Draft
Wetland and Stream Report

Strawberry Bay Restoration

Prepared for
Washington State Department of Natural Resources

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA
Science + Planning + Design

Note:
Some pages in this document have been purposely skipped or blank pages inserted so that this document will print correctly when duplexed.

Wetland and Stream Report

Strawberry Bay Restoration
Cypress Island, Skagit County

Prepared for:
Washington State Department of Natural Resources
Northwest Region
919 North Township Street
Sedro-Woolley, Washington 98284

Prepared by:
Herrera Environmental Consultants, Inc.
1329 North State Street, Suite 200
Bellingham, Washington 98225

DRAFT
June 30, 2023

This page intentionally left blank

Contents

Appendices

Tables

Figures

Photo Exhibits

DISCLAIMER

Herrera Environmental Consultants, Inc. (Herrera), has prepared this report for use by the Washington State Department of Natural Resources (WDNR). The results and conclusions in this report represent the professional opinion of Herrera. They are based upon examination of public domain information concerning the study area, field delineation, and data analysis.

The work was performed according to accepted standards in the field of jurisdictional wetland determination and delineation using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010). However, final determination of jurisdictional wetland boundaries pertinent to Section 404 of the Clean Water Act is the responsibility of the Seattle District of the U.S. Army Corps of Engineers. Various agencies of the State of Washington and local jurisdictions may require a review of final site development plans that could potentially affect zoning, buffer requirements, water quality, or habitat functions of lands in question. Therefore, the findings and conclusions in this report should be reviewed by appropriate regulatory agencies before commencing any detailed site planning or construction activities.

HERRERA QUALIFICATIONS

Established in 1980, Herrera is an innovative, employee-owned, consulting firm focused on three practice areas: water, restoration, and sustainable development. The following staff authored this report and conducted field work in support of its findings. A summary of their qualifications is provided.

Tina Mirabile, PWS

Tina Mirabile is a senior ecologist with over 20 years of professional experience in natural resources management, wetland and stream delineations, and mitigation planning to address impacts to wetlands and streams. Tina specializes in performing natural resource assessments of environmentally sensitive areas (wetlands, shorelines, and fish and wildlife conservation areas); preparing mitigation strategies and natural habitat restoration plans; and securing federal, state, and local agency environmental permits for project regulatory compliance and authorization.

Credentials

- MBA, University of Massachusetts, Boston, 1990
- BA, Geology, Indiana University, Bloomington, 1983
- Professional Wetland Scientist (PWS), Society of Wetland Scientists, Certification #1705, 2006
- WSDOT and ODOT Qualified Biological Assessment Author, 2016

Danielle Rapoza, PWS

Danielle Rapoza is an ecologist with 8 years of experience in fisheries research, restoration monitoring, water quality assessment, and flow monitoring. Danielle has been involved in pre- and post-restoration monitoring efforts on stream and wetland projects. Danielle is trained in biological assessments, wetland delineation, functional wetland assessment, the policy framework, and summarizing results in reports.

Credentials

- BA Planning and Environmental Policy, Western Washington University, Bellingham, 2007
- Certificate in Wetland Science and Management, University of Washington, Seattle, 2018
- WSDOT Junior Biological Assessment Author, 2020
- Certified Professional Wetland Scientist (PWS) #3410, Society of Wetland Scientists, 2021

INTRODUCTION

The wetland and stream delineation described in this report was performed for Washington Department of Natural Resources (WDNR) in support of the Strawberry Bay Restoration project on Cypress Island in Skagit County, Washington. Mostly undeveloped, WDNR manages approximately 8 square miles of the island's high quality native forest, wetland, and grassland biological communities in a natural condition as the Cypress Island Natural Resources Conservation Area (NRCA) and Natural Area Preserve (NAP). WDNR also manages the Cypress Island Aquatic Reserve, established on August 1, 2007, that includes the state-owned tidelands and marine habitats surrounding Cypress Island and nearby Strawberry and Cone Islands (WDNR 2023).

In accordance with its conservation and preservations goals on Cypress Island, WDNR is proposing restore its recently acquired property in 2020 at Strawberry Bay, approximately 23 acres, to natural ecological conditions for use of fish and wildlife. The property, formerly in residential use, includes a vacant house, a cabin, a derelict outdoor swimming pool and other attendant features, which WDNR is proposing to remove. An estuarine tidal fringe wetland that has been modified as a closed coastal embayment comprises approximately 9.5 acres of WDNR's property and another 4-acres on adjacent private Madrona Estates residential community land to the north. WDNR's restoration plans include the reestablishment of an outlet channel through the beach berm to reduce the amount and length of flooding within the wetland during storm events. will . This report describes the conditions of wetlands and streams in the project's study area; wetland and stream ratings and required buffer widths; and applicable local, state, and federal laws and regulations. As WDNR's proposed restoration plans for the project are advanced, potential construction-associated impacts to remove existing built structures from the site and to restore national hydrology conditions between the closed wetland estuarine embayment and Strawberry Bay will be assessed. Mitigation will be prescribed according to the permit compliance requirements of Skagit County and applicable federal and state environmental regulatory agencies.

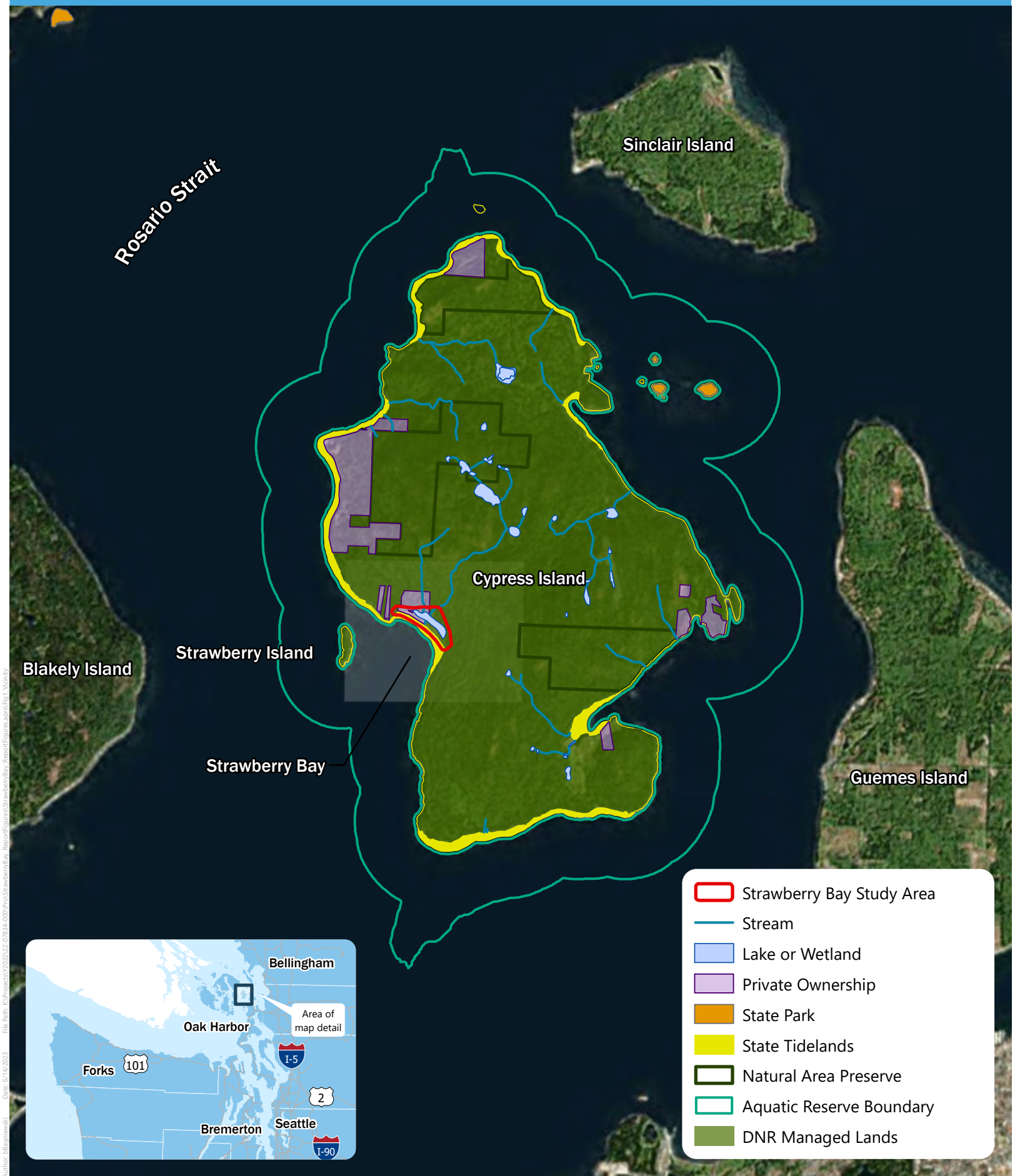
Project Setting

The project is located on WDNR owned parcels P46766, P46767, P104527, P104531 and P46778 in Sections 31 and 32, Township 26 North, Range 1 East of the Willamette Meridian on Cypress Island, Skagit County, Washington (Figure 1). The project is located in Water Resource Inventory Area (WRIA) 3: Lower Skagit–Samish watershed, and the Padilla Bay–Strait of Georgia sub watershed.

The approximate 23-acre study area is comprised of the marine shoreline of Strawberry Bay, a coastal embayment, and upland areas on WDNR owned properties. Upland areas and a portion of the embayment are located on private property where access was limited for formal wetland delineation. The northwest corner of the study area is surrounded by residential development and a small unpaved access road. On either side of the residential development are two abandoned residences. The surrounding forest in the southeast corner of the study area is managed by WDNR and contains recreational trails and historic logging roads.

HERRERA
Science + Planning + Design

Figure 1.
Strawberry Bay Restoration Project Vicinity Map.



Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Skagit County, WA DNR, Esri Clarity (Aerial, 2022)

0 0.25 0.5 1 Miles

File Path: K:\Projects\Y2022\22-07834-000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\Fig 1_Vicinity
Date: 6/14/2023
Author: bBagniewski

Study Objectives

The objectives of the study were to:

- Identify all wetlands and streams in the study area.
- Classify wetland vegetation according to the U.S. Fish and Wildlife Service (USFWS) wetland classification system (FGDC 2013).
- Classify wetlands using the hydrogeomorphic (HGM) classification system (Brinson 1993).
- Classify identified wetlands and assess their functions using the Washington State Wetland Rating System for Western Washington: 2014 Update (Hruby 2014), the classification system required by federal and state environmental regulatory agencies and Skagit County (Skagit County Code [SCC] 14.24.210).
- Classify all streams within the study area according to the Washington Department of Natural Resources (WDNR) Forest Practices Water Typing as described in the Washington Administrative Code (WAC 222-16-030).
- Determine wetland categories and classes, stream type, and applicable wetland and stream buffer widths required by SCC 14.24.210, 14.24.230, 14.24.510, and 14.24.530.
- Identify fish and wildlife habitat areas (FWHAs) as described by SCC 14.24.500.
- Identify regulations and guidance applicable to the protection of wetlands, streams, and buffers set forth by local, state, and federal authorities.

Regulatory and Policy Context

Wetlands and streams are subject to a variety of federal, state, and local regulations that will apply to any future activities planned for the project. Federal laws regulating wetlands and streams include Sections 404 and 401 of the Clean Water Act (United States Code, Title 33, Chapter 1344 [33 USC 1344]). Washington State laws and programs designed to control the loss of wetland acreage include the State Environmental Policy Act (SEPA), the Washington State Water Pollution Control Act (Revised Code of Washington 90.48), and Section 401 of the Clean Water Act (administered in the State of Washington by the Washington State Department of Ecology [Ecology]. In addition, the Washington state Hydraulic Code (Washington Administrative Code [WAC] 220-110) administered by Washington Department of Fish and Wildlife (WDFW) is designed to protect fish life. A Hydraulic Project Approval (HPA) is required for projects that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state.

Skagit County Code (SCC) regulates wetlands, streams, and fish and wildlife habitat conservation areas, under its Critical Areas Ordinance Chapter 14.24. Skagit County requires vegetated buffers are required around critical areas to protect their functions and values. Chapter 14.24 specifies exemptions, development standards, and permitting procedures for proposed modifications to critical areas and associated buffers. Those standards include provisions for mitigation sequencing requirements (e.g.,

impact avoidance, minimization, and rectification) and providing compensatory mitigation for unavoidable permanent impacts on critical areas and their buffers.

In addition, marine shorelines and upland areas within 200 feet, as well as portions of floodplains and associated wetlands fall within the jurisdiction of the Skagit County Shoreline Master Program Chapter 14.26. Skagit County's current shoreline designations for Cypress Island include conservancy and rural.

The current Shoreline Master Program is undergoing a scheduled update. A draft document dated February 15, 2022 has yet to be officially codified by Skagit County, nonetheless this document was referenced in order to apply the most applicable development standards at the time of permit application (Skagit County 2022).

The Cypress Island Comprehensive Management Plan provides management guidance of the three different designations of state-owned conservation lands on Cypress Island: Natural Resource Conservation Area (NRCA), Natural Area Preserve, and Aquatic Reserve (WDNR 2007). The conservation goals identified through the management plan include maintain, enhance, and restore ecological systems; maintain scenic landscapes; and maintain habitat for threatened, endangered, and sensitive species. Concurrently, WDNR strives to provide opportunities for low-impact public use, outdoor environmental education. WDNR also seeks to identify and protect cultural resources on Cypress Island. Goals specific to aquatic areas include: identification of aquatic habitats and associated plant and wildlife species, with special emphasis on rocky reef habitat, pocket beaches, kelp, and eelgrass beds; and preservation, restoration, and enhancement of the functions and natural processes of nearshore and subtidal ecosystems. As described in the management plan, management requires collaboration with public and private entities as well as local, state, federal, and tribal government to achieve these goals.

WDNR manages 5,230 acres on Cypress Island as Natural Resources Conservation Area and Natural Area Preserve (WDNR 2007, 2023a). The 6,065 acre Cypress Island Aquatic Reserve was established in 2007 to protect the largely undeveloped shoreline and waters surrounding Cypress Island. Strawberry Bay includes private land as well as both NRCA and Aquatic Reserve WDNR managed lands. WDNR land in Strawberry Bay is managed to recover and preserve natural environmental conditions. WDNR also provides low-impact public use opportunities and environmental education, as long as these activities do not harm the natural resources of the area.

RESULTS

Herrera conducted a review of available information about the study area prior to the site visit. The following sections describe the research methods and field protocols for the wetland and stream evaluations. Appendix A includes more information about the methodology used in the wetland delineation performed for this project.

