



FINAL
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Delineation of Wetlands and Other Waters Report Former Lake Hancock Target Range

NAS Whidbey Island

Whidbey Island, Washington

Department of the Navy

Naval Facilities Engineering Command Northwest

1101 Tautog Circle, Suite 203

Silverdale, WA 98315-1101



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FINAL
DELINEATION OF WETLANDS AND OTHER WATERS REPORT
FORMER LAKE HANCOCK TARGET RANGE
NAVAL AIR STATION WHIDBEY ISLAND, WASHINGTON

Prepared by:

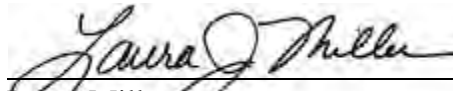
TETRA TECH INC.

Prepared for:

NAVAL FACILITIES ENGINEERING COMMAND NORTHWEST
SILVERDALE, WASHINGTON

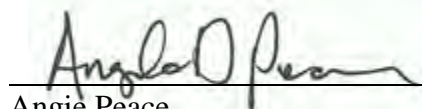
NOVEMBER 20, 2012

Prepared by:




Laura Miller
Professional Wetland Scientist

Reviewed by:



Angie Peace
Task Order Manager

Approved by:



Steve Negri
Supervising Biologist

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTO	Contract Task Order
CWA	Clean Water Act
DoD	Department of Defense
E1	estuarine subtidal
E2	estuarine intertidal
E2EM	estuarine intertidal emergent
E2AB/US	estuarine intertidal aquatic bed/unconsolidated shore
Ecology	Washington State Department of Ecology
°F	degrees Fahrenheit
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
FS	Feasibility Study
GIS	geographic information systems
GPS	geographic positioning system
LHTR	Lake Hancock Target Range
MEC	munitions and explosives of concern
MPPEH	material potentially presenting an explosive hazard
msl	mean sea level
NASWI	Naval Air Station, Whidbey Island
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Navy
NHD	National Hydrography Dataset

ACRONYMS AND ABBREVIATIONS (continued)

NIDIS	National Integrated Drought Information System
NOL	not on list
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWS	National Weather Service
OHW	ordinary high water
OBL	obligate
PA	Preliminary Assessment
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub-shrub
RCW	Revised Code of Washington
SMA	Washington State Shoreline Management Act
SR	State Route
Tetra Tech	Tetra Tech, Inc.
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WPCA	Washington State Water Pollution Control Act

1.0 INTRODUCTION

1.1 PURPOSE AND NEED

This Delineation of Wetlands and Other Waters Report for the former Lake Hancock Target Range (LHTR) at the Naval Air Station Whidbey Island (NASWI), Washington, was prepared for Navy Facilities Engineering Command (NAVFAC) Northwest by Tetra Tech, Inc. (Tetra Tech). This delineation was conducted under Contract Task Order (CTO) JP01 of Contract Number N62470-08-D-1008. The LHTR is a former range included in the Department of Defense (DoD) Munitions Response Program under the Defense Environmental Restoration Program. This program addresses munitions and explosives of concern (MEC) and material potentially presenting an explosive hazard (MPPEH).

Munitions response actions are conducted under the process outlined in the National Contingency Plan as authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). As part of the U.S. Navy's (Navy's) environmental restoration process for CERCLA sites, a Preliminary Assessment (PA) (Malcolm Pirnie 2007), a Site Investigation (TtEC 2010), and a Feasibility Study (FS) (TtNUS 2011) have been completed for the LHTR. The purpose of this wetland delineation was to identify the presence and extent of areas within the LHTR that meet the federal and state definitions of wetlands and other waters. This wetland delineation was conducted concurrently with a wetland impact study (reported separately) for the purpose of informing the selection and/or implementation of any future remedial action (as presented in the FS).

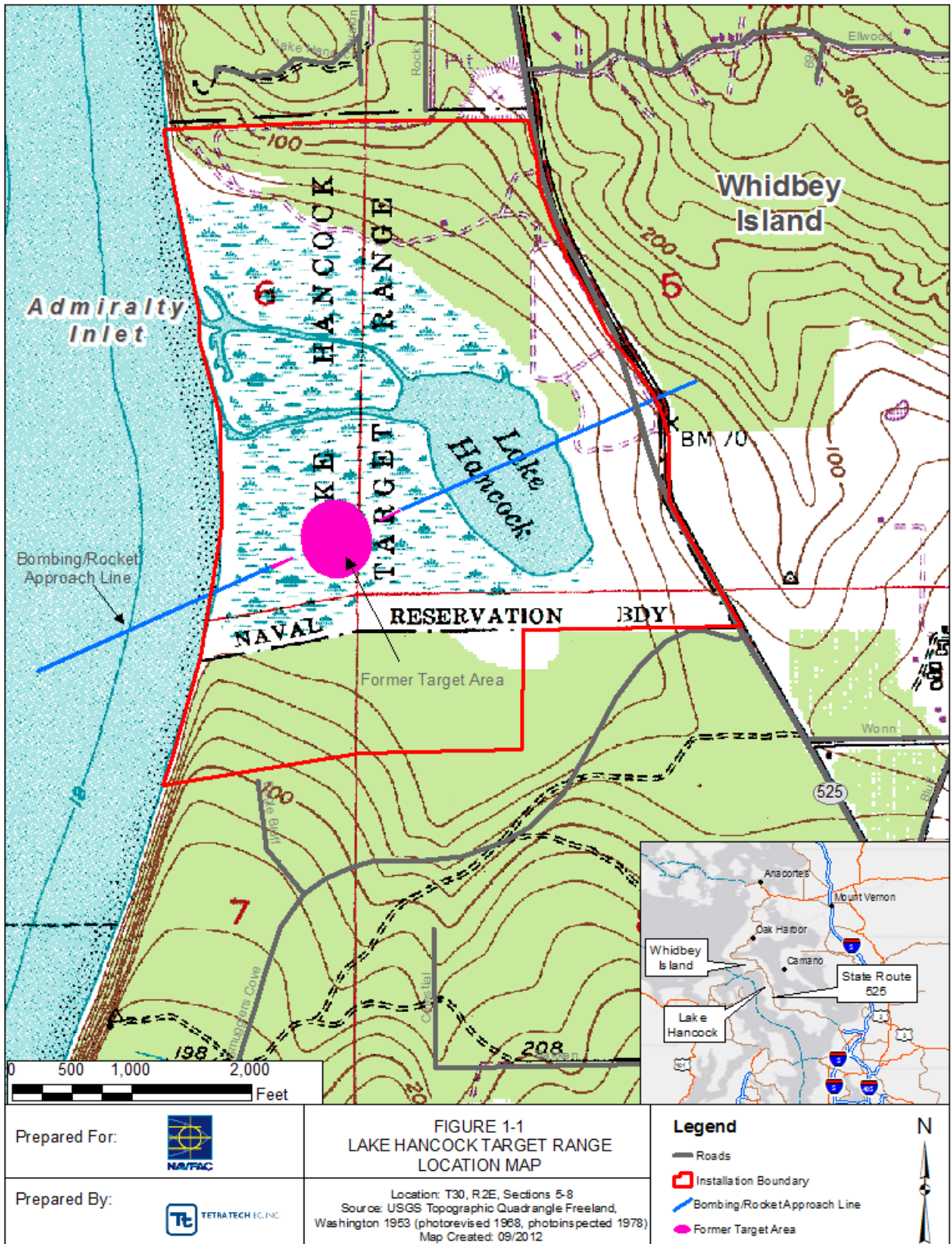
The former LHTR is a 417-acre site located about 20 miles south of NASWI and 1 mile north of the community of Greenbank just west of State Route (SR) 525 in Island County, Washington, in Township 30 North, Range 2 East, Sections 5, 6, 7, and 8 (Figure 1-1). Wetland delineation and impact study field efforts were conducted on the LHTR site by Tetra Tech over a 2-week period from August 13 to 23, 2012.

Section 2.0 of this report provides an overview of the delineation methods, Section 3.0 provides the details of the delineation results, Section 4.0 contains a summary of results, and Section 5.0 contains a list of references. Appendix A provides a photograph record of the aquatic resources identified, and Appendix B provides copies of completed wetland data forms.

1.2 REGULATORY AUTHORITY

State laws require that wetlands be protected under the Washington State Water Pollution Control Act (WPCA) and the Shoreline Management Act (SMA) and be delineated using a manual developed by the Washington State Department of Ecology (Ecology) and adopted into rules (Revised Code of Washington ([RCW] 36.70A.175 and RCW 90.58.380). Ecology adopted a wetland delineation manual in 1997 (Ecology 1997) that was based on the original 1987 U.S. Army Corps of Engineers (USACE) manual and subsequent Regulatory Guidance Letters. With the development and adoption of the USACE regional supplements, Ecology repealed the state delineation manual and now directs delineations be done according to the currently approved USACE manual and regional supplements.

Based on current policy for identifying federal and state jurisdictional wetlands, the delineation was performed in accordance with the 1987 USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010). The delineation technique employed for the LHTR involved collection and review of background information followed by a field delineation. All surface waters were delineated and evaluated for their likelihood of being jurisdictional and regulated under Section 404 of the Clean Water Act (CWA) and/or WPCA and SMA.



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2.0 METHODS

2.1 BACKGROUND RESEARCH

Prior to field delineation, Tetra Tech conducted a thorough review of existing site information, including:

- Freeland, Washington U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangle map (USGS 1953);
- National Wetlands Inventory (NWI), U.S. Fish and Wildlife Service (USFWS) NWI online map source (USFWS 2012);
- National Hydrography Dataset (NHD [USGS 2012]) Environmental Systems Research Institute source;
- Natural Resources Conservation Service (NRCS) Web Soil Survey online data service (NRCS 2012a) and Official Soil Series Descriptions (NRCS 2012b);
- NRCS Hydric Soils List for Island County (NRCS 2012c);
- NRCS SSURGO Soil Survey of Parts of Island County; Soil Data Mart online data service (NRCS 2012d);
- National Weather Service (NWS) climate data for Seattle, Washington, closest agency data center to project site (NWS 2012); and
- Map of Washington Shoreline Management Act Upstream Boundary Points; USGS/Ecology (Higgins 2003).

2.2 FIELD DELINEATION

2.2.1 Wetland Delineation

Following a review of background information, a wetland scientist from Tetra Tech performed a systematic field delineation of the project study area, defined as the property boundary of the former LHTR. The delineation was conducted from August 13 to 23, 2012. The delineation of the project study area was initiated with a walkover inspection of the entire site to identify topographic, drainage, and vegetation features that would indicate potential wetlands. Throughout the duration of field activities, a qualified unexploded ordnance Technician II accompanied the wetland delineation team to perform MEC/MPPEH avoidance. A hand-held magnetometer was used to scan areas prior to digging wetland delineation soil pits to provide for MEC/MPPEH avoidance. If evidence of potential anomalies was detected, proposed wetland soil pits were moved to avoid the anomalies.

Sampling locations within distinct plant communities were investigated using the Routine On-Site Determination Method (USACE 1987) refined by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010). This method involves a detailed examination of the soils, vegetation, and hydrologic indicators of a study area. At each sampling location, field data forms from the regional supplement were completed. Vegetation, soils, hydrology, and site characteristics were recorded at sample plot locations, generally with paired plots chosen to represent both the wetland and adjacent uplands. To further characterize each wetland, the hydrological connection to adjacent wetlands and other waters occurring in and outside of the project study area was evaluated. Specific methods for characterizing and evaluating the soils, vegetation, and hydrologic indicators at sample plot locations are described below.

Vegetation: Dominant plant species in each major vegetation stratum (tree, sapling/shrub, herbaceous, and woody vine) were identified within a variable radius size appropriate to the geomorphic position of the sample plot. Radius size was typically 30 feet for the tree and shrub/sapling strata and 5 feet for the herb and woody vine strata. The wetland indicator status (the three- or four-letter code following scientific plant names) of each plant species was assigned according to the recently updated National Wetland Plant List, Western Mountains, Valleys, and Coast Region Final Draft Ratings (Lichvar and Kartesz 2012).

In order to meet the hydrophytic vegetation criterion, more than 50 percent of the dominant species within a plot must be hydrophytes, that is, they must have an indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC). Although facultative upland (FACU) and upland species are not typically found in wetlands, they may occasionally occur in wetlands or in adjacent areas. Where no indicator status was provided for a particular species, that species was noted as NOL (not on list) and considered as an upland plant in the dominance analysis.

