

Biological Site Assessment & Mitigation Plan:
Filippini-Cascadian Falls
Parcel #P30951, Skagit County, WA

June 2024
Revised December 2024

Prepared by:



ATSI

Aqua-Terr Systems, Inc.

Environmental Science, Land Use, & Mitigation

***Making Sustainability Possible:
Since 1982***



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ATSI's ecological staff includes Karla Gallina, Molly Durkee, Jody Wiltfong, and Gianna Pistoresi whose qualifications are as follows (resumes available upon request). We complete relevant workshops and courses to maintain professional certifications and to have a current understanding of the best available science.

We are qualified to produce technical reports, assessments, and mitigation plans, and conduct monitoring for the following:

- Critical Areas (Wetlands, FWHCAs, and FFAs)
- Shorelines
- FEMA Floodplains
- Endangered Species Act Species and Habitat
- Stormwater Pollution Prevention

Our qualifications include the following:

- SWS PCP PWS
 - Karla Gallina #2340
- Society of Ecological Restoration CERP
 - Karla Gallina #161
- Ecology 2023 Updated Version 2 Wetland Rating System for Western WA
 - Jody Wiltfong
- Ecology 2014 Wetland Rating System for Western WA
 - Karla Gallina
 - Molly Durkee
 - Jody Wiltfong
- Ecology Determining the OHWM
 - Karla Gallina
 - Molly Durkee
 - Jody Wiltfong
- WSDOT Biological Assessments
 - Karla Gallina Senior Author
- CESCL
 - Molly Durkee #ECO-3-112982111
 - Jody Wiltfong #CWTA-64546493
- WA Commercial Pesticide Applicator
 - Karla Gallina #100805 with Aquatic Endorsement

Karla Gallina, PWS, CERP, is the chief scientist/owner at ATSI. Mrs. Gallina has a BS from Paul Smith's College (natural resources/environmental science) and has been working in this field since 2002.

Molly Durkee, CESCL, is a staff ecologist II/project manager at ATSI. Mrs. Durkee has a BS from WWU (College of the Environment environmental science with an emphasis in environmental toxicology) and has been working in this field since 2018.

Jody Wiltfong, CESCL, is a staff ecologist I at ATSI. Mr. Wiltfong has a BS from Skagit Valley College (environmental conservation with an emphasis on aquatic and terrestrial relations) and has been working in this field since 2022.

Gianna Pistoresi is an assistant ecologist at ATSI. Ms. Pistoresi has a BS from WWU (College of the Environment environmental science) and has been working in this field since 2023.

Methods

Biological critical areas and shorelines are identified utilizing the methods set forth in local jurisdiction code, i.e. SCC Chapter 14.24 Critical Areas Ordinance (Skagit County 16 March 2018).

Preliminary Review

Preliminary data review of public resource documents is performed to provide initial information on the potential vegetation, soil, hydrology, and biological critical areas located on the property and within the review area. These resources include, but are not limited to:

- Google Earth aerial photographs (Google Earth)
- USFWS NWI wetlands map (USFWS 1 May 2018)
- WDFW SalmonScape (WDFW SalmonScape)
- United States Department of Agriculture NRCS WSS soil map (NRCS WSS)
- WDFW PHS Mapper (WDFW PHS)
- WDNR Data Explorer – Rare Plant and Ecosystem Locations (WDNR)
- Ecology Water Quality Atlas (Ecology)
- FEMA National Flood Hazard Layer Viewer (FEMA December 2021)
- USFWS IPAC (USFWS)
- Skagit County iMap (Skagit County)

Wetlands

Delineation

Data is collected and typical and atypical wetlands delineated utilizing the methods set forth in the Corps Wetland Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) as accepted by Ecology (Corps May 2010). The geographic extent of critical areas offsite are approximated based on aerial photography, LiDAR topography, and/or obtained from local jurisdiction critical area public records (see attached Wetland Determination Data Forms).

Classification

Wetlands are classified using the methodology provided in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin 1979). Wetlands are also classified by A Hydrogeomorphic Classification for Wetlands (Brinson 1993).

Categorization/Functional Assessment

Wetlands are categorized and functions assessed using the 2014 update for the WA State Wetland Rating System for Western Washington (Hruby 2014). This system considers the hydrogeomorphic class of the wetland (Brinson 1993), sensitivity to disturbance, significance of the wetland, its degree of rarity, replacement potential, and functions the wetland provides. Categorizing information is recorded on wetland rating forms (see attached Wetland Rating Forms).

Land Alteration

As applicable areas of vegetation clearing and fill and grade are approximated and determined using historic Google Earth aerial images (Google Earth). The volume of wetland fill is approximated based on averaged nonnative fill measurements gathered onsite and LiDAR topography generated using QGIS and 2017 DTM data (WDNR LiDAR Portal).

Mapping

Critical area flag locations were mapped by Pacific Surveying & Engineering, INC and provided to ATSI.

Precipitation Data & Analysis

Precipitation data is generated using Corps APT software. Single point project location decimal degree latitude and longitude and date of site visit are entered into APT. APT generates wetter than normal, normal, and/or drier than normal precipitation conditions using NOAA daily global historical climatology network antecedent 30 year normal range and 3 month precipitation data from the date of the site visit, from weather stations within a 30 mi radius of input location. Weather station data is weighted based on elevation and distance from input location (Corps 7 February 2022).