Review of Available Information

A desktop review was performed to determine the historical and current presence of wetlands and streams in and near the study area. Sources of information include the following:

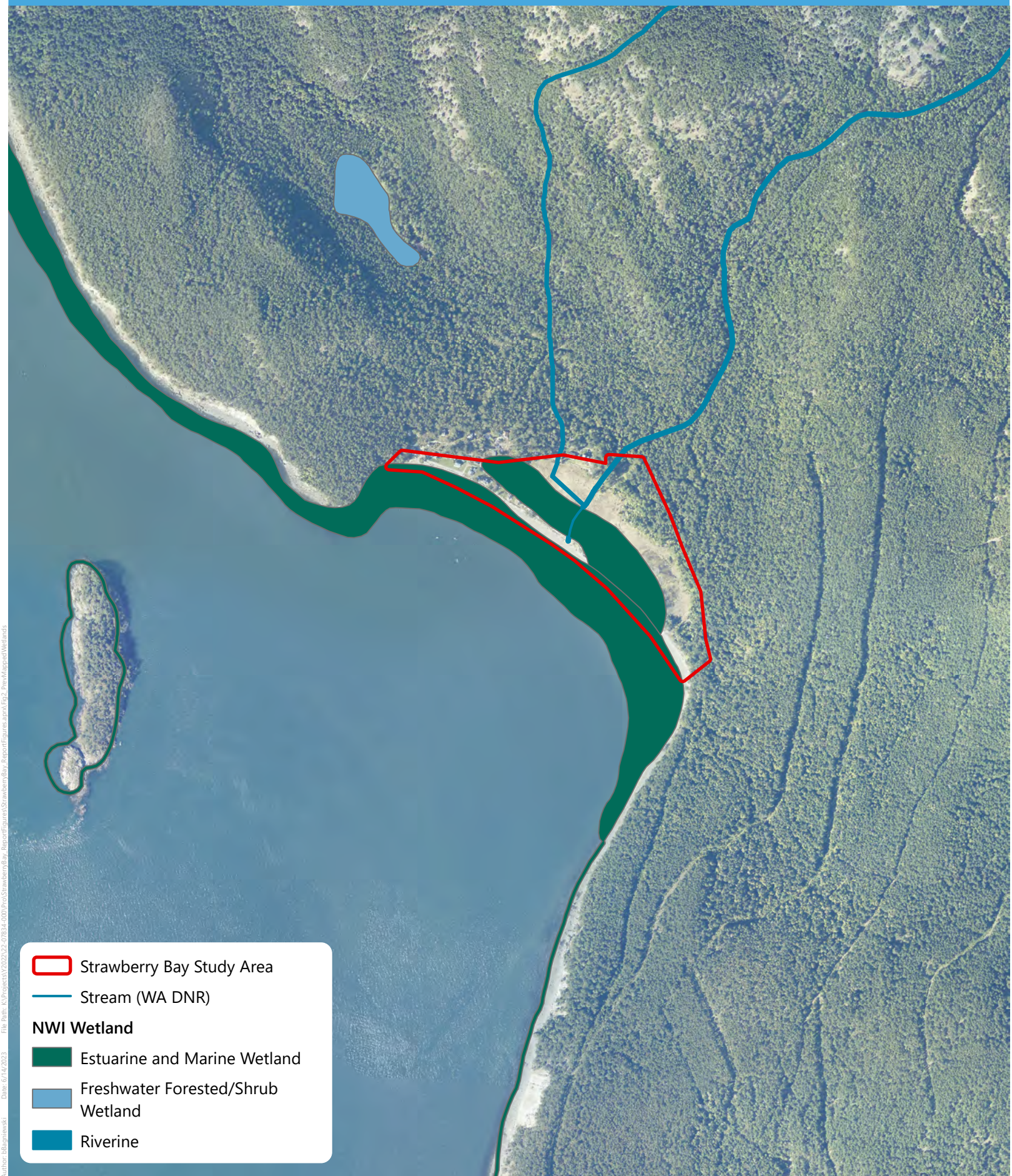
- National Wetlands Inventory (NWI) map of wetland areas in the study area (USFWS 2017)
- Fish use mapping including SalmonScape, Washington State Fish Passage mapping system, the Statewide Washington Fish Distribution mapping, and WDFW forage fish mapping (WDFW 2023a, WDFW and NWIFC 2023, WDFW 2023d)
- Washington State priority habitat and species (PHS) data (WDFW 2023c)
- Washington State Natural Heritage data for rare plants and ecosystems (WDNR 2023c)
- Climate data and precipitation data (NRCS 2023a)
- Soil survey maps for the study area (NRCS 2023b and 2023c)
- Washington State Department of Natural Resources Forest Practices Mapper (WDNR 2023b)
- Washington State Department of Ecology's Coastal Atlas Mapper (Ecology 2023a)
- The available existing information compiled for the wetland and stream delineation is summarized in the following subsections

Previously Mapped Wetlands and Streams

The NWI indicates the Strawberry Bay shoreline and embayment is an estuarine and marine wetland (USFWS 2017). The NWI and DNR mapping also indicates two streams that join in the embayment (Figure 2).

HERRERA
Science + Planning + Design

Figure 2. Previously Mapped Wetlands and Streams in the Strawberry Bay Restoration Study Area.



Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: USFWS, WA DNR, Skagit County (Aerial, 2021)

0 250 500 1,000 Feet

File Path: K:\Projects\Y2022\22-07834-000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\Fig2_PrevMappedWetlands
Date: 6/14/2023
Author: bBagniewski

Precipitation Data

Analyzing climatic conditions and local weather patterns is important in the assessment of vegetation, soil conditions, and hydrology for wetland delineations (Environmental Laboratory 1987, 2010), and information on precipitation that precedes a site visit is valuable in helping determine whether conditions observed at a site are reflective of normal rainfall. The Natural Resources Conservation Service (NRCS) methodology for the analysis of normal environmental conditions was used to analyze conditions prior to the site visit (NRCS 1997; see Appendix A for additional methodology description).

The historical average precipitation measurements were based on data collected in Sedro-Woolley, Washington (WETS Station Sedro-Woolley, Latitude 48.4958°, Longitude 122.2356°) for the period of record 1991 to 2021 (NRCS 2023a). This station is approximately 23 miles southeast of the study area which was the closest available WETS station to the study area. Using this dataset, precipitation was evaluated for the 3-month period prior to field investigations, which occurred on July 20 and 21 and August 1, 2022. Based on analysis of precipitation in the preceding 3-month period, conditions in May and June were considered wetter than normal, and July was considered normal (NRCS 2023a) (Table 1). The climatic condition of the 3 months prior to July and August field work was wetter than normal.

Precipitation for the 10 day period immediately preceding field work, a dataset closer to the study area in Anacortes, Washington (Anacortes 1.7 WNW), Latitude 48.5017°, Longitude -122.6635° was used (NRCS 2023a) A trace of rain was recorded in the 10 days prior to the July field work. There was no precipitation in the 10 days prior to the August field work.

Table 1. Evaluation of Average Precipitation for the Three-Month Period Preceding Field Investigations.

Prior Month	WETS Station Sedro-Woolley Rainfall Percentile (inch)		Measured Rainfall (inch)	Monthly Condition: Dry, Wet, Normal	Resultant Condition Based on Preceding Three-Month Period
	30th	70th			
April 2022	3.01	4.76	3.08	Normal	
May 2022	1.94	3.83	4.26	Wet	
June 2022	1.52	3.11	4.17	Wet	
July 2022	0.46	1.59	0.48	Normal	Wetter than normal
August 2022	NA	NA	NA	NA	Wetter than normal

Mapped Soils

There are two soil types mapped in the study area (NRCS 2023c) (Figure 3):

Catla

Catla gravelly fine sandy loam is a moderately well-drained soil that is formed in very compact glacial till (NRCS 2023b). A typical soil profile includes 0–2 inches surface layer of partially decomposed needles, leaves and twigs underlain by a 2 to 16-inch layer of brown (10YR 5/3) gravelly ashy sandy loam with strong brown (7.5 YR 5/6) redoximorphic concentrations. Dense glacial till is present at 16 inches. Catla

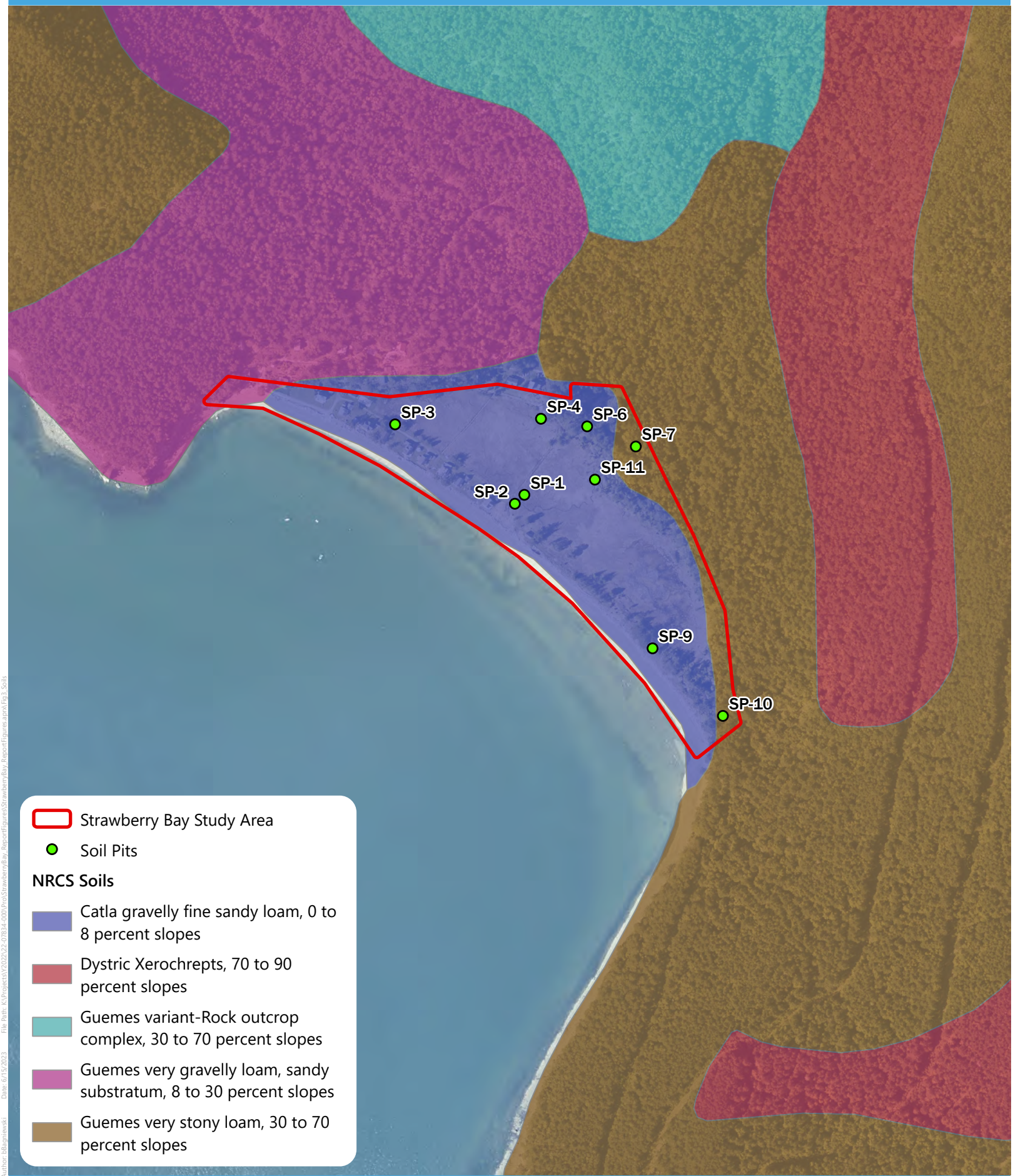
soils are considered hydric (NRCS 2023b). Minor components within the study area consist of Coveland soil, which are hydric.

Guemes

Guemes very stony loam consists of well drained soils formed on mountain sideslopes in colluvium, residuum and glacial high in olivine rich serpentine (NRCS 2023b). Guemes soil series is of limited extent as it is only found on Cypress Island. A typical soil profile includes a 1-inch layer of needles, leaves, and twigs underlain by 8 inches of grayish brown (10 YR 5/2) very stony loam. From 8 to 14 inches brown (10 YR 5/3) extremely gravelly loam is present. Dark brown (7.5YR 4/4 extremely gravelly clay loam is present between 14 and 32 inches. Guemes soil series not considered a hydric soil (NRCS 2023b). There are no minor components documented in the Study Area.

HERRERA
Science + Planning + Design

Figure 3. Mapped Soils in the Strawberry Bay Restoration Project Study Area.



File Path: K:\Projects\Y2022\22-07834.000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\Fig3_Soils
Date: 6/15/2023
Author: bBagniewski

Wetland Classification

Herrera conducted the wetland delineation in accordance with the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010), which is consistent with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The methods in these guidance manuals use a three-parameter approach for identifying and delineating wetlands and rely on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. The detailed methods for evaluating these three parameters and for performing the wetland delineation are described in Appendix A.

Test plots were established to document conditions in wetlands and in adjacent uplands. For each test plot, data on dominant plant species, soil conditions, and evidence of hydrologic conditions were recorded on wetland determination data forms (Appendix B). Herrera biologists delineated one wetland (Wetland A) in the study area (Figure 4) (Table 2). An Ecology wetland rating form for Wetland A is provided in Appendix C.

Wetlands observed within the study area were classified according to the U.S. Fish and Wildlife Service classification system (FGDC 2013). This system is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate. The wetlands were also classified according to the HGM system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Table 2. Wetlands Delineated in the Strawberry Bay Restoration Study Area.

Wetland Name	Size of Wetland (square feet/acre)	USFWS Classification[a]	Hydrogeomorphic Classification[b]	Wetland Rating Category (2014)[c]
A	603,658/ 13.86	Emergent, Forested	Tidal Fringe, Riverine, Depressional, Slope	I

[a] U.S. Fish and Wildlife Service classification is based on FGDC (2013).

[b] Hydrogeomorphic classification is based on FGDC (2013).

[c] Wetland Category is based on the Washington State Department of Ecology (Ecology) wetland rating system (Hruby 2014).

Wetland Delineation

Herrera biologists Tina Mirabile and Danielle Rapoza conducted wetland delineation field activities on July 20, 21, and August 1, 2022. Weather conditions during the July 2022 consisted of foggy in the morning to sunny and clear conditions with daytime high temperatures up to 80 degrees Fahrenheit (°F). August 2022 fieldwork consisted of sunny and clear conditions with a daytime high temperature of 90 °F. The July and August field dates were determined to be within the growing season (as defined in Appendix A).

One estuarine tidal fringe wetland, Wetland A, was identified during the site investigations (Figure 4). For those portions of the wetland extending on private property or not accessible at the time of the site investigation, the wetland boundary was estimated based on site topography and lidar analysis.

Wetland A is a 603,658 square foot (13.86 acre) tidal fringe wetland located in an enclosed embayment northwest of Strawberry Bay. Secondary hydrogeomorphic classes include riverine, depressional, and slope. The wetland is disturbed. Past land uses have resulted in ditching and fill within the wetland. A beach berm bounds the western edge of the wetland.

Exhibit 1. Drainage ditch within Wetland A.

A tide gate, that is not functioning properly, restricts the extent of tidal influence in the wetland.