Soils: A small soil pit was excavated with a hand shovel at each sample plot location to a minimum depth of 18 inches unless rocky or cemented substrate prohibited deeper probing. In the forested areas of the project study area, it was frequently necessary to excavate a deeper sample. The presence of a water table or soil saturation must be observed within 24 inches below ground surface (bgs) to meet the dry season hydrology indicator. The soils were characterized by determining the color, texture, and structure of each soil horizon. Colors of soil matrix and mottles were identified using Munsell Soil Color Charts (Munsell Color 2000). Mineral soils were generally considered hydric if they exhibited a depleted

soil matrix or a dark surface matrix with strong redoximorphic features within 10 inches of the soil surface. Additional indicators used to determine presence of hydric soils included mucky substance and a sulfidic or “rotten egg” odor.

Hydrology: Each sample plot was examined for evidence of wetland hydrology. Indicators of wetland hydrology found within the project study area included inundation, high water table, saturation in the upper 12 inches of the soil, dry season water table, algal mat or crust, geomorphic position (i.e., low lying or swale formation), drift deposits, drainage patterns, water stained leaves, and oxidized rhizospheres. Presence of standing water or depth to soil saturation was recorded when applicable.

Wetland cover types were classified according to the USFWS classification system for wetlands and deepwater habitats of the United States (Cowardin et al. 1979). Wetlands were classified according to these cover types as palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), estuarine subtidal (E1), or estuarine intertidal (E2). In some areas, navigation of the tidal marsh was prohibited by deep saturated or inundated muck soils and/or a network of channels too wide or saturated to cross, even at low tide. Access was generally sufficient however, to generally concur with the Cowardin classifications of marsh mapped by the existing NWI. Each wetland was photographed and additional notes and sketches characterizing the wetland were recorded on data forms. Appendix A provides representative photograph documentation, and Appendix B provides copies of the field data sheets for each wetland.

2.2.2 Wetland Boundary

Areas meeting wetland criteria described above were marked in the field with consecutively numbered plastic surveyor’s tape (flagging), and coordinates of wetland boundaries were recorded with a GPS unit as described below. Boundaries lacking woody vegetation within regularly inundated levels were not flagged because flagging would likely dislodge from emergent and low stature vegetation that is subject to tidal inundation and seasonal plant dormancy. Pink flagging printed with “Wetland Delineation” was tied to woody vegetation at vertices or pivot points of the wetland boundary to permit relocation as necessary.

2.2.3 Other Waters Delineation

Other waters are non-wetland surface waters including lakes, ponds, rivers, and streams. Lakes and ponds are permanently inundated at mean annual water depths greater than 6.6 feet or permanently inundated areas less than 6.6 feet in depth that do not support rooted-emergent or woody plant species. Areas less than 6.6 feet mean annual depth that support

only submergent aquatic plants are classified as vegetated shallows, not wetlands (USACE 1987).

A stream is defined as a drainage with a discernible channel. A discernible channel has a bed and banks that exhibit scour, sediment deposition, or other indicators of regular or irregular flow. Streams are classified by their sustained duration of flow. A stream is considered perennial if it flows continuously throughout the year and its water surface is usually at a lower elevation than the water table in the surrounding landscape. Intermittent streams are drainages situated on intermediate landscape positions (typically neither headwaters nor valleys) that receive baseflow only during the wet weather season for a minimum of three consecutive months. Ephemeral streams are small drainages in the upper reaches of the landscape that flow only in response to precipitation or snowmelt. Ephemeral streams can have widely variable channel or scour characteristics.

Prior to field delineation, known other waters in the study area were identified through examination of features mapped by the NWI, NHD, and USGS topographic quadrangle maps. These sources indicate only the lagoon and the channels contained within the boundaries of the on-site estuarine wetlands. However, a biologist examined the entire project study area for other waters concurrently with the delineation of wetlands. Streams within the LHTR were mapped and classified according to USACE guidelines (USACE 2007). Because the channels within the study area are tidal streams with obvious perennial flow and connection with Waters of the U.S. (Admiralty Inlet), it was not necessary to conduct further streamflow duration assessment for the purpose of jurisdictional determination. Accessible points along ordinary high water (OHW) were mapped with a geographic positioning system (GPS) unit; OHW in inaccessible areas was digitized by interpreting the geographic information systems (GIS) aerial layer channel locations.

2.2.4 GPS Mapping

The boundaries of wetlands and other waters were delineated using a Trimble GeoXH 6000 GPS unit. Wetland boundaries were located in accordance with Trimble, Inc. sub-meter accuracy standards.

Deep saturated muck soils made for impossible navigating in many areas of the salt marsh due to frequent tidal inundation. To the extent possible, the marsh was navigated at low tide for the purpose of confirming the location of the lake edge and channel banks with GPS points. The remaining portions of these features were then digitized using aerial photographs.

GPS data were differentially corrected using Windows Mobile Device Center software and commercial base station control points. A geo-referenced wetland delineation boundary suitable for overlay onto existing map and aerial photograph layers was created using ArcGIS (Environmental Systems Research Institute, Inc.; Redlands, California) mapping software.

3.0 RESULTS

This section provides a site description, results of the review of existing background information and field delineation, and descriptions of identified wetlands, adjacent upland areas, and other waters.

3.1 SITE DESCRIPTION

The former LHTR is located about 20 miles south of NASWI and 1 mile north of Greenbank just west of SR 525 in Washington (Figure 1-1). The site is approximately 417 acres in size and includes a saltwater lagoon (Lake Hancock) surrounded by salt marsh. The former LHTR is bordered to the north and south by forest and rural residential land use, to the east by SR 525, and to the west by Admiralty Inlet. An approximately 50-foot-wide channel connects Lake Hancock to Admiralty Inlet to the west, which creates a tidal influence to Lake Hancock.

3.2 BACKGROUND RESEARCH

3.2.1 Habitat Types

The LHTR site is a large and diverse coastal lagoon system. A total of 17 habitat types that support a variety of wildlife species have been identified within this system, including salt marsh, brackish marsh, freshwater marsh, and dense pole forest (Navy 2012). The largest of these habitat types include salt marsh within the interior of the site and second growth mixed deciduous-conifer forest surrounding the salt marsh on the southwest, southeast, and northeast sides.

3.2.2 Topography

The LHTR study area ranges in elevation from below mean sea level (msl) to approximately 140 feet above msl. The northern and eastern portions of the study area slope gently to the southwest and west. The wooded zone in the southwest corner of the range slopes to the northeast. Bluffs approximately 40 to 80 feet high are present on the northern and southern beach areas. The rest of the site is virtually flat, and much of it receives regular tidal flooding. In addition, a freshwater forested wetland in the southern portion of the study area is beyond tidal influence; however, this area has a high water table due to its flat geomorphic position at the toe-of-slope of the upland forest abutting it offsite to the south.

3.2.3 Soils

Review of soil survey data for Island County, Washington (NRCS 2012a, 2012b, 2012c, and 2012d) indicate that nine soil units and one non-soil type are mapped within the study area. These mapped soil units are presented in Table 3-1 and Figure 3-1 and are discussed in detail below. (Note that figures for this section are located in the back of the section.)

Table 3-1. Lake Hancock Target Range Soils

Map Unit Symbol	Map Unit Name	Hydric Soil Classification
998	Water, saline	NA
1006	Semiahmoo muck, 0 to 2 percent slopes	Yes
1021	Sholander, cool-Spieden complex, 0 to 5 percent slopes	No ^{1/}
1025	Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes	No ^{1/}
1053	Dugualla muck, 0 to 2 percent slopes	Yes
2010	Whidbey-Hoypus complex, 2 to 15 percent slopes	No
3001	Hoypus sandy loam, 3 to 25 percent slopes	No
3017	Everett-Alderwood complex, 3 to 15 percent slopes	No
3019	Everett-Alderwood complex, 15 to 40 percent slopes	No
3022	Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes	No

^{1/} These soils may have hydric inclusions
 Source: NRCS Soil Survey of Island County, Washington

Water, saline (998): Saline water is identified for Lake Hancock and the main channel connecting Lake Hancock to Admiralty Inlet. The Water, saline map unit is a miscellaneous area.

Semiahmoo muck, 0 to 2 percent slopes (1006): Semiahmoo muck is mapped in the south-central portion of the LHTR. This soil component is found on depressions and plains. The parent material consists of highly decomposed plant material with a thin layer of volcanic ash mixed with diatomaceous earth. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded, but is frequently ponded. A seasonal zone of water saturation is at the soil surface during January, February, March, April, May and December. Organic matter content in the surface horizon is about 70 percent. NRCS lists this mapped soil unit as hydric (NRCS 2012d).

Sholander, cool-Spieden complex, 0 to 5 percent slopes (1021): A small portion of Sholander, cool-Spieden complex is found in the southeastern corner of the LHTR. The Sholander, cool component makes up 45 percent of map unit 1021. Slopes are 2 to 5 percent.

This component is found on plains and in valleys. The parent material consists of glacial outwash over dense glaciomarine deposits. Depth to a root restrictive layer is 40 to 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 8 inches during January and February. Organic matter content in the surface horizon is about 9 percent. This soil component does not meet hydric criteria (NRCS 2012d).

The Spieden component makes up 35 percent of map unit 1021. Slopes are 0 to 2 percent. This soil component is found on drainageways and plains. The parent material consists of glacial outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded but is frequently ponded. A seasonal zone of water saturation is at 2 inches during January, February, March and December. Organic matter content in the surface horizon is about 20 percent. The Spieden component meets hydric criteria; therefore, map unit 1021 has hydric inclusions (NRCS 2012d).

Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes (1025): The Beaches-Endoaquents, tidal-Xerorthents association is found along the bluffs between Lake Hancock and Admiralty Inlet. The Beaches component of this map unit is a miscellaneous area and not a soil series type.

The Endoaquents, tidal component makes up 30 percent of map unit 1025. Slopes are 0 to 2 percent. This component is found on shore complexes and beaches. The parent material consists of beach sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is very frequently flooded, but it is not ponded. A zone of water saturation is at the soil surface throughout the year. Organic matter content in the surface horizon is about 1 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

The Xerorthents component makes up 20 percent of map unit 1025. Slopes are 0 to 5 percent. This soil component is found on hillslopes, beaches, and shore complexes. The parent material consists of beach sand and colluvium from glacial outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded or ponded. There

is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. While the Xerorthents soil type is not listed as hydric by the NRCS, the Endoaquents, tidal component is listed by the NRCS as hydric; therefore, map unit 1025 may contain hydric inclusions (NRCS 2012d).

Dugualla muck, 0 to 2 percent slopes (1053): Dugualla muck is found throughout the low marsh area surrounding Lake Hancock. The Dugualla component makes up 80 percent of map unit 1053. Slopes are 0 to 2 percent. This component is found on shore complexes, tidal flats and depressions. The parent material consists of herbaceous organic deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is very frequently flooded, but it is not ponded. A zone of water saturation is at the soil surface throughout the year. Organic matter content in the surface horizon is about 80 percent. NRCS lists this mapped soil unit as hydric (NRCS 2012d).

Whidbey-Hoypus complex, 2 to 15 percent slopes (2010): The Whidbey-Hoypus complex is found east of Lake Hancock, between the lake and SR 525. The Whidbey component makes up 60 percent of map unit 2010. Slopes are 2 to 10 percent. This component is found on hillslopes and hills on plains. The parent material consists of glacial drift over dense glacial drift. Depth to a root restrictive layer is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 16 inches during January and February. Organic matter content in the surface horizon is about 75 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

The Hoypus component makes up 40 percent of map unit 2010. Slopes are 5 to 15 percent. This soil component is found on hills on plains and hillslopes. The parent material consists of glacial outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 75 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

Hoypus sandy loam, 3 to 25 percent slopes (3001): Hoypus sandy loam is found in the northeast portion of the LHTR. The Hoypus component is the only component in this map

unit. Slopes are 3 to 25 percent. This soil component is described above. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

Everett-Alderwood complex, 3 to 15 percent slopes (3017): The Everett-Alderwood complex, 3 to 15 percent slopes is found to the east and west of the Semiahmoo muck in the southern portion of the LHTR, as well as in the southwestern corner of the site. The Everett component makes up 70 percent of map unit 3017. Slopes are 3 to 15 percent. This component is found on plains and hillslopes. The parent material consists of glacial outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches and shrink-swell potential of this soil component are low. This soil is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 75 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

The Alderwood component makes up 30 percent of map unit 3017. Slopes are 3 to 15 percent. This component is found on hillslopes and plains. The parent material consists of glacial drift over dense glaciomarine deposits. Depth to a root restrictive layer is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 16 inches during January and February. Organic matter content in the surface horizon is about 75 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

Everett-Alderwood complex, 15 to 40 percent slopes (3019): The Everett-Alderwood complex, 15 to 40 percent slopes is found in the southern portion of the LHTR. Slopes for both the Everett and Alderwood components are 15 to 40 percent. The Alderwood component makes up 45 percent of map unit 3019, and the Everett component makes up 45 percent of this map unit. These soil components are described above. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

Aquic Dystrocherepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes (3022): A small portion of Aquic Dystrocherepts-Oxyaquic Xerorthents complex is found in the northwest corner of the LHTR. The Aquic Dystrocherepts, coastal bluffs component makes up 45 percent of map unit 3022. Slopes are 15 to 70 percent. This soil component is found on sea cliffs and shore complexes. The parent material consists of beach sand and colluvium from glacial drift. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is

moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 20 inches during January. Organic matter content in the surface horizon is about 75 percent. NRCS does not list Aquic Dystrocherepts as hydric (NRCS 2012d).