Introduction

ATSI was retained by the client to produce a biological site assessment, here and after referred to as BSA, for an improvement project. The property is approximately 20 ac and located at parcel #P30951 within Skagit County, WA 98237 (Figure 1). The project site is located on the south west corner of the property. The construction consists of a gravel round about road. The north portion of the round about will consist of retaining a portion of an existing gravel access road. The rest of the existing gravel road will be removed and restored. The round about will include eight parking spaces and a pad for a porta potty on the south portion (see attached Site Plan; Figures 2A and 2B). ATSI staff Molly Harding and Jody Wiltfong performed site inspections of the property on 22 August 2023, 24 August 2023, and 13 September 2023 with review and oversight by Karla Gallina (Skagit County 16 March 2018).

Landscape Setting & Land Use

The property is owned by Kim and Brenan Filippini. The property is in a portion of Section 13, Township 34 north, Range 09 east, WM within WRIA 4 (Ecology WRIA). The property is zoned Rural Reserve (Skagit County Map Gallery). In the general vicinity the property is surrounded by lots zoned Rural Reserve and Secondary Forest. The property is bound by land owned by the WDNR to the north, land owned by logging companies to the east (Sierra Pacific Land and Timber Co.), single family residence on forested acreage to the south, and SR 530 to the west. The onsite forested area extends in all directions onto the neighboring parcels (Skagit County Map Gallery; Figures 1, 2A, and 2B).

There is a historic gravel access road on the central portion of the property from SR 530 extending approximately three fourths of the way across the property to the east. The topography of the property slopes downward from the east to the west. The highest point is the east border of the property. The entire property is forested (Figures 2A and 2B).

Vegetation

Forested Upland

The forested upland tree stratum was comprised of Western Red Cedar (*Thuja plicata*; FAC), Red Alder (*Alnus rubra*; FAC), Bigleaf Maple (*Acer macrophyllum*; FACU), Black Cottonwood (*Populus balsamifera*; FAC), and Western Hemlock (*Tsuga heterophylla*; FACU). The shrub stratum was comprised of Salmonberry (*Rubus spectabilis*; FAC), Osoberry (*Oemleria cerasiformis*; FACU), Common Snowberry (*Symphoricarpos albus*; FACU), Vine Maple (*Acer circinatum*; FAC), and Thimbleberry (*Rubus parviflorus*; FACU). The herbaceous stratum was comprised of Stinging Nettle (*Urtica dioica*; FAC), Sword Fern (*Polystichum munitum*; FACU), Piggyback Plant (*Tolmiea menziesii*; FAC), Licorice Fern (*Polypodium glycyrrhiza*; UPL), Lady Fern (*Athyrium cyclosorum*; FAC), Dewey's Sedge (*Carex deweyana*; FAC), and Herb Robert (*Geranium robertianum*; FACU) (Figures 2A and 2B).

Scrub Shrub Wetland

The scrub shrub wetland tree stratum was comprised of Vine Maple (*Acer circinatum*; FAC), Red Alder, Black Cottonwood, and Red Osier Dogwood (*Cornus alba*; FACW). The shrub/sapling stratum was comprised of Black Twinberry (*Lonicera involucrata*; FACW),

and Salmonberry. The herbaceous stratum was comprised of Slough Sedge (*Carex obnupta*; OBL), Dewey's Sedge, Piggyback Plant, Lady Fern, and Reed Canary Grass (*Phalaris arundinacea*; FACW) (Figures 2A and 2B).

Emergent Wetland

The emergent wetland tree stratum was comprised of Red Alder, Black Cottonwood, and Red Osier Dogwood. The shrub/sapling stratum was comprised of Black Cottonwood, Salmonberry, Red Osier Dogwood, and Vine Maple. The herbaceous stratum was comprised of Slough Sedge, Reed Canary Grass, European Burr-Reed (*Sparganium emersum*; OBL), Lesser Bladder Sedge (*Carex vesicaria*; OBL), Stinging Nettle, Lady Fern, Bitter Dock (*Rumex obtusifolius*; FAC), Field Mouse-Ear Chickweed (*Cerastium arvense*; FACU), and Lamp Rush (*Juncus effusus*; FACW).

Land Alterations

Per Skagit County historical aerial images dating back to 1937 and Google Earth historical images to 1998, the following description of land alterations over time generally includes building removal/construction and logging on neighboring parcels (Figures 2A and 2B; Skagit County iMap and Google Earth).

- 1998** Parcel to the east logged
- 1998-2001** Vegetation and tree clearing on parcel to the north and driveway and building constructed. More logging on parcel to the east.
- 2013-2016** Neighboring parcel to the north removed building and constructed a new one just to the south of the previous building.

Critical Areas & Buffers, & Floodplains

The property and/or review area pertain(s) to critical areas and buffers, shorelines, and floodplains as follows (Figures 2A and 2B):

- Critical Area-Wetlands:
 - ATSI delineated the onsite portion of Wetland A, a 70,826 sf Category III PEM1E depressional closed on the south east portion of the property. With a habitat score of 8, Wetland A has Skagit County regulated 150 ft buffer.
 - ATSI delineated Wetland B, a 1,314 sf Category IV PEM1Bs slope on the east portion of the property. With a habitat score of 6, Wetland B has a Skagit County regulated buffer of 25 ft.
 - ATSI delineated Wetland C, a 742 sf Category IV PSS6B depressional outflow on the north east portion of the property. With a habitat score of 6, Wetland C has a Skagit County regulated buffer of 25 ft.
 - ATSI delineated Wetland D, a 2,132 sf Category III R2EM2 riverine flow-through on the central portion of the property. With a habitat score of 6, Wetland D has a Skagit County regulated buffer of 75 ft.
 - ATSI delineated Wetland E, a 5,565 sf Category IV PSS2E riverine flow-through/depressional outflow on the north west portion of the property. With a habitat score of 6, Wetland E has a Skagit County regulated buffer of 25 ft

