Appendix F:

Wetland Delineation & Functions & Values Report

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DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 22270
JUNEAU, AK 99802-2270

August 5, 2020

Regulatory Division
POA-2020-00370

City and Borough of Sitka
100 Lincoln Street
Sitka, AK 99835

Dear Mr. Grabel,

This letter is in response to your July 23, 2020 request for a Department of the Army (DA) Jurisdictional Determination (JD) for your proposed seaplane base. The project is located within Section 35 T. 55 S., R. 63 E., Copper River Meridian; at Latitude 57.055418º N., Longitude -135.363889º W.; Sitka Borough, in Sitka, Alaska. The project are would include 0.06 acres of Palustrine, scrub-shrub wetlands and 0.01 acres of intertidal marine waters. Your project has been assigned number POA-2020-00370, Sitka Harbor, which should be referred to in all correspondence with us.

Based on our review of the information you provided and available to our office, we have preliminarily determined the subject project area contains waters of the United States (U.S.), and/or wetlands, under the Corps of Engineers (Corps) regulatory jurisdiction. See the attached Preliminary Jurisdictional Determination (PJD) Forms. Please sign and return the forms to our office. A PJD is not appealable, however, if you have additional information you would like the Corps to consider you may submit at any time. In addition, at any time you have the right to request and obtain an Approved Jurisdictional Determination (AJD), which can be appealed. If it is your intent to request an AJD, we recommend that work not commence until one is obtained.

Department of the Army authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands. You can find a copy of the DA permit application online at: www.poa.usace.army.mil/Missions/Regulatory. You can refer to the sample drawing on our website at: www.poa.usace.army.mil/Portals/34/docs/regulatory/guidetodrawings2012.pdf.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean High Water Mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

If you have questions or to request a hard copy of the DA permit application, please contact me via email at: Delana.P.Wilks@usace.army.mil, by mail at the address above, or by phone at (907) 790-4494. For more information about the Regulatory Program, please visit our website at: www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

Delana Wilks
Regulatory Specialist

Enclosures

Preliminary Jurisdictional Determination Form

This preliminary JD find that there "*may be*" waters of the United States on the subject project site that could be affected by the proposed activity based on the following information:

District Office: Juneau Field Office | File/ORM #: POA-2020-00370 | PJD Date: Aug 3, 2020

State: AK | City/County: City and Borough of Sitka

Nearest Waterbody: Sitka Harbor

Project Location: Section(s): 35 | Township: 55 S | Range: 63 E | Meridian: Cooper River

Name and Address of Person Requesting PJD:
DOWL
ATTN: Josh Grabel
4041 B Street
Anchorage, AK 99503

USGS Quad Map: | Latitude: 57.055418 N | Longitude: -135.363889 W

Subdivision Name, Block, Lot, Directions to Project Site:

Identify (Estimate) Amount of Waters in the Review Area

Non-Wetland Waters:

Linear ft	Width	Acres	Stream Flow
	0.01		Perennial

Wetlands

Acres	Cowardin Class
0.06	Palustrine, scrub-shrub

Name of Any Water Bodies on the Site Identified as Section 10 Waters:
Tidal: Sitka Harbor
Non-Tidal:

☒ Office (Desk) Determination
☐ Field Determination
Date of Site Visit:

SUPPORTING DATA: Data Review for Preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below)

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Supplied by consultant on July 24, 2020
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data Sheet prepared by the Corps
- ☐ Corps navigable waters' study:
  - ☐ USGS NHD Data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s) Cite quad name:
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☒ National Wetlands Inventory map(s): NWI
- ☐ State/Local Wetland Inventory map(s):
- ☐ FEMA/FIRM map(s):
- ☐ 100-year Floodplain Elevation:
- ☒ Photographs:
  - ☒ Aerial (Name & Date): Google Earth Imagery 5/15/2020
  - ☐ Other (Name & Date):
- ☐ Previous determination(s). File # and date of response letter:
- ☐ Other Information:

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

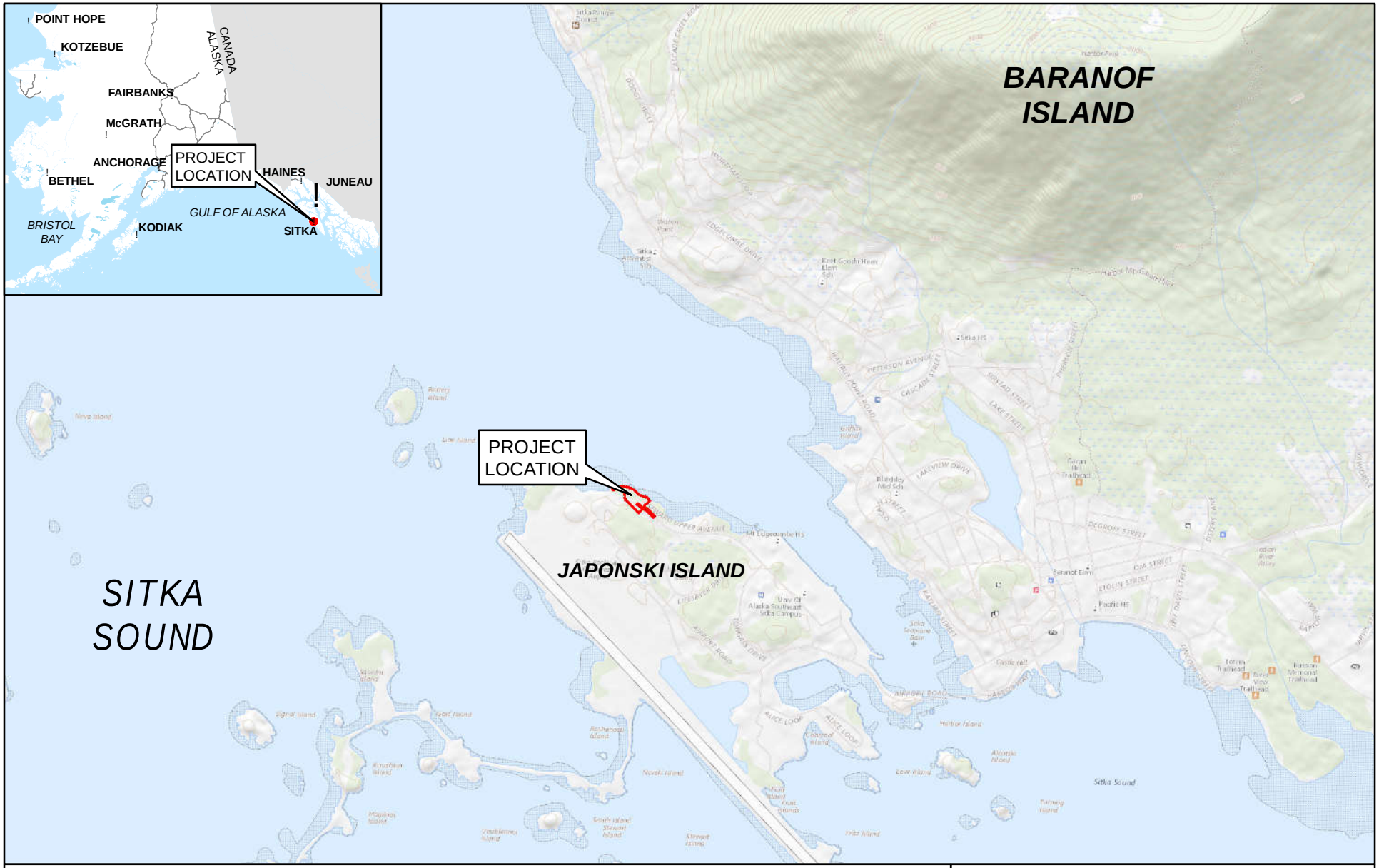
8/3/2020

Signature and Date of Regulatory Project Manager (REQUIRED)

8/5/2020

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS: 1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time. 2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.