The Oxyaquic Xerorthents component makes up 45 percent of map unit 3022. Slopes are 15 to 70 percent. This component is found on hillslopes, sea cliffs, and shore complexes. The parent material consists of beach sand and colluvium from glacial drift. Depth to a root restrictive layer is 40 to 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded or ponded. A seasonal zone of water saturation is at 20 inches during January and February. Organic matter content in the surface horizon is about 75 percent. NRCS does not list this mapped soil unit as hydric (NRCS 2012d).

3.2.4 Hydrology and Hydrogeology

Lake Hancock is a shallow, permanent lagoon surrounded by intertidal saltwater marsh habitat. A natural shoreline breakwater comprises accumulated washed up sand and debris in the form of two spits separates this marsh basin from Admiralty Inlet. A single tidal channel connects the lagoon system to Admiralty Inlet. In addition to this inlet channel, several minor channels with numerous branching channels are situated within the tidal marsh. Surface water flow direction in the lowland area varies according to the tidal cycle. Water flows toward the lagoon during the flood cycle and toward Admiralty Inlet during the ebb cycle. Salt pans (small, shallow ponds of saline water without emergent vegetation) are present within the southern half of the salt marsh, particularly around the former target area. The salt pans may have been created from the impact of munitions or disturbance during construction and operation of the target facility.

Numerous freshwater springs support a PEM wetland subtype in the southern portion of the marsh (see Photograph 29 in Appendix A). Hydrogeologic conditions at the former LHTR are not known. Groundwater monitor wells have not been installed within the study area. In addition, there are no known groundwater production wells in the area. Because aquifer elevations generally reflect the surface topography and the majority of the tidal marsh is located below or at sea level, it is assumed that the surface water throughout much of the tidal cycle includes groundwater discharging to the marine environment.

The gradient of PFO wetland appears to be at or near sea level; however, the hydrological source for this wetland subclass is likely a high water table due to its geomorphic position at

the toe of the slope. Forestland in the southernmost portion of the study area slopes northward towards the PFO wetland.

3.2.5 Climate and Precipitation

Island County is located in the Puget Trough section, Pacific Border province, of the Pacific Mountain division (Fenneman 1931). The climate of the county is temperate; summers are cool and dry, and winters are mild and moist. In winter, the average temperature is 40 degrees Fahrenheit (°F) and the average daily minimum temperature is 35°F. In summer, the average temperature is 60°F and the average daily maximum temperature is 70°F. The average annual total precipitation in Coupeville, Washington, is about 22 inches. Of this, about 6 inches, or 29 percent, usually falls in May through September (NRCS 2008).

Daily precipitation and temperature data were obtained from the NWS for the Seattle Weather Field Office. Daily precipitation amounts in August 2012 were slightly below average, reported as a -0.97 departure from normal (NWS 2012). Daily temperatures for August were slightly above average, reported as a 1.2 departure from normal (NWS 2012). However, temperature and precipitation data for the month of July 2012 were slightly below and above normal, respectively. Therefore, it is assumed that the drier August conditions had a moderating effect on the wetter July conditions, and thus, the field delineation was conducted under overall normal seasonal hydrological levels. The area was not considered by the National Integrated Drought Information Systems (NIDIS) to be experiencing drought conditions (NIDIS 2012).

3.2.6 National Wetlands Inventory Mapped Wetlands

The NWI map indicates the following seven mapped Cowardin wetland subclasses within the site boundary (Figure 3-2):

- Lake Hancock is designated as estuarine, subtidal, unconsolidated bottom (E1UBL) wetland.
- The area immediately surrounding Lake Hancock to the north, south, and west towards Admiralty Inlet is designated as estuarine, intertidal, emergent, regularly flooded (E2EMN) wetland.
- The area south of Lake Hancock and the E2EMN mapped wetland is designated as estuarine, intertidal, emergent, irregularly flooded (E2EMP) wetland.
- Two areas are designated as palustrine, forested, seasonally flooded (PFOC) wetlands: the area immediately adjacent to Lake Hancock to the east, and the area south of the E2EMP mapped wetland.

- The area northwest of Lake Hancock and the E2EMN mapped wetland is designated as estuarine, intertidal, unconsolidated shore, irregularly flooded (E2USP).
- The area of Admiralty Inlet adjacent to the beach and shoreline is designated as estuarine intertidal aquatic bed/unconsolidated shore, regularly flooded (E2AB/USN).

3.2.7 Mapped Waterbodies

The USGS 7.5 minute quadrangle map (Figure 1-1) and the NHD do not identify any streams within the survey boundaries (as identified by solid or dashed blue lines), but they do identify Lake Hancock and three main channels connected to Lake Hancock. The southern channel connects Lake Hancock to Admiralty Inlet. The northern channel historically connected the lagoon to Admiralty Inlet, but was closed off by beach dune development (Navy 2012).

3.3 FIELD WETLAND DELINEATION

The former LHTR contains eleven areas that meet the criteria for designation as wetland, comprising a total of 230.39 acres (Table 3-2). These are designated alphabetically as Wetlands A through K. Although Wetland A, the predominant wetland within the study area, is contiguous with Wetlands B, C, D, and E, these wetlands were delineated as separate wetlands due to each having distinct Cowardin classifications from Wetland A as described in Table 3-2 under Subclass Description. A detailed description of each wetland and the dominant community types is described below. Plant species are provided with the common name followed by the scientific name and wetland indicator status in parentheses. Although the discussion of observed wetland characteristics are presented as currently existing conditions, gradual ecological changes such as increased or decreased shading due to canopy changes could alter wetland plant community species composition. A significant or catastrophic event, such as a tsunami, could not only result in changes to wetland characteristics but also the wetland boundaries as currently recorded. Note that jurisdiction is described as “likely” or “unlikely” because jurisdiction can only be determined by a federal or state agency in a formal concurrence. Field-delineated wetlands are depicted on Figure 3-3 (located in the back of this section).

Table 3-2. Lake Hancock Target Range Wetlands

Wetland ID	Map Sheet Number ^{1/}	NWI Sub-class(es) ^{2/}	Field Observed Sub-class(es) ^{2/}	Subclass Description(s)	Delineated Wetland Area (acres)	Description and Likelihood of Being Federal/State Jurisdictional
A	1, 2, 3, 4, 5	E2USP, E2EMN, E2EMP	E2USP, E2EMN, E2EMP, E1UB3, PEM1T	Estuarine intertidal: unconsolidated shore irregularly flooded (E2USP); emergent regularly flooded (E2EMN); emergent irregularly flooded (E2EMP); Estuarine subtidal unconsolidated bottom mud (E1UB3); palustrine emergent persistent semipermanently flooded-tidal (PEM1T)	193.48 (excluding lagoon and mapped major channel areas)	Subtidal salt marsh and brackish and freshwater emergent wetland; likely federal and state jurisdictional
B	3	PFOC	PSSE	palustrine scrub-shrub seasonally flooded/saturated	0.19	Small isolated depression; not likely federal jurisdictional; likely state jurisdictional
C	3	PFOC	PEME	palustrine emergent seasonally flooded/saturated	0.06 (excluding portion overlapping Wetland A)	Small swale; surface water connection to Waters of the U.S.; likely federal and state jurisdictional
D	4, 5	PFOC, E2EMP	PSSC/H	palustrine scrub-shrub seasonally flooded/permanently flooded	3.64	Freshwater wetland at fringe of salt marsh; surface water connection to Waters of the U.S.; likely federal and state jurisdictional
E	4, 5, 6, 7	PFOC	PFOF/H	palustrine forested semipermanently flooded/permanently flooded	32.68	Freshwater wetland; surface water connection to Waters of the U.S.; likely federal and state jurisdictional
F	4	None	PEME	palustrine emergent seasonally flooded/saturated	0.03	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional
G	4	None	PEME	palustrine emergent seasonally flooded/saturated	0.01	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional

3-9

Table 3-2. Lake Hancock Target Range Wetlands (continued)

Wetland ID	Map Sheet Number ^{1/}	NWI Sub-class(es) ^{2/}	Field Observed Sub-class(es) ^{2/}	Subclass Description(s)	Delineated Wetland Area (acres)	Description and Likelihood of Being Federal/State Jurisdictional
H	6	None	PEME	palustrine emergent seasonally flooded/saturated	0.04	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional
I	6	None	PEME	palustrine emergent seasonally flooded/saturated	0.04	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional
J	6	None	PEME	palustrine emergent seasonally flooded/saturated	0.18	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional
K	6	None	PEME	palustrine emergent seasonally flooded/saturated	0.04	Isolated wetland swale; likely not federal jurisdictional; likely state jurisdictional
Total:					230.39	

1/ Map sheet numbers correspond with the maps provided in Figure 3-3 of this report, provided at the end of this section

2/ NWI and field classification based on Cowardin et al., 1979

3.3.1 Wetland A

Wetland A is a 193.48-acre wetland that surrounds the coastal lagoon known as Lake Hancock (Figure 3-3, Sheets 1 through 5). This wetland includes extensive estuarine intertidal (saltwater) marsh (E2) with lesser subtidal (E1) and PEM wetlands abutted by PEM, PSS, and PFO wetlands to the east and south. The marsh contains the lagoon, a main tidal channel, and a system of minor channels and salt pans (see Photographs 2, 3, 5, 12, and 25 in Appendix A). The marsh is also characterized by a large accumulation of logs on its northern side, particularly the northwest corner (see Photograph 1 in Appendix A).

The majority of the salt marsh is euhaline (having a salinity level approximating that of seawater), receiving water from daily tidal flows. The surface source of tidal flow is via a main channel connecting the marsh to Admiralty Inlet of Puget Sound. The flow is distributed by three other large channels with numerous branching channels. The source of fresh water for the majority of the marsh is rainfall (Lefstad and Fonda 1995). However, several freshwater springs along the south side of the marsh were identified, particularly in the southeast corner where minor bubbling up of water was observed in small pools. The freshwater springs dilute the salinity along the south side of the marsh as evidenced by a palustrine emergent community dominated by broad-leaf cat-tail (*Typha latifolia* OBL) and soft-stem club-rush (*Schoenoplectus tabernaemontani* OBL).

The dominant plant species in the tidal marsh portion of the wetland include salt-tolerant emergents such as woody saltwort (*Salicornia depressa* OBL), coastal salt grass (*Distichlis spicata* FACW), and seaside arrow-grass (*Triglochin maritima* OBL). Subdominant plant species include marsh jaumea (*Jaumea carnosa* OBL) and saltmarsh dodder (*Cuscuta salina* var. *salina* NOL). As noted, the PEM community influenced by freshwater springs is dominated by broad-leaf cat-tail and soft-stem club-rush. The wetland area between the tidal marsh and freshwater sourced area is a mixed zone of brackish water dominated by tufted hair grass (*Deschampsia caespitosa* FACW), saltmarsh club-rush (*Schoenoplectus maritimus* OBL), and coastal salt grass. Subdominant species included common silverweed (*Argentina anserina* OBL), and numerous sedge (*Carex* spp.) and rush (*Juncus* spp.) species. Wetland vegetation in all Wetland A wetland sample plots met criteria for both the Rapid Test for Hydrophytic Vegetation (Indicator 1) and the Dominance Test (Indicator 2).

