler Derelict Structure (Float House) Removal

Project Summary:

After the passing of the owners, a float house located on the Columbia River in Longview WA fell into severe disrepair. DNR started work on removal plans in 2022. The plan included removal of the float house, a collapsed shed, and several pilings. After obtaining the required permits and arranging a public works contract for removal, DNR staff received a phone call from a local resident informing DNR that the float house was starting to sink (Figure 2). This change in structural stability of the float house was an immediate and unforeseen change and, if left unaddressed, the float house may have completely collapsed into the Columbia River, posing a threat to human health and safety. In addition, a collapse may have damaged private property, caused damage to anadromous species habitat, and exponentially increased removal costs.

Due to the imminent collapse and sinking of the float house, DNR accelerated the removal timeframe and entered into an emergency contract for removal. Crane removal work was conducted from April 10-12, and divers removed debris from the bedlands (Figures 3-6). On April 13, the barges were unloaded, and debris were hauled to upland disposal sites. By removing the derelict float house, DNR restored the nearshore habitat used by migrating and juvenile salmonids and other anadromous species (Figure 7).

Cost: \$307,500.

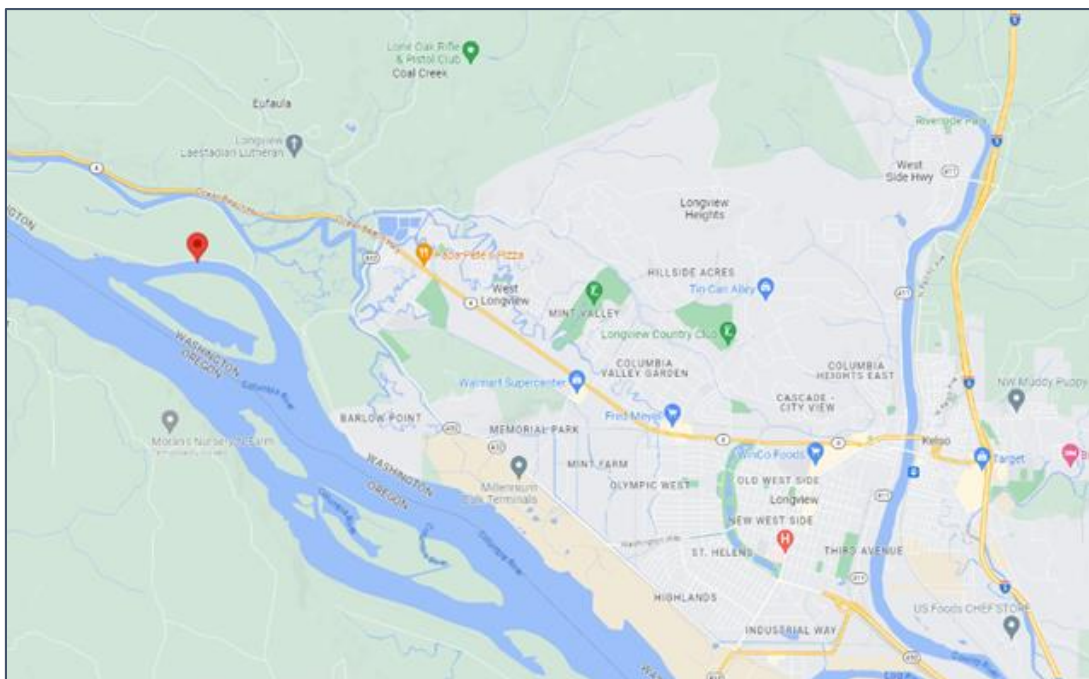


Figure 1. Location of the project east of Longview.



Figure 2. Float house listing into the water 03/29/2023.



Figure 3. Aerial view of Global's crane and barges, 04/10/2023.



Figure 4. Float house structure collapsed in on itself, 04/10/2023.



Figure 5. Removal of wood log floatation by clam shell attachment on crane.



Figure 6. Float house debris in dumpsters on barge, 04/12/2023.



Figure 7. Float house, shed, and pilings removed. Remaining 4 pilings are on private tidelands.

Snohomish River Estuary Piling Removal Project

Project Summary:

In 2020, the Snohomish County Marine Resources Committee (MRC) initiated a comprehensive survey on individual derelict pilings in the Snohomish River Estuary. Pilings were ranked by presence/absence of creosote as well as potential habitat gain from removal. DNR utilized the MRC data to develop a piling removal project focused on the two sites with the highest concentrations of creosote-treated piling within the most critical habitat areas. The project was performed in partnership with the Tulalip Tribes Restoration, Acquisition, and Stewardship Program and took place on both state-owned and Tulalip-owned tidelands.

In early 2023, DNR contracted for the removal of 196 pilings from the mouth of Steamboat Slough and 280 pilings from the Quilceda Creek estuary for a total 476 pilings. The resulting habitat gains will directly benefit the existing salmon runs in Quilceda Creek and contribute significantly to the overall health and recovery of the highly industrialized Snohomish River estuary.

This project contributes directly to actions called out in the broader interagency focus on landscape scale restoration through the Snohomish Watershed Resilience Action Plan.

Cost: \$418,302.



Figure 1. Location of the project south of Marysville.

Yakama Nation “Suspension Reach” Restoration

Project Summary:

DNR partnered with the Yakama Nation on a large restoration project in the Methow River. DNR is providing \$500,000 for the procurement, transport, and installation of 11 large engineered log jams, along with post construction site restoration and planting work. These in-water structures will restore historic instream habitat complexity and create cool water refugia for juvenile and migrating fish. In addition, the restoration work will reduce lateral channel migration and improve the resilience of important infrastructure such as the Tawlks-Foster Suspension Bridge and Community Trail.