Location Vicinity Map

Sitka SPB Wetland Delineation

DOWL

Date: June 02, 2020

Figure 1

\\ANC-FS\anc-projects\23\63021-01\60GIS\ENV\Wetland Delineation\Location Vicinity Map.mxd Jun 02, 2020 12:47:23 PM User: jgrabel

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed October 2018.

Sources: Esri, Garmin, USGS, NPS

Cowardin Code

- Mean High Water
- Photo
- Test Holes
- Study Area
- M2USN
- PSS1B
- Upland
- Mean High Water
- Fence

N

0 40 80 Feet

Wetland Delineation

Sitka SPB Wetland Delineation

DOWL

Date: June 03, 2020

Figure 3

Q:\23\63021 01\60GIS\ENV\Wetland Delineation\Wetland Delineation.mxd Jun 03, 2020 9:33:12 AM User: tjameson

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CITY AND BOROUGH OF SITKA

New Sitka Seaplane Base

Wetland Delineation/ Functions & Values Report

June 2020

Prepared for:

City and Borough of Sitka
100 Lincoln Street
Sitka, Alaska 99835

Prepared by:

DOWL
4041 B Street
Anchorage, AK 99503

SITKA SEAPLANE BASE

Wetland Delineation/Functions and Values Report

Prepared for:

City and Borough of Sitka
100 Lincoln Street
Sitka, Alaska 99835

Prepared by:

DOWL

4041 B Street
Anchorage, AK 99503

June 2020

1123.63021.02

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GRAPHICS

TABLES

APPENDICES

ACRONYMS

AA.....assessment area
CWA.....Clean Water Act
FAC.....Facultative
FACU.....Facultative Upland
GHCN.....global historical climatology network
MHW.....Mean High Water
M2.....marine intertidal
PFO.....palustrine forested
PSS.....palustrine scrub shrub
US.....United States
USACE.....United States Army Corps of Engineers
USGS.....United States Geological Survey
USFWS.....United States Fish and Wildlife Service

1.0 INTRODUCTION

DOWL is providing environmental support for the City and Borough of Sitka for a new Sitka Seaplane Base. The project area is located at 1190 Seward Avenue, Sitka, Alaska 99835 (57.055418 North Latitude; -135.363889 West Longitude, Copper River Meridian, Township 55S, Range 63E, Section 34 and 35) (Appendix A; Figure 1). This project may impact jurisdictional waters of the United States (US) in Sitka, Alaska.

DOWL was contracted to conduct a Wetland Delineation and assess wetland function and values for an approximately 2.0 acre-study area to identify and classify areas that may fall under the United States Army Corps of Engineers (USACE) jurisdiction per Section 404 of the Clean Water Act (CWA). The USACE is the jurisdictional agency with authority to permit the discharge of dredged or fill material into a Waters of the United States (WOUS) per Section 404 of the CWA. Outlined within the CWA, wetlands are categorized as "Other WOUS." The USACE further defines wetlands as areas that are "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987) (40 CFR Part 230.3(t)).

The data herein is intended to provide the USACE with sufficient information to determine regulatory jurisdiction of aquatic resources subject to Section 404 of the CWA, and to evaluate the hydrological connectivity of such resources to a traditional navigable waterway, territorial sea, or navigable interstate waterway.

1.1 Environmental Setting

1.1.1 Regional Characteristics

The study area is within the Coastal Western Hemlock-Sitka Spruce Forest ecoregion, which is characterized by deep narrow bays, steep valley walls, irregular coastline and thin moraine deposits on hills and in valleys. Forests of western hemlock and Sitka spruce are widespread. The ecoregion has a maritime climate and has the mildest winters in Alaska and is generally free of permafrost. Soils near the mountains formed in gravelly and stony moraine deposits or in a mantle of volcanic ash over the morainal deposits. Soils of river deltas, terraces, alluvial fans, and floodplains formed in waterlain silts and clays. Poorly drained depressions are filled with fibrous peat (Gallant et al. 1995).

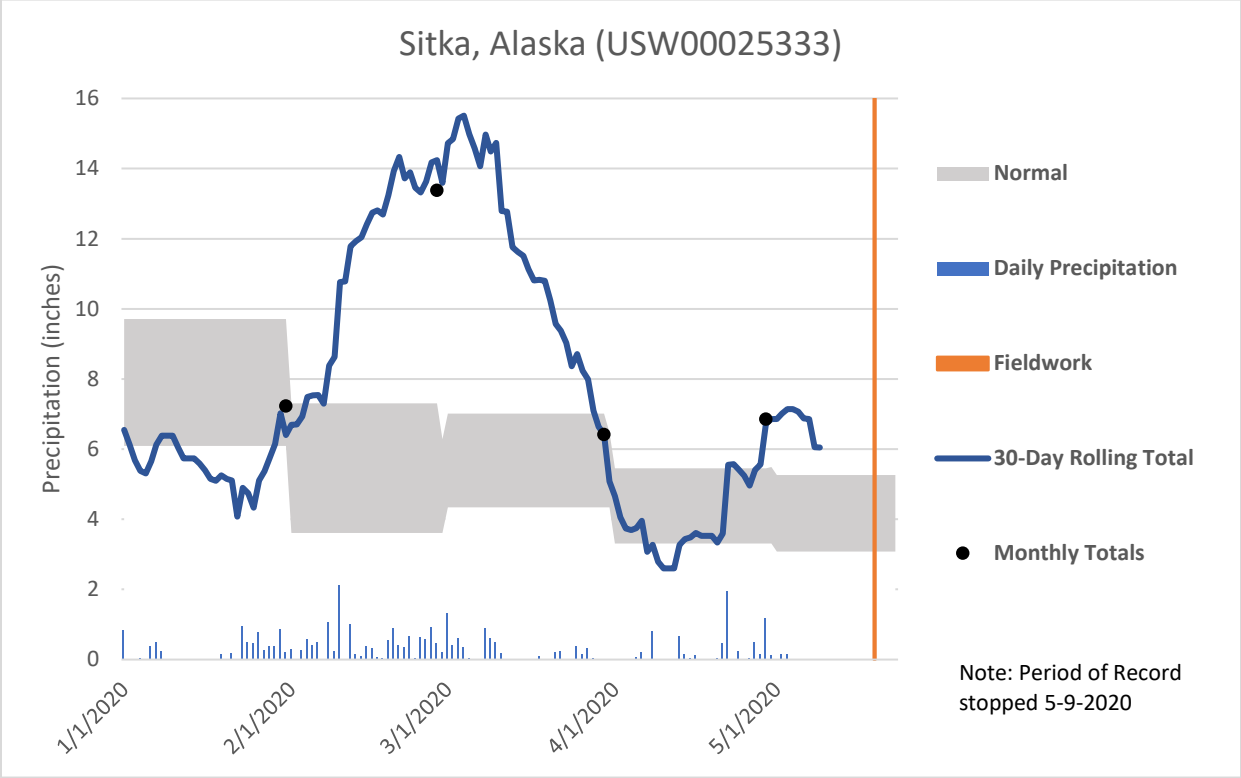
1.1.2 Study Area Characteristics

The City of Sitka is located on Baranof Island, approximately 93 miles southwest of Juneau. The study area is on Japonskii Island near the airport. Sitka lies in the maritime climate zone with small temperature variations, wet, cool summers, and relatively mild winters. Vegetation consists primarily of coastal western hemlock and Sitka spruce forest. Mean annual precipitation is about 87 inches (USGS 1995). The mean high-water (MHW) elevation for Sitka harbor is 9.16 feet. Japonski Island has seven distinct surficial deposits including drift, volcanic ash, muskeg, elevated delta and shore deposits, alluvial deposits, modern beach deposits, and man-made fill (Yehle 1974). Numerous expanses of subtidal wetlands exist on Japonski Island. The Indian River, Sawmill Creek, Swan Lake, Cascade Creek, Blue Lake, and an unnamed lagoon on

Japonski Island are the principal surface-water bodies in the Sitka area (USGS 1995). The City of Sitka in located in the Baranof Mountains, with a gradual southwest slope and steep eastern slope (Figure 1) (Wahrhaftig 1965). The growing season of this region is from May 29th to September 27th (USACE 2007).