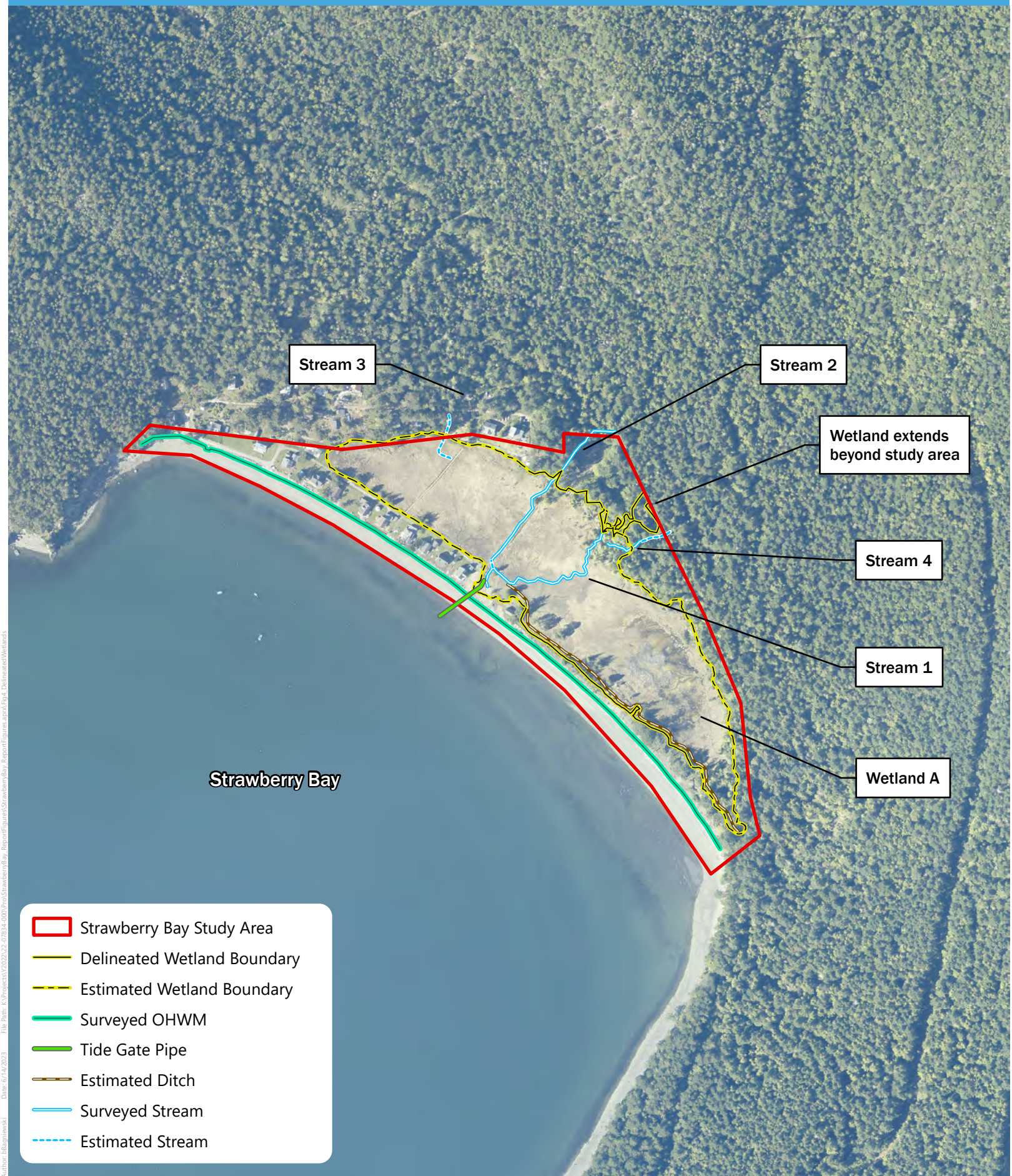
Four streams contribute to the wetland's hydrology. The central drainage that connects to the tide gate has been straightened (Figure 4). A small drainage ditch traverses the built cabin area and then parallels the western edge of Wetland A to its southwest end (Exhibit 1, Figure 4).

A total of 9 sample plots documenting the site vegetation, soils and hydrology conditions were recorded during the site investigations. Wetland and upland data forms are provided in Appendix B and summarized below.

SP-1 was located approximately 100 feet northwest of the tide gate and is a representative sample plot of brackish conditions in the embayment (Figure 3). SP-7 is representative of the forested non-tidal portion of the wetland.

HERRERA
Science + Planning + Design

Figure 4. Wetlands and Streams Delineated in the Strawberry Bay Restoration Project Study Area.



File Path: K:\Projects\Y2022\22-07834-000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\Fig4_DelineatedWetlands
Date: 6/14/2023
Author: bBagniewski

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: WADNR, Skagit County (Aerial, 2021)

0 125 250 500 Feet

Vegetation

Wetland A contains a persistent emergent wetland plant community dominated by a mixture of salt tolerant and freshwater species including (*Angelica arguta*), water parsley (*Oenanthe sarmentosa*), baltic rush (*Juncus balticus*), Pacific silverweed (*Potentilla anserina*), seaside arrowgrass (*Triglochin maritima*), sea plantain (*Plantago maritima*), hardstem bulrush (*Schoenoplectus acutus*), mannagrass (*Glyceria grandis*), monkey flower (*Erythranthe* sp.), common spike-rush (Eleocharis palustris), slough sedge (*Carex obnupta*), and Lyngbye's sedge (*C. lyngbyei*).

A relatively small area of a forested wetland community is also present and is dominated by Western redcedar (*Thuja plicata*), salal (*Gaultheria shallon*), Western skunk cabbage (*Lysichiton americanus*), and unvegetated bare ground. At the intersection of the emergent and forested wetland communities in the vicinity of Stream 1, shore pine (*Pinus contorta*), Pacific ninebark (*Physocarpus capitatus*), Labrador tea (*Rhododendron groenlandicum*), maidenhair fern (*Adiantum pedatum*) and hardhack (*Spiraea douglasii*) were also prevalent. A small amount of yellow-flag iris (*Iris pseudacorus*) was also observed. The extent of invasive and non-native vegetation was very limited in all wetland areas. Representative wetland vegetation photos are provided in Exhibit 2.

Exhibit 2. Representative vegetation in Wetland A emergent community (top), forested community (bottom).

Soils

At SP 1, soils were examined to a depth of 18 inches below the ground surface and exhibited hydric characteristics. The 18-inch profile was very dark brown (10YR 2/2) sandy loam with muck and redoximorphic concentrations that were weak red (2.5YR 4/2, 5 percent). This profile meets the criteria for Histosol (A1).

At SP 7, soils were examined to a depth of 16 inches below the ground surface and exhibited hydric characteristics. The top 9 inches was organic and met the indicator Black Histic (A3). From 9 to 16 inches the soil was very dark greenish gray (5GY 3/1) clay with dark brown (7.5YR 3/4, 5 percent) redoximorphic concentrations in the matrix.

Representative soil pit photos are provided in Exhibit 3.

Exhibit 3. Representative wetland pits: SP-1 (left) and SP-7 (right); upland soil pits: SP-2 (left) and SP-6 (right).

Hydrology

At SP 1, the soil was saturated to the surface meeting the hydric indicator A3, and the water table was present at 14 inches from the soil surface. At SP-7 the soil was saturated to the surface meeting, also meeting the A3 indicator.

Tides (through the malfunctioning tide gate) and freshwater streams are the primary sources of hydrology to the wetland. Primary hydrology sources are important to understand as hydrogeomorphic class influences the wetland rating. To determine extent of saltwater influence on Wetland A and thus inform the rating, an analysis of salt tolerant vegetation was performed (Table 3) (FGDC 2013, Hutchinson 1988). Salinity of less than 0.5 parts per thousand (PPT) during annual low flow is the threshold between saltwater and freshwater tidal fringe wetlands (Hruby 2014). Based on that evaluation a mix of freshwater and brackish water conditions were found. Saltwater influence as indicated by a dominance of salt tolerant vegetation species and was strongest near the tide gate and weakest as distance and elevation from the tide gate increased.

Table 3. Estimated Extent of Saltwater Influence on Vegetation Assemblages in Wetland A.

Sample Plot[a]	Species[b]	Max Salinity (PPT) (Hutchinson 1988)	Tolerance Rating (Hutchinson 1988)	Approximate Horizontal Distance to Tide Gate (feet)	Estimated Salinity at Sample Plot
SP-1	*Juncus balticus*	27	Very tolerant	100	**Brackish**
	Potentilla anserina	13	Moderately tolerant		
	Triglochin maritima	21	Very tolerant		
SP-3	*Potentilla anserina*	13	Moderately tolerant	550	**Brackish**
	Schoenoplectus acutus	6	Moderately sensitive		
	Juncus balticus	27	Very tolerant		
SP-4	*Carex obnupta*	0	Sensitive	400	**Freshwater[d]**
	Juncus balticus	27	Very tolerant		
SP-10	*Carex obnupta*	0	Sensitive	1,100	**Freshwater[d]**
SP-11	*Achillea millefolium*	9	Moderately sensitive	375	**Freshwater[d]**
	Glyceria grandis	0	Sensitive		
	Carex obnupta	0	Sensitive		
	Juncus balticus	27	Very tolerant		
	Physocarpus capitatus	0	Sensitive		
	Pinus contorta[c]	–	–		
	Potentilla anserina	13	Moderately tolerant		
	Rhododendron groenlandicum[c]	–	–		
	Spirea douglasii[c]	–	–		
	Thuja plicata[c]	–	–		
	Triglochin maritima	21	Very tolerant		

[a] SP-7 was excluded from this evaluation because it is situated at a higher elevation and is unlikely to receive tidally influenced hydrology.

[b] Dominant vegetation from sample plots were used for this analysis. Non-dominant species and upland plots were not included.

[c] Salinity data for this species was not available (Hutchinson 1988).

[d] Conditions were determined to be primarily freshwater due the presence of salinity sensitive species.

Wetland Rating and Functional Assessment

Wetland functions were assessed using *Washington State Wetland Rating System for Western Washington: 2014 Update*, referred to hereafter as the Ecology rating system (Hruby 2014). This system generates a qualitative functional rating (high, moderate, or low) for each of the functions (water quality, hydrology, and habitat) provided by wetlands. The Ecology rating system is required by Skagit County Code (SCC) 14.24.210. It categorizes wetlands according to specific attributes such as rarity; sensitivity to disturbance; hydrologic, water quality, and habitat functions; and special characteristics (e.g., mature forested wetland, estuarine, bog). The total score for all functions determines the wetland rating. The rating system consists of four categories, with Category I wetlands exhibiting outstanding functions and/or special characteristics and Category IV wetlands exhibiting minimal attributes and functions. The rating categories are used to identify permitted uses in a wetland and its buffer, to determine the width of buffers needed to protect a wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands.

Wetland functions are those physical and chemical processes that occur within a wetland, such as the storage of water, cycling of nutrients, and maintenance of diverse plant communities and habitat that benefit wildlife. Wetland functions are grouped into three broad categories: water quality, hydrologic, and habitat.

- Water quality functions include the potential for removing sediment, nutrients, heavy metals, and toxic organic compounds in the water passing through the wetland.
- Hydrologic functions include reducing the velocity of stormwater, recharging and discharging groundwater, and providing flood storage.
- Habitat functions include providing food, water, and shelter for fish, shellfish, birds, amphibians, and mammals. Wetlands also serve as a breeding ground and nursery for numerous species.

Based on analysis in the prior section, freshwater tidal fringe (in higher areas) and saltwater tidal fringe (estuarine, in lower areas) wetland conditions were determined to be present. Wetland A was assessed as a freshwater tidal fringe wetland and was determined to be a Category I wetland based on the functional assessment. Table 4 provides a summary of the function scores, the total wetland score, and the associated rating (category) for Wetland A based on the Ecology rating system (Hruby 2014).

Table 4. Individual Wetland Function Scores for Wetland A.

Wetland Name	Water Quality Functions Rating[a]			Hydrologic Functions Rating[a]			Habitat Functions Rating[a]			Total Score[b]	Ecology Rating Category
	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value		
A	M	M	H	H	M	H	M	H	H	23	I

[a] Qualitative ratings of H (high), M (moderate), and L (low) are based on the Washington State Department of Ecology (Ecology) rating system (Hruby 2014).

[b] Total score is derived by adding all qualitative ratings together. Low ratings are worth 1 point, Moderate ratings are worth 2 points, and High ratings are worth 3 points.

Wetland A has a moderate potential to improve water quality at the site due to its large area of surface depressions and structure of vegetation which can slow flows and trap pollutants. The close proximity of residential development provides some potential for water quality benefits on the landscape scale. A water quality improvement plan for nutrients is currently in development which makes water quality functions provided by Wetland A valuable to society (Ecology 2023b).

Wetland A has a high potential to provide hydrologic functions on site due to the large area of overbank storage, and thick emergent vegetation which can slow flood velocities. Flooding is occasionally a problem downgradient of Wetland A in the surrounding residences, however the primary driver may be storm surge and high tide events. Because the residences with historical flooding issues are situated between the wetland and Strawberry Bay, coastal buffering functions provided by Wetland A are somewhat limited.

Wetland A has a high potential to provide important habitat for wildlife due to its emergent and forested vegetation classes, richness of plant species, and several habitat features such as downed wood, overhanging plants, and low amount of invasive cover. Wetland A has a high potential to support habitat functions on a landscape scale due to the relatively large area of undisturbed habitat abutting the wetland. There are several WDFW priority habitats accessible to Wetland A including riparian, instream, nearshore, and snags and logs.

Wetland Rating Based on Special Characteristics

Due to the dominance of salt tolerant vegetation in some areas, the wetland was also evaluated for Special Characteristics of estuarine and coastal lagoons. Ecology defines estuarine or saltwater tidal fringe wetlands as wetlands where water salinity is greater than 0.5 parts per thousand (Hruby 2014). Ecology defines coastal lagoons as shallow bodies of water, like a pond, partly or completely separated from the sea by a barrier beach, which may be connected to the sea by an inlet and receives period influxes of salt water through storm surges, flow through porous beach sediments. Coastal lagoons may have freshwater flowing into one side that dilutes the salinity below 0.5 ppt, however the seaward edges of the lagoons always contain some salt water at or near the bottom.

Based on evaluations for both estuarine and coastal lagoons, Wetland A meets the criteria of a Category I wetland. Criterion contributing to Category I ratings based on special characteristics included:

- At least 3/4 of the landward edge of the wetland has a 100-foot buffer of shrub, forest, or un-grazed or un-mowed grassland.
- The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.
- The wetland is larger than 1/10 acre (4,350 square feet).

Estuarine wetlands and coastal lagoons are put into a separate 'special characteristics' category because the indicators used to characterize how well a freshwater wetland functions do not apply to these systems. No rapid methods have been developed to date to characterize how well estuarine and coastal lagoons wetlands functions (Hruby 2014).