- ATSI delineated Wetland F, a 3,733 sf Category III PSS6E depressional closed on the west portion of the property. With a habitat score of 5, Wetland F has a Skagit County regulated buffer of 75 ft.
- The USFWS NWI maps two riverine habitats on the property and within the review area (USFWS 1 May 2018; Figure 3):
 - R5UBH on the north portion of the property and the review area continuing northwest.
 - R4SBC on the central portion of the property.
- The WDFW PHS maps (WDFW PHS):
 - Hilt Creek.
- Critical Area-HCAs:
 - ATSI determined the onsite and southern portion of the OHWM for Hilt Creek located on the north portion of the property continuing northeast and northwest into the review area. The WDNR water type is F and has a Skagit County regulated buffer of 150 ft.
 - The USFWS IPaC maps the following threatened, endangered, PSAT, and candidate species within the property/review area (USFWS IPaC):
 - Endangered: Gray Wolf (*Canis lupus*)
 - Threatened: North American Wolverine (*Gulo gulo luscus*), Marbled Murrelet (*Brachyramphus marmoratus*) and its critical habitat, Northern Spotted Owl (*Strix occidentalis caurina*), Yellow Billed Cuckoo (*Coccyzus americanus*) and its critical habitat, and Bull Trout (*Salvelinus confluentus*) and its critical habitat.
 - PSAT: Dolly Varden (*Salvelinus malma*) and its critical habitat.
 - Candidate: Monarch Butterfly (*Danaus Plexippus*)
 - ATSI did not observe these species. The property and/or the review area contains habitat for North American Wolverine, Northern Spotted Owl, Gray Wolf, and Yellow Billed Cuckoo. The property and/or the review area does not contain critical habitat for any of the above listed species.
 - The WDFW PHS maps (WDFW PHS):
 - Occurrence of: Resident Coastal Cutthroat (*Oncorhynchus clarki*), Winter and Summer Steelhead (*Oncorhynchus mykiss*), Coho Salmon (*Oncorhynchus kisutch*), Dolly Varden/Bull Trout (*Salvelinus malma*/*S. confluentus*), Winter and Summer Steelhead (*Oncorhynchus mykiss*), and Pink Salmon (*Oncorhynchus gorbuscha*) within Hilt Creek, and Gray Wolf (*Canis lupus*), Northern Spotted Owl (*Strix occidentalis*), and Wolverine (*Gulo gulo*) within the entire property and continuing north south and east.
 - Breeding area for: Fall Chum (*Oncorhynchus keta*), Coho Salmon (*Oncorhynchus kisutch*), and Harlequin Duck (*Histrionicus histrionicus*) within Hilt Creek.
 - Regular concentrations of: Elk (*Cervus elaphus*) within the south west corner of the property continuing south west off site.
 - ATSI did not observe these species. The property and/or the review area contains habitat for North American Wolverine,

Northern Spotted Owl, Gray Wolf, Residential Coastal Cutthroat, Steelhead, Coho, Pink Salmon, and Elk.

- The WDFW SalmonScape maps a perennial stream within the north portion of the property and continuing into the north portions of the review area continuing west with the following distribution type and fish (WDFW SalmonScape):
 - Documented: Chum Salmon (*Oncorhynchus keta*) Fall, Steelhead Trout (*O. mykiss*) Summer/Winter, Coho Salmon (*O. kisutch*), Residential Coastal Cutthroat (*O. clarki*), Pink Salmon (*Oncorhynchus gorbuscha*) Odd Year
 - Gradient Accessible: Chinook Salmon (*O. tshawytscha*) Spring/Summer
 - Presumed: Dolly Varden/Bull Trout (*Salvelinus malma*/*S. confluentus*)
 - ATSI did not observe these species, however habitat for Chum, Steelhead, Coho, Residential Coastal Cutthroat, and Pink Salmon were observed.
- The FEMA 100 year floodplain, Zone A6, is mapped within the west portion of the property and review continuing west (FEMA 3 January 1985).
- The south west portion of the review area is mapped as “Floodway” (Skagit County November 2017).

Additional Information

NRCS WSS Soils

Per the NRCS WSS soils map, two units within the property and/or review area are mapped: 4—Andic Xerochrepts, warm-Rock outcrop complex, 65 to 90 percent slopes and 88—Larush silt loam. The NRCS adapted descriptions for the soil units are listed below (NRCS WSS; Figure 4).