1.2 Precipitation and Climatic Data

The closest global historical climatology network (GHCN) weather station is the Sitka Airport. The Sitka Airport GHCN weather station is located approximately 0.5 miles south of the project area. Precipitation data (Utah Climate Center 2020; Western Regional Climate Center 2020) from May 2000 to May 2020 was used to analyze antecedent conditions preceding the May 2020 data collection (Graphic 1). Daily precipitation values over a 30-day period were accumulated in order to examine the three-month period preceding data collection activities to determine if surface hydrology or soil moisture conditions observed were drier than normal, or wetter than normal (Natural Resource Conservation Service 2018). The period of record was stopped 5/9/2020 possibly due to COVID-19 impacts to data collection. Surface hydrology or soil moisture conditions observed were wetter than normal according to the precipitation analysis.



Graphic 1: Sitka Airport (USW00025333) 2020 Precipitation Data.

2.0 METHODS

2.1 Existing Data and Preparatory Analysis

The approximate 2.0-acre study area consists of forested, scrub shrub, and tidal areas adjacent to Sitka Harbor. A preliminary review of the study area was conducted prior to fieldwork based on:

- U.S. Geological Survey (USGS) 2017 Sitka A-5 SE Quadrangle
- USGS National Hydrography Dataset
- 2019 Aerial imagery
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory
- National Oceanic and Atmospheric Administration (NOAA) Tidal Datum for Sitka, Alaska
- Natural Resources Conservation Service (NRCS) Web Soil Survey

2.2 Field Data Collected

DOWL Environmental Specialists Joshua Grabel and Caity Kennedy conducted the wetland delineation fieldwork May 20, 2020 in accordance with *Part IV of the Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region [Version 2.0,* (USACE 2007)*]*.

Data was collected using the three-parameter approach combining site-specific indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. Field notes were taken to document landscape topography and general site characteristics.

At each sampling location, soil test pits (TH) were excavated to a depth of at least 24 inches, or to the presence of a restrictive digging layer. Soil and hydrology characteristics of texture, color, saturation, and depth to water table were recorded on Corps Routine Wetland Determination forms (Appendix B). Soil color was recorded using *Munsell Soil-Color Charts* (Munsell Color 2012). In the event soil excavation was not necessary to make a wetland/upland determination, a photographic point (PP) was taken. MHW photopoints (MHW) were taken along the 9.16-foot elevation to verify the NOAA tidal datum.

Typically, US Department of Agriculture Natural Resource Conservation Service Web Soil Survey is analyzed. No soil data was available for the terrestrial portions of the study area.

A GPS with 20-ft accuracy and Trimble Nomad with sub-meter accuracy were used to pinpoint sample point and photopoint locations for GIS mapping reference. ESRI ArcMap was used to calculate acreages. Report mapping is an estimate of wetland boundaries based on site photos and sketches, topographic data, and field observations. Additional survey investigations will be conducted to capture flagged wetland boundaries under a dense forest canopy, where a normal GPS and Trimble Nomad have trouble with accuracy.

Wetlands were classified and grouped according to guidelines outlined in the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Sampling locations were selected to verify the preliminary mapping.

3.0 RESULTS

The 2.0-acre study area is comprised of approximately 0.06 acres of potentially jurisdictional wetlands and 0.01 acres of WOUS (3% of the study area), and 1.9 acres of non-jurisdictional uplands (97% of the study area) (Appendix 1: Figure 2). Percentages are rounded to the nearest whole number. All data sheets and photos are included in Appendix B. Table 1 summarizes the results by Cowardin classification.

Table 1: Wetlands, Waters of the U.S., and Uplands

Jurisdictional Type	Acres	Cowardin Classification	Data Points
Wetlands	0.06	PSS1B	TH2, TH5
Waterbodies	0.01	M2USN	MHW1, MHW2, MHW3, MHW4, MHW5, MHW6, MHW7
Uplands	1.9	N/A	TH1, TH3, TH4, PP1, PP2, PP3, PP4, PP5, PP6
Total Study Area	**2.0**		

PSS1B Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Saturated
M2USN Marine, Intertidal, Unconsolidated Bottom, Regularly Flooded

On-site observations indicate the study area has predominantly facultative (FAC) dominant hydrophytic vegetation and has greater than 2 inches of an organic layer typically. Wetland hydrology comes from primary indicators of high-water table, saturation, and sparsely vegetated concave surface. Analysis of the data collected in 2020 identified approximately 0.07 acres of wetlands and waterbodies, and 1.9 acres of uplands.

3.1 Wetlands

Wetland habitats in the study area typically begin as small seeps and flow downhill and are found in the northern and northwestern portion of the study area. One wetland starts as two seeps that flow together into a single swale. The other wetland is a small seep that starts at a toeslope. The wetlands are found on 2-3 percent slopes between several hills. Both wetlands are adjacent to the coastline and Sitka Harbor, separated by approximately 6-20 feet of uplands.

Wetland habitat types in the study area are palustrine, composed of two wetland areas. Palustrine habitats contain scrub shrub vegetation with a forest canopy growing overtop, however tree canopy did not exceed 10%. There is 30-60 percent bare ground underneath the scrub shrub canopy. Hydrology is composed of saturation, water table, sparsely vegetated concave surface, geomorphic position, and presence of reduce iron. Saturation is at 4-6 inches below the soil surface. Hydric soils indicators were histosols and histic epipedon.

The study area has one wetland Cowardin habitat system consisting of palustrine. Habitats within the study area are organized by vegetation stratum and then classified based on the

presence of hydrophytic vegetation, hydric soils, and wetland hydrology. See Table 2 for a summary of the data collected.

Table 2: Summary of Data Collected

Data #	Date Data Taken	Wetland Determination Form Completed	Hydrophytic Vegetation Present	Hydric Soils Present	Wetland Hydrology Present	Jurisdictional Status (Cowardin)
TH1	5/20/2020	Yes	No	Yes	No	Upland
TH2	5/20/2020	Yes	Yes	Yes	Yes	PSS1B
TH3	5/20/2020	Yes	Yes	No	No	Upland
TH4	5/20/2020	Yes	Yes	No	No	Upland
TH5	5/20/2020	Yes	Yes	Yes	Yes	PSS1B
PP1	5/20/2020	No	No	N/A	No	Upland
PP2	5/20/2020	No	No	N/A	No	Upland
PP3	5/20/2020	No	No	N/A	No	Upland
PP4	5/20/2020	No	No	N/A	No	Upland
PP5	5/20/2020	No	No	N/A	No	Upland
PP6	5/20/2020	No	No	N/A	No	Upland

Within the study area, there is one wetland habitat type as defined by a Cowardin classification.

3.1.1 Vegetation

Scrub-shrub wetlands (Cowardin classifications: PSS1B) are characterized by greater than 30% percent aerial cover in the shrub layer (Photo Set 1). These wetlands have a robust scrub shrub layer of stink currant (*Ribes bracteosum*) and salmonberry (*Rubus spectabilis*) with an herbaceous layer of false lily of the valley (*Maianthemum dilatatum*). All wetlands in the study area are classified as PSS1B. Characteristically, these wetlands are depressional, concave (two-to-three percent slopes) features that form as seeps.