The upland community adjacent to Wetland A on its sloped north side comprises second-growth mixed deciduous-conifer forest on well-drained sandy soils. Dominants include planted western hemlock (*Tsuga heterophylla* FACU), Douglas fir (*Pseudotsuga menziesii* FACU), grand fir (*Abies grandis* FACU), and red alder (*Alnus rubra* FAC). Sitka spruce

(*Picea sitchensis* FAC) is common in the wetter soils along the Wetland A boundary and is a subdominant species further upslope of the marsh. Dominants in the upland forest understory include salal (*Gaultheria shallon* FACU), salmon raspberry (*Rubus spectabilis* FAC), California dewberry (*Rubus ursinus* FACU), red elder (*Sambucus racemosa* FACU), and pineland sword fern (*Polystichum munitum* FACU). Vegetation in the Wetland A upland sample plots (SP A1, SP A3, and SP A5) did not meet criteria for Indicators 1 or 2 for hydrophytic vegetation.

The substrate throughout Wetland A is comprised of mucky peat and muck soils characterized by dark (black [7.5YR 2.5/1 or 10YR 2/2], very dark grey [5YR 3/1 or 7.5YR 3/1], or very dark brown [10YR 2/2]), permanently saturated histosols (soils with high levels of partially decomposed organic material). These soils are permanently saturated and intermittently inundated by variable levels of tidal flow. A strong hydrogen sulfide odor was experienced during the excavation of sample pits indicating anaerobic soil conditions resulting from prolonged or permanent soil saturation and/or inundation. Hydric soil indicators identified within Wetland A wetland sample plots (SP A2, SP A4, and SP A6) included hydrogen sulfide (A4), histosol (A1), histic epipedon (A2), and black histic (A3).

Upland soils along Wetland A were variable because it is a large wetland, but soils generally resembled the brown gravelly sandy loams of the Hoypus sandy loams and the very dark brown fine sandy loam over gravelly fine sandy loam of the Whidbey-Hoypus complex.

The field investigation revealed an upland riparian area in a portion of the study area mapped by the NWI as PFOC. The vegetation community included a dominance of facultative species common in both wetlands and uplands. Many species that are reliable wetland indicators elsewhere are not reliable in the coastal region of the Pacific Northwest due to sustained high precipitation and low evapotranspiration levels (ODSL 2005). In the project study area, these include slough sedge (*Carex obnupta* OBL), red alder, Sitka spruce, and salmon raspberry, all species common to both wetlands and uplands in the project study area. Dominant species with a FACU indicator status included western hemlock, red elder, and pineland sword fern. Stinging nettle (*Urtica dioica* FAC) was also common in patches throughout the uplands. The vegetation community in this area did not meet criteria for hydrophytic vegetation indicators.

Saturation (A3), high water table (A2), drift deposits (B3), hydrogen sulfide odor (C1), and presence of reduced iron (C4) were the primary wetland hydrology indicators observed in Wetland A wetland sample plots. Indicators of wetland hydrology were not observed in associated Wetland A upland sample plots. Several informal soil pits were excavated and

examined along the upland boundaries in the area mapped by the NWI as PFOC wetland in an effort to confirm the presence of NWI-mapped wetlands. One test pit (TP 1, Figure 3-3, Sheet 5; Photograph 15 in Appendix A) was recorded in order to formally document the lack of hydric soil and dry season wetland hydrology indicators. Soils in this test pit resembled the non-hydric soil unit mapped by the NRCS for this area, Whidbey-Hoypus complex, 2 to 15 percent slopes (Figure 3-1). The soils examined were moderately well-drained with a dry surface layer from zero to 1 inches of black (7.5YR 2.5/1) fine sandy loam with a high organic component. The subsurface layer (1 to 18 inches) was a very dark brown (7.5YR 2.5/2) fine sandy loam with gravels and cobbles. Hydric soil indicator criteria were not met; therefore the area was delineated as upland.

3.3.2 Wetland B

Wetland B is a 0.19-acre isolated palustrine scrub-shrub seasonally flooded/saturated (PSSE) wetland in a small depression within a terrace above Wetland A on its northeast side (Figure 3-3, Sheet 3).

Salmon raspberry comprises the dominant plant species in Wetland B (see Photograph 4 in Appendix A). The tree stratum was discounted as the surrounding trees are rooted in the uplands, considerably upslope of the elevation of this small depression. Nootka rose (*Rosa nutkana* FAC) is dominant in portions of the wetland; however, this species did not occur within the wetland sample plot (SP B2). No herbaceous layer was present in the wetland sample plot; however, two-leaf false Solomon's seal (*Maianthemum dilatatum* FAC) was common along the higher margins of this depression. The vegetation within Wetland B meets criteria for the Dominance Test and was therefore considered hydrophytic.

The uplands adjacent to Wetland B comprise a mix of communities including an area of planted grand fir adjacent to Wetland B on its north side and more generally, a mixed conifer forest with red alder, Douglas fir, Sitka spruce, and western hemlock beyond. The shrub species in the uplands adjacent to Wetland B include Nootka rose, red elder, creambush (*Holodiscus discolor* FACU), and salal. The herbaceous layer of adjacent uplands included some patches of stinging nettle, but overall the overstory does not produce enough light to support an herbaceous layer.

The examined surface soils in Wetland B were a black (7.5YR 2.5/1) muck from zero to 8 inches bgs, brown (7.5YR 5/2) sandy clay loam from 8 to 10 inches bgs, and brown (7.5YR 5/2) gravelly sandy clay with prominent yellowish brown (10YR 5/6) redoximorphic features from 10 to 14 inches bgs. Deeper excavation was prohibited by rock refusal. This soil profile meets the criteria for hydric soil indicator A2, histic epipedon. Soils in the uplands

adjacent to Wetland B were a very dark brown (7.5YR 2.5/2) well-drained sandy loam in contrast with the muck surface layer and redoximorphic features in the subsurface layer observed in the Wetland B sample plot. Soils in the Wetland B upland sample plot did not meet criteria for hydric soil indicators.

The hydrological source for Wetland B is direct precipitation and runoff. No primary hydrology indicators (e.g., saturation or inundation) were present within the wetland; however, secondary indicators of water-stained leaves (B9), drainage patterns (B10), and geomorphic position (D2) were sufficient to meet the criteria for USACE wetland hydrology. Primary and secondary wetland hydrology indicators were not observed in the upland sample plot; thus, the uplands adjacent to Wetland B did not meet USACE criteria for wetland hydrology.

3.3.3 Wetland C

Wetland C is a 0.06-acre PEM swale with a surface water connection to Wetland A (Figure 3-3, Sheet 3). Although the dominant species is slough sedge, the wetland is surrounded by palustrine scrub-shrub species (see Photograph 9 in Appendix A). Dominant species in the sapling/shrub stratum include salmon raspberry and western arborvitae (*Thuja plicata* FAC). The tree canopy includes red alder and Sitka spruce. The vegetation in Wetland C met criteria for the Dominance Test and was therefore considered hydrophytic.

The soils in Wetland C have a 9-inch surface layer of black (10YR 2/1) loam underlain by a reduced matrix of gray (10YR 5/1) sandy clay loam between 9 and 16 inches bgs. A cemented sandy clay layer at 16 inches bgs provides for perching of runoff waters. This soil profile meets the criteria for the F3 depleted matrix hydric soil indicator.

Although no primary indicators of wetland hydrology were observed in Wetland C, this wetland met the criteria for two secondary indicators, including geomorphic position (D2) and the FAC-neutral test (D5).

In contrast, the upland community immediately adjacent to Wetland B, dominated by red alder, transitions to a conifer forest dominated by western hemlock, Douglas fir, grand fir, and Sitka spruce. The surface layer of the upland soils is very dark brown (7.5YR 2.5/2) loamy sand with a subsurface layer of very dark gray (7.5YR 3/1) course loamy sand with gravels underlain by a layer of course sand. There were no primary or secondary wetland hydrology indicators observed. Thus, the uplands adjacent to Wetland B did not meet the USACE criteria for wetland vegetation, soils, or hydrology.

3.3.4 Wetland D

Wetland D is a 3.64-acre palustrine scrub-shrub seasonally flooded/permanently flooded (PSSC/H) wetland abutting Wetland A (Figure 3-3, Sheets 4 and 5). Wetland D is abutted by upland forest to the east and west, and Wetland D to the south.

Dominant species in the herb strata of Wetland D include soft-stem club-rush, black bent (*Agrostis gigantea* FAC), and purple marshlocks (*Comarum palustre* OBL). Additionally because this wetland is in a transitional area between the salt marsh and freshwater springs, coastal salt grass is also dominant in the herb stratum. Sitka spruce, salmon raspberry, and black hawthorn (*Crataegus douglasii* FAC) are common in the sapling/shrub stratum and the tree canopy is dominated by red alder and Sitka spruce. The plant community within the Wetland D wetland sample plot (SP D2) represents the boundary of the Wetland D PSS community as it transitions to the Wetland A PEM community. The plant community passes the Dominance Test and therefore meets criteria for Indicator 2 of hydrophytic vegetation (see Photograph 11 in Appendix A).

The soils examined in Wetland D have a 14-inch surface layer of black (10YR 2/1) mucky peat with partially decomposed wood over a very dark grayish brown (10YR 3/2) cemented gravelly loamy sand. This soil profile meets criteria for hydric soil indicator A3, black histic.

A shallow water table was present at 15 inches bgs in the wetland soil pit, and soils were saturated to 12 inches bgs. Outside of the wetland sample plot and closer to a freshwater spring, the wetland exhibited areas of shallow inundation and soils were saturated with a near surface water table. Therefore, USACE criteria for hydrologic indicators were met in Wetland D.

The upland communities adjacent to Wetland D vary in their composition depending on which end of this long wetland is examined, but overall, overstory dominants include red alder, choke cherry (*Prunus virginiana* FACU), western hemlock, Sitka spruce, and Douglas fir. California dewberry was dominant in the woody vine strata. In contrast to the muck soils in Wetland D, the surface layer in the adjacent upland soils is a well-drained dark brown (10YR 3/3) gravelly sandy loam over layers of dark grayish brown (10YR 4/2) gravelly sandy loam and brown (7.5YR 4/2) loamy sand. There were no primary or secondary wetland hydrology indicators observed. Thus, the uplands adjacent to Wetland D did not meet the USACE criteria for wetland vegetation, soils, or hydrology.

3.3.5 Wetland E

Wetland E is a 32.68-acre palustrine forested semipermanently flooded/permanently flooded (PFOF/H) wetland with a surface water connection to Wetlands A and D (Figure 3-3, Sheets 4, 5, 6, and 7). This wetland is at the toe-of-slope of the adjacent upland forest to the southeast and its wetland hydrology sources include surface runoff and a very high water table including several freshwater surface springs. The wetland extends offsite south and east from the study area (see Photographs 16 through 22, 26, and 29 in Appendix A).

The dominant species in Wetland E include a mix of hydrophytic and facultative upland (FACU) species. Many areas, at first glance, had obvious hydric soils and wetland hydrology characteristics but did not meet the wetland vegetation criterion. These areas were re-examined for plant adaptations to the wet environment. For example, while the herbaceous layer in many areas is dominated by yellow skunk cabbage (*Lysichiton americanus* OBL) and slough sedge with a tree canopy dominated by red alder, Sitka spruce, and western arborvitae, many areas have a tree canopy dominated by western hemlock (not a hydrophyte). Upon closer examination, however, western hemlock is often growing suspended above the saturation or inundation of this wetland on a combination of logs, stumps, or old large tree roots, and thick layers of duff. Similar to tree stratum, the sapling/shrub stratum in Wetland E includes salmon raspberry and Sitka spruce as well as the upland species, salal. Upon close examination, salal was observed to be rooted in substrate (stumps, logs) above the saturated or inundated soil layer. Vegetation within the wetland sample plots for Wetland E (SP PFO1, SP E1, SP E2, and SP E5) was considered hydrophytic because it met criteria for either Indicator 2 (Dominance Test) or Indicator 3 (Prevalence Index).

The soils in Wetland E were typically thick black (7.5YR 2.5/1 or 10YR 2/1) muck soils saturated to the surface or with shallow inundation. Soils were determined to be hydric because they met the criteria for hydric soil indicators such as histosol (A1), histic epipedon (A2; Photograph 17), and/or loamy mucky mineral (F1).

In contrast, the upland community immediately adjacent to Wetland E was typically dominated by western hemlock and Douglas fir with an understory of salmon raspberry, creambush, and red elder. The surface layers of the upland soils are highly variable with very dark brown (7.5YR 2.5/2, 10YR 2/2) to dark reddish (5YR 2.5/2) or dark grayish (10YR 4/2) brown loam, clay loam, sandy loam, and sandy clay loam with varying quantities of gravels. Low chroma soils appeared to be a result of high organic content rather than prolonged saturation. There were no primary or secondary wetland hydrology indicators

observed. Thus, the uplands adjacent to Wetland E did not meet the USACE criteria for wetland vegetation, soils, or hydrology.