Map Unit: 4—Andic Xerochrepts, warm-Rock outcrop complex, 65 to 90 percent slopes
Component: Andic Xerochrepts (65%)

The Andic Xerochrepts component makes up 65 percent of the map unit. Slopes are 65 to 90 percent. This component is on sides of canyons, sides valleys, mountains. The parent material consists of colluvium from volcanic ash, glacial drift, and phyllite, argillite, or conglomerate. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Minor Component: Rock outcrop (25%)

Minor Component: Vanzandt (3%)

Minor Component: Tokul (3%)

Minor Component: Squires (2%)

Minor Component: Heisler (2%)

Map Unit: 88—Larush silt loam

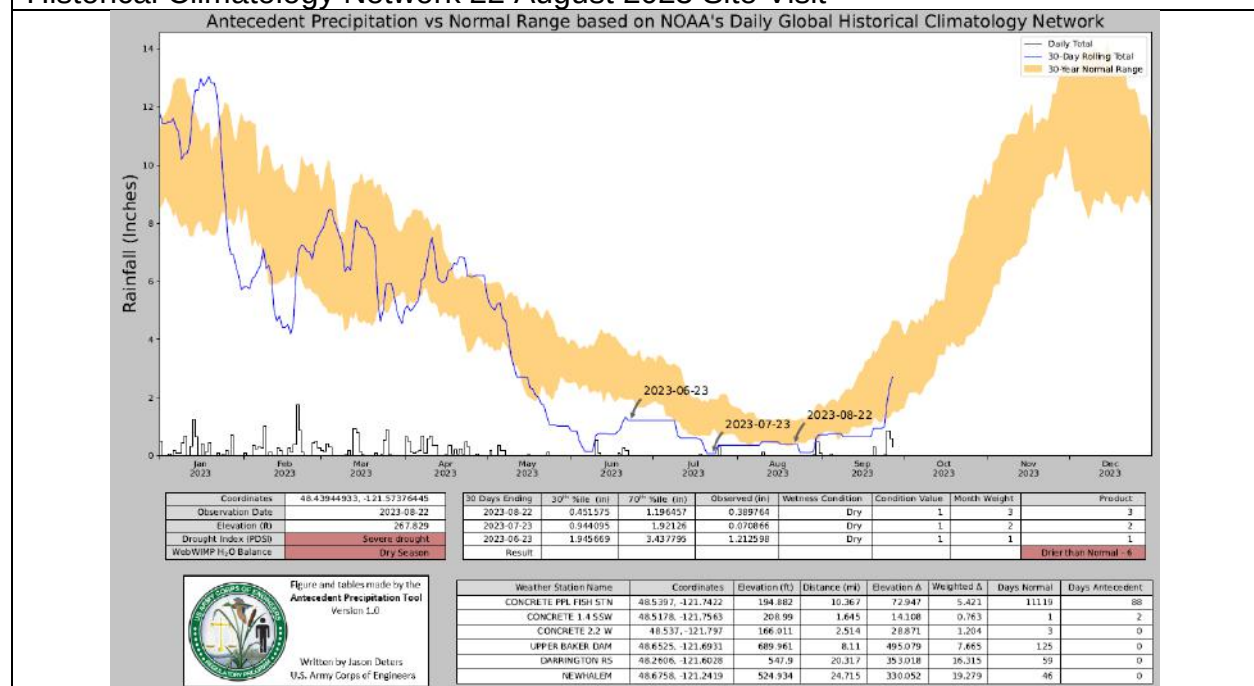
Component: Larush (100%)

The Larush component makes up 100 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains, terraces, river valleys. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 6 percent. This component is in the F002XA005WA Puget Lowlands Moist Forest ecological site. Nonirrigated land capability classification is 3w. Irrigated land capability classification is 3w. This soil does not meet hydric criteria

Precipitation Data & Analysis

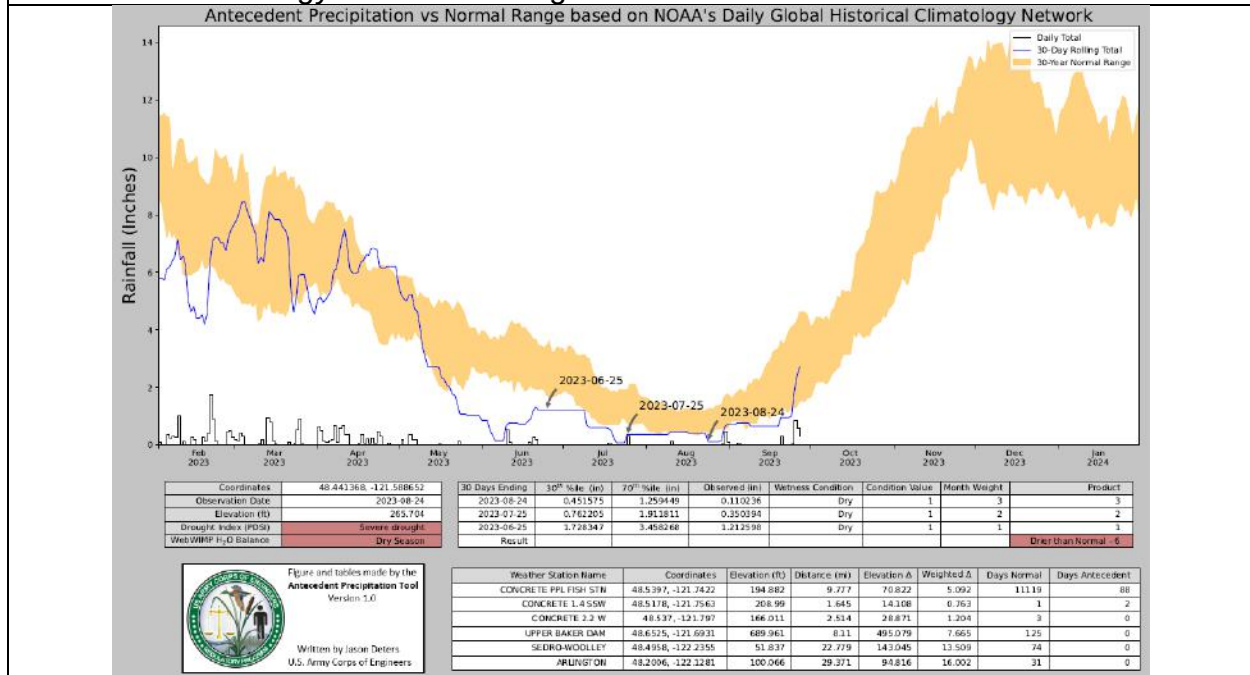
Per the APT, the conditions at the time of the 22 August 2023 site visit were drier than normal (NOAA Reginal Climate Center AgACIS for Skagit County; Table 1).