Estuaries are highly productive and complex ecosystems where large amounts of sediments, nutrients and organic matter are exchanged between terrestrial, freshwater and marine communities. This availability of resources benefits a large diversity of animals and plants as well as primary producers such as including marine diatoms, macro-algae, and invertebrates. Similar to estuaries, coastal lagoons are located at the interface between freshwater, marine, and terrestrial ecosystems and hugely benefit biodiversity (Rodrigues-Filho et al. 2023). Both estuaries and coastal lagoons are important rearing habitat for juvenile salmonids (Beamer et. al. 2003, Toft et. al. 2007, Busby and Barnhard 1995).

Stream and Shoreline Classification

Streams within the study area were delineated using the definition provided in the WAC, Section 222-16-010. According to this definition, the ordinary high water mark (OHWM) of streams is "that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation." In addition, methods in the publication Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State (Anderson et al. 2016) were applied. Delineated streams were classified per SCC 14.24.510 and per the Washington Department of Natural Resources water typing system based on WAC 222-16-030. The detailed methods for evaluating field conditions to perform the delineation are described in Appendix A.

Within Skagit County, streams are regulated as a type of Fish and Wildlife Habitat Conservation Area (FWHCA), according to SCC 14.24.500(1)(f). The Strawberry Bay shoreline falls under the jurisdiction of the Skagit County's Shoreline Master Program (SCC 14.26). Within the Study Area Streams 2 and 3 are mapped by WDNR as Type F streams (WDNR 2023b). Streams 1 and 4 are not currently mapped by WDNR. The Strawberry Bay shoreline is a Type S water and a designated Shoreline of the State.

Ordinary High Water Mark Delineation

Herrera delineated the OHWM of three streams (Streams 1, 2, and 4) within the study area (Figure 4) (Exhibit 4). A third stream (Stream 3) was observed but not delineated due to lack of access on private property. Based on the field investigations, all streams in the study area were observed to have perennial or seasonal flows and are Type F (fish bearing) streams. The average bankfull width for all streams was less than 5 feet wide. Indicators frequently used to make the stream OHWM determinations during the July field visit included a line indicated by unvegetated substrate, lack of leaf litter, a topographic bench located at the top of bank.

Exhibit 4. Stream 1 (top left) and Stream 2 (top right), Stream 3 (bottom left), Stream 4 (bottom right).

The marine shoreline is designated as Rural Conservancy adjacent to the residential properties and is elsewhere designated as Natural under the Skagit County Shoreline Master Program. Herrera used several indicators to delineate the OHWM of the Strawberry Bay shoreline including racked debris, water stains, and vegetation establishment (Exhibit 5).

Exhibit 5. Strawberry Bay shoreline.

Wetland, Stream, and Shoreline Buffers

In Skagit County, wetland buffer widths are determined according to critical areas code and are based on the wetland category and the proposed land use impact (SCC 14.24.230). Therefore, the wetland buffer may vary between 150 and 300 feet based on the development proposal. For the purposes of this restoration project a standard buffer width of 150 feet would apply (Table 5). In addition, Wetland A is an "associated wetland" under the Skagit County Shoreline Master Program and is therefore subject to additional development standards (Skagit County 2022).

Table 5. Aquatic Resources Delineated in the Strawberry Bay Restoration Study Area.

Name	WDNR Water Type or Wetland Category	Skagit County Buffer Width (feet)
Stream 1	F	100[a]
Stream 2	F	100[a]
Stream 3	F	100[a]
Strawberry Bay Shoreline	S	150/200[b]
Wetland A	I	150[c]

[a] Stream buffer widths are based WDNR water type per SCC 14.24.530(1)(c).

[b] The shoreline buffer widths based on the shoreline designation per the Draft SMP (Skagit County 2022).

[c] Wetland buffer width is based on the wetland category and proposed land use intensity, per SCC 14.24.230(1)(a).

In Skagit County, Type F streams less than 5 feet wide are afforded 100-foot buffers (SCC 14.25.530(1)(C). Marine shorelines with Rural Conservancy and Natural designations are afforded a 150-foot and 200-foot buffer, respectively (SMC 14.26.310-1) Per SCC 14.24.520 projects within 200 feet of a fish and wildlife habitat conservation area (i.e., streams) outside the special flood hazard area (SFHA) or within the protected review area as defined in SCC 14.34.055 requires a fish and wildlife HCA site assessment. An evaluation of riparian buffer functions, as required by SCC are summarized in Table 6. The vegetated riparian area likely functions as a connectivity network for wildlife to access surrounding habitat patches and adjacent wetlands. The plant community supports stream habitat functions, including shading of the stream channel, and bank integrity by means of root reinforcement. In addition, the forest canopy and underlying shrubs function to filter stormwater runoff from nearby developed land and provide some wildlife habitat.

Table 6. Evaluation of Riparian Buffer Functions for Streams in the Strawberry Bay Restoration Study Area.

Stream Name	Recruitment of LWD	Temperature Regulation (shade)	Bank Integrity (root reinforcement)	Runoff Filtration	Wildlife Habitat
Stream 1	Moderate	High	High	High	High
Stream 2	Moderate	High	Moderate	High	Moderate/High
Stream 3	Low	High	Moderate	NA	Moderate
Stream 4	Moderate	High	High	High	High

The site's existing buffer vegetation in forested areas is generally dominated by native species (Exhibit 6). Dominant species included western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Pacific madrone (*Arbutus menziesii*), Douglas fir (*Pseudotsuga menziesii*), salal, ninebark, evergreen huckleberry (*Vaccinium ovatum*), Pacific trailing blackberry (*Rubus ursinus*), western bracken fern (*Pteridium aquilinum*), and western sword fern (*Polystichum munitum*).

Exhibit 6. Representative forested buffer conditions.

Dominant species between the shoreline and Wetland A included shore pine, seaside juniper (*Juniperus scopulorum*), Oregon grape (*Mahonia nervosa)* salal, yarrow (*Achillea millefolium*), American dunegrass (*Leymus mollis*), wild onion (*Allium* sp.), trisetum (*Trisetum* sp.), fescue (*Festuca* sp.*),* perennial ryegrass (*Lolium perenne*), and colonial bentgrass (*Agrostis capillaris*) (Exhibit 7). Invasive vegetation was more commonly observed close to development and above the OHWM of the shoreline and included Scotch broom (*Cytisus scoparius*), sowthistle (*Sonchus* sp.), and Canada thistle (*Cirsium arvense*).

Exhibit 7. Representative buffer vegetation between Wetland A and the Strawberry Bay Shoreline.

Fish and Wildlife Habitat Use

Cypress Island is the largest relatively undeveloped island in the area, and is home to a variety of high-quality, native biological communities (WDNR 2007, 2023a). The island is also home to the only protected low-elevation serpentine forest in Washington. and marine bedlands surrounding Cypress Island, Strawberry Island, and Cone Islands (WDNR 2007, 2023a).

Many species likely benefit from the interconnection of instream, estuarine, nearshore, undisturbed forested habitat, and high-quality native vegetation within the study area (Exhibit 8). In addition to streams, Skagit County designates several fish and wildlife habitat conservation areas applicable to the study area (SCC 14.25.500). Applicable HCAs include:

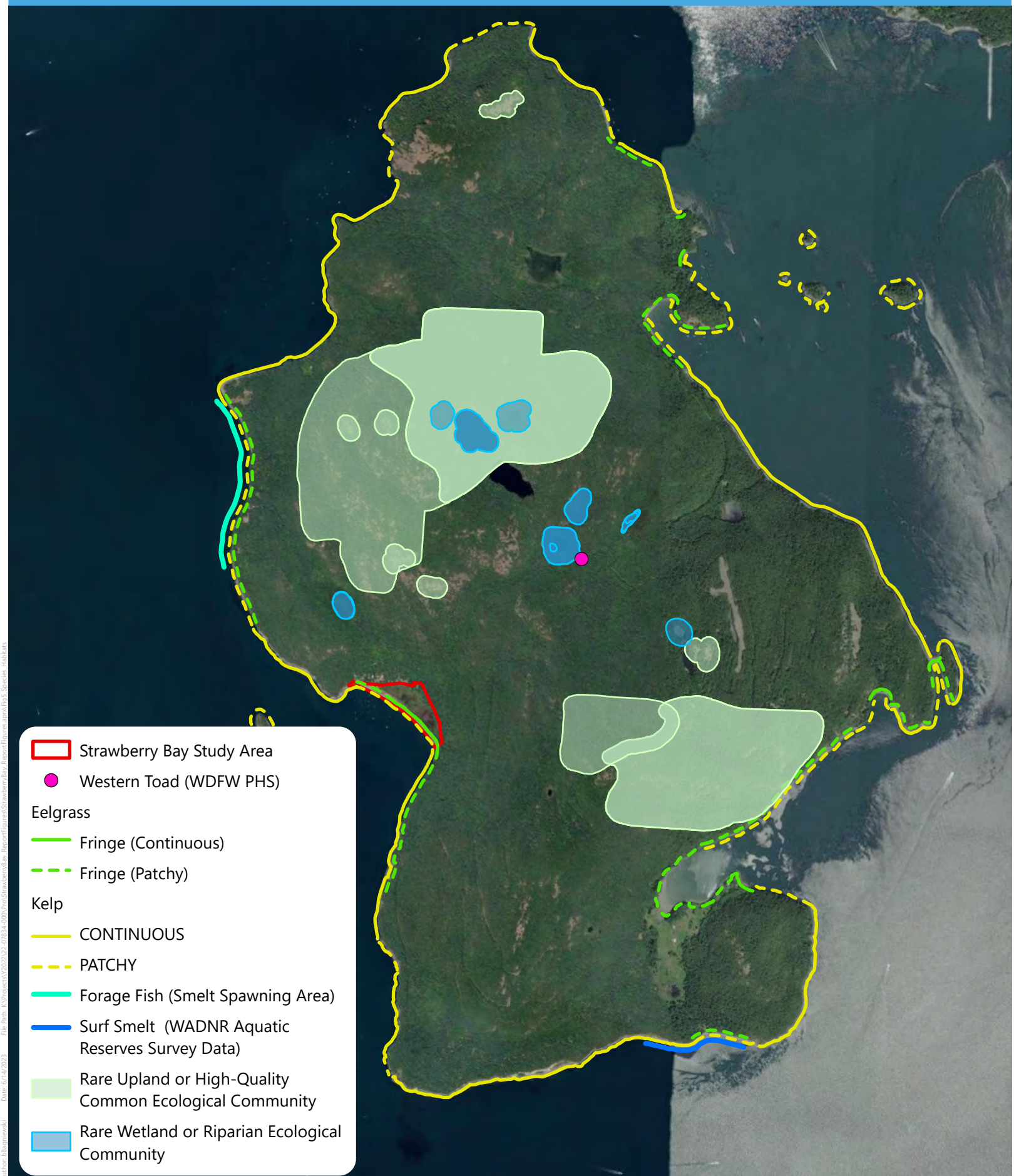
- Areas where endangered, threatened, and sensitive species have a primary association;
- All public and private tidelands suitable for shellfish harvest;
- Kelp and eelgrass beds, herring and smelt spawning areas;
- Areas with which anadromous fish species have a primary association;
- Other aquatic resource areas; and
- State priority species habitats (PHS) as defined in WAC 365-190-080.

Habitats and species mapped by public agencies on Cypress Island and the surrounding area are provided on Figure 5.

Exhibit 8. Proximity and conditions of habitat available to wildlife.

HERRERA
Science + Planning + Design

Figure 5. Species and Habitats in the Strawberry Bay Restoration Study Area.



File Path: K:\Projects\Y2022\22-07834.000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\Fig5_Species_Habitats
Date: 6/14/2023
Author: bBagniewski

Streams and Wetland A

The Washington Department of Natural Resources maps Streams 2 and 3 as Type F streams within the study area (WDNR 2023b). However, based on the Washington Department of Fish and Wildlife's (WDFW) SalmonScape, Priority Species and Habitats (PHS) mapping, and the Statewide Washington Integrated Fish Distribution mapping salmonids have not been documented in any of the streams in the study area or Wetland A (WDFW 2023a, WDFW 2023b, NWIFC and WDFW, 2023c).

Research conducted by Wild Fish Conservancy on behalf of WDNR's Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment in 2009 determined that there are no known anadromous fish populations currently extant to Cypress Island (Wild Fish Conservancy 2011). Many of the streams on Cypress Island are small and seasonal with steep gradients or lacking enough volume and energy to force a permanent channel through the barrier beaches across their mouth; for most of the year sinking into the beach substrates before reaching a tidewater confluence. However, the report indicates that the lower reach of the Cypress Lake or Strawberry Creek outlet (Site Stream 1 or 2) within the embayment (Wetland A) may have been a location for freshwater fish spawning and rearing until fill in the 1950s, rendered the stream inaccessible to migrating salmon.

Herrera biologists observed three-spined stickleback (*Gasterosteus aculeatus*) in Wetland A and Stream 2. It is currently unknown whether diadromous species are able to access Wetland A through the tide gate. Improvements to fish passage into the embayment and upstream areas in Strawberry Bay Creek may provide access to potential suitable spawning habitat upstream of the study area.

Strawberry Bay and Nearshore

The Washington State Department of Ecology's (Ecology) Coastal Atlas maps seagrass habitat in the form of a continuous eelgrass bed along the shoreline in Strawberry Bay (Ecology 2023, Skagit County 2011). Kelp is mapped as occurring along the shoreline north and south of the project area, and surrounding Strawberry Island (Ecology 2023, Skagit County 2011). Skagit County also maps green and brown algae occurring along the Strawberry Bay shoreline and were observed by Herrera biologists during field work (Skagit County 2011).

The PHS maps the study area for the generalized location of pinto abalone (*Haliotis kamtschatkana*) which is endangered in Washington State (WDFW 2023b). Pinto abalone are found in kelp beds along well-exposed coasts, from the low intertidal zone to 40 meters (NOAA Fisheries 2023). The PHS also maps red sea urchin (*Strongylocentrotus franciscanus*) as occurring approximately 0.4 miles west of the project area around Strawberry Island (WDFW 2023a). In the San Juan Islands, red sea urchin is most common in at depths of 20-30 meters (Bizzaro et al. 2022).

Skagit County's GIS data layer from 2010 maps a bald eagle nest on Strawberry Island, the buffer of which extends onto the shoreline of the study area (Skagit County 2011). Several observations of black oystercatcher (*Haematopus bachmani*) have been recorded on Strawberry Island and were observed by Herrera biologists on the Strawberry Bay shoreline within the Study Area during the July 2022 field visit (Skagit County 2011). A WDFW record from 2016 maps the Cypress Island shoreline, approximately

0.8 miles northwest of the study area, as a surf smelt (*Hypomesus pretiosus*) spawning area (WDFW 2023d). Skagit County maps Strawberry Bay as a forage fish spawning beach (Skagit County 2011).

The Wild Fish Conservancy found regular use of the Strawberry Bay nearshore habitat by juvenile chum (*Oncorhynchus keta*), Chinook (*O. tshawytscha*), and coho (*O. kisutch*) salmon (Wild Fish Conservancy 2011). In total, 29 fish species have been documented in the Strawberry Bay nearshore environment including greenling (*Hexagrammos spp*.), gunnels and pricklebacks (Pholidae and Stichaeidae families), sculpin (Cottidae family), shiner perch (*Cymatogaster aggregate*), three-spined stickleback, and flounder (Pleuronectidae family). Three forage fish species, Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea pallasii*), surf smelt (*Hypomesus pretiosus*) were also documented.