3.3.6 Wetlands F, G, H, I, J, and K

Each of Wetlands F through K comprises a palustrine emergent seasonally flooded/saturated (PEME) wetland swale. These six small isolated wetlands are addressed here as a group because of their very similar characteristics (see Photographs 23, 24, 28, and 30 in Appendix A for representative photographs). The wetlands are scattered on the slopes of the otherwise well-drained upland forest in the southwest portion of the study area (Figure 3-3, Sheets 4 and 6). These wetlands vary in size between 0.03 acres (Wetland F) and 0.18 acres (Wetland J).

The wetlands are all characterized by having a dominant herbaceous layer of slough sedge. Pineland sword fern typically surrounds the slough sedge, distinguishing the wetland boundary. The wetland overstory for Wetlands F through K is generally the same as that of the adjacent upland and includes western hemlock, Douglas fir, red alder, and Sitka spruce. The sapling/shrub layer for these wetlands is dominated by salmon raspberry, creambush, and red elder. Red elder and pineland sword fern located within wetland sample plots were excluded from the hydrophytic vegetation analysis within Wetlands G, I, and J because of their rooting in substrate above wetland soils, often in decaying logs or stumps.

The soils in these slough sedge-dominated wetland swales and depressions are variable but typically include a black (10YR 2/1, 5YR 2.5/1, or 7.5YR 2.5/1) muck or loamy surface layer over loamy sand or sandy loam (or clay) with redoximorphic features. These surface layers are typically underlain by a cemented gravelly pan that results in a perched water table during the rainy season. In contrast, the soils in adjacent uplands are typically well-drained brown or reddish brown loams over gravelly loamy sands and lack the muck layer, cemented pans and redoximorphic features of the wetland soils.

In the process of delineating Wetlands F through K, six additional patches of slough sedge in proximity to the swales were examined and found to lack sufficient wetland characteristics to meet all wetland criteria. Each of these six patches of slough sedge differed from the slough sedge-dominated wetland swales in having a flat or convex geomorphic position. In addition, each patch also contained upland dominants, generally pineland sword fern but also red elder, red-flowering currant (*Ribes sanguineum* NOL), and/or California dewberry.

A soil pit was excavated at each of these patches to 24 inches bgs to look for hydric soil indicators and ascertain whether dry season hydrology indicators could be met. Though all

the soil pits in these informal tests were dry to 24 inches, the soil pits were also dry in the wetland swales so this was not a reliable test to rule out wetland hydrology. See Test Pit 2 (TP 2) in Appendix B for a formal test pit example. These additional slough sedge patches lacked primary and secondary hydrology characteristics and thus they did not meet the USACE criteria for wetland hydrology. As noted previously, many species such as slough sedge that are reliable wetland indicators elsewhere are not reliable in the coastal region because they can be sustained by the high precipitation and low evapotranspiration of the coastal climate (ODSL 2005) and are referred to as “false-positive” indicators.

3.4 OTHER WATERS FIELD DELINEATION

No streams were observed within the study area except the tidal channels contained within Wetland A. Data was collected from a total of eight surface waters (Table 3-3).

Table 3-3. Lake Hancock Target Range Other Waters

Name	Map Sheet Number ^{1/}	Streamflow Duration	Average Width (feet) OHW	Estimated Average Depth (feet)	Comments
Admiralty Inlet	1, 2, 4, 6	N/A	N/A	N/A	Height of OHW varies
Lake Hancock	2, 3, 5	N/A	N/A	3	Coastal lagoon
Main Channel	2	Perennial	125	4	Southern channel connecting Lake Hancock to Admiralty Inlet
Channel 2	2, 3	Perennial	80	1.5	Northeastern channel; connectivity with Channel 3 at highest seasonal tides
Channel Branch	2	Perennial	10	1	Branch of Channel 2
Channel 3	2	Perennial	50	2	Western channel; connectivity with Main Channel and Channel 4
Channel 4	2	Perennial	50	2	Connectivity with Main Channel via Channel 3 and network of small shallow channels (historic northern channel that formerly connected Lake Hancock to Admiralty Inlet)
Ditch	3	Ephemeral	1	0.5	Shallow isolated ditch directing roadside runoff west under SR 525 via two culverts

1/ Map sheet numbers correspond with the maps provided in Figure 3-3 of this report, provided at the end of this section

OHW – ordinary high water

3.4.1 Admiralty Inlet

Ordinary High Water (OHW) was delineated for the shoreline of Admiralty Inlet of Puget Sound because the LHTR property boundary provided was drawn to include a portion of the shoreline (Figure 3-3, Sheets 1, 2, 4, and 6; Photographs 13 and 14 in Appendix A). The shoreline meets the base of 40- to 80-foot-high bluffs on the northern and southern ends of the beach where the forest habitat slopes up from Wetland A. OHW is otherwise defined by a natural spit of accumulated log debris extending along the western edge of Wetland A through which the Main Channel enters Wetland A (Figure 14).

3.4.2 Lake Hancock

OHW of the lagoon known as Lake Hancock was delineated to the ordinary high tide line (Figure 3-3, Sheets 2, 3, and 5). This shallow lagoon was estimated to be only 3 feet deep in the middle (see Photographs 5, 7, and 8 in Appendix A). The dynamic nature of sediment input from the main channel does not allow for the rooting of aquatic vegetation, and thus, the entire lagoon has an unconsolidated mud substrate. Lake Hancock has a surface water connection to Admiralty Inlet via the Main Channel (discussed below). See Section 3.2.4 above for additional known characteristics of Lake Hancock.

3.4.3 Main Channel

The Main Channel provides direct input of tidewater from Admiralty Inlet to Lake Hancock. Overflow from this channel fills the larger channels and eventually the network of channels in the approximate western half of Wetland A (Figure 3-3, Sheet 2). The Main Channel has a cobbly substrate on its west end near Admiralty Inlet (see Photograph 14 in Appendix A) and an increasingly unconsolidated mud substrate moving east towards the lagoon (Lake Hancock) where increased sediment is deposited by tidal ebb and flow.

3.4.4 Channels 2, 3, 4 and Channel Branch

Three discernible channels across Wetland A were delineated where accessible and labeled Channels 2 through 4 with a major Channel Branch identified off of Channel 2 (see Table 3-3 for estimated width and depth). Each of these is a mud bottom channel fed by the Main Channel with daily tidewater. The tidewater is distributed throughout the network of small channels in the western half of Wetland A (see Photograph 6 in Appendix A).

3.4.5 Ditch

One channel feature adjacent to SR 525 on its east side was examined for channel and wetland characteristics and connectivity to other waters. This channel was found to be an ephemeral roadside ditch with a hydrological regime driven by precipitation events. Flow

direction within the ditch is northwest. A large culvert guides storm water runoff west under SR 525 from the lowest (northern) end of this ephemeral ditch to two outfall culverts on the west side of SR 525. Channelized storm water terminates as overland flow at these outfall culverts and thus connectivity of the roadside ditch to other waters is lacking. Aside from a few scattered lamp rush (*Juncus effusus* FACW) observed within the short level portion of an otherwise sloped channel, the ditch was dominated by upland species including a Douglas fir sapling and numerous upland grass species including large sweet vernal grass (*Anthoxanthum odoratum* FACU). It was therefore determined that the channel does not contain wetlands.

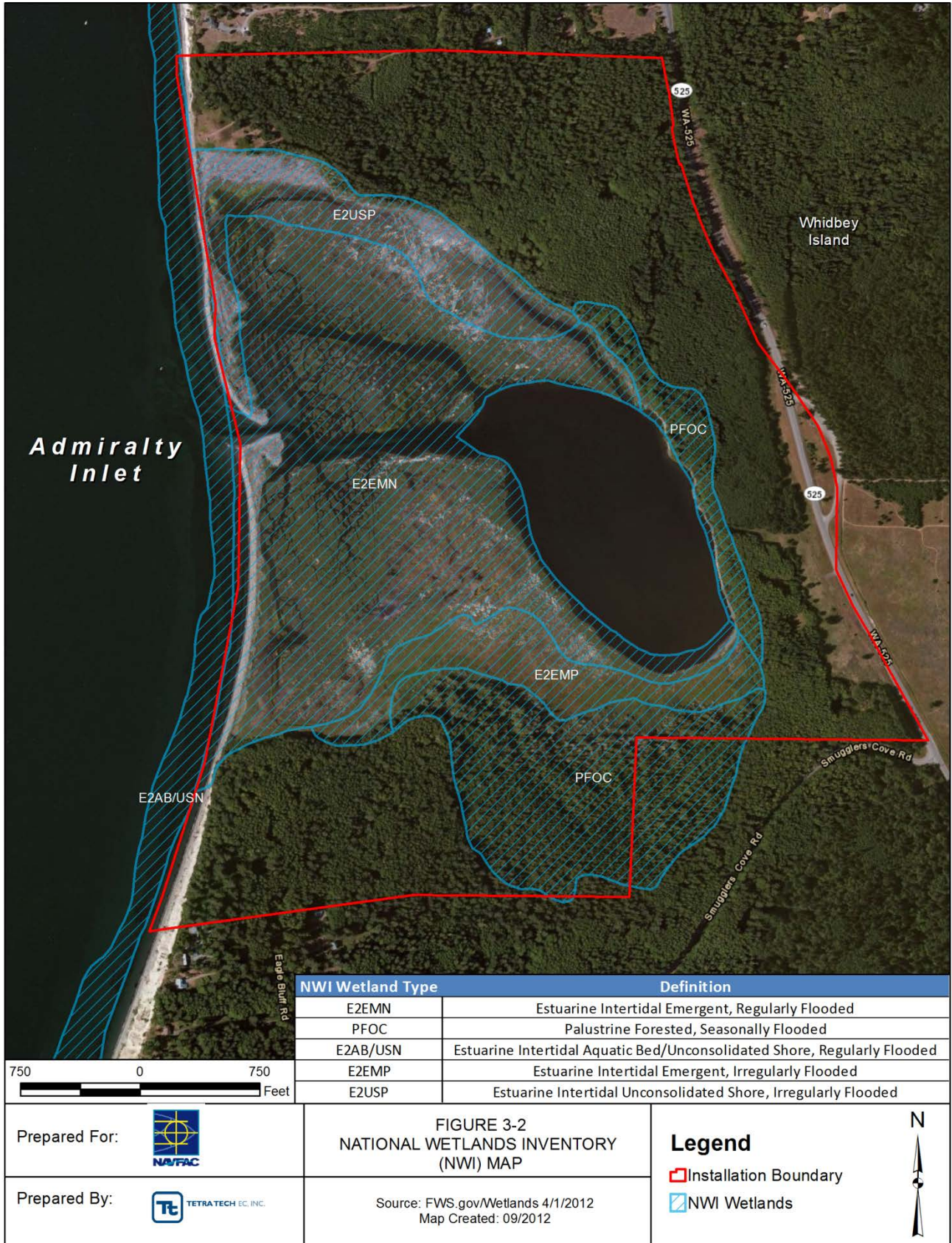


Island County, Washington (WA029)			
Map Unit Symbol	Map Unit Name	Acres in IB	Percent in IB
998	Water, saline	37.7	7.3%
1006	Semiahmoo muck, 0 to 2 percent slopes	51.4	9.9%
1021	Sholander, cool-Spieden complex 0 to 5 percent slopes	0.2	<0.1%
1025	Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes	17.0	3.3%
1053	Dugualla muck, 0 to 2 percent slopes	115.2	30.0%
2010	Whidbey-Hoypus complex, 2 to 15 percent slopes	54.8	10.6%
3001	Hoypus sandy loam, 3 to 25 percent slopes	82.5	16.0%
3017	Everett-Alderwood complex, 3 to 25 percent slopes	43.4	8.4%
3019	Everett-Alderwood complex, 15 to 40 percent slopes	62.3	12.1%
3022	Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes	7.0	1.4%
Subtotals for Soil Survey Area		511.6	99.0%
Total for Installation Boundary		517.0	100.0%