Table 1. Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network 22 August 2023 Site Visit



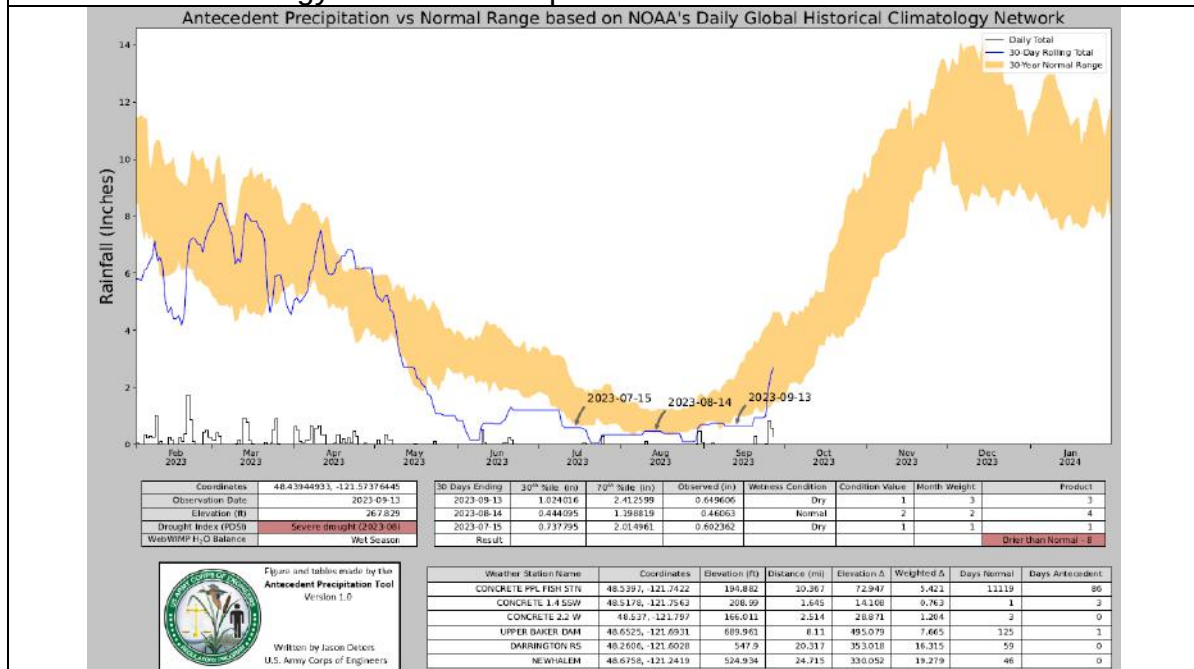
Per the APT, the conditions at the time of the 24 August 2023 site visit were drier than normal (NOAA Reginal Climate Center AgACIS for Skagit County; Table 2).

Table 2. Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network 24 August 2023 Site Visit



Per the APT, the conditions at the time of the 13 September 2023 site visit were normal (NOAA Reginal Climate Center AgACIS for Skagit County; Table 3).

Table 3. Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network 13 September 2023 Site Visit



Regulations

All critical areas and buffers, shorelines, and/or floodplains located on the property and/or within the review area are regulated by Skagit County, Ecology, WDFW, and/or Corps. Future proposed project impacts to critical areas and buffers, shorelines, and/or floodplains must be developed in association with said jurisdiction requirements per law.

Mitigation Plan

Project

The project site is located on the southwest corner of the property. The project consists of an access apron, gravel circular driveway, eight parking spaces, and a pad for a porta potty. The north portion of the circular driveway will consist of retaining a portion of the existing gravel access road (see attached Site Plan; Figures 2A and 2B).

No trails are proposed as part of this plan; however, it is recommended that any future pedestrian trails be carefully planned and constructed to minimize impact. To prevent disturbance to critical areas and buffers, the trails must be designed and located in a manner that avoids any decrease in wetland, riparian, stream, or buffer functions and values. Additionally, the trails should not inhibit or prevent the recovery of the buffer to its pre-altered condition or function and must meet the requirements of SCC 14.24.240(6)(b) and 14.24.540(5)(d & e) (Skagit County 16 March 2018).

Allowed Uses

Per SCC 14.24.240(6), roads are permitted within wetland buffers. The proposed access is to be installed through Wetland F's buffer, a Category III wetland. The proposed access from SR 530 is to be installed further south than the existing access road, therefore reducing adverse impacts to Wetland F. There are no practical alternative routes that would effectively facilitate the proposed development, as it is designed as far south as possible while adhering to setbacks, avoiding tree impacts, meeting highway sight distance requirements, and utilizing as much of the existing access road as possible. The proposed stormwater management plan has been developed to prevent any significant impacts to surface water and groundwater (Skagit County 16 March 2018; see attached Site Plan).