Cost: \$500,000.

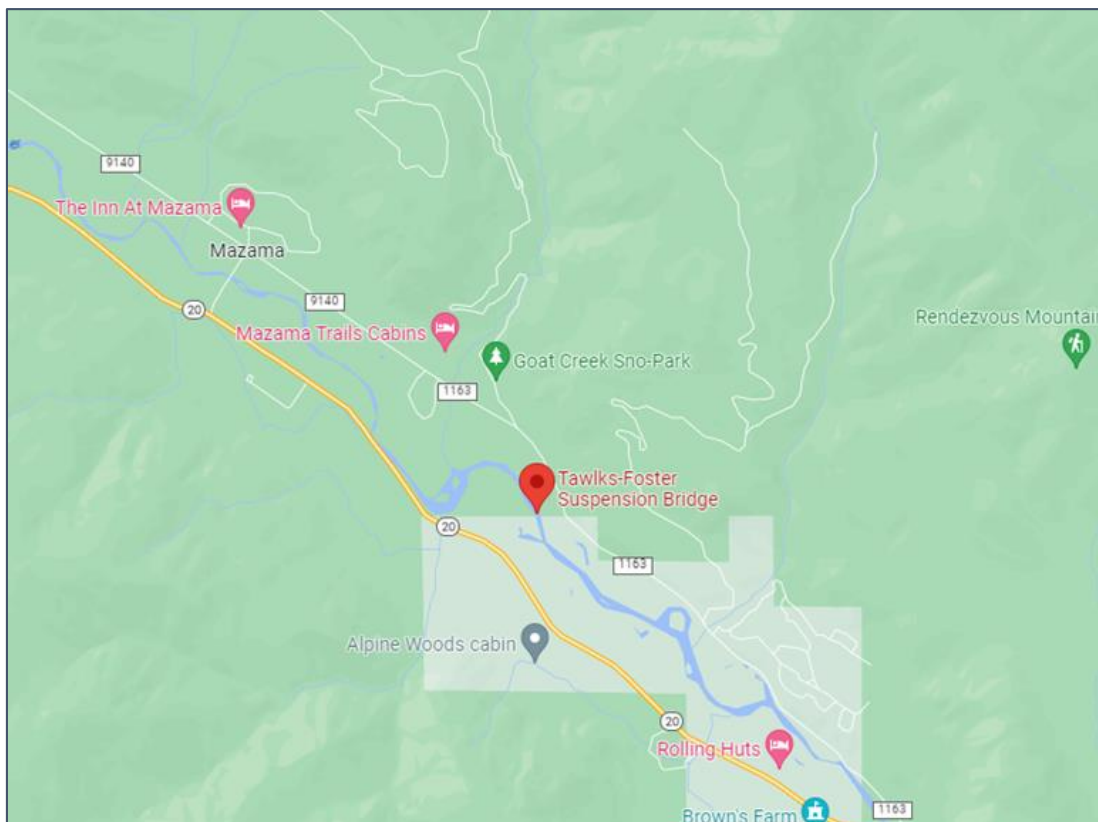


Figure 1. Location of the Tawlks-Foster Suspension Bridge east of Mazama.



Figure 2. Before restoration work.



Figure 3. A large engineered log jam.

McNeil Island – Still Harbor Armor Removal and Shoreline Restoration

Project Summary:

This work included the design and permitting for Phase 2 of the comprehensive restoration of Still Harbor on McNeil Island. This phase includes the removal of 1,245 feet of shoreline armor, relocation of a boat ramp, and the revegetation of 122,000 square feet of marine shoreline and forest. Phase 2 will go to construction in 2024 and has already received funding through an Estuary and Salmon Restoration Program grant. Riparian proviso funding supports the development of Phase 3 permit level designs for the final stage of shoreline restoration in Still Harbor. Phase 3 will result in the removal of the remaining 0.5 miles of coastal road and reestablish the connection of four streams to Puget Sound. Upon its completion in 2025, a total of 1.4 miles of nearshore processes will be restored, providing direct benefit to Chinook and other juvenile salmonids, forage fish spawning, and other fish and wildlife.

This project occurs on Washington Department of Fish and Wildlife (WDFW) uplands and state-owned aquatic tidelands. The project is the continuation of a coordinated effort by DNR and WDFW to return as much of the McNeil Island shoreline to its natural condition as possible. DNR and WDFW have completed four projects to date and have secured funding for two additional fish passage barrier removal and salt marsh restorations at Bodley and Floyds Cove.

Cost: \$675,892.00. Costs funded Phase 3 permit level designs, Phase 2 feasibility study, cultural resource assessment, wetland delineation, final designs, and permits.



Figure 1. Location of phased work within Still Harbor on McNeil Island.

Bird Island Planting

Project Summary:

At the south end of Lake Washington and just offshore in Renton's Gene Coulon Memorial Beach Park, the heavily-visited Bird Island provides habitat to a number of wildlife species, including juvenile Chinook salmon who enter Lake Washington from the Cedar River. DNR has partnered with the City of Renton Community Services Department to enhance the shoreline habitat of Bird Island while also improving public access to it. The second phase of the Bird Island project was completed in December 2017.

Bird Island restoration provided a unique opportunity to improve habitat for migrating juvenile Chinook salmon due to its proximity to the mouth of the Cedar River, and providing shallow sandy shorelines with overhanging vegetation. This project connected existing habitat between the Gene Coulon swim beach and the South Lake Washington Shoreline Restoration Project adjacent to the Boeing property. The end result of this project was improved habitat for salmon, birds and other wildlife that use the island by restoring the shoreline, planting native vegetation, and adding large wood structures. In addition, public access was also facilitated by creating a boardwalk to minimize the impacts to the native vegetation and a new area was created for the public to view the wildlife.