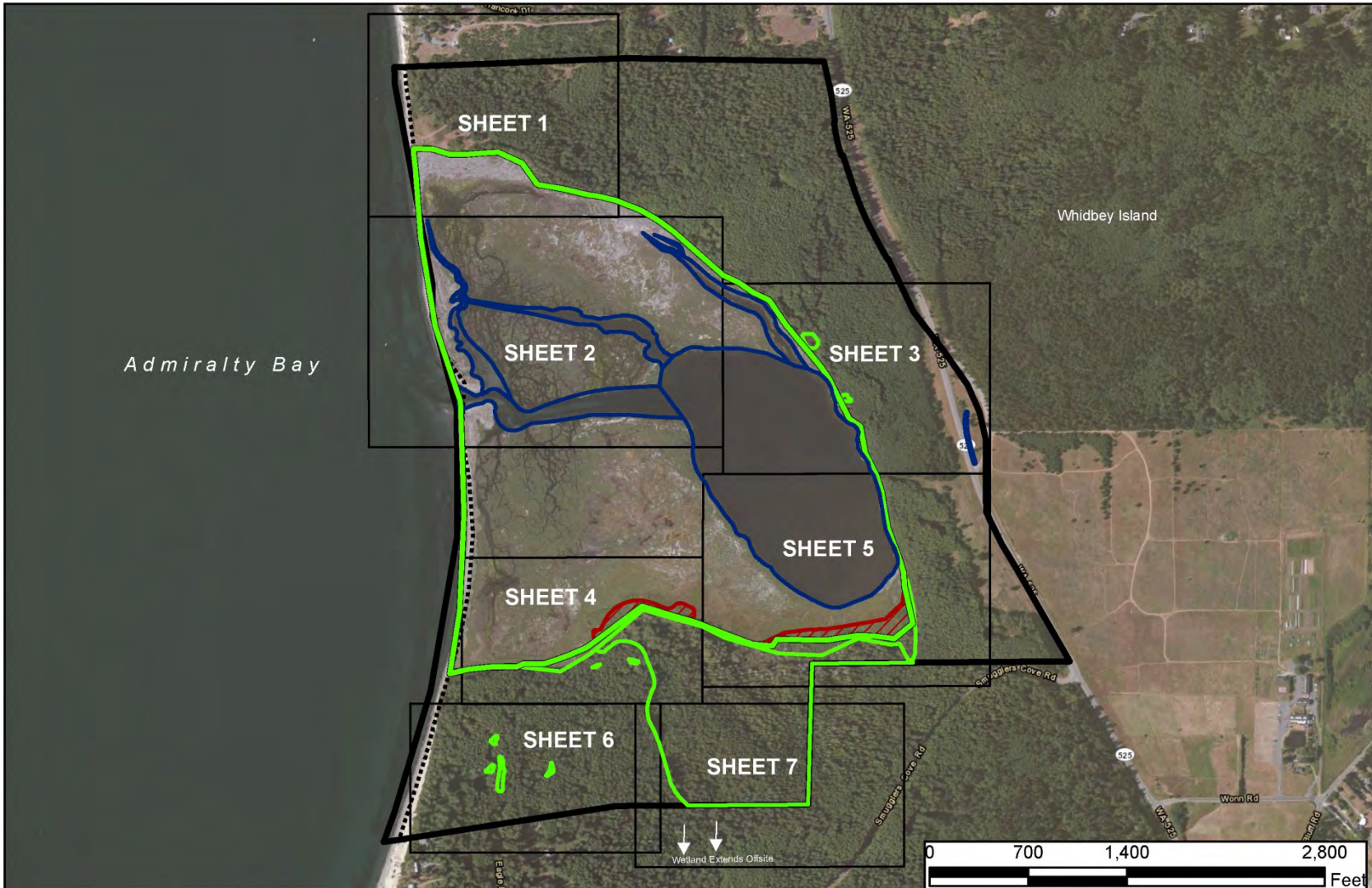
Prepared For:		FIGURE 3-1 LAKE HANCOCK TARGET RANGE SOILS MAP	Legend Study Area Boundary Soil Map Units	N
Prepared By:				





















R:\projects_2012\Lake_Hancock\maps\Figure_3_1_LHTR_Soils_Map_aj.mxd



R:\projects_2012\Lake_Hancock\maps\Figure_3_2_LHTR_NASW_Wetlands_Map.mxd


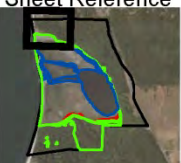

3-23



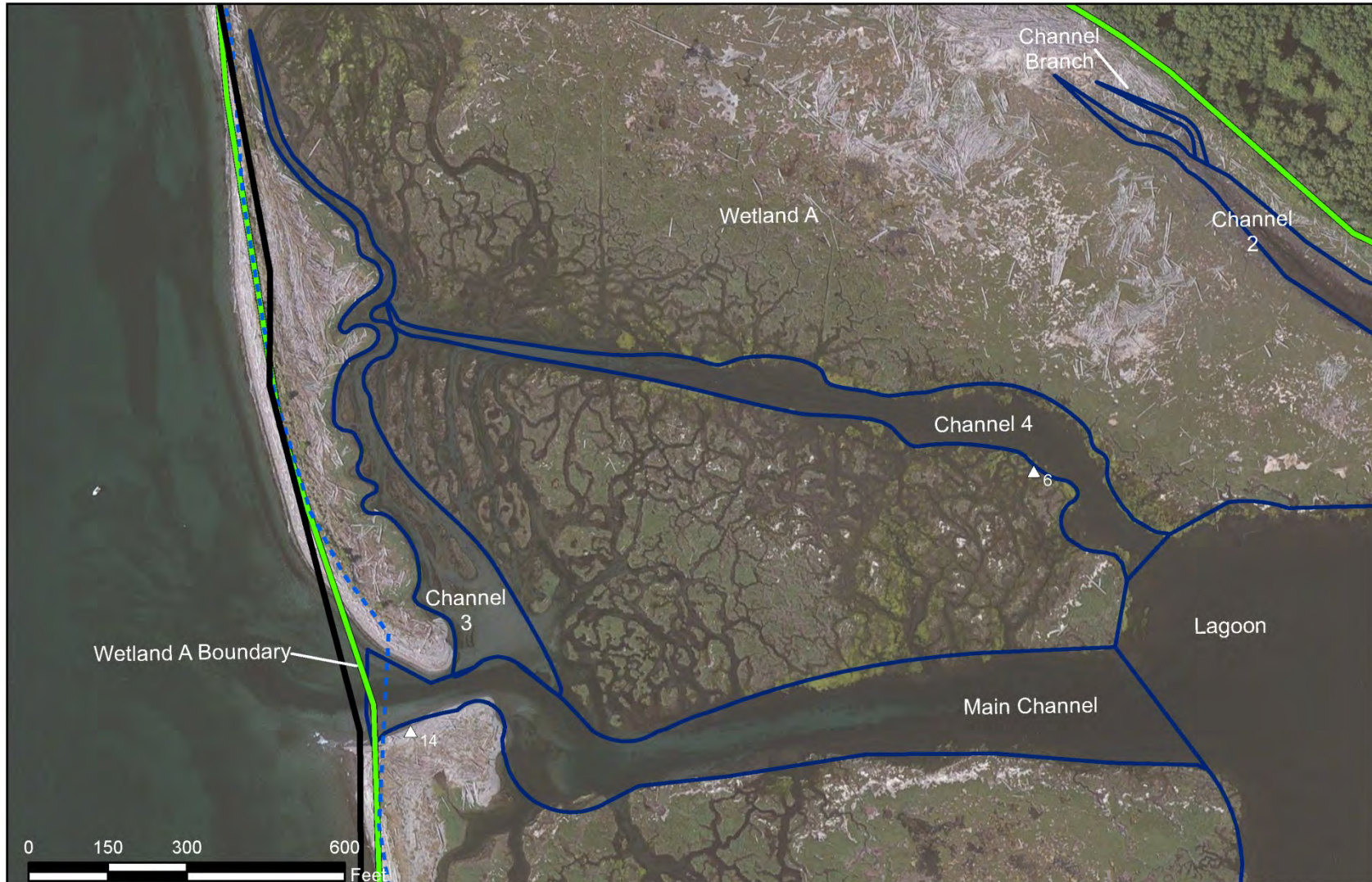
<p>Prepared For:</p> 	<p align="center">FIGURE 3-3 LAKE HANCOCK TARGET RANGE WETLAND AND OTHER WATERS DELINEATION MAP SHEET INDEX</p>	<p>Legend</p> <table border="0"> <tr> <td> Wetland Boundaries</td> <td> PEM1</td> </tr> <tr> <td> Other Waters</td> <td> Sheet Area</td> </tr> <tr> <td> Study Area Boundary</td> <td></td> </tr> <tr> <td> Shoreline Ordinary High Water</td> <td></td> </tr> </table>	 Wetland Boundaries	 PEM1	 Other Waters	 Sheet Area	 Study Area Boundary		 Shoreline Ordinary High Water	
 Wetland Boundaries			 PEM1							
 Other Waters	 Sheet Area									
 Study Area Boundary										
 Shoreline Ordinary High Water										
<p>Prepared By:</p> 	<p>Source: Wetland Field Delineation GPS Data, Tetra Tech August 2012 Aerial Photo: Bing Maps 2010 Map Created: 09/2012</p>									

3-24



Prepared For: 	FIGURE 3-3 LAKE HANCOCK TARGET RANGE WETLAND AND OTHER WATERS DELINEATION MAP SHEET: 1	Legend △ Photo ● Culvert ● Sample Point ● Test Point ■ Study Area Boundary - - - Shoreline OHW - - - Wetland Boundary	Sheet Reference 
Prepared By: 			






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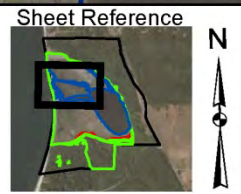


Prepared For:	
Prepared By:	

FIGURE 3-3
 LAKE HANCOCK TARGET RANGE
 WETLAND AND OTHER WATERS DELINEATION MAP
 SHEET: 2

Source: Wetland Field Delineation GPS Data, Tetra Tech August 2012
 Aerial Photo: Bing Maps 2010
 Map Created: 09/2012

 Photo
 Culvert
 Sample Point
 Test Point
 Study Area Boundary
 Shoreline OHW
 Wetland Boundary










3-26

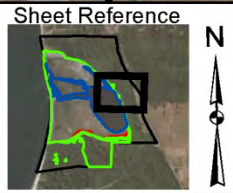


Prepared For:	
Prepared By:	

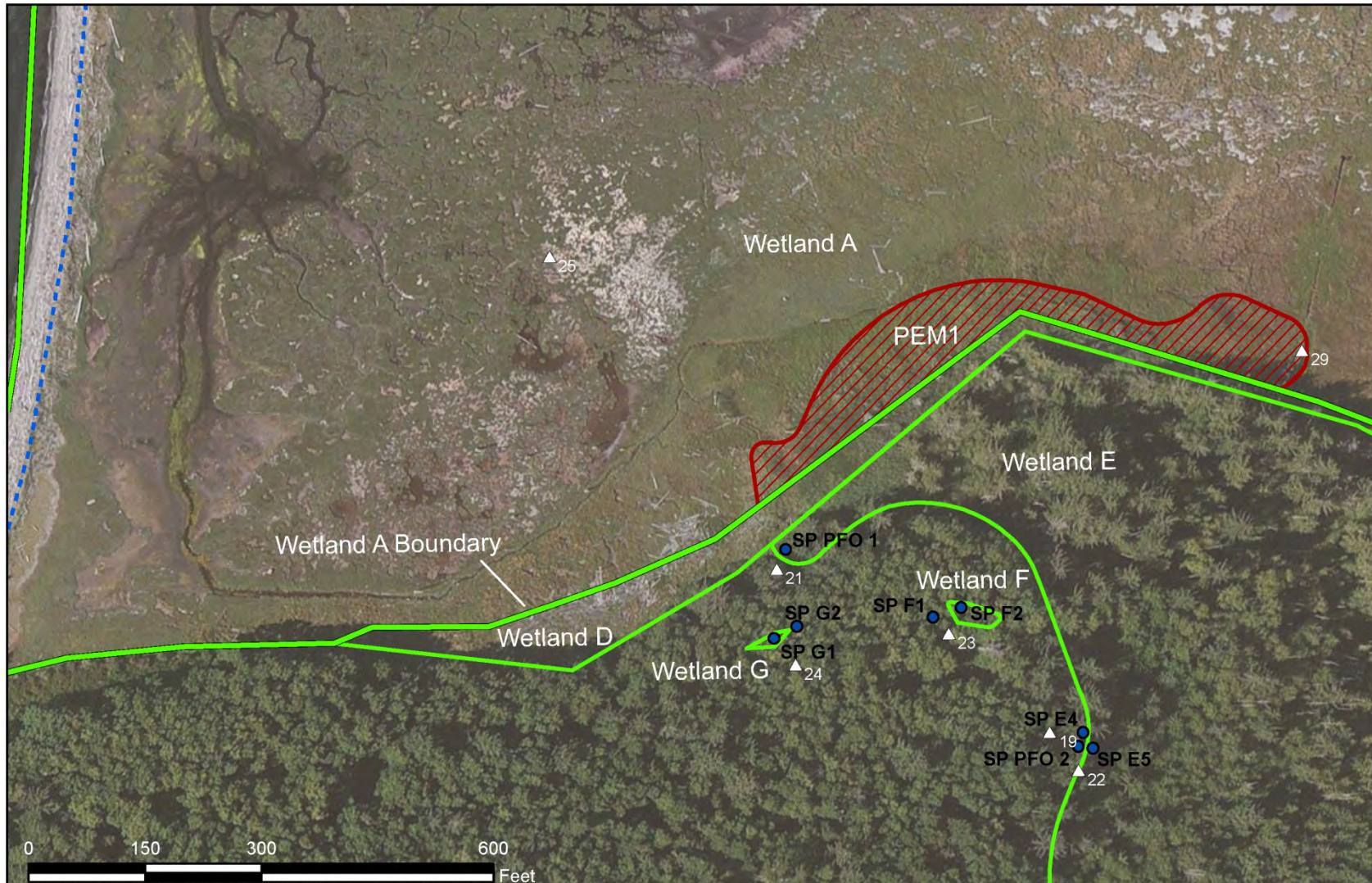
FIGURE 3-3
 LAKE HANCOCK TARGET RANGE
 WETLAND AND OTHER WATERS DELINEATION MAP
 SHEET: 3