Impacts, Restoration, & Mitigation

The proposed project will result in 4,645 sf of direct permanent buffer impacts compensated for with 1,334 sf of buffer restoration mitigation, and 6,734 sf of buffer enhancement mitigation as follows in Table 4. Restoration mitigation will include removal of gravel, decompaction of surface, soil amendment as needed, and tree and shrub planting at a 1:1 ratio. Enhancement mitigation will include invasive/nonnative species management, mainly Blackberry removal, followed by tree and shrub planting at a 2:1 ratio (Table 4; Figures 5 and 6).

Table 4. Proposed Buffer Impacts & Mitigation (Restoration & Enhancement)						
Impact Area Name	Impact Area (sf)	Impact Type	Ratio	Compensation Name	Compensation Type	Compensation Area (sf)
IA1	3,311	Direct Permanent	2:1*	MA1	Enhancement	6,734
IA2	1,334	Direct Permanent	1:1	RA1	Restoration	1,334
Total	4,645				Total	8,068
*=2:1 ratio given existing forested conditions.						

Buffer Restoration

The proposed restoration of a portion of the existing historic road consists of the removal of approximately 1,334 sf/49 cubic yards of gravel; decompaction of the remaining surface soil; amending as needed to 12 inches topsoil; and revegetating the area with trees and shrubs. Gravel shall be reused in association with the proposed project or disposed of at an official disposal facility (Figures 2A, 2B, 5, and 6).

Buffer Enhancement

The wetland buffer between the impact area and Wetland F was initially considered for enhancement. However, it was found to be densely vegetated with limited potential for further functional improvement. As a result, no significant functional gains were expected from enhancing this area, and therefore this area is not proposed for enhancement.

Wetland F itself was also assessed as a potential enhancement area. However, Wetland F currently exhibits a limited vegetated state, which poses a risk for ecological succession and enhancement efforts as well as a concern that such efforts may not lead to desired improvements. Given these challenges, Wetland F was not proposed as a suitable site for enhancement.

It was instead concluded that a portion of the buffer area west of Wetland E offers the greatest potential for achieving functional gains through enhancement. This location allows for improved ecological functions by supporting more biodiversity, and provides for more predictable succession and habitat development. By focusing on this area, the proposed enhancement would contribute ecological benefits and improve the overall buffer functional integrity of the surrounding wetlands and stream ecosystems.

Buffer No Net Loss

A buffer no net loss analysis was performed on the proposed impact, restoration, and mitigation areas. Per said analysis in Table 5 below, a net gain of buffer functions is projected (Table 5; Figures 2A, 2B, 5, and 6).

Table 5. Weighted Qualitative Buffer Function & No Net Loss Analysis						
Buffer Functions	Existing Buffer			Proposed Buffer		
	Direct Impact Area (sf)	Existing Impact Area (sf)	Enhancement Area (sf)	Direct Impact Area (sf)	Existing Impact Area (sf)	Enhancement Area (sf)
	3,311	1,334	6,734	3,311	1,334	6,734
Sediment Removal	1	1	2	1	3	3
Excess Nutrient/Pollutant Removal	1	1	2	0	2	3
Flood Flow Alteration/Storage	1	1	2	0	2	3
Native Vegetation Diversity	0	0	1	0	3	3
Disturbance Screening	0	0	3	0	3	3
Water Temperature Control	0	0	2	0	2	3
Habitat Connectivity	0	0	3	0	3	3
Woody Debris	0	0	1	0	3	3
Amphibian Habitat	0	0	2	0	2	2
Bird Habitat	0	0	3	0	3	3
Mammal Habitat	0	0	0	0	3	3
Average Value	0.27	0.27	1.91	0.09	2.64	2.91
Combined Score	0.82			1.88		
Net Change of Function	Score change of:1.1					
Analysis	Change is positive: A net functional gain is predicted.					

Table 5 No Net Loss Analysis adopted from ATSI's Buffer Rating for No Net Loss (ATSI January 2021).

Mitigation Sequencing

Mitigation sequencing steps were taken to avoid and minimize project-related impacts to critical areas and buffers to the maximum extent practicable.

The project site is located within the FEMA 100-year floodplain, Zone A6. Due to the remainder of the property being almost entirely encumbered by critical areas and their buffers, there is no opportunity to build outside the FEMA floodplain (Figures 5 and 6). Impacts in this regard were avoided and minimized by constructing the proposed access from SR 530 farther south than the existing access, increasing the distance between the access portion of the road and Wetland F therefore reducing the adverse effects from traffic and stormwater runoff to Wetland F and its buffer.

Regarding the access road, taking no action to construct an access road is not a viable option, as it would significantly reduce the ease of use for the recreational area by hindering access to the off-street parking at a location where parking on the state road itself is unsafe. Therefore, the planned development proposes that unavoidable direct

permanent buffer impacts resulting from access road construction be compensated for with onsite buffer enhancement.

The portions of the existing access road associated with the proposed and located within the buffer are proposed to be removed and the land restored to its pre-disturbance conditions.

Project-related minimization measures include the following:

- Site construction shall occur on upland areas and away from wetlands.
- Heavy and site-disturbing construction activity shall be scheduled for the dry season to limit chances of water quality issues.
- The edge of the construction areas will feature stormwater protection measures such as straw wattles, silt fencing, and/or mulch berms.
- Straw wattles shall be used to prevent erosion from occurring throughout the construction phases.
- Hay or seeding shall be applied to exposed soils to prevent sedimentation throughout the construction phases.
- All buffers impacted by unavoidable temporary disturbances during construction shall be restored to their pre-disturbance conditions after construction is complete.

Mitigation Implementation

The total restoration area shall be 1,334 sf and the total enhancement area shall be approximately 6,734 sf (Table 4; Figure 6).