As part of maintaining the restoration site, periodic surveys are done on the success of the plantings. The current project supplements the existing plants and replaces and plants that have died. The planting is coordinated with the Puget SoundCorps crew.

Cost: \$2000.

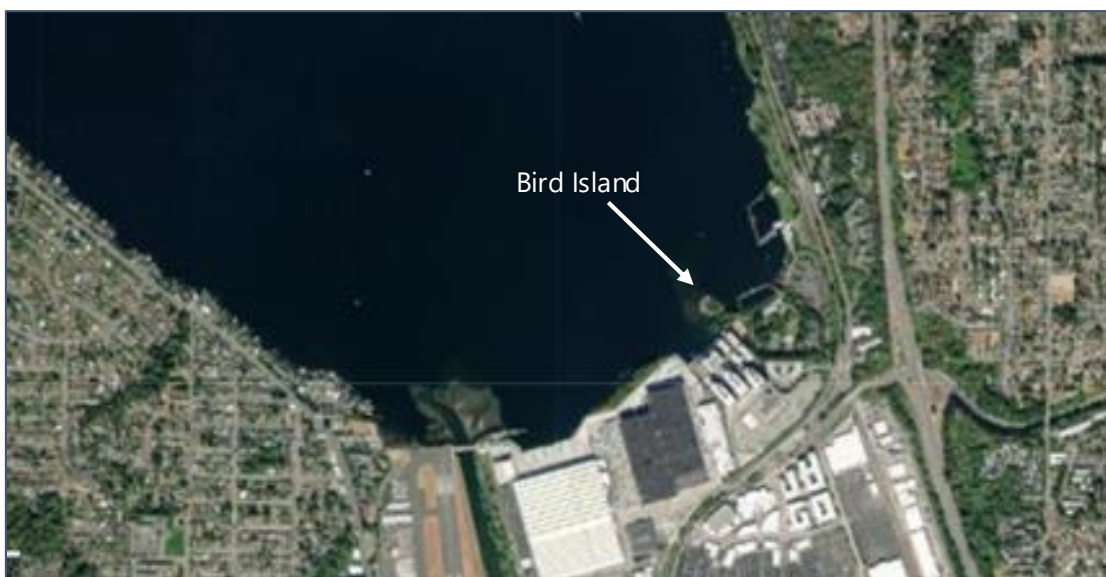


Figure 1. Location of the project at the southern end of Lake Washington.



Figure 2. Aerial view of the restored Bird Island.

Amazon Creek Slash Barriers

Project Summary:

Amazon Creek had several sections that were identified by the Department of Ecology as areas where cattle had been accessing and/or crossing the creek with great disturbance and hoof shear. A DNR corrections crew was hired to go through the identified sections, cutting and stacking downed woody materials. Wood was strategically placed to create a creek-side barrier, deterring cattle from continued use and disturbance of Amazon Creek. Stakeholders include DNR, Department of Corrections, Stevens County Conservation Service, Department of Ecology, and the Confederated Tribes of the Colville Reservation.

Cost: \$2,185.

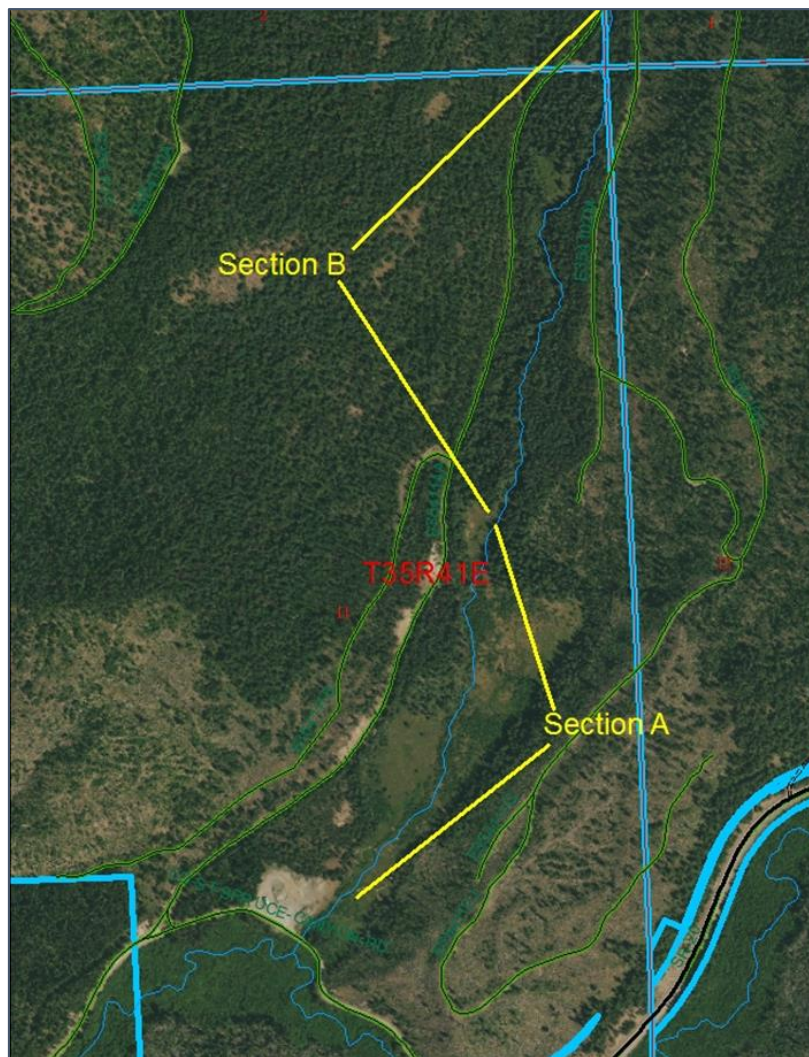


Figure 1. Amazon Creek disturbed sections.