Photo Set 1: Typical Scrub-Shrub Wetland

These wetlands are located beneath the forest canopy but are small in size and have either scrub shrub vegetation or a sparsely vegetated concave surface. Both wetlands start as seeps flowing downhill. One wetland forms a swale while the other flows to a downhill point, forming a

triangle. Dominant vegetation includes stink currant, false lily of the valley, and salmonberry. Wetland vegetation is dominantly FAC to FACU.

The triangle-shaped seep wetland at TH 5 has problematic hydrophytic vegetation due to having a hydric soil, primary wetland hydrology, being a concave seep forming at a toeslope, and having a sparsely vegetated concave surface. The shrub stratum is growing over top of the wetland to maximize sunlight with few individuals rooted in the seep, and the herb stratum is growing at the downslope point of the triangle on a slight rise in elevation. The shrub stratum is dominantly salmonberry, which is most common on moist to wet, water-receiving sites in forested or wooded areas (Zouhar 2015). The Salmonberry aerial stems can be seen in Photo Set 1 on the right photo, growing laterally over top of the seep.

The most common plant species identified in the study area include western hemlock (*Tsuga heterophylla*), Sitka mountain ash (*Sorbus sitchensis*), salmonberry, false lily of the valley, stink currant, and red alder (*Alnus rubra*). All species and wetland indicators observed within the study area are shown in Table 3.

Table 3: Plant Species within the Study Area

Scientific Name	Common Name	Indicator Status
Alnus rubra	Red alder	FAC
Alnus viridis	Sitka alder	FAC
Maianthemum dilatatum	False lily of the valley	FAC
Picea sitchensis	Sitka spruce	FACU
Ribes bracteosum	Stink currant	FAC
Rubus spectabilis	Salmonberry	FACU
Sorbus sitchensis	Sitka mountain ash	FACU
Tsuga heterophylla	Western hemlock	FAC
Vaccinium ovalifolium	Oval-leaf blueberry	FAC

Notes: FAC = Facultative; FACU = Facultative Upland

3.1.2 Soils

Soils observed within the study area had anywhere from 2 to 24 inches of organic layer. Table 4 describes observations made in the field.

Table 4: Soil Observations at Full Sample Points within the Study Area

Sample Point	Organic Mat Thickness (inches)	Mineral Soil	Saturated Organics	Hydric
TH1	9	Sandy Loam	No	Yes, black histic
TH2	24	N/A	Yes	Yes, histosol
TH3	8	Silt Loam	No	No, 3” buried organics
TH4	2	Sandy Loam	No	No
TH5	12	Silt Loam	Yes	Yes, histic epipedon

A black histic was observed at TH1. This soil profile was characterized by 9 inches of organic material underlain by a sandy loam (B) horizon with a color of 7.5YR 3/2 from the Munsell Soil Color Chart (Munsell 2012). This site was moderately well drained, and no wetland hydrology was observed.

A histosol (A1) was observed at TH2. This soil profile was characterized by 24 inches of organic material. This site was very poorly drained and was characterized by saturation and high water table (4 inches deep).

A histic epipedon was observed at TH5. This soil profile was characterized by 12 inches of organic material underlain by a silt loam (B) horizon with a color of 10YR 2/1 from the Munsell Soil Color Chart (Munsell 2012). Soils at this site were poorly drained and primary wetland hydrology was present.

3.1.3 Hydrology

Using the NRCS method, it was determined that precipitation for the three months prior to the field investigation was above normal. Indicators of wetland hydrology were prevalent in the wetlands but lacking in upland areas.

At least one primary indicator was observed at both wetland locations where data forms were completed. Both sites (TH2 and TH5) had evidence of one secondary hydrologic indicator (geomorphic position, presence of reduced iron). No evidence of primary or secondary wetland hydrology indicators were observed at the remaining three data form sites. Hydrology indicators observed at each plot are shown in Table 5.

Table 5: Soil Observations at Full Sample Points within the Study Area

Sample Point	Hydrology Indicators	Wetland Hydrology Met
TH1	N/A	No
TH2	High water table, saturation, geomorphic position	Yes
TH3	N/A	No
TH4	N/A	No
TH5	Saturation, sparsely vegetated concave surface, presence of reduced iron, geomorphic position	Yes

3.2 Waterbody

Marine waters are found in tidal areas in Sitka Harbor below MHW. Waterbody consists of a tidally influenced coastline of Sitka Harbor. The MHW elevation of 9.16 feet was confirmed using a submeter accuracy GPS with visual observations of barnacles, saltwater vegetation growing on boulders, and debris deposits.

Photo Set 2: Mean High Water

Marine waters below MHW are composed of gravel, cobble, boulder, and bedrock substrate with barnacles and marine vegetation growing along the rocks. A low tide survey was conducted with photos for various substrate types and is attached as Appendix C. Table 6 is a summary of marine waterbody data collected.

Table 6: Summary of Data Collected

Data #	Date Data Taken	Jurisdictional Status (Cowardin)
MHW1	5/20/2020	M2USN
MHW2	5/20/2020	M2USN
MHW3	5/20/2020	M2USN
MHW4	5/20/2020	M2USN
MHW5	5/20/2020	M2USN
MHW6	5/20/2020	M2USN
MHW7	5/20/2020	M2USN

3.3 Non-Jurisdictional Uplands

The study area is predominantly uplands, consisting of western hemlock and Sitka spruce forests. The southern side of the access road has an open understory, while the northern forested area has a scrub shrub understory consisting of salmonberry, Sitka mountain ash, and alder. Upland slopes are 2-3%.

A black histic was detected at TH1. This soil profile was characterized by 9 inches of organic material with a 10YR 2/1 color from the Munsell Soil Color Chart but no saturation (Munsell 2012). The soil was underlain by a mineral soil material with chroma of 2 or less. Soil at this site was somewhat poorly drained.

TH3 had 5 inches of organic material, a 3-inch layer of mineral soil with a chroma greater than 2, and then a lower layer of 3 inches of organic material. The mineral soil beneath the lower organic layer contained a chroma of 2 or less. Black histic is not described in the 2007 Alaska Regional Supplement. The description comes from the NRCS Field Indicators of Hydric Soils in the United States (2018) that does not describe the separation of organic material by thin mineral layers to meet hydric soil indicator requirements. This forested area was near the

access road and potential disturbance and contained a soil layer of iron colored silt between layers of organics and a layer of ash below organics.

No hydrology indicators were met in upland areas.

3.4 Ecosystem Services Score and Functional Assessment

The WESPAK-SE Functional Assessment was completed for the two PSS1B wetlands as an assessment area. These wetlands were similar in Cowardin Classification, hydrogeomorphic classification, small in size, and similar in formation from spring seeps. The field and desktop tabs of the workbook were completed resulting in an overall score of 7.17 and higher overall rating (Appendix 4). The assessment area scored higher functioning for surface water storage, streamwater cooling, sediment & toxicant retention & stabilization, phosphorus retention, and nitrate removal & retention.

The online, WESPAK-SE module is no longer functioning to answer some of the questions in the workbook, and the data available for download does not encompass all data needs. The same sources were used to answer questions with data from original sources.

4.0 CONCLUSION OR DISCUSSION

Approximately 0.06 acres of wetlands and 0.01 acres of waterbody fall within the extend of USACE jurisdiction under Section 404 and 10 the CWA. No streams were observed in the study area. Even though climatic conditions were wetter than normal, no surface water was observed in either wetland during the May 20, 2020 fieldwork. Wetland seeps such as those observed in the study area are common to southeast Alaska.