The restoration and enhancement installation will proceed in this approximate sequence:

1. Flag buffer restoration and enhancement boundaries.
2. Confirm completion of permitting for work to begin.
3. Establish staging and storage areas, place erosion control BMPs, and mobilize equipment.
4. Manage invasive/nonnative species.
5. Remove gravel and stage outside of critical areas or dispose of at an official disposal facility.
6. Install native trees and shrubs (target early spring) in restoration and enhancement areas. Identify trees and shrubs with colorful flagging attached on branches, not central leaders, and install blue tubes on trees and shrubs to limit predation, maintenance damage, and for ease of identification during monitoring.
7. Apply mulch collars for installed trees and shrubs.
8. Install split rail fencing and sign.
9. Prepare as-built report at time of construction completion.

Nonnative/Invasive Species Management

The nonnative/invasive species listed in Table 6 below shall be removed (Table 6).

Table 6. Common Nonnative/Invasive Species	
Scientific Name	Common Name
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Buddleja davidii</i>	Butterfly Bush
<i>Calystegia sepium</i>	Hedge Bindweed
<i>Centaurea</i> spp.	Knapweed
<i>Chondrilla juncea</i>	Rush Skeletonweed
<i>Cirsium arvense</i>	Canada Thistle
<i>Cirsium vulgare</i>	Bull Thistle
<i>Conium maculatum</i>	Poison Hemlock
<i>Cytisus scoparius</i>	Scotch Broom
<i>Epilobium hirsutum</i>	Hairy Willowherb
<i>Hedera helix</i>	English Ivy
<i>Ilex aquifolium</i>	English Holly
<i>Iris pseudacorus</i>	Pale Yellow Iris
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Phalaris arundinacea</i>	Reed Canarygrass
<i>Polygonum</i> spp.	Knotweed
<i>Rubus armeniacus</i>	Himalayan Blackberry
<i>Rubus laciniatus</i>	Evergreen Blackberry
<i>Senecio jacobaea</i>	Tansy Ragwort

Species removal shall be done via hand pulling or motorized cutting when necessary. Hand pulling is the preferred method to reduce the risk of damaging native vegetation. If mechanical removal is not effective, a suitable herbicide (aquatic-safe) may be utilized after consulting a qualified biologist and determining that other non-chemical alternatives would not be effective.

Planting Plan

The existing restoration area is currently a gravel driveway. Existing vegetation in the buffer enhancement area is dense Blackberry. Enhancement and restoration planting will interplant conifer/secondary forest species and scrub shrub in the understory to assist forest succession, provide additional diversity, and increase the removal of pollutants and excess sediments. Red Osier Dogwood and Black Twinberry shall be planted adjacent and/or in close proximity to Wetland E and Hilt Creek. Planting details are proposed as follows (Table 7):

Table 7. Buffer Planting Plan					
Scientific Name	Common Name	On Center Spacing (ft)	Cover	Size	Quantity
Restoration Area: 1,334 sf					
<i>Psuedotsuga menziesii</i>	Douglas Fir	15	Tree	Bareroot	1
<i>Thuja plicata</i>	Western Red Cedar	15	Tree	Bareroot	2
<i>Tsuga heterophylla</i>	Western Hemlock	15	Tree	Bareroot	2
<i>Acer macrophyllum</i>	Big Leaf Maple	15	Tree	Bareroot	1
<i>Symphoricarpos albus</i>	Common Snowberry	6	Shrub	Bareroot	8
<i>Oemleria cerasiformis</i>	Osoberry	6	Shrub	Bareroot	8
<i>Rubus parviflorus</i>	Thimbleberry	6	Shrub	Bareroot	8
<i>Acer circinatum</i>	Vine Maple	6	Shrub	Bareroot	8
Subtotal					38
Enhancement Area: 6,734 sf					
<i>Psuedotsuga menziesii</i>	Douglas Fir	18	Tree	Bareroot	5
<i>Thuja plicata</i>	Western Red Cedar	18	Tree	Bareroot	5
<i>Tsuga heterophylla</i>	Western Hemlock	18	Tree	Bareroot	5
<i>Acer macrophyllum</i>	Big Leaf Maple	18	Tree	Bareroot	5
<i>Symphoricarpos albus</i>	Common Snowberry	8	Shrub	Bareroot	14
<i>Oemleria cerasiformis</i>	Osoberry	8	Shrub	Bareroot	14
<i>Rubus parviflorus</i>	Thimbleberry	8	Shrub	Bareroot	14
<i>Acer circinatum</i>	Vine Maple	8	Shrub	Bareroot	14
<i>Cornus alba</i>	Red Osier Dogwood	8	Stake	Bareroot	14
<i>Lonicera involucrata</i>	Black Twinberry	8	Shrub	Bareroot	14
Subtotal					104
TREE TOTAL:					26
SHRUB TOTAL:					116
GRAND TOTAL:					142

Sound Native Plants Plant Quantity Calculator used to estimate the number of plants recommended per area (Sound Native Plants).

Tree and shrub species shall be planted in groups of approximately three to five plants each in the planting areas. This will encourage establishment of these species in clumps, which most accurately mimics their natural growth pattern. Each tree and shrub shall be marked with a reflective flag tied on a lateral branch to simplify maintenance and monitoring, and shall be protected with blue tubes. Planting shall occur approximately 2 weeks after nonnative/invasive species present have been managed. Planting is ideal in the early fall, before a hard freeze, and suitable in the late winter/early spring after the chance of snow is unlikely. Species may be substituted in consultation with a qualified

biologist if quantities of the recommended species are not available, or to increase diversity. Plant stock shall be from a local native plant nursery or seed supplier with plant stock from the Puget Sound lowlands, preferably originating within Whatcom County or Skagit County. One-gallon plants can replace bareroot at the owner's discretion as seasonally available.