North American river otter *(Lontra canadensis*) was observed along the Strawberry Bay nearshore during the July 2022 site visit.

Threatened and Endangered Species

There are several species listed as threatened or endangered by the Endangered Species Act (ESA) which may occur in study area (NOAA Fisheries 2023a, 2023b, USFWS 2023) (Table 7). The nearshore habitat in Strawberry Bay is located within designated critical habitat for the Puget Sound Evolutionary Significant Unit of Chinook salmon (NOAA Fisheries 2023b). Juvenile Chinook, anadromous bull trout, and other salmonids are likely to use the eelgrass beds along marine nearshore for foraging and refugia habitat (NMFS 2007, USFWS 2015). Shallow nearshore habitat including pocket estuaries and eelgrass beds in close proximity to natal deltas are highly significant habitat for young salmon (NMFS 2007). Steelhead are not known to extensively rear in estuaries or nearshore habitats and generally out-migrate from natal streams between April to June (NMFS 2018).

Table 7. Protected ESA Species and Designated Critical Habitat Potentially Present in the Study Area[a,b].

Species	Designated Critical Habitat in Study Area	Federal Listing Status	Possible Use of Study Area
Bocaccio, Coastal/Puget Sound DPS (*Sebastes paucispinis*)	Yes	Endangered	Strawberry Bay, nearshore
Bull trout, Coastal/Puget Sound DPS (*Salvelinus confluentus*)	No	Threatened	Strawberry Bay, nearshore
Chinook salmon, Puget Sound ESU	Yes	Threatened	Strawberry Bay, nearshore
Eulachon, Southern DPS (*Thaleichthys pacificus*)	No	Threatened	Rosario Strait
Green sturgeon, Southern DPS (*Acipenser medirostris*)	No	Threatened	Strawberry Bay, nearshore
Golden paintbrush (*Castilleja levisecta*)	No	Threatened	Cypress Island grasslands
Killer whale, Southern Resident DPS (*Orcinus orca*)	Yes	Endangered	Rosario Strait

Table 7 (continued). Protected ESA Species and Designated Critical Habitat Potentially Present in the Study Area[a,b].			
Species	**Designated Critical Habitat in Study Area**	**Federal Listing Status**	**Possible Use of Study Area**
Marbled murrelet (*Brachyramphus marmoratus*)	No	Threatened	Strawberry Bay, nearshore
Steelhead, Puget Sound DPS (*O. mykiss*)	Yes	Threatened	Strawberry Bay, nearshore
Taylor's Checkerspot (*Euphydryas editha taylori*)	No	Endangered	Cypress Island grasslands
Yelloweye rockfish, Coastal/ Puget Sound DPS rockfish (*S. ruberrimus*)	Yes	Threatened	Strawberry Bay, nearshore

[a] NOAA Fisheries 2023a, 2023b, USFWS 2023.

[b] The Western DPS of Yellow-billed cuckoo (*Coccyzus americanus*) and the North American wolverine (*Gulo gulo luscus*) were generally mapped in the region by USFWS, however there is no suitable habitat on Cypress Island for either of these species.

Nearshore habitat in Strawberry Bay is also situated within designated critical habitat for the Puget Sound/Georgia Basin Distinct Population Segment of Bocaccio and yelloweye rockfish (NOAA 2021d, 79 FR 68042). Free-floating larval Bocaccio and yelloweye rockfish likely use nearshore areas in Strawberry Bay. Adult rockfish may be located in deeper water habitat in the vicinity such as around Strawberry Island. Southern Resident DPS Killer whale may make use of Rosario Strait and the habitat surrounding Cypress Island and are most likely to occur between late spring and early autumn, though they may occur at any time of year (NMFS 2008).

Other Species and Ecosystems

SCC 14.24.500 designates areas of rare plant species and high-quality ecosystems as identified by the Washington State Department of Natural Resources through the Natural Heritage Program in Chapter 79.70 RCW. The Washington Natural Heritage Program maps several rare and high-quality wetland and upland ecosystems on Cypress Island, none of which occur near the study area (WDNR 2023c). Patches of Roemer's fescue and prairie junegrass ecosystems have been documented north and east of the project area on Cypress Island (WDNR 2023c). These types of grasslands have similar floristic attributes to the habitat requirements of golden paintbrush and Taylor's checkerspot butterfly (USFWS 2020d, USFWS 2022e). Skagit County and a 1996 record from WDFW document the presence of Western toad (*Anaxyrus boreas*), a Washington State Candidate species, near the headwaters of Stream 2 approximately 0.8 miles northeast of the study area (Figure 5) (Skagit County 2011, WDFW 2023c, WDFW 2023b).

As observed during the June and August 2022 site visits, driftwood, downed trees, and standing snags are providing valuable habitat structure for terrestrial species within the study area (Exhibit 9). Other larger sized mammals likely to be common on the island include Columbian black-tailed deer (*Odocoileus hemionus*), and racoon (*Procyon lotor*).

Exhibit 9. Habitat provided by snags and woody debris.

Upland and wetland forest habitat within the study area are relatively young and even aged but are providing good canopy cover, and some complexity in the understory (Exhibit 10).

Exhibit 10.Wetland and upland forest habitat.

Approximately 120 species of resident and migratory birds have been observed in the vicinity of Cypress Island (WDNR 2011). During the July 2022 site visit Herrera biologists recorded the presence of several relatively common birds (Table 8). Herrera also observed garter snakes (*Thamnophis* sp.) and made auditory observations of Pacific chorus frog (*Pseudacris regilla*).

Table 8. Birds Observed in Study Area During July 2022 Site Visit.

Species	
American goldfinch (*Spinus tristis*)	Great blue heron (*Ardea herodias*)
American kestrel (*Falco sparverius*)	House wren (*Troglodytes aedon*)
American robin (*Turdus migratorius*)	Northern flicker (*Colaptes auratus*)
Bald eagle (*Haliaeetus leucocephalus*)	Pacific slope flycatcher (*Empidonax difficilis*)
Barn swallow (*Hirundo rustica*)	Pigeon guillemot (*Cepphus columba*)
Black oystercatcher (*Haematopus bachmani*)	Red-breasted nuthatch (*Sitta canadensis*)
Canada goose (*Branta canadensis*)	Red crossbill (*Loxia curvirostra*)
Cedar waxwing (*Bombycilla cedrorum*)	Spotted towhee (*Pipilo maculatus*)
Dark-eyed junco (*Junco hyemalis*)	Song sparrow (*Melospiza melodia*)
Double-crested cormorant (*Phalacrocorax auratus*)	Violet-green swallow (*Tachycineta thalassina*)
Glaucous-winged gull (*Larus glaucescens*)	White-crowned sparrow (*Zonotrichia leucophrys*)

REFERENCES

Anderson, P.S., Meyer, S., Olson, P., Stockdale, E. 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. Ecology Publication 16 06 029. Washington State Department of Ecology.

Beamer, E., R. Henderson, A. McBride, and K. Wolf. 2003. The importance of non-natal pocket estuaries in Skagit Bay to wild Chinook salmon: an emerging priority for restoration. Skagit System Cooperative, Research Department. La Conner, Washington, 10 p.

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRP DE 4. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. August.

Busby, M.S., Barnhart R.A. 1995. Potential Food Sources and Feeding Ecology of Juvenile Fall Chinook Salmon in California's Mattole River Lagoon. National Marine Fisheries Service. National Biological Survey. California Fish and Game 81(4):133-146.

Ecology. 2021. Wetland Mitigation in Washington State–Part 1: Agency Policies and Guidance (Version 2). Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2021. Washington State Department of Ecology Publication 21 06 003.

Ecology. 2023a. Coastal Atlas Map. Washington Department of Ecology. Accessed June 1, 2023 https://apps.ecology.wa.gov/coastalatlasmap

Ecology. 2023b. Water Quality Atlas Map. Version 2.0.0.0. Washington Department of Ecology. Accessed June 1, 2023 https://apps.ecology.wa.gov/waterqualityatlas/wqa/map.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y 87 1. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi. January.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region. Technical Report TR 08 13. U.S. Army Corps of Engineers, Engineer Research and Development Center, Wetlands Regulatory Assistance Program, Vicksburg, Mississippi.

FGDC. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC STD 004 2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Department of Ecology, Olympia, Washington. Publication #14 06 029. October.

Hutchinson, I. 1988. Salinity tolerance of plants of estuarine wetlands and associated uplands. Report to the Washington State Shorelands and Coastal Zone Management Program. Contract C0088137. Simon Fraser University, Burnaby, BC. <https://fortress.wa.gov/ecy/publications/documents/0706018.pdf>.

NOAA Fisheries. 2023a. ESA Threatened & Endangered Species Directory. Accessed June 1, 2023. <https://www.fisheries.noaa.gov/species-directory/threatened-endangered>.

NOAA Fisheries. 2023b. Protected Resources App. NOAA Fisheries, West Coast Region. Accessed March 29, 2021. <https://www.webapps.nwfsc.noaa.gov/portal/apps/webappviewer/index.html?id=7514c715b8594944a6e468dd25aaacc9>.

NRCS. 2023a. Agricultural Applied Climate Information System. U.S. Department of Agriculture, Natural Resources Conservation Service. Accessed March 20, 2021. <https://efotg.sc.egov.usda.gov/efotg_locator.aspx>.

NRCS. 2023b. Official Soil Series Descriptions. Natural Resources Conservation Services, U.S. Department of Agriculture. Accessed March 20, 2021. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053587>.

NRCS. 2023c. WebSoil Survey. Natural Resources Conservation Services, U.S. Department of Agriculture. Accessed March 20, 2021. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

Rodrigues-Filho, J.L., Macêdo, R.L., Sarmento, H. et al. From ecological functions to ecosystem services: linking coastal lagoons biodiversity with human well-being. Hydrobiologia. 2023. <https://doi.org/10.1007/s10750-023-05171-0>.

Skagit County. 2011. Appendix B Shoreline Inventory Map Folio: Western Region. Skagit County Planning and Development Services. Accessed at <https://www.skagitcounty.net/Departments/PlanningAndPermit/SMPappendixBWEST.htm>.

Skagit County. 2022. Skagit County Shoreline Master Program. BOCC Public Hearing Draft. February 15. Accessed June 1, 2023 at <https://skagitcounty.net/Departments/PlanningAndPermit/SMPmain.htm>.

Toft, J.D., Cordell J.R., Simenstad C.A., & Stamatiou, L.A. 2007. Fish Distribution, Abundance, and Behavior along City Shoreline Types in Puget Sound, North American Journal of Fisheries Management, 27:2, 465-480, DOI: 10.1577/M05-158.1

USFWS. 2017. National Wetlands Inventory Wetlands Dataset Layer. Digital data created in 2017. U.S. Fish and Wildlife Service. Accessed November 29, 2022. <https://www.fws.gov/wetlands/data/data-download.html>.

USFWS. 2023. IPaC Information for Planning and Consultation. U.S. Fish and Wildlife Service. Accessed June 1, 2023 <https://ipac.ecosphere.fws.gov/>.

WDFW and NWIFC. 2023. Statewide Washington Fish Distribution mapping. Washington Department of Fish and Wildlife and Northwest Indian Fisheries Commission. Accessed June 13, 2023 at <https://geo.nwifc.org/swifd/>.

WDFW. 2023a. SalmonScape mapping system. Washington Department of Fish and Wildlife. Accessed March 25, 2021. <http://wdfw.wa.gov/mapping/salmonscape/index.html>.

WDFW. 2023b. State Listed Species. Revised April 2023. Washington Department of Fish and Wildlife. Accessed June 1, 2023. <https://wdfw.wa.gov/species-habitats/at-risk/listed>.

WDFW. 2023c. Priority Species and Habitat Database. Provided by Washington Department of Fish and Wildlife. Accessed March 25, 2021<http://wdfw.wa.gov/mapping/phs/>.

WDFW. 2023d. Forage Fish Spawning Map–Washington State. Washington Department of Fish and Wildlife. Accessed June 1, 2023. <https://wdfw.maps.arcgis.com/home/webmap/viewer.html?webmap=19b8f74e2d41470cbd80b1af8dedd6b3&extent=-126.1368,45.6684,-119.6494,49.0781>.

Wild Fish Conservancy. 2011. Cypress Island Aquatic Reserve Pilot Nearshore Fish Use Assessment March–October 2009. Prepared for the Washington State Department of Natural Resources Aquatic Reserves Program. Duvall, WA. June.

WDNR. 2004. Forest Practices Board Manual. Washington State Department of Natural Resources. Olympia, Washington.

WDNR. 2007. Cypress Island Comprehensive Management Plan. Washington Department of Natural Resources. Skagit County, Washington. August.

WDNR. 2023a. Cypress Island Natural Resources Conservation Area. Washington State Department of Natural Resources. Accessed June 15, 2023 <https://www.dnr.wa.gov/CypressIsland>.

WDNR. 2023b. Forest Practices Application Mapping Tool (FPAMT). Washington State Department of Natural Resources. Accessed June 1, 2023 <https://fpamt.dnr.wa.gov/>.

WDNR. 2023c. Washington Natural heritage Program. Accessed March 23, 2021. <http://www.dnr.wa.gov/NHPwetlandviewer>.

This page intentionally left blank

APPENDIX A

Delineation Methods

HERRERA
Science + Planning + Design

This page intentionally left blank

Wetland and Stream Delineation Methods

Wetland Delineation Methods

The wetland delineation for the Strawberry Bay Restoration project was performed in accordance with the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010)) which is consistent with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). These methods use a three-parameter approach for identifying and delineating wetlands: the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. This wetland delineation was performed according to procedures specified for the routine wetland determination method (Environmental Laboratory 1987).

To identify potential wetlands, wetland biologists evaluated field conditions by traversing the study area and noting wetlands, streams, and other aquatic features. The biologists evaluated field conditions within 150 feet of the study area boundary by observing them from within the study area boundaries because permission to access this property was not provided.

A test plot was established for each area that appeared to have potential wetland characteristics. For each test plot, data on dominant plant species, soil conditions in test plots, and evidence of hydrologic conditions were recorded on wetland determination data forms. Plants, soils, and hydrologic conditions were also analyzed and documented in adjacent uplands. Based on collected data, a determination of wetland or upland was made for each area examined.

Following confirmation of wetland conditions in a given area, the wetland boundary was delineated by placing sequentially numbered, flagging along the wetland perimeter. Test plot locations were marked with pin flags. The locations of wetland boundaries and were subsequently surveyed by PowerTek.

Hydrophytic Vegetation

Hydrophytic vegetation is characterized by the ability to grow, effectively compete, reproduce, and persist in anaerobic soil conditions resulting from periodic or long-term saturation (Environmental Laboratory 1987). Vegetation must meet at least one of the four indicators (described below) that are used to determine the presence of hydrophytic vegetation in wetlands. Problematic and atypical situations for hydrophytic vegetation are also described in the US Army Corps of Engineers (USACE) delineation manual and supplement (Environmental Laboratory 1987, 2010).