Wetlands within the study area are adjacent to a traditional navigable water (Sitka Harbor) and are separated by approximately 6-20 feet of uplands. The waterbody is Sitka Harbor. Wetlands and waters are assumed to be jurisdictional according to Section 10 and 404 of the Clean Water Act due to proximity to a traditional navigable water.

5.0 REFERENCES

Cowardin, L.M.; V. Carter, F. C. Golet, and E. T. La Roe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* Wetland Classification System, Jamestown: U.S. Department of the Interior.

Gallant, A.L., E.F. Binnian, J.M. Omernik, and M.B. Shasby. 1995. *Ecoregions of Alaska.* USGS Professional Paper 1567, Washington; United Srares Government Printing Office.

Munsell Color. 2012. *Munsell Soil-Color Charts with genuine Munsell color chips.* Grand Rapids: Munsell Colot.

NRCS. 2018. Field Indicators of Hydric Soils. A Guide for Identifying and Delineating Hydric Soils, Version 8.2.

USACE. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1, Washington D.C.: Wetlands Research Program.

USACE. 2007. *Regional Suppliment to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)*. ERDC.EL TR-07-24, Washington D.C.: Wetland Regulatory Assistance Program.

USGS. 1995. *Overview of Environmental and Hydrogeologic Conditions at Sitka, Alaska*. Open File Report 95-345, Anchorge, Alaska.

Utah Climate Center. 2020. *Sitka Airport (USW00025333).* Logan: Utah State University.

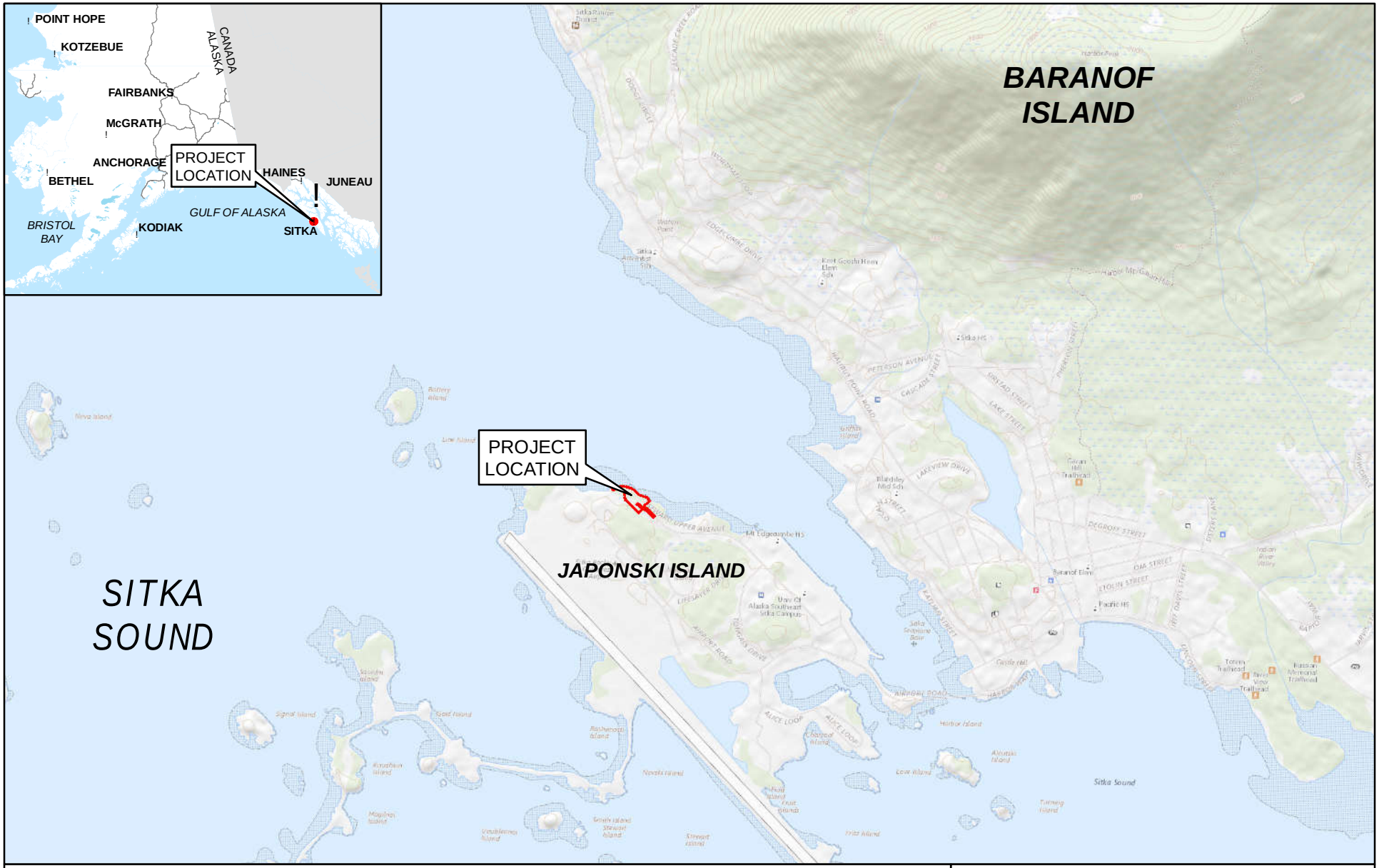
Wahrhaftig, C., 1965, Physiographic divisions of Alaska: U.S. Geological Survey Professional Paper 482, 52 p

Western Regional Climate Center. 2020. "Period of Record Monthly Climate Summary." Cooperative Climatological Data Summaries—Website: agacis.rcc-acis.org/

Yehle, L.A., 1974, Reconnaissance engineering geology of Sitka and vicinity, Alaska, with emphasis on evaluation of earthquake and other geologic hazards: U.S. Geological Survey Open File Report 74-53, 104 p.

Zouhar, Kris. 2019. Rubus spectabilis, salmonberry. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/plants/plants/shrub/rubspe/all.html [2020, June 1].

APPENDIX 1: FIGURES



Location Vicinity Map

Sitka SPB Wetland Delineation

DOWL

Date: June 02, 2020

Figure 1

\\ANC-FS\anc-projects\23\63021-01\60GIS\ENV\Wetland Delineation\Location Vicinity Map.mxd Jun 02, 2020 12:47:23 PM User: jgrabel

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed October 2018.

Sources: Esri, Garmin, USGS, NPS

Cowardin Code

- Mean High Water
- Photo
- Test Holes
- Study Area
- M2USN
- PSS1B
- Upland
- Mean High Water
- Fence

N

0 40 80 Feet

Wetland Delineation

Sitka SPB Wetland Delineation

DOWL

Date: June 03, 2020

Figure 3

Q:\23\63021 01\60GIS\ENV\Wetland Delineation\Wetland Delineation.mxd Jun 03, 2020 9:33:12 AM User: tjameson

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

APPENDIX 2: DATASHEETS AND PHOTODOC

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Sitka Seaplane Base | Borough/City: Sitka | Sampling Date: 5/20/2020

Applicant/Owner: City of Sitka | Sampling Point: TH1

Investigator(s): JRG, CLK | Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): convex | Slope (%): 2

Subregion: Southeast | Lat: 57.055628 | Long: -135.364343 | Datum: NAD 83

Soil Map Unit Name: No digital data available | NWI classification: Upland

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N 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 X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Wetter than normal climatic conditions.