Figure 2. Amazon Creek before wood placement.



Figure 3. Amazon Creek after wood placement.



Figure 4. Amazon Creek before wood placement and Amazon Creek after wood placement.

Lake Kapowsin Shoreline Restoration

Project Summary:

This project is focused on removing invasive species along the Lake Kapowsin Aquatic Reserve shoreline on state-owned property managed by the Department of Fish and Wildlife, adjacent to state-owned aquatic lands managed by DNR. DNR and WDFW have signed a management agreement to support shared work on the site. The shoreline is of key importance to the local community for water access and a trail has been established on an old railroad grade along the shoreline. Above and below this trail, the area was choked with Armenian blackberry, English Hawthorn, and other invasive species.

The Aquatic Reserves program and Friends of Lake Kapowsin have worked on about 2 acres of this to remove blackberry and replant with native species. Future work includes several more acres of blackberry to be treated. The goal of the project is to restore large woody material and tree and shrub shade to the shoreline and associated riparian area, at the same time making it easier to access by removal of thorny invasive species. The area within the lavender perimeter is the invasive species control worksite.

Cost: \$5,000.



Figure 1. Project boundaries on the shore of Lake Kapowsin near the WDFW boat launch.

Beaver Dam Analog Installation Project Capitol State Forest

Project Summary:

Beaver Dam Analogs will be constructed to replace 0.16 acres of wetland area impacted by road construction. The installation of 4 Beaver Dam Analogs (BDAs) will occur in June of 2023 in the Capitol State Forest in Grays Harbor County.

BDAs are hand-built structures designed to mimic the function of natural beaver dams. BDAs can accelerate recovery of incised streams and riparian and wet meadow habitats by reducing water velocities, increasing sediment deposition and aggradation, enhancing floodplain connectivity, raising groundwater tables and increasing habitat complexity. The desired outcome is to initiate restoration of natural processes that self-sustain riparian and wet meadow habitats. (USDA, NRCS Conservation Practice 643).

A minimum of 2 spans of approximately 50 feet each will be constructed on two headwater streams for a total of 4 BDAs.

Cost: \$6,100.

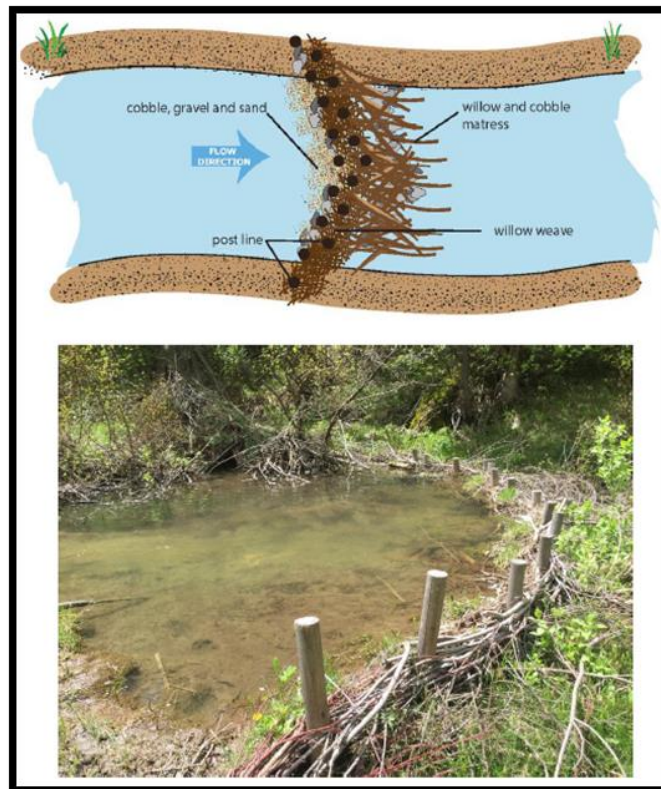


Figure 1. Overview of a BDA and installation picture.

Narcisse Lease Fence

Project Summary:

In 2019, DNR Biologists identified four critical wetlands along tributaries to Mill Creek. All four wetlands are located within a new DNR cattle-grazing lease. To protect those identified wetlands, a DNR corrections crew is installing 13,000 feet of four-strand wildlife friendly fence. The fences aim to exclude the areas from cattle use and subsequent degradation. Stakeholders include DNR, the grazing leaseholder, and Confederated Tribes of the Colville Reservation.

Cost: \$22,000.