Plant holes shall be twice as wide and deep as the root size. The soil removed from the holes shall be used as backfill. The backfill soil shall be broken up to eliminate large clumps and amended with compost if organic content is poor. Each plant shall be held gently in a vertical position while its hole is backfilled with soil, and the base of each plant shall be gently tamped to remove air pockets. Protective blue tubes shall be immediately installed as applicable. Plants shall be watered immediately after planting unless frequent rains have saturated the soil.

Mulch

Mulch collars shall be placed for each plant within the enhancement and restoration areas to minimize the growth of competitive species, hold moisture, and provide a combination of organic matter and soil microorganisms to enhance soil fertility. Collars shall have a 2 ft diameter ring, 4 inches deep with a 1 inch gap from the plant stem to minimize the chances for stem decay. Alternatively, sheet mulching may be placed to a depth of 4 inches throughout all or a portion of the planting area. Each plant shall receive at least the collar of mulch. Mulch may also be used to establish a reliable access trail for maintenance through the mitigation sites. Mulch shall not be placed around plantings in inundated areas.

Protection

Protection measures were deemed unnecessary for the restoration and enhancement sites due to their locations away from the parking areas and amenities and therefore low likelihood of pedestrian exposure.

Legal Means

A legal means (e.g. ownership, deed restriction, or conservation easement) will be obtained and recorded with the Skagit County Auditor for the mitigation sites within 60 days of permit issuance.

Goals & Performance Standards

Once installed, an as-built/Year 0 monitoring report will be prepared by a qualified biologist to comprehensively document the mitigation. This report will include a description of the work completed to-date, an as-built map, and photographs from fixed reference point locations. To evaluate the mitigation, monitoring for a 5-year period will be conducted once annually in Years 1, 2, 3, and 5 to assure that goals and performance standards are being met (Table 8).

Table 8. Goals & Performance Standards			
Year	1 Size	2 Vegetation	3 Protection
1	<u>1.0</u> Buffer Enhancement 6,734 sf	<u>2.0</u> Knotweed 0 sf/% cover Other invasives <10% cover <u>2.1</u> >95% of Native Shrub & Tree installed shall survive	<u>3.0</u> <u>3.1</u> Protection documentation submitted to Auditor and regulating agencies (conservation easement)
2	Buffer Restoration 1,334 sf	<u>2.0</u> Knotweed 0 sf/% cover Other invasives <10% cover <u>2.1</u> Native Shrub & Tree >25% cover &/or >90% survival	
3			
5		<u>2.0</u> Knotweed 0 sf/% cover Other invasives <10% cover <u>2.1</u> Native Shrub & Tree >55% cover &/or >80% survival	

Methods

Monitoring shall be conducted by a qualified biologist via site visits for the benefit of the client's maintenance activities. The mitigation/restoration site will be visited for 5 years, in Years 1, 2, 3, and 5, or until the site is deemed successful.

Qualitative data collection protocols will be utilized. All data will be recorded in a field book. Pictures will be taken from fixed photo reference point locations that best represent the site as well as from random locations to show whether a specific performance standard is or is not being met. These fixed photo point locations will be determined in the as-built report. All data and photographs from each site monitoring visit will be synthesized into an accompanying monitoring report. The method of data collection for each monitoring goal and associated performance standards will be visual observation.

In addition to the specific data collected as described above, general data about the site shall also be collected and will include, but will not be limited to, wildlife observations, temperature, and current weather within the previous 24 hours.

Monitoring reports shall be submitted by 31 December of the applicable monitoring year. These reports will include the observed site monitoring results, an assessment of the progress of the site toward meeting the performance standards described above, and color photographs to document the observed conditions (Table 8).

Contingency Measures

Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the mitigation project that result from undetermined and unanticipated biological conditions. If a performance standard is not met within the time specified, a contingency plan may be implemented. A contingency

plan includes an analysis of the causes of failure, a description of the proposed corrective measures, and the time frame for implementing these actions. Contingency measures, including potential causes and corrective measures, will be given in the future for each monitoring goal and subsequent performance standard as needed.

Per SCC 14.24.080(6), projects with a mitigation cost of \$10,000 or more require financial assurance. Since the estimated cost of the proposed development is \$9,540.58, no financial assurance is required (Skagit County 16 March 2018).

Maintenance

Per SCC 14.24.090(5)(e), the mitigation sites will be maintained to ensure the performance standards are met. Maintenance may include, but is not limited to, plant replacement, invasive species removal, and/or trash removal (Skagit County 16 March 2018).

Nonnative/Invasive Species Management

The species listed in Table 6 shall be removed. Species removal shall be completed as outlined in the associated section above.

Trash Removal

If present, trash in the restoration site shall be removed by hand and disposed of in an appropriate location.

Disclaimer

We have used the most current, established methods to make determinations as to the location, size, and types of critical areas and buffers, shorelines, and floodplains located on the property and within the review area. All of the above statements are based on our best professional judgment. Although we follow the local, state, and federal criteria, we cannot guarantee their determination will correspond with ours. Please note that regulations are subject to change over time and this report is not valid until approved by a regulator(s).

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Figures