VEGETATION – Use scientific names of plants. List all species in the plot.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum			
1. Tsuga heterophylla	10.00	Y	FAC
2.			
3.			
4.			
Total Cover:	10		
50% of total cover: 5	20% of total cover: 2		
Sapling/Shrub Stratum			
1. Sorbus sitchensis	35	Y	FACU
2. Alnus viridis	15	N	FACU
3. Rubus spectabilis	30	Y	FACU
4.			
5.			
6.			
Total Cover:	80		
50% of total cover: 40	20% of total cover: 16		
Herb Stratum			
1. Maianthemum dilatatum	25	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	25		
50% of total cover: 12.5	20% of total cover: 5		

Plot size (radius, or length x width) 1/10th acre | % Bare Ground 10

% Cover of Wetland Bryophytes - (Where applicable) | Total Cover of Bryophytes 5

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species -	x 1 = -
FACW species -	x 2 = -
FAC species 50	x 3 = 150
FACU species 65	x 4 = 260
UPL species -	x 5 = -
Column Totals: 115 (A)	410 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 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 X

Remarks:
Mossy alder trunks

SOIL

Sampling Point: TH1

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
0-3	Dead roots	-	-	-	-	-	Org	Fibric
3-9	10YR 2/1	100	-	-	-	-	Org	Hemic
9-24	7.5YR 3/2	100	-	-	-	-	SaL	Coarse

[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:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ Alaska Redox With 2.5Y Hue
- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ☑ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: -

Depth (inches): -

Hydric Soil Present? Yes X No ____

Remarks:

Black histic hydric soil indicator met.
Dark mineral soil below organic
No aquic soil conditions in 0-9" layers

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ 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 Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

Dry soils -- no indicators of hydrology.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Sitka Seaplane Base | Borough/City: Sitka | Sampling Date: 5/20/2020

Applicant/Owner: City of Sitka | Sampling Point: TH2

Investigator(s): JRG, CLK | Landform (hillside, terrace, hummocks, etc.): Swale

Local relief (concave, convex, none): Concave | Slope (%): 2

Subregion: Southeast | Lat: 57.055748 | Long: -135.364531 | Datum: NAD 83

Soil Map Unit Name: No digital data available | NWI classification: Upland

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N 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 X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
Wetter than normal climatic conditions.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
Total Cover: 0			
50% of total cover: ____ 20% of total cover: ____			
Sapling/Shrub Stratum			
1. Rubus spectabilis	5	N	FACU
2. Vaccinium ovalifolium	10	N	FACU
3. Alnus viridis	5	N	FAC
4. Ribes bracteosum	50	Y	FAC
5.			
6.			
Total Cover: 70			
50% of total cover: 35 20% of total cover: 14			
Herb Stratum			
1. Maianthemum dilatatum	35	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover: 35			
50% of total cover: 17.5 20% of total cover: 7			

Plot size (radius, or length x width) 1/10th acre * % Bare Ground 30

% Cover of Wetland Bryophytes - (Where applicable) Total Cover of Bryophytes -

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 -	x 1 = -
FACW species -	x 2 = -
FAC species 100	x 3 = 300
FACU species 5	x 4 = 20
UPL species -	x 5 = -
Column Totals: 105 (A)	320 (B)

Prevalence Index = B/A = 3.04

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
* Swale has trees with canopy over top but not growing in swale, Western hemlock. 30% bare ground in swale.

SOIL

Sampling Point: TH2

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	10YR 2/2	100	-	-	-	-	Org	Sapric
8-24	10YR 2/2	50	-	-	-	-	Org	Sapric, 50% gravels

[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:

- [x] Histosol or Histel (A1)
- [ ] Histic Epipedon (A2)
- [ ] Hydrogen Sulfide (A4)
- [ ] Thick Dark Surface (A12)
- [ ] Alaska Gleyed (A13)
- [ ] Alaska Redox (A14)
- [ ] Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- [ ] Alaska Color Change (TA4)[4]
- [ ] Alaska Alpine Swales (TA5)
- [ ] Alaska Redox With 2.5Y Hue
- [ ] Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- [ ] Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: -

Depth (inches): -

Hydric Soil Present? Yes X No ____

Remarks:

Broken down organics
thick organics in swale

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Marl Deposits (B15)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Dry-Season Water Table (C2)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water-stained Leaves (B9)
- [ ] Drainage Patterns (B10)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Salt Deposits (C5)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 4

Wetland Hydrology Present? Yes X No ____

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

Remarks:

-Water seeping into pit at 4 inches
-Swale collects water flowing down hill

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Sitka Seaplane Base | Borough/City: Sitka | Sampling Date: 5/20/2020

Applicant/Owner: City of Sitka | Sampling Point: TH3

Investigator(s): JRG, CLK | Landform (hillside, terrace, hummocks, etc.): Terrace

Local relief (concave, convex, none): None | Slope (%): 0-1

Subregion: Southeast | Lat: 57.055718 | Long: -135.364931 | Datum: NAD 83

Soil Map Unit Name: No digital data available | NWI classification: Upland

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N 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 X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Wetter than normal climatic conditions.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
1.	Tsuga heterophylla	40.00	Y	FAC
2.	Alnus rubra	10.00	Y	FAC
3.				
4.				
	Total Cover:	50		
	50% of total cover: 25		20% of total cover: 10	
Sapling/Shrub Stratum				
1.	Rubus spectabilis	35	Y	FACU
2.	Vaccinium ovalifolium	5	N	FAC
3.				
4.				
5.				
6.				
	Total Cover:	40		
	50% of total cover: 20		20% of total cover: 8	
Herb Stratum				
1.	Maianthemum dilatatum	45	Y	FAC
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
	Total Cover:	45		
	50% of total cover: 22.5		20% of total cover: 9	

Plot size (radius, or length x width) 1/10th acre | % Bare Ground 2

% Cover of Wetland Bryophytes - (Where applicable) | Total Cover of Bryophytes -

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	-	x 1 =	-
FACW species	-	x 2 =	
FAC species	100	x 3 =	300
FACU species	35	x 4 =	140
UPL species	-	x 5 =	-
Column Totals:	135 (A)		440 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
Forested area with minimal species diversity

SOIL

Sampling Point: TH3

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
0-5	10YR 2/1	100	-	-	-	-	Org	Hemic
5-8	2.5YR 3/6	90	-	10	-	-	SiL	10% Org, Iron layer
8-11	10YR 2/1	100	-	-	-	-	Org	Sapric
11-20	5Y 5/1	90	-	10	-	-	SiL	10% gravels, Ash layer

[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:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ Alaska Redox With 2.5Y Hue
- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ☐ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: Rock

Depth (inches): 20"

Hydric Soil Present? Yes ____ No X

Remarks:

Rock refusal at 20"
AA(-) in all layers

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ 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 Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

No wetland hydrology present

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Sitka Seaplane Base | Borough/City: Sitka | Sampling Date: 5/20/2020

Applicant/Owner: City of Sitka | Sampling Point: TH4

Investigator(s): JRG, CLK | Landform (hillside, terrace, hummocks, etc.): Bench

Local relief (concave, convex, none): None | Slope (%): 0-1

Subregion: Southeast | Lat: 57.055233 | Long: -135.364446 | Datum: NAD 83

Soil Map Unit Name: No digital data available | NWI classification: Upland

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N 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 X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Wetter than normal climatic conditions.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga heterophylla	80.00	Y	FAC
2. Picea sitchensis	5.00	N	FACU
3.			
4.			
Total Cover:	85		
50% of total cover: 42.5	20% of total cover: 17		
Sapling/Shrub Stratum			
1. Rubus spectabilis	5	Y	FACU
2. Vaccinium ovalifolium	2	Y	FAC
3.			
4.			
5.			
6.			
Total Cover:	7		
50% of total cover: 3.2	20% of total cover: 1.4		
Herb Stratum			
1. Maianthemum dilatatum	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	20		
50% of total cover: 10	20% of total cover: 4		