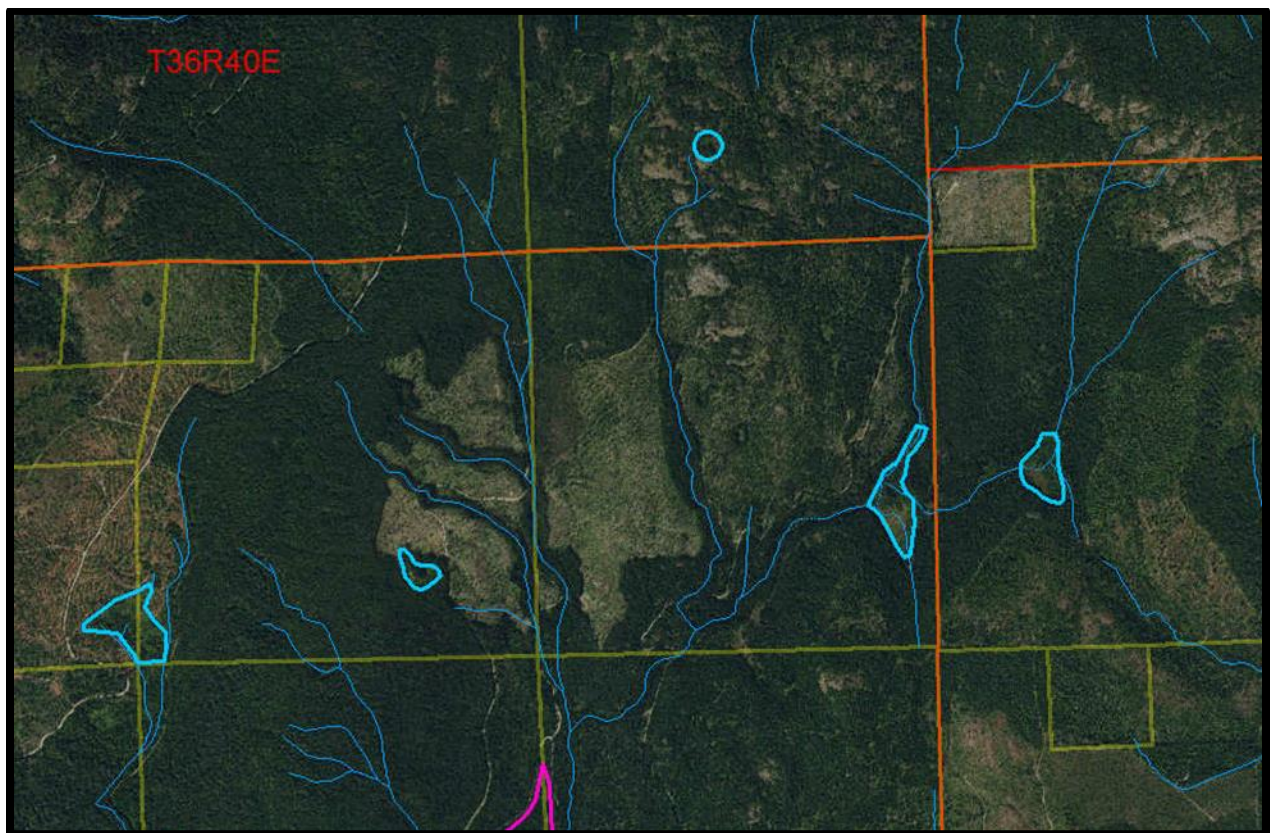


Figure 1. Four wetlands within the Narcisse Lease.

Loomis and Sweat Creek Restoration

Project Summary:

DNR Land Managers identified areas in the Loomis Natural Resource Conservation Area and along a tributary to Chiliwist Creek for fence repair and riparian restoration stemming from the 2021 Chickadee Fire.

The 1.75 miles Chickadee fence was burned and lost in the 2021 Chickadee Fire. With the fence down, cattle are currently able to move out of the grazing lease, and traverse the recently burned riparian area of Chickadee Creek. Hoof shear and slope degradation are among the chief concerns with the cattle traversing the recently burned area.

Another fence line damaged by fire, the Chiliwist fence was identified as needing repairs and complete reconstructs in some sections. The fence once protected Sweat Creek (a tributary to Chiliwist Creek), which flows through a DNR cattle lease. Due to the fire damage to the fence cattle have access to Sweat Creek. Hoof shear and water turbidity are concerns for overall water quality and riparian zone health.

In addition to the fence lines being restored, DNR is installing watering troughs at key points along the creeks to steer cattle away from the riparian areas. A total of 13 troughs has been purchased for installation in areas most frequented by the cattle, to provide a water source outside of the riparian area.

Stakeholders include DNR and the grazing leaseholder.

Cost: \$ 36,487.