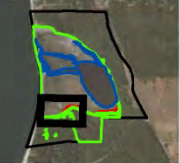


Source: Wetland Field Delineation GPS Data, Tetra Tech August 2012
 Aerial Photo: Bing Maps 2010
 Map Created: 09/2012

	Photo
	Culvert
	Sample Point
	Test Point
	Study Area Boundary
	Shoreline OHW
	Wetland Boundary



3-27

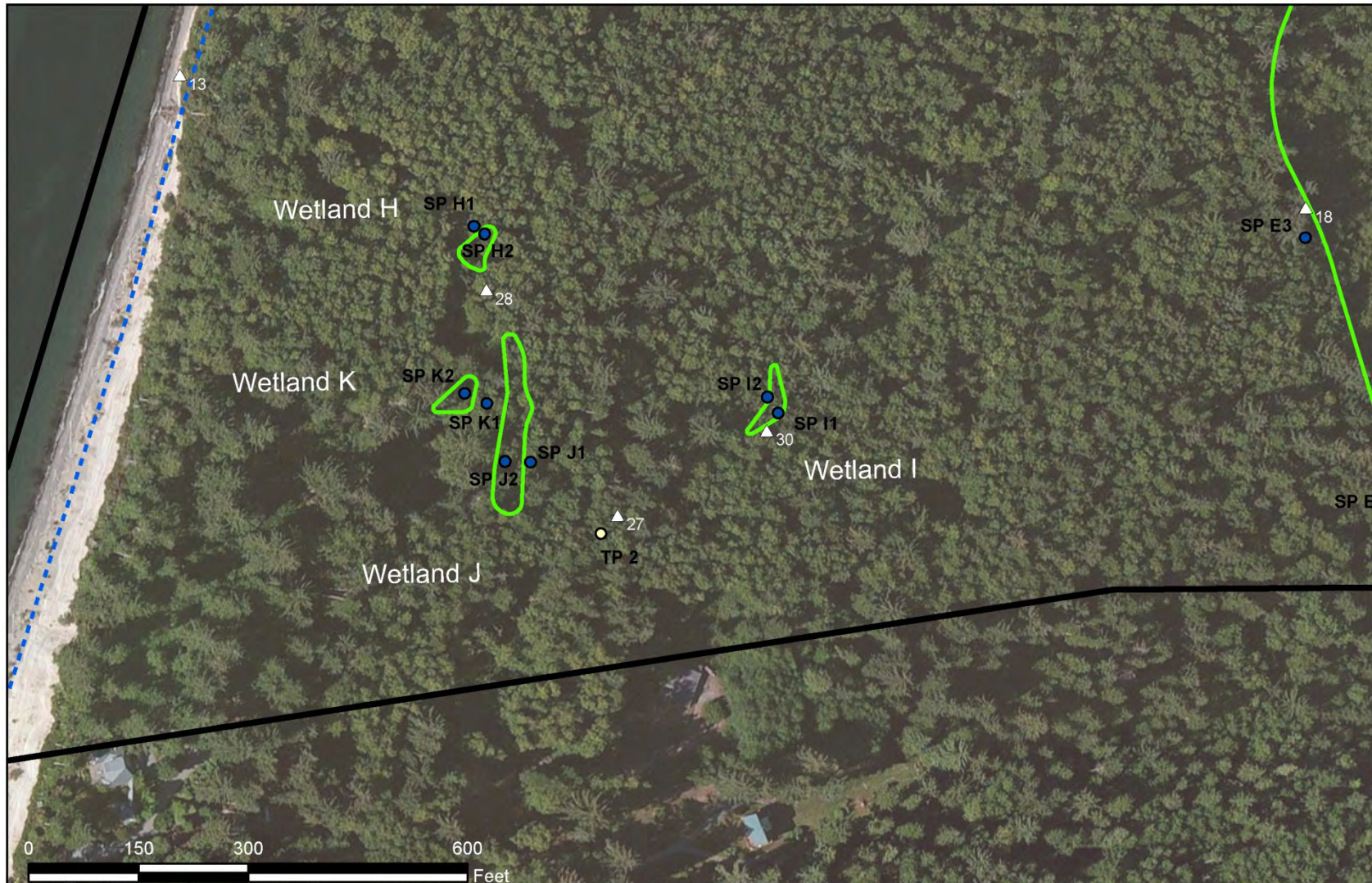








Prepared For: 	FIGURE 3-3 LAKE HANCOCK TARGET RANGE WETLAND AND OTHER WATERS DELINEATION MAP SHEET: 4	Legend △ Photo ● Culvert ● Sample Point ○ Test Point  Study Area Boundary  Shoreline OHW  Wetland Boundary	Sheet Reference  
Prepared By: 		Source: Wetland Field Delineation GPS Data, Tetra Tech August 2012 Aerial Photo: Bing Maps 2010 Map Created: 09/2012	

3-28

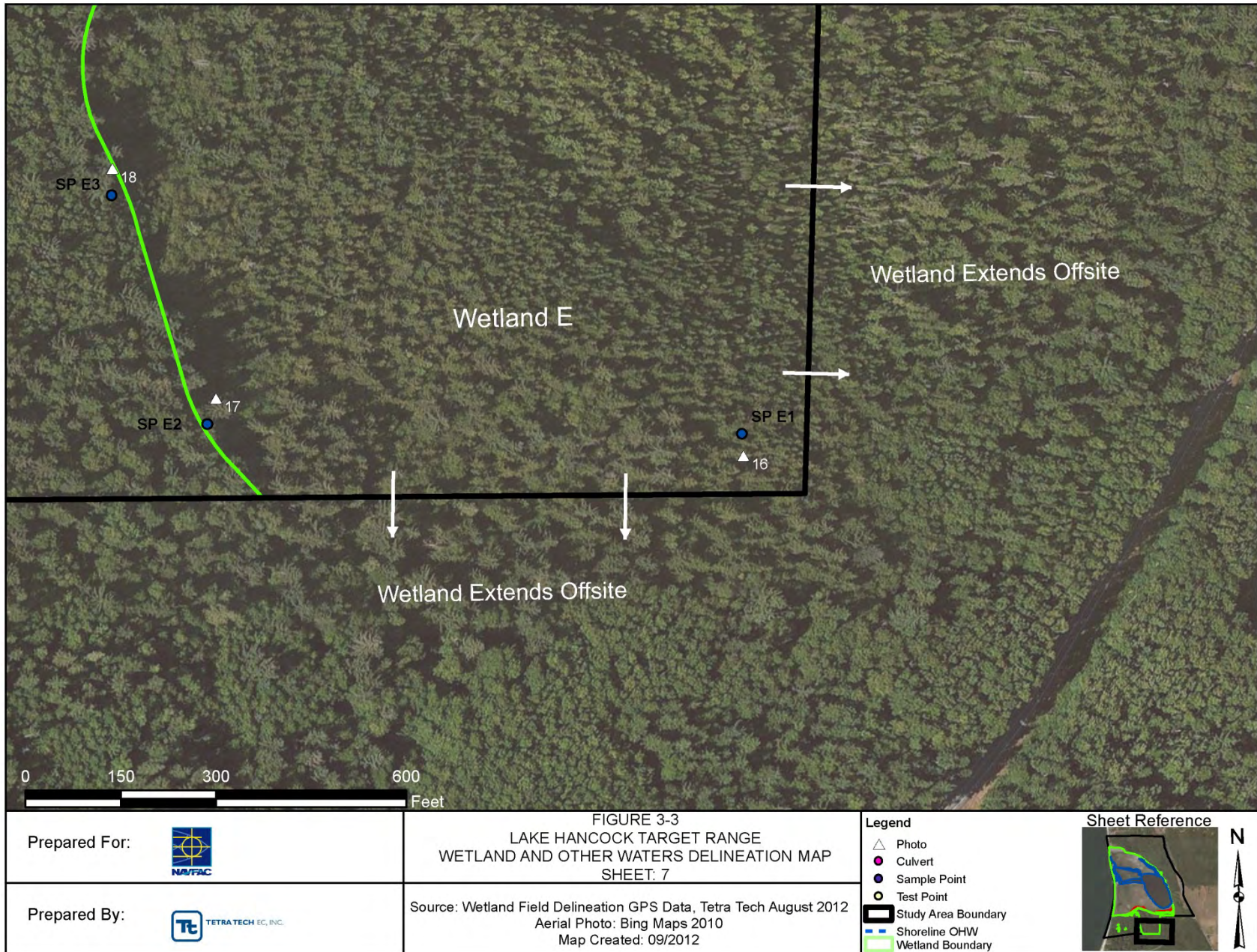


3-29



Prepared For: 	FIGURE 3-3 LAKE HANCOCK TARGET RANGE WETLAND AND OTHER WATERS DELINEATION MAP SHEET: 6	Legend △ Photo ● Culvert ● Sample Point ○ Test Point  Study Area Boundary  Shoreline OHW  Wetland Boundary	Sheet Reference 
Prepared By: 			

3-30



0 150 300 600
 Feet

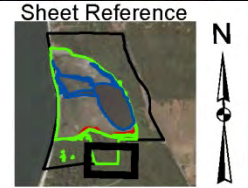
Prepared For:

Prepared By:

FIGURE 3-3
 LAKE HANCOCK TARGET RANGE
 WETLAND AND OTHER WATERS DELINEATION MAP
 SHEET: 7

Source: Wetland Field Delineation GPS Data, Tetra Tech August 2012
 Aerial Photo: Bing Maps 2010
 Map Created: 09/2012

- Legend**
- Photo
 - Culvert
 - Sample Point
 - Test Point
 - Study Area Boundary
 - Shoreline OHW
 - Wetland Boundary



4.0 SUMMARY

Tetra Tech performed a field delineation of the wetlands and other waters within the former LHTR at NASWI in Island County, Washington, between August 13 and 23, 2012. The project study area encompassed approximately 417 acres within the LHTR property boundary. The field investigation determined that 11 areas totaling 239.39 acres meet the federal, state, and/or local criteria for wetland designation. A summary of the delineated wetlands is presented in Table 3-2. Additionally, eight other waters were identified, and a summary of these is presented in Table 3-3.