Plot size (radius, or length x width) 1/10th acre | % Bare Ground 60

% Cover of Wetland Bryophytes - (Where applicable) | Total Cover of Bryophytes -

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species -	x 1 = -
FACW species -	x 2 = -
FAC species 102	x 3 = 306
FACU species 10	x 4 = 40
UPL species -	x 5 = -
Column Totals: 112 (A)	346 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
60% bare ground under tree canopy
Hemlock dominant forest with open understory

SOIL

Sampling Point: TH4

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
0-2	10YR 2/1	100	-	-	-	-	Org	Fibric
2-8	7.5YR 4/4	100	-	-	-	-	SaL	Coarse
8-24	7.5YR 3/3	90	-	-	-	-	SaL	Coarse, 10% organic inclusions

[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:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ Alaska Redox With 2.5Y Hue
- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ☐ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: -

Depth (inches): -

Hydric Soil Present? Yes ____ **No** X

Remarks:

Bright, upland soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ 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 Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ **No** X

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

Remarks:

No wetland hydrology

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Sitka Seaplane Base | Borough/City: Sitka | Sampling Date: 5/20/2020

Applicant/Owner: City of Sitka | Sampling Point: TH5

Investigator(s): JRG, CLK | Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): concave | Slope (%): 2-3

Subregion: Southeast | Lat: 57.055882 | Long: -135.365142 | Datum: NAD 83

Soil Map Unit Name: No digital data available | NWI classification: Upland

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

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation Y, Soil N, or Hydrology N 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 X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Problematic vegetation with shrubs growing over top of seep. Some rooted in seep. Wetter than normal.

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
1.	-			
2.				
3.				
4.				
	Total Cover:	0		
	50% of total cover: ____		20% of total cover: ____	
Sapling/Shrub Stratum				
1.	Rubus spectabilis	70	Y	FACU
2.	Sorbus sitchensis	15	N	FACU
3.				
4.				
5.				
6.				
	Total Cover:	85		
	50% of total cover:	42.5	20% of total cover:	17
Herb Stratum				
1.	Maianthemum dilatatum	20	Y	FAC
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
	Total Cover:	20		
	50% of total cover:	10	20% of total cover:	4

Plot size (radius, or length x width) 20' x 10' | % Bare Ground 60

% Cover of Wetland Bryophytes - (Where applicable) | Total Cover of Bryophytes 5

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	-	x 1 =	-
FACW species	-	x 2 =	-
FAC species	20	x 3 =	60
FACU species	85	x 4 =	340
UPL species	-	x 5 =	-
Column Totals:	105 (A)		400 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☑ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
60% bare ground beneath shrub layer
Salmonberry growing over top of seep but not dominatly rooted in seep. Sparse veg in seep. Hydrophytic vegetation problematic due to lack of indicator. Hydric soil and primary indicator of wetland hydrology met. Area is concave seep at toeslope.

SOIL

Sampling Point: TH5

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
0-12	10YR 2/1	100	-	-	-	-	Org	Sapric
12-24	10YR 2/1	5	-	-	-	-	SiL	95% gravels, cobbles

[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:

- ☐ Histosol or Histel (A1)
- ☐ Histic Epipedon (A2)
- ☐ Hydrogen Sulfide (A4)
- ☐ Thick Dark Surface (A12)
- ☐ Alaska Gleyed (A13)
- ☐ Alaska Redox (A14)
- ☐ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ☐ Alaska Color Change (TA4)[4]
- ☐ Alaska Alpine Swales (TA5)
- ☐ Alaska Redox With 2.5Y Hue
- ☐ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ☐ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: -

Depth (inches): -

Hydric Soil Present? Yes X No ____

Remarks:

Dark organics
AA(+) in both layers

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ 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 Visible on Aerial Imagery (B7)
- ☑ Sparsely Vegetated Concave Surface (B8)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-stained Leaves (B9)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☑ Presence of Reduced Iron (C4)
- ☐ Salt Deposits (C5)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 6

Wetland Hydrology Present? Yes X No ____

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

Remarks:

Seep starting at toeslope and flowing downhill
AA(+) in 0-24'

Location Description: PP1 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southeast

Observed ground cover

Location Description: PP2 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Northwest

Observed ground cover

Location Description: PP3 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southeast

Observed ground cover

Location Description: PP4 LANDSCAPE – FACING Southeast

LANDSCAPE – FACING Southwest

Observed ground cover

Location Description: PP5 LANDSCAPE – FACING Southeast

LANDSCAPE – FACING Southwest

Observed ground cover

Location Description: PP6 LANDSCAPE – FACING Southeast

LANDSCAPE – FACING Southwest

Observed ground cover

#63021 Wetland Delineation	**Field Dates** May 20, 2020	**Site Photos** PP1-PP7 TH1-TH5

Location Description: TH1 LANDSCAPE – FACING Southwest

LANDSCAPE – FACING Northwest

SOILS: Soil pit

Location Description: TH2 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southwest

SOILS: Soil pit

Location Description: TH3 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southeast

SOILS: Soil pit

Location Description: TH4 LANDSCAPE – FACING North

LANDSCAPE – FACING West

SOILS: Soil pit

#63021 Wetland Delineation	**Field Dates** May 20, 2020	**Site Photos** PP1-PP7 TH1-TH5

Location Description: TH5 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southwest

SOILS: Soil pit

Location Description: MHW1 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southwest

Observed ground cover

Location Description: MHW2 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Northwest

Observed ground cover

Location Description: MHW3 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Southeast

Observed ground cover

Location Description: MHW4 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Northwest

Observed ground cover

Location Description: MHW5 LANDSCAPE – FACING Southwest

LANDSCAPE – FACING Northwest

Observed ground cover

#63021 Wetland Delineation	**Field Dates** May 20, 2020	**Site Photos** PP1-PP7 TH1-TH5

Location Description: MHW6 LANDSCAPE – FACING Southeast

LANDSCAPE – FACING Southwest

Observed ground cover

#63021 Wetland Delineation	**Field Dates** May 20, 2020	**Site Photos** PP1-PP7 TH1-TH5

Location Description: MHW7 LANDSCAPE – FACING Northeast

LANDSCAPE – FACING Northwest

Observed ground cover

APPENDIX 3: LOW TIDE SURVEY

Low Tide Survey 5-20-2020

Location Description: B1

2” gravel swath down to low tide, boulders scattered along mean high water area.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

Location Description: B2

Boulders down to low tide, bedrock near mean high water area.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

Location Description: B3

Boulders from mean high water to low tide.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

Location Description: B4

Cobbles and boulders down to low tide.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

Location Description: B5

Boulders and cobbles down to low tide.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

Location Description: B6

Gravel from mean high water to start of boulders, bedrock in areas.