Plant Species Identification

Plant species were identified using *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1987) and *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon* (Cooke 1997). The indicator status of each plant species is based on the *National Wetland Plant List* (Lichvar 2016) for the Western Mountains, Valleys, and Coast Region.

Dominant Species Determination

Dominant species are those that contribute more than other species to the character of a plant community. To determine dominance, a vegetation sampling area is determined by the field biologist to accurately characterize the plant community that occurs in the area to be evaluated. These are commonly circular sampling areas, centered on the location of the test plot (where soil and hydrologic data is also collected). The radius of the circle is determined in the field, based on site conditions. In large wetlands, a typical sampling radius would be 2 to 5 meters for tree and sapling/shrub species, and 1 meter for herbaceous species. In a small or narrow wetland (or upland), the radius might be reduced to accurately sample wetland (upland) areas, thereby avoiding an overlap into an adjacent community having different vegetation, soils, or hydrologic conditions (Environmental Laboratory 2010).

Within the vegetation sampling area, a complete list of plant species that occur in the sampling area is compiled and the species divided into four strata: tree, shrub (including saplings, see criteria below), herb, and woody vines. A plant is included in the tree stratum if it is a woody plant 3 inches in diameter at breast height (dbh) or greater; in the shrub stratum if it is a woody plant less than 3 inches dbh (including tree saplings under 3 inches dbh); in the herb stratum if it is an herbaceous (non-woody) plant; and in the woody vine stratum if it is a woody vine of any height (Environmental Laboratory 2010). To be included in the sampling, 50 percent or more of the plant base must be within the radius of the sampling area. For trees specifically, more than 50 percent of the trunk (diameter) must be within the sampling radius to be included.

A rapid test, dominance test (e.g., the 50/20 rule), or prevalence index are commonly used to determine which species are considered dominant and to assess whether the criteria for hydrophytic vegetation are met at each test plot (Environmental Laboratory 2010). Additional hydrophytic vegetation indicators are discussed in the following section.

To conduct a rapid test (Indicator 1 on the wetland determination data form), the dominant species are evaluated visually and if all are FACW or OBL, the vegetation data passes the rapid test. To conduct a dominance test (Indicator 2 on the wetland determination data form), the absolute areal coverage of the plant species within a stratum are totaled, starting with the most abundant species and including other species in descending order of coverage, until the cumulative coverage exceeds 50 percent of the total coverage for the stratum. The plant species that constitute this first 50 percent of areal coverage are considered the dominant species in the stratum. In addition, any other any single plant species that constitutes at least 20 percent of the total percent cover in the stratum is also considered a dominant species (Environmental Laboratory 2010). The indicator status category for each plant (shown in Table A-1) is also listed on the wetland determination form. If more than 50 percent of the dominant species across all strata are rated OBL, FACW, or FAC, the hydrophytic vegetation dominance test (Indicator 2) is met.

The prevalence index (Indicator 3 on the wetland determination data form) is a weighted-average wetland indicator status of all plant species in the sampling plot, where weighting is by abundance (Environmental Laboratory 2010). This method is used where indicators of hydric soil and wetland hydrology are present, but the vegetation initially fails the rapid and dominance tests (Indicators 1 and 2). To determine the prevalence index, the absolute cover of each species in each stratum is determined. All

species (across all strata) are organized into wetland indicator status groups (i.e., OBL, FACW, FAC, FACU, or UPL) and their cover values are summed within the groups. The formula for the prevalence index is applied. If the prevalence index (which ranges from 1.0 to 5.0) equals 3.0 or less, this hydrophytic vegetation indicator is met.

Table A-1.

Indicator Status	Indicator Symbol	Definition
Obligate wetland plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions but also occur rarely (estimated probability <1%) in upland areas
Facultative wetland plants	FACW	Plants that usually occur (estimated probability >67%) in wetlands under natural conditions but also occur (estimated probability 1% to 33%) in upland areas
Facultative plants	FAC	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and upland areas
Facultative upland plants	FACU	Plants that sometimes occur (estimated probability 1% to 33%) in wetlands but occur more often (estimated probability >67% to 99%) in upland areas
		Plants that rarely occur (estimated probability <1%) in wetlands under natural conditions
$WET \longleftarrow OBL - FACW - FAC - FACU - UPL \longrightarrow DRY$		

Source: Environmental Laboratory (1987).

Additional Hydrophytic Vegetation Indicators

The presence of morphological adaptations to wetland conditions in plants that lack a published hydrophytic vegetation indicator status or with an indicator status of FACU or drier is also a hydrophytic vegetation indicator (Indicator 4). Evidence of physiological, morphological, or reproductive adaptations indicating growth in hydrophytic conditions can include, but are not limited to, buttressed roots, adventitious roots, multi-stemmed trunks, or tussocks. To determine whether Indicator 4 is met, the morphological features must be observed on more than 50 percent of the individuals of a FACU species (or species without a published indicator status) living in an area where hydric soil and wetland hydrology are present. On the wetland determination data form, the indicator status of the species with morphological adaptations would be changed to FAC (with supporting notes), and the dominance test (Indicator 2) and/or prevalence index (Indicator 3) would then be recalculated.

Wetland non-vascular plants, referred to as bryophytes and consisting of mosses, liverworts, and hornworts, may also meet the hydric vegetation criteria, under Indicator 5 (Environmental Laboratory 2010). These plants must be present in areas containing hydric soils and wetland hydrology. The percent cover of wetland specialist bryophytes is determined in 10-inch-by-10-inch square plots placed at the base of hummocks, if present. The summed cover of wetland specialist bryophytes must be more than 50 percent of the total bryophyte cover in the vegetation sampling area.

The problematic hydrophytic vegetation indicator section in the USACE regional supplement further explains how to interpret situations in which hydric soils and wetland hydrology are present but

hydrophytic vegetation Indicators 1 through 5 are lacking (Environmental Laboratory 2010). Procedures for looking at settings such as areas with active vegetation management (e.g., farms), areas dominated by aggressive invasive species, active floodplains, and low terraces are described, as well as explanations for specific situations, such as seasonal shifts in plant communities, extended drought conditions, and riparian areas.

Hydric Soils

A hydric soil is a soil that is saturated, flooded, or inundated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987, 2010). The evaluation of existing soil maps (developed by the US Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] and other sources) is used to understand hydric soil distribution and to identify the likely locations of hydric soils (by verifying their inclusion on the hydric soils list). Comparison of these mapped soils to conditions found on site help verify the presence of hydric soils.

For onsite soils characterization, hydric soils data were obtained generally by digging test pits at least 20 inches deep and 4 inches wide. Hydric soil conditions were evaluated using indicators outlined in *Field Indicators of Hydric Soils in the United States* (NRCS 2017) and adopted by the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010).

Hydric soil indicators applicable to the Western Mountains, Valleys, and Coast region include, but are not limited to, the presence of organic soils (i.e., histosols or histic epipedons); sulfidic material (i.e., hydrogen sulfide); depleted, gleyed, or reduced soil matrices; and/or the presence of iron or manganese concretions (Environmental Laboratory 2010). Soil color characterization (i.e., hue, value, and chroma) is a critical tool in determining depleted, gleyed, and reduced soil conditions. Soil color was evaluated by comparing soil colors at test plots to standardized color samples in *Munsell Soil Color Charts* (Munsell Color 2000).

Wetland Hydrology

Wetland hydrology is indicated by site conditions that demonstrate the periodic inundation or saturation to the soil surface for a sufficient duration during the total growing season. A *sufficient duration* during the growing season is defined as 14 or more consecutive days of flooding, ponding, or presence of a water table at 12 inches or less from the soil surface (Environmental Laboratory 2010). The growing season is the period of consecutive frost-free days, or the longest period during which the soil temperature stays above biological zero (41°F), when measured at 12 inches below the soil surface.

Two indicators of biological activity can be used to determine whether the growing season has begun and is ongoing (Environmental Laboratory 2010):

- Occurrence of aboveground growth and development of at least two non-evergreen vascular plant species growing within the wetland. Examples of this growth include the emergence or elongation of leaves on woody plants and the emergence or opening of flowers.

- Soil temperature, which can be measured once during a single site visit, should be at least 41°F or higher at a depth of 12 inches.

For this assessment, onsite hydrologic indicators were examined at the test plots. Hydrologic indicators may include the presence of surface water, standing water in the test pit at a depth of 12 inches or less, saturation in the root zone, watermarks, drift lines, sediment deposits, drainage patterns within wetlands, oxidized rhizospheres surrounding living roots, and water-stained leaves.

Antecedent Precipitation Analysis

Analyzing climatic conditions and local weather patterns are important in the assessment of vegetation, soil conditions, and hydrology for wetland delineations (Environmental Laboratory 1987, 2010), and information on precipitation that precedes a site visit is valuable in helping determine whether conditions observed as a site are reflective of normal rainfall. The NRCS (1997) provides methodology for the analysis of normal environmental conditions using antecedent rainfall measurements. For this method, "normal precipitation" is defined as ranges of normal precipitation or values falling within defined thresholds, in this case, the 30th and 70th percentile thresholds (Sprecher and Warne 2000). These ranges for a particular site are provided by WETS tables, which can be accessed through the NRCS National Water and Climate Center (NRCS 2023) and are calculated using long-term data (30 years) recorded at National Weather Service meteorological stations. USDA WETS tables display monthly average rainfall data (50th percentile) in addition to the upper and lower limits at which there is a 30 percent chance that rainfall will be more or less than the average (30th and 70 percentiles) (NRCS 2017). USDA WETS tables use climatological probabilities and are calculated on the basis of the most recent three decades of data, as factors such as climate change and different recording technologies may alter probabilities (Sprecher and Warne 2000). Currently, the 30-year range from 1981 to 2010 is used. This method makes the assumptions that rainfall is evenly distributed within a month, that antecedent precipitation can be properly evaluated for a 3-month period (i.e., assumes that evapotranspiration is the same in each season), that antecedent precipitation affects different systems similarly, and that snowmelt has the same contribution to hydrology as rainfall (Sprecher and Warne 2000).

To determine whether recent precipitation is reflective of normal precipitation, a representative weather station near the site is selected; as other conditions may affect precipitation (e.g., elevation, aspect, and proximity to mountains), the nearest station may not be the most representative of the site (Environmental Laboratory 2010). The procedure for determining normal precipitation uses measured rainfall data from the 3 months prior to the month of the site visit. For example, if the site visit occurs in September, precipitation data from June, July, and August would be analyzed. The recorded rainfall of each month is first compared to the long term range of normal precipitation (30th and 70th percentiles) and is determined to have a "normal" condition if it falls within this range; if the recorded data is higher or lower than the range, then it is determined to have a "wet" or "dry" condition, respectively. The condition is then given a value, "1" for "dry", "2" for "normal", and "3" for "wet", and this value is multiplied by the weighted monthly value, where the most recent month (one month prior) is weighted heavier (3) than 3 months prior (1). The sum of this product is then used to determine whether the entire 3-month period is "drier than normal" (6-9), "normal" (10-14) or "wetter than normal" (15-18). While this method is useful for comparing a short-term time period to normal, this method is limited in that it is

discounts analysis of daily precipitation patterns within a given month (Sprecher and Warne 2000, Sumner et al. 2009).

Stream and Shoreline Delineation Methods

The OHWMs of streams within the study area were delineated using the definition provided in the WAC, Section 222-16-010. According to this definition, the OHWM of streams is "that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation." In addition, methods in the publication *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016) were applied.

To delineate the OHWM, the bed and adjacent banks of streams in the study area were examined for indications of regular high water events. Factors considered when assessing changes in vegetation include:

- Scour (removal of vegetation and exposure of gravel, sand, or other soil substrate)
- Drainage patterns
- Elevation of floodplain benches
- Changes in sediment texture across the floodplain
- Sediment layering
- Sediment or vegetation deposition
- Changes in vegetation communities across the floodplain

Biologists hung flagging on vegetation to mark the horizontal location of the OHWM which was located directly beneath the flag. The locations of the OHWM flags were subsequently surveyed by PowerTek.

References

Anderson, P.S., Meyer, S., Olson, P., Stockdale, E. 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. Ecology Publication 16 06 029. Washington State Department of Ecology.

Cooke, S. 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwest Oregon. Seattle Audubon Society and Washington Native Plant Society, Seattle, Washington. June 1997.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi. January 1987.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region. Technical Report TR-08-13. US Army Corps of Engineers, Engineer Research and Development Center, Wetlands Regulatory Assistance Program, Vicksburg, Mississippi.

Hitchcock, C.L., and A. Cronquist. 1987. Flora of the Pacific Northwest. University of Washington Press, Seattle, Washington.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30:1-17. US Army Corps of Engineers. Accessed June 27, 2016. <http://rsgisias.crrel.usace.army.mil/NWPL/>.

Munsell Color. 2000. Munsell Soil Color Charts. New Windsor, New York.

NRCS. 1997. Hydrology Tools for Wetland Determination. Chapter 19, Engineering field handbook. D. E. Woodward, ed. USDA-NRCS, Fort Worth, Texas.

NRCS. 2017. Field Indicators of Hydric Soil in the United States, Version 8.1. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). US Department of Agriculture, Natural Resources Conservation Service, in cooperation with the National Technical Committee for Hydric Soils.

NRCS. 2023. Agricultural Applied Climate Information System. US Department of Agriculture, Natural Resources Conservation Service. Accessed January 25, 2018. <https://www.nrcs.usda.gov/resources/guides-and-instructions/agacis-climate-data-retrieval-0>.

Sprecher, S., and A. Warne. 2000. Accessing and Using Meteorological Data to Evaluate Wetland Hydrology. Technical Report TR-WRAP-00-01. US Army Corps of Engineers, Engineer Research and Development Center, Operations Division Regulatory Branch, Vicksburg, Mississippi. April.

Sumner , J.P., M.J. Vepraskas, and R.K. Kolka. 2009. Methods to Evaluate Normal Rainfall for Short-term Wetland Hydrology Assessment. Wetlands 29(3): 1049-1062.

APPENDIX B

Wetland Data Forms

HERRERA
Science + Planning + Design

This page intentionally left blank

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-1

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T36N R1E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): A 2 Lat: 48.56488 Long: -122.721889 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP-1 (wetland) - All three wetland parameters present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m)			
1. Juncus balticus	70	✓	FACW
2. Potentilla anserina	30	✓	OBL
3. Triglochin maritima	20	✓	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.	0		
	120% = Total Cover		
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	70	x 2 =	140
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		190 (B)

Prevalence Index = B/A = 1.58

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Hydrophytic vegetation indicators present.

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 2/2		2.5Y 4/2	5	D	M	Muck	Lots of roots/fibric organic soil
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soils meet hydric criteria (histosol).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrology indicators present. A3, D2, and D5 indicators present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-02

Applicant/Owner: WADNR State: Washington Sampling Point: SP-2

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T36N R1E

Landform (hillslope, terrace, etc.): Backshore Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR): A 2 Lat: 48.564589 Long: -122.721904 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

SP-2 (upland) - no wetland parameters present. Wetland parameters are positive. Sample plot located near backshore berm next to cabin.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	5		FAC
2.			
3.			
4.			
	5%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Festuca rubra	80	✓	FAC
2. Leymus mollis	20	✓	FACU
3. Achillea millefolium	20	✓	FACU
4. Holcus lanatus	10		FAC
5. Persicaria spp.	10		FAC
6. Taraxacum officinale	5		FACU
7.			
8.			
9.			
10.			
11.			
	145%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	105	x 3 =	315
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	150 (A)		495 (B)

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No vegetation indicators present.