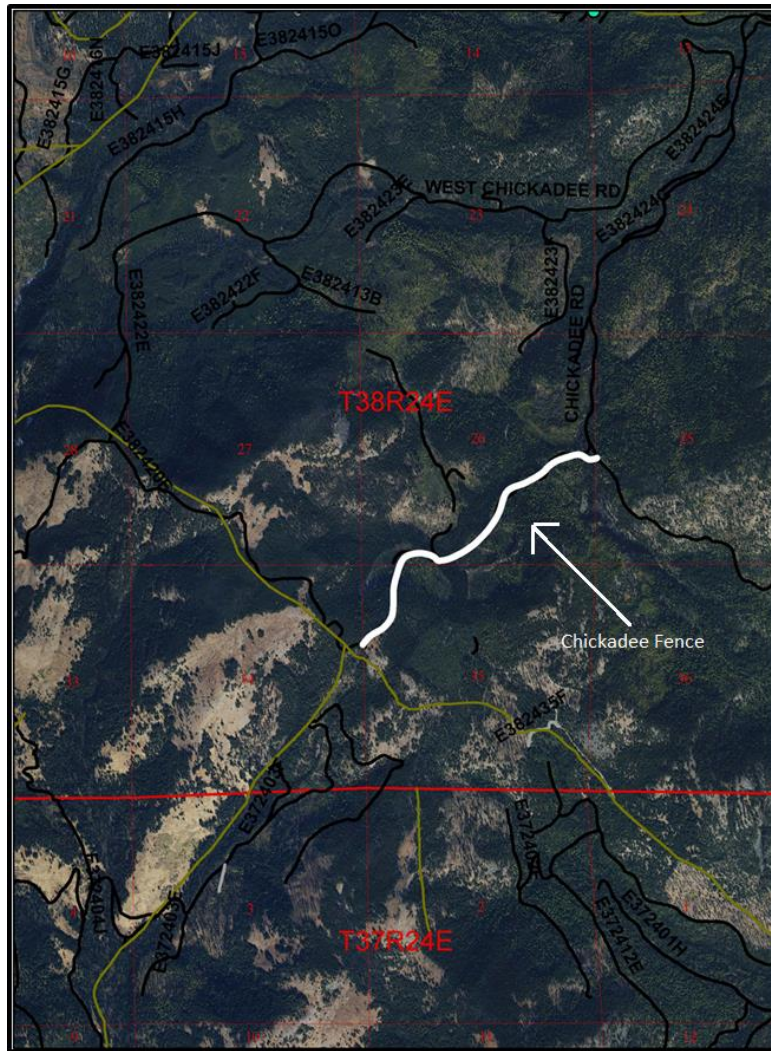


Figure 1. Chickadee fence line.

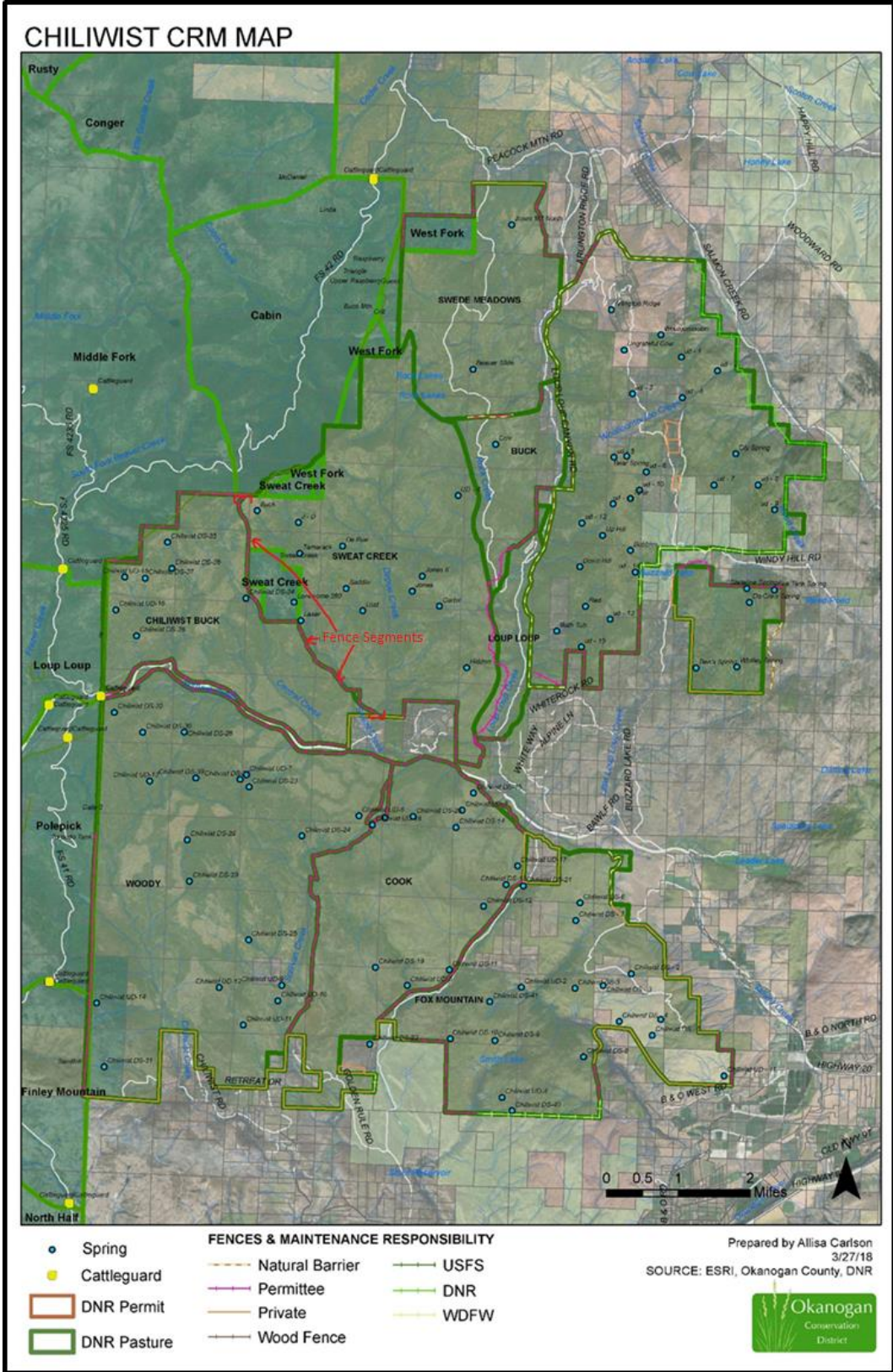


Figure 2. Chiliwist damaged fence segments.

Teanaway Virtual Fencing

Project Summary:

Traditional hard fencing has been a continual issue for both DNR and WDFW in the Teanaway Community Forest. Snow pack, falling trees, and wildlife mean the fence lines in the forest need continual attention and upkeep to keep grazing cattle where they are supposed to be. With Vence Corporation's virtual fencing solution, DNR aims to remedy the issue of fence lines constantly needing to be maintained.

Vence Corporation's virtual fence is an innovative technology designed to create a virtual boundary for livestock management. It utilizes a combination of advanced hardware and software to provide an effective and efficient solution for containing and monitoring livestock without the need for traditional physical fences.