FACING Northeast	FACING Southeast
	
FACING Southwest	**FACING Northwest**
	

APPENDIX 4: WESPAK-SE SUMMARY

Site Name or ID #:	Sitka Seaplane Base
Investigator Name:	Joshua Grabel
Date of Field Assessment:	5/20/2020
Nearest Town:	City of Sitka
Latitude (decimal degrees):	57.055418
Longitude (decimal degrees):	-135.363889
HUC12 Watershed # (from UAS web site):	190102121206
Approximate size of the Assessment Area (AA, in acres)	0.06
AA as percent of entire wetland (approx.)	100
Tidal phase during most of visit:	Low
What percent (approx.) of the **wetland** were you able to visit?	100.00
What percent (approx.) of the **AA** were you able to visit?	70.00
Have you attended a training session for this protocol? If so, indicate approximate month & year.	
How many wetlands have you assessed previously using this protocol (approx.)?	10.00

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

WESPAK-SE version 2 scores for this NON-tidal Wetland Assessment Area (AA):

Specific Functions or Values:	Function Score raw	Value Score raw	**Score (normalized)**	**Function Rating**	**Value Score (normalized)**	**Value Rating**	FV raw	FV Index	**(normalized)**	**FUNCTION** Median of Normalized F Scores	*Thresholds for Function Rating (normalized score)* Low is < or =	High is >	**VALUE** Median of Normalized V Scores	*Thresholds for Value Rating (normalized score)* Low is < or =	High is >
Surface Water Storage (WS)	10.00	10.00	10.00	Higher	10.00	Higher	10.00	10.00	10.00	2.95	2.89	6.34	3.06	1.85	5.00
Stream Flow Support (SFS)	0.00	0.00	0.00	Lower	0.00	Lower	0.00	0.00	0.00	3.17	2.67	6.13	3.33	1.45	4.48
Streamwater Cooling (WC)	7.20	0.00	7.20	Higher	0.00	Lower	3.60	7.20	7.00	4.00	3.36	5.87	1.98	2.11	5.49
Streamwater Warming (WW)	5.00	0.00	5.00	Moderate	0.00	Lower	2.50	5.00	4.03	5.42	3.33	6.80	2.78	2.78	6.63
Sediment & Toxicant Retention & Stabilization (SR	10.00	0.17	10.00	Higher	0.00	Lower	5.00	10.00	10.00	3.13	3.36	6.52	0.84	2.05	5.86
Phosphorus Retention (PR)	10.00	1.07	10.00	Higher	1.04	Lower	5.52	10.00	10.00	3.34	3.06	6.17	1.27	2.45	5.73
Nitrate Removal & Retention (NR)	10.00	4.17	10.00	Higher	4.56	Moderate	7.28	10.00	10.00	2.33	2.19	4.64	3.25	2.17	4.94
Carbon Sequestration (CS)	6.08		3.89	Moderate			3.89	3.89	3.89	6.53	3.66	6.43			
Organic Nutrient Export (OE)	0.00	0.00	0.00	Lower	0.00	Lower	0.00	0.00	0.00	7.68	0.00	7.59	7.00	0.00	7.00
Anadromous Fish Habitat (FA)	0.00	0.00	0.00	Lower	0.00	Lower	0.00	0.00	0.00	0.00	2.93	7.23	0.00	0.63	6.67
Resident & Other Fish Habitat (FR)	0.00	0.00	0.00	Lower	0.00	Lower	0.00	0.00	0.00	0.00	0.00	7.43	0.00	1.50	7.76
Aquatic Invertebrate Habitat (INV)	4.53	2.26	3.50	Moderate	0.71	Lower	2.11	3.50	3.50	3.92	2.48	5.04	2.22	2.50	6.43
Amphibian Habitat (AM)	5.66	5.56	4.35	Moderate	6.45	Higher	5.40	5.40	4.80	4.40	3.59	6.74	4.21	2.43	5.19
Waterbird Feeding Habitat (WBF)	0.00	0.00	0.00	Lower	0.00	Lower	0.00	0.00	0.00	4.60	0.00	5.68	2.53	0.85	4.07
Waterbird Nesting Habitat (WBN)	2.53	0.00	3.65	Moderate	0.00	Lower	1.83	3.65	3.65	4.58	0.00	6.44	6.90	1.67	8.70
Songbird, Raptor, & Mammal Habitat (SBM)	5.35	3.33	6.61	Moderate	3.33	Moderate	4.97	6.61	6.44	8.05	0.00	7.35	4.22	2.50	5.63
Pollinator Habitat (POL)	2.30	3.20	2.72	Moderate	4.29	Moderate	3.50	3.50	3.06	4.94	2.45	5.38	4.15	2.65	5.83
Native Plant Habitat (PH)	5.28	5.88	4.88	Moderate	4.54	Moderate	4.71	4.88	3.94	5.24	4.52	6.51	3.78	3.78	6.46
Other Values or Attributes:															
Public Use & Recognition (PU)		2.54			3.16	Moderate	3.16	3.16	3.16				2.91	2.32	5.59
Subsistence & Provisioning Services (Subsis)		10.00			10.00	Higher	10.00	10.00	10.00				5.00	0.00	6.67
Wetland Sensitivity (Sens) - *not used in subsequent calculations*		4.58			7.13	Moderate	7.13	7.13	10.00				5.91	5.03	7.46
Wetland Ecological Condition (EC) - *not used in subsequent calculations*		1.72			1.81	Lower	1.81	1.81	1.91				4.15	2.79	5.08
Stress Potential (STR) - *not used in subsequent calculations*		4.91			7.32	Higher	7.32	7.32	10.00				6.43	3.31	5.73
Summary Scores for Groups:								Group Score Not Normalized	Group Score Normalized	Group Rating					
HYDROLOGIC Group (WS)								10.00	10.00	Higher	3.08	5.91			
WATER QUALITY Group (max+avg/2 of SR, PR, NR, CS)								9.24	10.00	Higher	4.23	6.75			
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC, WW)								4.95	0.00	Lower	4.07	6.60			
FISH Group (max+avg/2 of FA, FR)								0.00	0.00	Lower	2.52	5.83			
AQUATIC HABITAT Group (max+avg/2 of AM, WBF, WBN)								3.81	2.48	Lower	4.04	6.82			
TERRESTRIAL HABITAT Group (max+avg/2 of SBM, PH, POL)								5.46	3.95	Moderate	3.61	6.32			
SOCIAL GROUP (max+avg/2 of PU, Subsis)								10.00	10.00	Higher	3.66	6.58			

		AVG w/o Social	with Social	selected higher	normalized
Overall Score (see Manual for explanation of how the spreadsheet calculates it):	7.17	7.20	7.60	7.60	7.17
Overall Rating:	Higher				

	Fmin raw	Fmax raw	Vmin raw	Vmax raw
WS	1.18	10.00	0.00	10.00
SFS	0.00	8.33	0.00	6.64
WC	0.00	10.00	0.00	7.58
WW	0.00	10.00	0.00	5.38
SR	2.14	10.00	0.17	4.54
PR	3.32	10.00	0.42	6.67
NR	3.49	10.00	0.42	8.65
CS	4.09	9.20		
OE	0.00	6.92	0.00	9.94
FA	0.00	7.67	0.00	10.00
FR	0.00	7.22	0.00	10.00
INV	2.81	7.73	1.66	10.00
AM	3.27	8.77	2.02	7.50
WBF	0.00	7.25	0.00	7.70
WBN	0.00	6.92	0.00	10.00
SBM	0.00	8.10	0.00	10.00
POL	0.61	6.82	0.00	7.47
PH	3.71	6.92	2.50	9.95
PU			0.78	6.34
SubSis			0.00	10.00
EC			2.52	5.41
Sen			0.00	9.50
STR			1.65	6.10

	FVmin raw	FVmax raw
WS	2.00	10.00
SFS	0.00	10.00
WC	0.67	10.00
WW	1.62	10.00
SR	3.35	7.48
PR	0.76	10.00
NR	0.00	10.00
CS	0.00	10.00
OE	0.00	10.00
FA	0.00	10.00
FR	0.00	10.00
INV	0.00	10.00
AM	1.16	10.00
WBF	2.37	8.09
WBN	0.00	10.00
SBM	0.48	10.00
POL	0.63	10.00
PH	1.84	9.57
PU	0.00	10.00
SubSis	0.00	10.00
EC	2.52	5.41
Sen	0.00	9.50
STR	1.65	6.10

HYDRO	0.00	10.00
WQ & CS	3.00	9.14
AQSUPP	4.97	9.42
FISH	0.00	10.00
HABAQ	1.82	9.84
HABTERR	2.49	10.00
SOCIAL	0.60	8.66

NOTE: Complete WESPAK spreadsheet available to agencies electronically upon request.