Nearby in shrub stratum: Rosa nutkana. Trace in herb stratum: Plantago lanceolata, Festuca arudinacea.

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	7.5YR 2.5/2	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Soils do not meet hydric criteria.

Layer 1: Layer of rounded cobble 0-4''. Smaller gravel below 4'' and mostly sand. Glass shard in pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-3

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T36N R1E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): A 2 Lat: 48.565699 Long: -122.724157 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP-3 (wetland) - all 3 wetland parameters present.
Sample plot located in edge of wetland behind the 2nd and third houses (Danielle photo) north of the boardwalk, adjacent upland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Potentilla anserina	80	✓	OBL
2. Schoenoplectus acutus	70	✓	OBL
3. Juncus balticus	20	✓	FACW
4. Oenanthe sarmentosa	5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	175%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	155	x 1 =	155
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	175 (A)		195 (B)

Prevalence Index = B/A = 1.11

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
✓ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation indicators present.
Big juniper nearby in tree stratum. Trace in shrub stratum: Cytisus scoparius. Trace in herb stratum: Glyceria elata.

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	7.5YR 2.5/1						Loam	Fibric organic
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✓ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soil meets hydric criteria of A3 (Black histic)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 11

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are positive. A2, A3, and D2 indicators met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-4

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T36N R1E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): A 2 Lat: 48.565769 Long: -122.721729 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP-4 (wetland) - all 3 wetland parameters present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m)			
1. Juncus balticus	50	✓	FACW
2. Carex obnupta*	40	✓	OBL
3. Rumex crispus	10		FAC
4. Potentilla anserina	5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	105% = Total Cover		
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	50	x 2 =	100
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		175 (B)

Prevalence Index = B/A = 1.67

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation indicators present.

*Sample taken, C. lyngbyei present elsewhere in wetland.

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18	7.5YR 2.5/1	100					Muck	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✓ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 9

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrology indicators present. A2, A3, D2, and D5 indicators present.
Saturated to surface. Surface water 3' from pit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-6

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S32 T36N R1E

Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): A 2 Lat: 48.565694 Long: -122.720819 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: N/A upland meadow

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

SP-6 (upland) - Sample plot located west of the house ~ open meadow near salal hedge on south edge. Vegetation is mixed facultative nd facutative upland herbaceous plant species.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Trisetum cernuum	40	✓	FACU
2. Schedonorus arundinaceus	20	✓	FAC
3. Agrostis capillaris	20	✓	FAC
4. Viola adunca	15		FAC
5. Angelica arguta	10		FACW
6. Rubus ursinus	5		FACU
7.			
8.			
9.			
10.			
11.			
	110%	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	55	x 3 =	165
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	110 (A)		365 (B)

Prevalence Index = B/A = 3.32

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation indicators not present based on prevalance Index worksheet.
Nearby in tree statum: Pseudotsuga menziesii. Nearby in shrub stratum: Gaultheria shallon.
Trace in herb stratum: Cirsium vulgare, Lolium perenne, Achillea millefolium, Hypochaeris radicata.

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 11	7.5YR 2.5/2	100					Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

No hydric soil indicators present.

Soil layer 1: Angular gravel throughout pit. Soil too compact to get at further depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-7

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S32 T36N R1E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): A 2 Lat: 48.565632 Long: -122.719525 Datum: WGS 84

Soil Map Unit Name: 63 - Guemes very stony loam, 30 to 70 percent slopes NWI classification: PFO Wetland A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

S-7 (wetland) - all 3 wetland parameters present.
Sample plot located in sparsely vegetated depression south of house and east of the zig-zag channel next to a weir flag A-30 (?)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	20	✓	FAC
2.			
3.			
4.			
	20%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1. Gaultheria shallon	40	✓	FACU
2.			
3.			
4.			
5.			
	40%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Lysichiton americanus	30	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	90 (A)		250 (B)

Prevalence Index = B/A = 2.78

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
✓ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation indicators present. Lots of downed trees.
Nearby in tree stratum: Cherry spp.

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 9	10YR 2/1	100					Organic	Black histic
9 - 16	5GY 3/1	95	7.5YR 3/4	5	C	M	Clay	(No gravel) some charcoal
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✓ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Clay

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil indicators are positive.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrologic indicators present. Surface water nearby.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-9

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S32 T36N R1E

Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): A 2 Lat: 48.563197 Long: -122.719696 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification: E2EM1P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

SP-9 (upland) - no wetland parameters present.
Located east of shoreline berm in upland forest.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	60	✓	FACU
2.			
3.			
4.			
	60%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1. Juniperus scopulorum	20	✓	UPL
2. Rosa sp.	20	✓	OBL
3. Alnus rubra	20	✓	FAC
4. Betula papyrifera	15		FAC
5. Mahonia nervosa	5		FACU
	80%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Rubus ursinus	40	✓	FACU
2. Linnaea borealis	30	✓	FACU
3. Schedonorus arundinaceus	20	✓	FAC
4. Vicia americana	10		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	135	x 4 =	540
UPL species	20	x 5 =	100
Column Totals:	240 (A)		855 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation indicators not present. Lots of downed wood and snags.
Trace in shrub stratum: Gaultheria shallon, Holodiscus discolor, Tsuga heterophylla

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 2/1	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-10

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S32 T36N R1E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR): A 2 Lat: 48.562446 Long: -122.718458 Datum: WGS 84

Soil Map Unit Name: 63 - Guemes very stony loam, 30 to 70 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP-10 (wetland) - all 3 wetland parameters present. Near wetland flag W56.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	70	✓	FAC
2.			
3.			
4.			
	70%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1.			
2.			
3.			
4.			
5.			
	_____	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Carex obnupta	20	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		230 (B)

Prevalence Index = B/A = 2.56

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation indicators present.

Bitter cherry, Doug fir located upland of boundary. Salal, bracken fern, trailing blackberry.

SOIL

Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	7.5YR 2.5/1	100					Organic	
8 - 16	7.5YR 2.5/1	85	2.5YR 3/3	15	C	M	Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✓ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrological indicators present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Strawberry Bay - Cypress City/County: Skagit Sampling Date: 2022-08-01

Applicant/Owner: WADNR State: Washington Sampling Point: SP-11

Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S32 T36N R1E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): A 2 Lat: 48.56508 Long: -122.720851 Datum: WGS 84

Soil Map Unit Name: 25 - Catla gravelly fine sandy loam, 0 to 8 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

SP-11 (wetland) - all 3 wetland parameters present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	15	✓	FAC
2. Thuja plicata	10	✓	FAC
3.			
4.			
	25%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2m)			
1. Rhododendron groenlandicum	30	✓	OBL
2. Spiraea douglasii	30	✓	FACW
3. Physocarpus capitatus	20	✓	FACW
4. Gaultheria shallon	5		FACU
5.			
	85%	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Carex obnupta	80	✓	OBL
2. Triglochin maritima	45	✓	OBL
3. Juncus balticus	40	✓	FACW
4. Potentilla anserina	30	✓	OBL
5. Achillea millefolium	20	✓	FACU
6. Glyceria grandis	10		OBL
7. Pteridium aquilinum	5		FACU
8. Eleocharis palustris	5		OBL
9.			
10.			
11.			
	235%	= Total Cover	
Woody Vine Stratum (Plot size: 1m)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 90 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	200	x 1 =	200
FACW species	90	x 2 =	180
FAC species	25	x 3 =	75
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	345 (A)		575 (B)

Prevalence Index = B/A = 1.67

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation indicators present.

Trace in herb stratum: Mentha spp., Erythranthe alsinoides, Angelica arguta.

SOIL

Sampling Point: SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	7.5YR 2.5/1	80	2.5YR 4/8	20	C	M	Organic	
8 - 10	10YR 2/1	100					Organic	
10 - 12	10YR 2/1	100					Sandy Loam	Organic with sandy loam with woodchunks
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✓ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydrological indicators present.

APPENDIX C

Wetland A Rating Form

HERRERA
Science + Planning + Design

This page intentionally left blank

Wetland name or number WLA

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Strawberry Bay - Wetland A Date of site visit: 8/1/2022

Rated by D. Rapoza, T. Mirabile Trained by Ecology? ✓ Yes ___ No Date of Training 10/2018

HGM Class used for rating Freshwater Tidal Fringe Wetland has multiple HGM classes? ✓ Yes ___ No

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map Skagit County

OVERALL WETLAND CATEGORY I (based on functions ✓ or special characteristics ✓)

1. Category of wetland based on FUNCTIONS *

Category I – Total score = 23 – 27

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Circle the appropriate ratings				
Site Potential	M	H	M	
Landscape Potential	M	M	H	
Value	H	H	H	**TOTAL**
Score Based on Ratings	7	8	8	23

Score for each function based on three ratings
(*order of ratings is not important*)
9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland*

CHARACTERISTIC	CATEGORY
Estuarine	(I) II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	(I) II
Interdunal	I II III IV
None of the above	

* Wetland A was rated based on functions as a Freshwater Tidal Fringe AND was evaluated for special characteristics as an Estuarine and Coastal Lagoon wetland because there was evidence of all of these hydrologic regimes. All methods determined Wetland A to be Category I.

Wetland name or number WLA

Maps and figures required to answer questions correctly for Western Washington

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	C-1
Hydroperiods	H 1.2	NA*
Ponded depressions	R 1.1	C-2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	C-2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	C-1
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	C-2
Map of the contributing basin	R 2.2, R 2.3, R 5.2	C-3
1 km Polygon: Area that extends 1 km from entire wetland edge—including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	C-4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	C-5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	C-5

*Manual states that Freshwater Tidal Fringe wetlands be scored with 2 points for H1.2 Hydroperiods, therefore figure is not applicable.

Wetland name or number WLA

HGM Classification of Wetlands in Western Washington

For questions 1–7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1–7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – Go to 2 ✓**YES** – The wetland class is **Tidal Fringe** – Go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) ✓**YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – Go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands*.

3. Does the entire wetland unit **meet all** of the following criteria?

   _____The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   _____At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – Go to 4 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

   _____The wetland is on a slope (*slope can be very gradual*),
   _____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   _____The water leaves the wetland **without being impounded**.

   NO – Go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number WLA

5. Does the entire wetland unit **meet all** of the following criteria?

   _____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   _____The overbank flooding occurs at least once every 2 years.

   NO – Go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland*.

   NO – Go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

   NO – Go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1–7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	**HGM class to use in rating**
Choose an item.	

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number WLA

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions – Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions present but cover <1/2 area of wetland | points = 2	2
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) Herbaceous plants (>6 in high) >2/3 area of the wetland | points = 6	6
Total for R 1 Add the points in the boxes above	8

Rating of Site Potential If score is: 6–11 = M *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?		
R 2.1. Is the wetland within an incorporated city or within its UGA?	No = 0	0
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	No = 0	0
R 2.3 Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?	No = 0	0
R 2.4. Is >10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1–R 2.4? **If yes,** other sources:	No = 0	0
Total for R 2 Add the points in the boxes above		1

Rating of Landscape Potential If score is: 1 or 2 = M *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?	No = 0	0
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?	No = 0	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*)	Yes = 2	2
Total for R 3 Add the points in the boxes above		2

Rating of Value If score is: 2–4 = H *Record the rating on the first page*

COMMENTS:

Stream is locally important as it serves as the water source for nearby residences. A TMDL for the Puget Sound Nutrient Source Reduction is currently in development and encompasses the area around Strawberry Bay.

Wetland name or number WLA

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Hydrologic Functions – Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks). (1,300 ft/(3ft +3ft + 3ft) = 186* If the ratio is more than 20 | points = 9	9
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes)*. Emergent plants >2/3 area | points = 7	7
Total for R 4 — Add the points in the boxes above	16

Rating of Site Potential If score is: 12–16 = H *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	No = 1	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	No = 0	0
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0	0
Total for R 5 — Add the points in the boxes above		1

Rating of Landscape Potential If score is: 1 or 2 = M *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The subbasin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) | points = 2	2
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? No = 0	0
Total for R 6 — Add the points in the boxes above	2

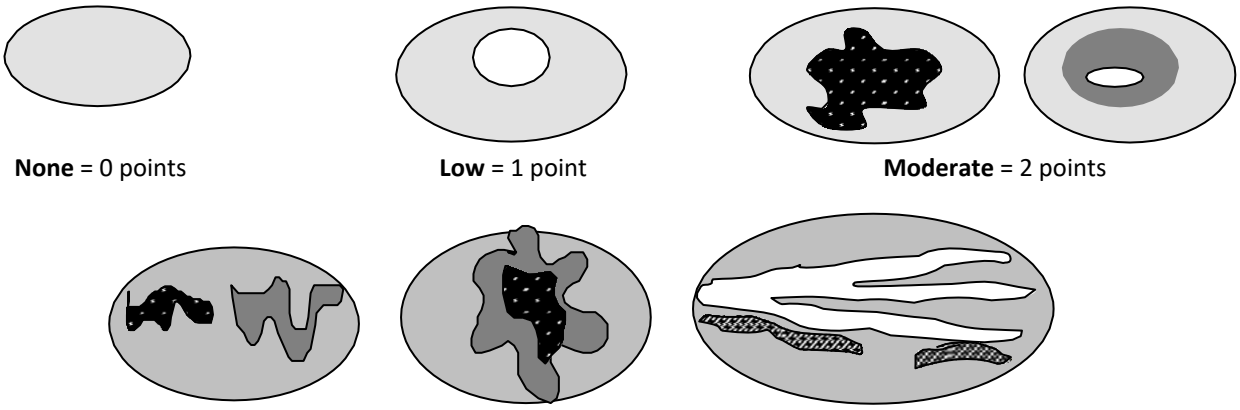
Rating of Value If score is: 2–4 = H *Record the rating on the first page*

COMMENTS:

Wetland name or number WLA

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) *If the unit has a Forested class, check if:* ☒ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	3 structures | points = 2	2
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (*see text for descriptions of hydroperiods*). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☐ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake Fringe wetland** ☒ **Freshwater tidal wetland**	3 types present | points = 2 **2 points** **2 points**	2
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species*. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.*** If you counted: >19 species | points = 2		2

Wetland name or number WLA

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.* Choose an item.  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3 points	1
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points*. ☒ Large, downed, woody debris within the wetland (>4 in diameter and 6 ft long). ☐ Standing snags (dbh >4 in) within the wetland ☒ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☒ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☒ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	4
Total for H 1 Add the points in the boxes above	11

Rating of Site Potential If score is: 7–14 = M *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate*: % undisturbed habitat 99**+** [(% moderate and low intensity land uses)1/2] 0.5 **= 99.5**% If total accessible habitat is: 1/3 (33.3%) of 1 km Polygon | points = 3	3
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate*: % undisturbed habitat 99 **+** [(% moderate and low intensity land uses))1/2] 0.5 **= 99.5**% Undisturbed habitat >50% of Polygon | points = 3	3
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity | points = 0	0
Total for H 2 Add the points in the boxes above	6

Rating of Landscape Potential If score is: 4–6 = H *Record the rating on the first page*

Wetland name or number WLA

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☒ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: 2 = H *Record the rating on the first page*

Wetland name or number WLA

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: https://wdfw.wa.gov/species-habitats/at-risk/phs/list).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:
NOTE: *This question is independent of the land use between the wetland unit and the priority habitat*.

- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) >32 in (81 cm) dbh or >200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80–200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ✓**Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ✓**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ✓**Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5–6.5 ft (0.15–2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ✓**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of >20 in (51 cm) in western Washington and are >6.5 ft (2 m) in height. Priority logs are >12 in (30 cm) in diameter at the largest end, and >20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number WLA

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ● The dominant water regime is tidal, ● Vegetated, and ● With a salinity greater than 0.5 ppt Yes: Go to **SC 1.1** No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** ✓No: Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ● The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are *Spartina*, see page 25) ● ✓At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ● ✓The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ✓Yes = **Category I** No = **Category II**	(Cat. I) **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to **SC 2.2** ✓No: Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** ✓No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ✓Yes: **Contact WNHP/WDNR and go to SC 2.4** No = **Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** ✓No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below*. ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** ✓No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** ✓No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** ✓No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** ✓No **= Is not a bog**	**Cat. I**

Wetland name or number WLA

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** ● **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. ● **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80–200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes **= Category I** ✓No **= Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ● ✓The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ● ✓The lagoon in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*) ✓Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ● The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). ● ✓At least 3/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ● ✓The wetland is larger than 1/10 ac (4350 ft^2) ✓Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ● Long Beach Peninsula: Lands west of SR 103 ● Grayland-Westport: Lands west of SR 105 ● Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** ✓No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

HERRERA
Science + Planning + Design

Figure C-1.
Wetland A Cowardin Classes.

File Path: K:\Projects\Y2022\22-07834-000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\RatingFigC1_CowardinClass
Date: 5/24/2023
Author: bBagniewski

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: WA DNR, Skagit County (Aerial, 2021)

0 0.01 0.03 0.05
Miles

HERRERA
Science + Planning + Design

Figure C-2.
Wetland A Ponded Depressions and Wetland/Stream Width.

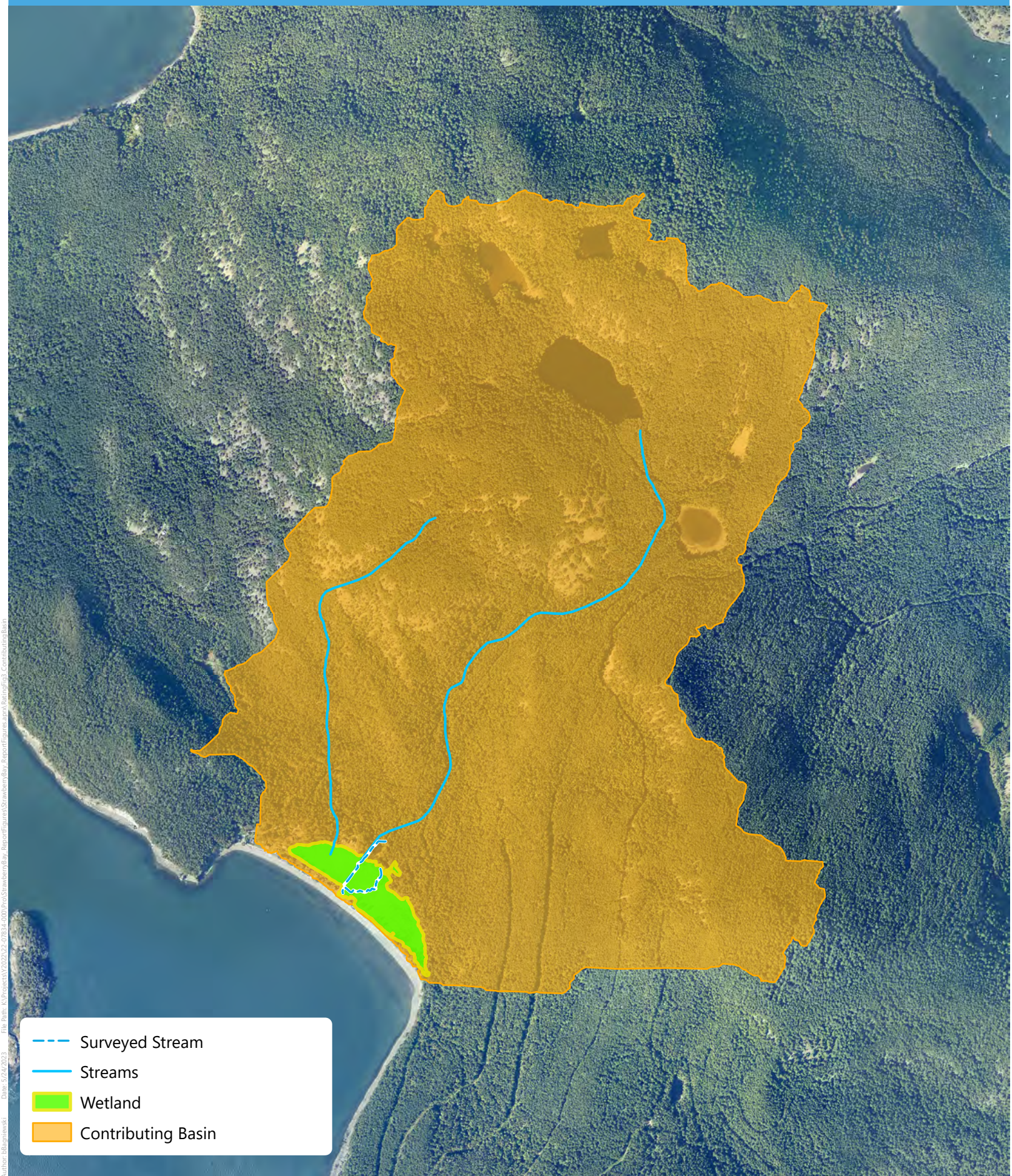
File Path: K:\Projects\Y2022\22-07834-000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\RatingFig2_PondedDepressions
Date: 5/30/2023
Author: bBagniewski

Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Skagit County, Aerial (2021)

0 0.01 0.03 0.05 Miles

HERRERA
Science + Planning + Design

Figure C-3.
Wetland A Contributing Basin.



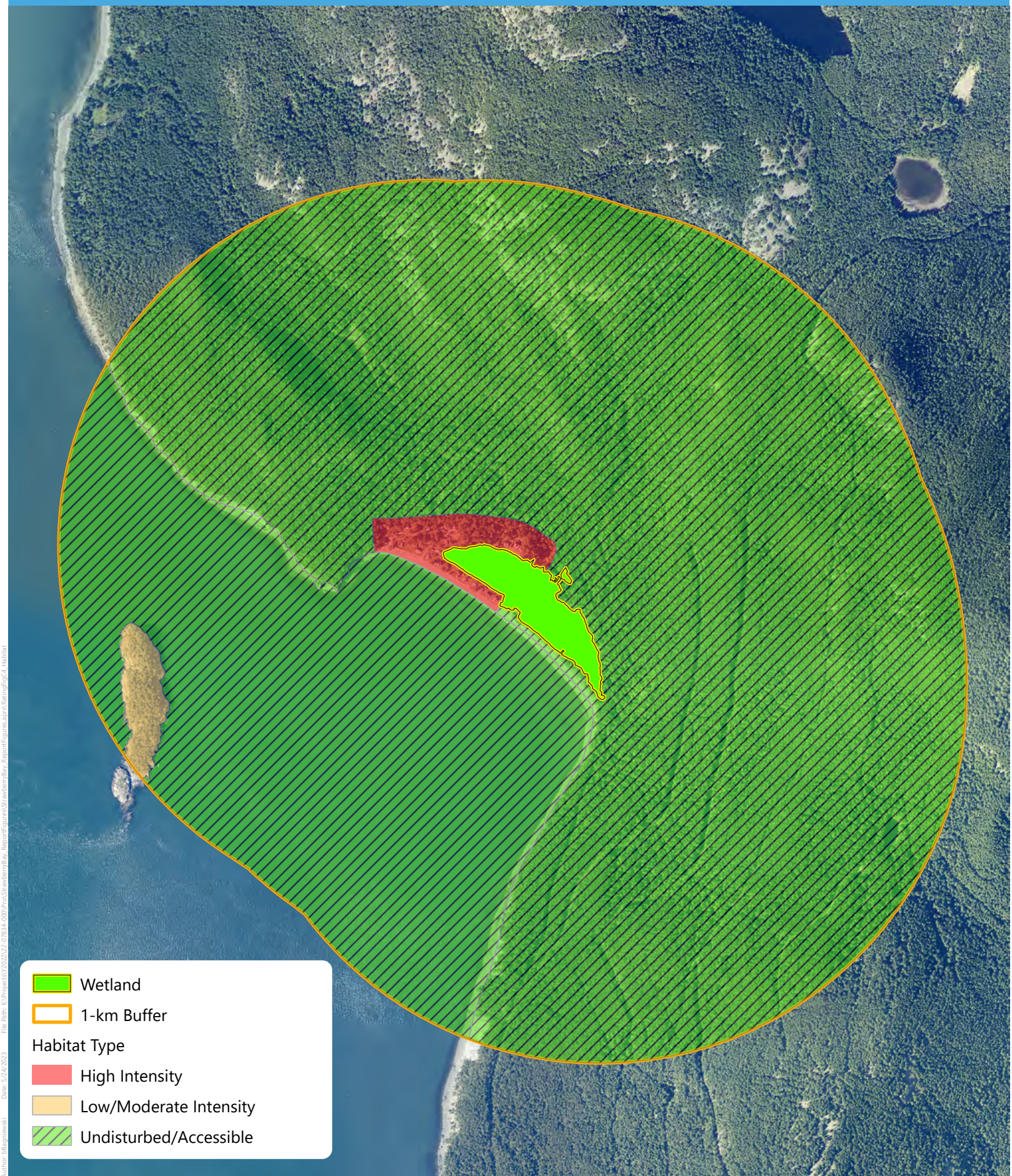
Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Skagit County, Aerial (2021)

0 0.13 0.25 0.5 Miles

File Path: K:\Projects\Y2022\22-07834.000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\RatingFig3_ContributingBasin
Date: 5/24/2023
Author: bBagniewski

HERRERA
Science + Planning + Design

Figure C-4.
Habitat Within a 1-km Radius of Wetland A.



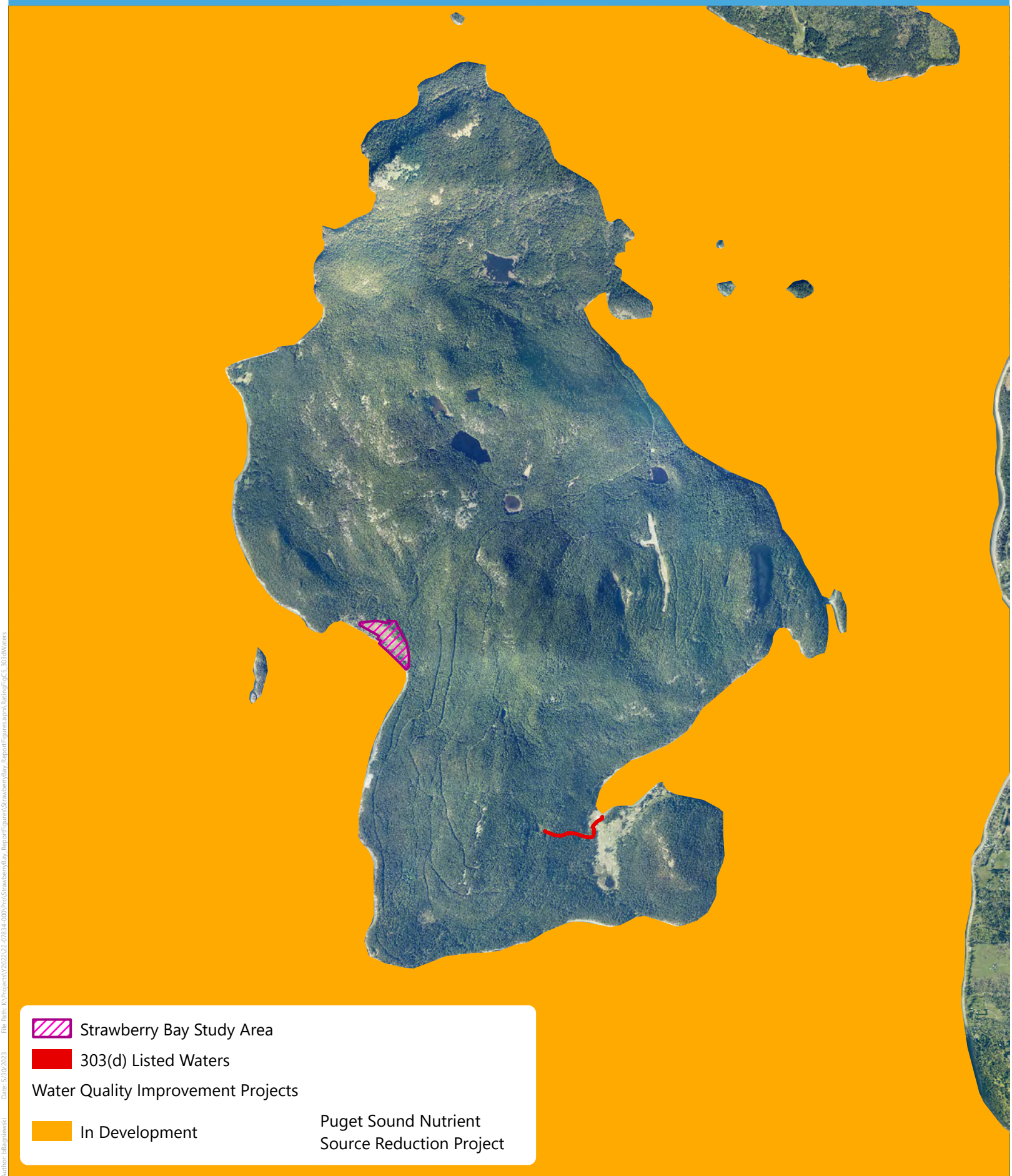
Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Skagit County, Aerial (2021)

0 0.13 0.25 0.5 Miles

File Path: K:\Projects\Y2022\22-07834.000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\RatingFigC4_Habitat
Date: 5/24/2023
Author: bBagniewski

HERRERA
Science + Planning + Design

Figure C-5.
303(d) Waters and TMDLs.



Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: WA Dept. of Ecology, Skagit County (Aerial, 2021)

0 0.25 0.5 1 Miles

File Path: K:\Projects\Y2022\22-07834.000\Pro\StrawberryBay_ReportFigures\StrawberryBay_ReportFigures.aprx\RatingFigC5_303dWaters
Date: 5/30/2023
Author: bBagniewski