The virtual fence system consists of: 1) GPS-enabled neck collars that are attached to the animals continuously tracking the animals' locations and movements in real-time, and 2) base stations situated throughout the landscape that communicate with the GPS collars by processing the data received and issuing commands to the animals based on predefined settings and parameters.

The virtual fence's software incorporates sophisticated algorithms that analyze the animals' positions, behavior, and predefined rules to determine their proximity to the virtual boundaries. The system allows ranchers or farmers to set up virtual fence boundaries on a digital map, defining areas where the animals are allowed to graze or roam freely.

When an animal approaches the virtual boundary, the control unit triggers a response through the collar. This can be in the form of an audio or vibrational signal, providing a gentle deterrent for the animal to prevent it from crossing the boundary. The animals quickly learn to associate these signals with the virtual fence and usually stay within the designated areas.

The virtual boundaries can be easily adjusted and modified using the software, allowing ranchers and farmers to adapt to changing needs or environmental conditions. The system also provides real-time alerts and notifications to the users, enabling them to monitor the status of their livestock and address any issues promptly.

Moreover, the virtual fence system offers various data insights. It collects and analyzes data on the animals' movement patterns, grazing behavior, and overall health, providing valuable information to optimize livestock management practices. Ranchers can make informed decisions regarding rotational grazing, pasture utilization, and animal health based on the data collected by the virtual fence system.

DNR aims to better control the cattle on the landscape by implementing this system on the Teanaway Community Forest to deter cattle from tributaries to the Teanaway River and their riparian areas. All the hardware has been purchased to deploy the system on the North Fork Teanaway, West Fork Teanaway, and First Creek grazing leases. This will see around 640 cattle collared and controlled in the Teanaway Community Forest.

Implementation of the virtual fencing system will begin next grazing season.

Stakeholders include DNR, WDFW, Kittitas Cattleman's Association, The Confederated Tribes and Bands of the Yakama Nation, and the Teanaway Community Forest Advisory Committee.

Cost: \$154,000.

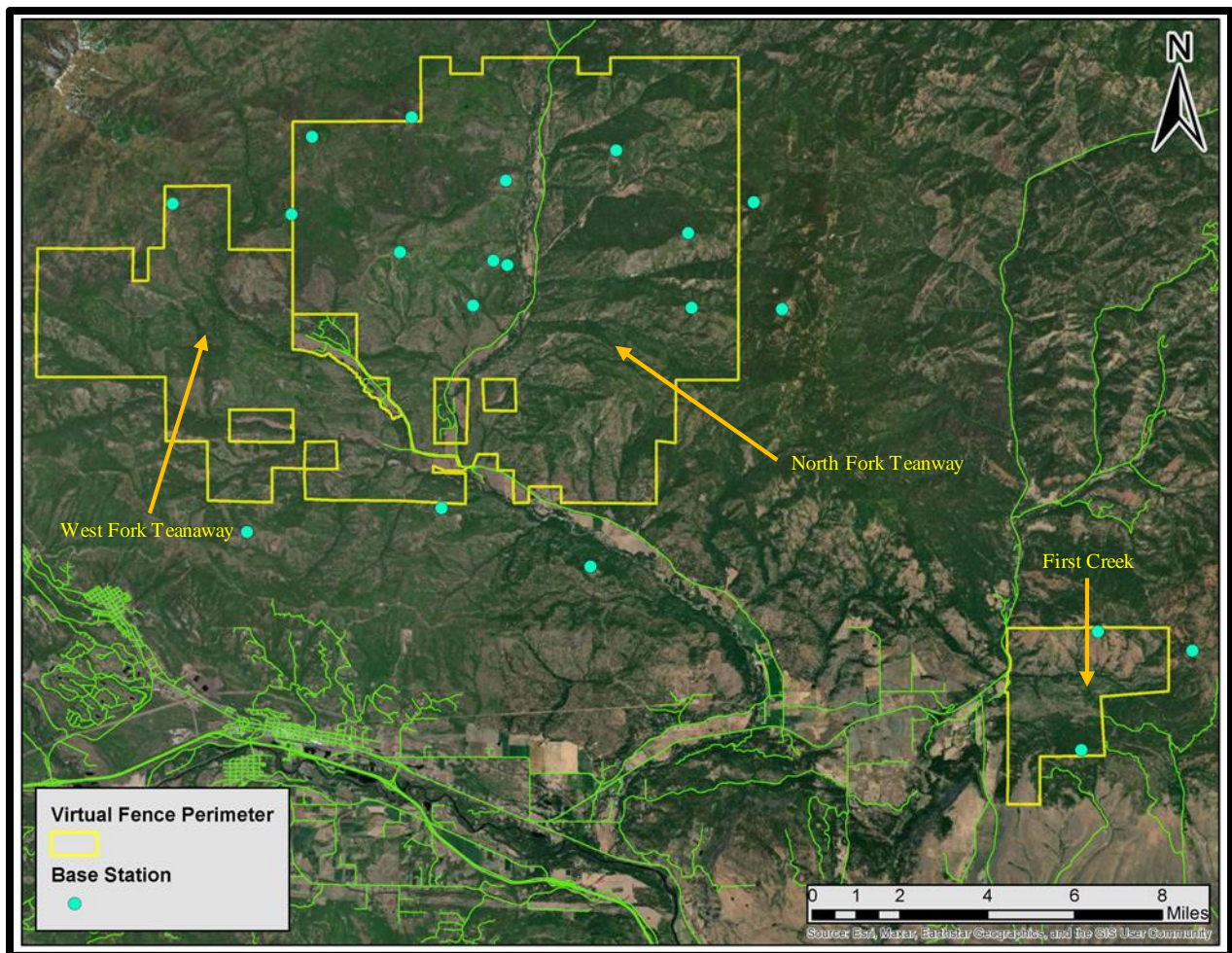


Figure 1. Fence Boundaries and Base Station Sites

McNeil Island – Still Harbor Gravel Yard and Stream Restoration Project

Project Summary:

This project occurred on McNeil Island and is part of a series of restoration activities DNR is taking the lead on. Still Harbor is on the north end of the island and is an important habitat for a variety of marine fish and wildlife. The restoration project restores a former gravel yard, by regrading and planting with native vegetation. The project also removes a road and restores an adjacent stream, that would benefit salmon and other animals.

Restoration of the gravel yard in the southeastern corner of Still Harbor presents a great opportunity to remove debris, restore cross-shore connectivity, input of LWD and organic material and the marine riparian ecotone. Restoration to convert the gravel yard into a native forested vegetation habitat corridor will improve shoreline buffer functions by increasing canopy cover to provide shade for temperature modification as well as contribute toward the recruitment of large woody debris along the shoreline in the long-term. Forest habitats provide shoreline stability and important forage and refuge opportunities for a variety of insect, amphibian, mammal, and bird species.

The project occurs on land owned by Washington Department of Fish and Wildlife and is adjacent to state-owned aquatic tidelands and bedlands. In addition, DNR worked collaboratively with the Nisqually Tribe to conduct the planting of the native vegetation.

Cost: \$190,000 for regrading the former gravel yard, removal of side road, stream restoration, and purchase of native vegetation.



Figure 1. Project area within Still Harbor on McNeil Island.

Lakebay Marina Restoration

Project Summary:

The Lakebay Marina Redevelopment Project restores the 2.45-acre marina property located in Lakebay, Washington on the western side of Mayo Cove in Carr Inlet (Figure 1). The goal for this site is restoration of the shoreline, protection of the aquatic habitat, and public access to state-owned aquatic lands, and marina facilities for recreational users.

The proviso funds restore the riparian function of the adjacent freshwater creek and shoreline in Mayo Cove (Figure 2). Phase 1 of this project removes approximately 165 feet of hard armoring consisting of 234 concrete ecology blocks and 175 feet of armoring made up of 39 creosote-treated piling. Project feasibility, technical surveys, public outreach, conceptual design (including alternatives analysis), and permitting are paid for with this funding proviso. Phase 2 includes the revegetation of the shoreline with native plants.

Restoring the riparian habitat adjacent to the creek will improve salmon habitat and riparian function by restoring natural processes, increasing vegetation, and improving nutrient cycling.

Cost: \$499,030.

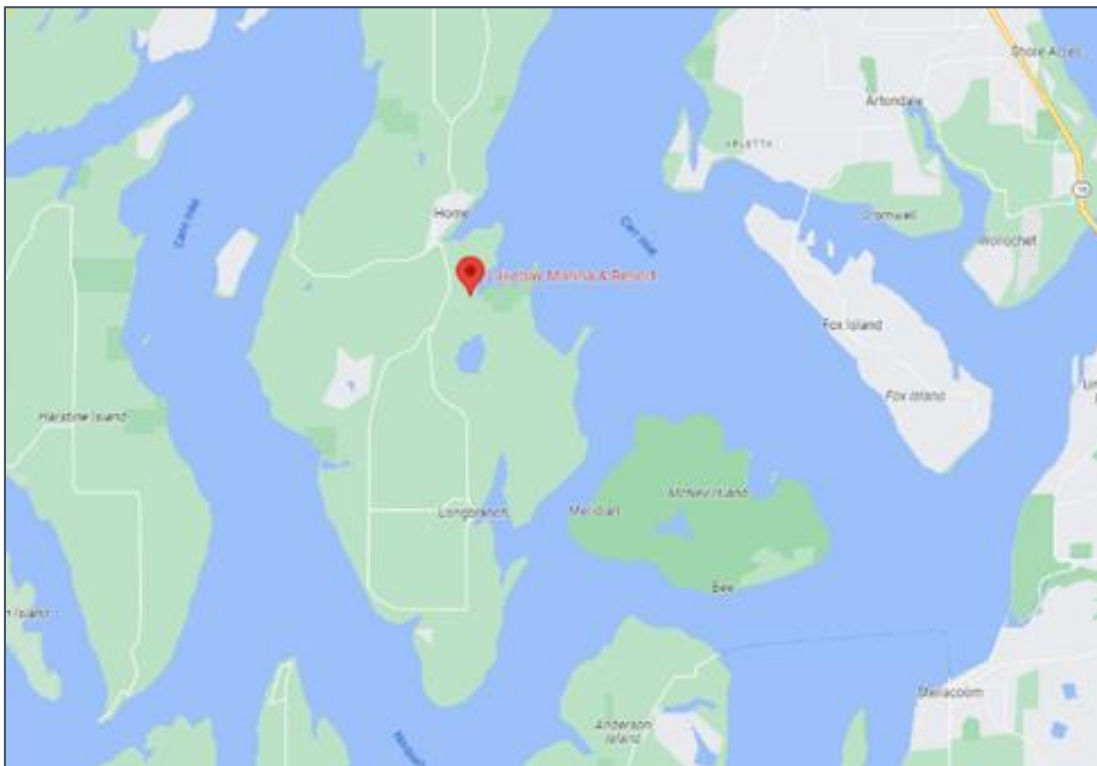


Figure 1. Location of Lakebay Marina on the Key Peninsula.



Figure 2. Aerial view of armoring along Mayo Cove.



Figure 3. Aerial view of armoring along the creek side of the property.