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APPENDIX A
PHOTOGRAPH RECORD



DATE: 14 August 2012

PHOTOGRAPH #: 1 (Figure 3-3, Sheet 1)

DIRECTION: Northwest

COMMENTS: Facing downslope across sample plot SP A1 into Wetland A salt marsh; at upland-wetland boundary, northwest corner of Wetland A



DATE: 14 August 2012

PHOTOGRAPH #: 2 (Figure 3-3, Sheet 1)

DIRECTION: Northwest

COMMENTS: Facing the unmapped channel that connects Channels 2 and 3 during high tide at the northern boundary of Wetland A; between tides; upland sample plot SP A3 (right) and wetland sample plot SP A4 (left)



DATE: 14 August 2012

PHOTOGRAPH #: 3 (Figure 3-3, Sheet 3)

DIRECTION: Southeast

COMMENTS: Wetland A northwestern boundary; upland sample plot SP A5 (offsite left) and wetland sample plot SP A6 (right); lagoon (Lake Hancock) in distance



DATE: 14 August 2012

PHOTOGRAPH #: 4 (Figure 3-3, Sheet 3)

DIRECTION: West

COMMENTS: Wetland B near northern boundary, wetland sample plot SP B2 in small depression dominated by thick salmon raspberry (*Rubus spectabilis*) in contrast to adjacent upland that includes grand fir (*Abies grandis*) as a dominant



DATE: 14 August 2012

PHOTOGRAPH #: 5 (Figure 3-3, Sheet 3)

DIRECTION: Southeast

COMMENTS: Overview (zoomed in) of the north central portion of Wetland A; dominants include woody saltwort (*Salicornia depressa*) and seaside arrow-grass (*Triglochin maritima*); upland forest surrounds lagoon and marsh on the south and east sides of project study area



DATE: 22 August 2012

PHOTOGRAPH #: 6 (Figure 3-3, Sheet 2)

DIRECTION: North

COMMENTS: Channel 4 connecting Channel 3 to lagoon (Lake Hancock) at daily high tide



DATE: 16 August 2012

PHOTOGRAPH #: 7 (Figure 3-3, Sheet 3)

DIRECTION: Northwest

COMMENTS: View from eastern edge of lagoon within Wetland A during low tide



DATE: 16 August 2012

PHOTOGRAPH #: 8 (Figure 3-3, Sheet 5)

DIRECTION: North

COMMENTS: View of wooded community at edge of lagoon; wooded community is mapped by the NWI as palustrine forested seasonally flooded (PFOC) wetland; however, hydric soils and wetland hydrology indicators were lacking in this forested area



DATE: 16 August 2012

PHOTOGRAPH #: 9 (Figure 3-3, Sheet 3)

DIRECTION: Northwest

COMMENTS: Wetland sample plot SP C2 at eastern boundary of Wetland C; small wetland swale dominated by slough sedge (*Carex obnupta*) and salmon raspberry



DATE: 16 August 2012

PHOTOGRAPH #: 10 (Figure 3-3, Sheet 5)

DIRECTION: Northwest

COMMENTS: View facing downhill towards Wetland D; upland sample plot SP D1; woody vine stratus dominated of California dewberry (*Rubus ursinus*)



DATE: 16 August 2012

PHOTOGRAPH #: 11 (Figure 3-3, Sheet 5)

DIRECTION: Southwest

COMMENTS: Sample plot SP D2 at transition area from palustrine scrub-shrub (PSS, Wetland D) to Palustrine emergent (PEM, Wetland A) communities; soft stem club-rush (*Schoenoplectus tabernaemontani*) and muck soils are dominant



DATE: 16 August 2012

PHOTOGRAPH #: 12 (Figure 3-3, Sheet 5)

DIRECTION: South

COMMENTS: Inundated area of PEM portion of Wetland A; in area of numerous freshwater springs at the margins of the salt marsh and PEM areas of Wetland A; broad-leaf cat-tail (*Typha latifolia*) and soft-stem club-rush are dominant



DATE: 16 August 2012
PHOTOGRAPH #: 13 (Figure 3-3, Sheet 6)
DIRECTION: North
COMMENTS: Admiralty Inlet shoreline from a point south of Wetland A



DATE: 16 August 2012
PHOTOGRAPH #: 14 (Figure 3-3, Sheet 2)
DIRECTION: West
COMMENTS: Main Channel flowing into Admiralty Inlet (connects Puget Sound with lagoon)



DATE: 17 August 2012

PHOTOGRAPH #: 15 (Figure 3-3, Sheet 5)

DIRECTION: Northwest

COMMENTS: Confirmation test pit TP 1; indicative of numerous formal and non-formal soil pits dug to observe soil characteristics; pit is located in riparian area mapped by the NWI as PFOC wetland but lacked soil and hydrology wetland indicators



DATE: 17 August 2012

PHOTOGRAPH #: 16 (Figure 3-3, Sheet 7)

DIRECTION: North

COMMENTS: Sample plot SP E1 in Wetland E; location chosen to confirm high water table in area with overstory of second growth western hemlock (*Tsuga heterophylla*); trees are suspended above saturated muck soils on old logging slash, stumps, thick duff, or nurse logs

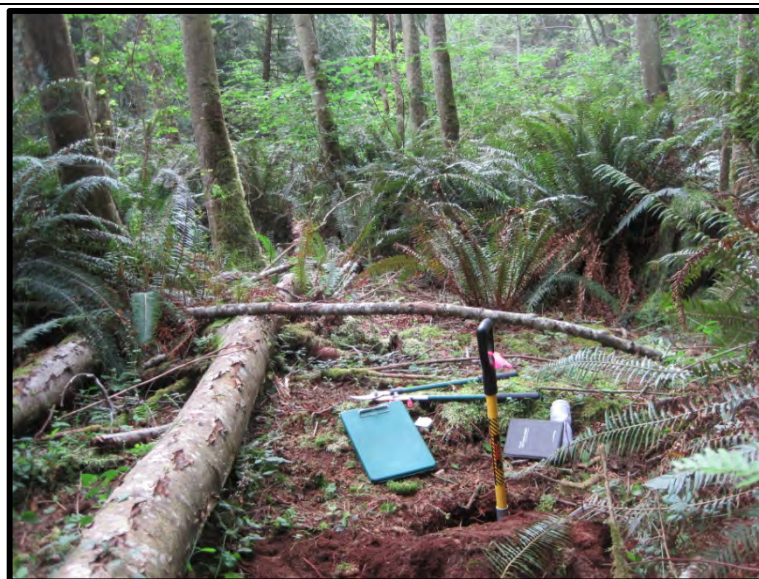


DATE: 17 August 2012

PHOTOGRAPH #: 17 (Figure 3-3, Sheet 7)

DIRECTION: Southwest

COMMENTS: Wetland sample plot SP E2 of Wetland E; dry black muck surface soil layer over very dark gray sandy clay loam



DATE: 20 August 2012

PHOTOGRAPH #: 18 (Figure 3-3, Sheet 7)

DIRECTION: South

COMMENTS: Looking upslope at upland sample plot SP E3 from Wetland E



DATE: 20 August 2012

PHOTOGRAPH #: 19 (Figure 3-3, Sheet 4)

DIRECTION: East

COMMENTS: Looking downslope towards boundary of Wetland E across upland sample plot SP E4; upland community is dominated by salal (*Gaultheria shallon*) and pineland sword fern



DATE: 20 August 2012

PHOTOGRAPH #: 20 (photograph not mapped)

DIRECTION: East

COMMENTS: Wetland E in the southwestern portion of the study area; wetland sample plot SP E5 (Figure 3-3, Sheet 4); shallow inundation barely visible in lower right quadrant of photograph; senesced Pacific water-dropwort (*Oenanthe sarmentosa*) can be seen in this depression



DATE: 20 August 2012

PHOTOGRAPH #: 21 (Figure 3-3, Sheet 4)

DIRECTION: North

COMMENTS: Wetland sample plot SP PFO1 at boundary of Wetland E abutting Wetland D



DATE: 20 August 2012

PHOTOGRAPH #: 22 (Figure 3-3, Sheet 4)

DIRECTION: North

COMMENTS: Upland sample plot SP PF02 of Wetland E; dominants include California dewberry and pineland sword fern



DATE: 20 August 2012

PHOTOGRAPH #: 23 (Figure 3-3, Sheet 4)

DIRECTION: North

COMMENTS: Wetland sample plot SP F2 at Wetland F boundary; this wetland swale is dominated by slough sedge



DATE: 20 August 2012

PHOTOGRAPH #: 24 (Figure 3-3, Sheet 4)

DIRECTION: Northwest

COMMENTS: Near wetland sample plot SP G1 of Wetland G; this wetland swale is dominated by slough sedge; topography and presence of pineland sword fern define wetland-upland boundary



DATE: 20 August 2012
PHOTOGRAPH #: 25 (Figure 3-3, Sheet 4)
DIRECTION: South
COMMENTS: Overview of southwest quadrant of Wetland A; salt pans in salt marsh



DATE: 17 August 2012
PHOTOGRAPH #: 26 (Figure 3-3, Sheet 5)
DIRECTION: North
COMMENTS: Typical area of shallow inundation supporting muck soils, yellow-skunk-cabbage (*Lysichiton americanus*) and slough sedge; within PFO forest that includes Sitka spruce (*Picea sitchensis*) and red alder overstory



DATE: 22 August 2012
PHOTOGRAPH #: 27 (Figure 3-3, Sheet 6)
DIRECTION: Southwest
COMMENTS: Facing test pit TP 2 excavated in very small, flat patch of slough sedge; indicative of several similar patches with upland co-dominants, pineland sword fern and red elder (*Sambucus racemosa*); test pit lacked hydric soils and dry season wetland hydrology indicators



DATE: 22 August 2012
PHOTOGRAPH #: 28 (Figure 3-3, Sheet 6)
DIRECTION: North
COMMENTS: Wetland H; a small swale dominated by slough sedge and bordered by pineland sword fern and salal



DATE: 22 August 2012
PHOTOGRAPH #: 29 (Figure 3-3, Sheets 4, 5)
DIRECTION: West
COMMENTS: Overview of PEM1 area of Wetland A; broad-leaf cat-tail in center photograph; abutting PFO wetland (Wetland E); Sitka spruce is a dominant in the Wetland E overstory



DATE: 22 August 2012
PHOTOGRAPH #: 30 (Figure 3-3, Sheet 6)
DIRECTION: North
COMMENTS: Sample plot SP I2 in Wetland I; this wetland swale is dominated by slough sedge and bordered at the upland-wetland boundary by pineland sword fern

APPENDIX B
WETLAND DETERMINATION FORMS

Photo PH2

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP A1
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 6, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope, TOB Local relief (concave, convex, none): convex Slope (%): 10
 Subregion (LRR): A Lat: 120.9190 Long: 41.2804 Datum: NAD 83
 Soil Map Unit Name: 3001-Hoyopus sandy loam, 3-25% slopes NWI classification: none
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>NONE</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
4. _____				
	<u>0</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>NONE</u>				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
	<u>0</u> = Total Cover			UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Helcus lanatus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. <u>Anthoxanthum odoratum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>	<input type="checkbox"/> 2 - Dominance Test is >50%
3. <u>Dactylus glomerata</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
4. <u>Hypochaeris radicata</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. <u>Calamagrostis nutkaensis</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>	<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹
6. <u>Poa sp (pratensis?)</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u>Agrostis gigantea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. _____				
9. _____				
10. _____				
11. _____				
	<u>100</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. <u>Rubus ursinus</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. <u>Rosa nutkana</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
	<u>10</u> = Total Cover			
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: SP A1

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	7.5YR 3/3	90	other colors	-	due to sand content, not redox	-	sandy loam	} no redox
6-18	7.5YR 3/3	95	other colors	-	due to sand, not redox	-	loamy sand	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- 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)

- 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)

- 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? Yes _____ No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No

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

Remarks:

photo #3 SPA2
Wet

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPA2
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec. 6, T30N, R2E
 Landform (hillslope, terrace, etc.): flat area in larger basin Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): A Lat: 120.9176 Long: 41.2778 Datum: NAD83
 Soil Map Unit Name: Beaches-Endoagments, tidal-Xerothents assoc., 0-5% slopes NWI classification: E2USP
 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: <u>plot inside salt marsh</u>			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
1. <u>none</u>																				
2.																				
3.																				
4.																				
<u>0</u> = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species</td> <td>x 1 =</td> </tr> <tr> <td>FACW species</td> <td>x 2 =</td> </tr> <tr> <td>FAC species</td> <td>x 3 =</td> </tr> <tr> <td>FACU species</td> <td>x 4 =</td> </tr> <tr> <td>UPL species</td> <td>x 5 =</td> </tr> <tr> <td>Column Totals:</td> <td>(A) (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>N/A</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species	x 1 =	FACW species	x 2 =	FAC species	x 3 =	FACU species	x 4 =	UPL species	x 5 =	Column Totals:	(A) (B)	Prevalence Index = B/A = <u>N/A</u>	
Total % Cover of:	Multiply by:																			
OBL species	x 1 =																			
FACW species	x 2 =																			
FAC species	x 3 =																			
FACU species	x 4 =																			
UPL species	x 5 =																			
Column Totals:	(A) (B)																			
Prevalence Index = B/A = <u>N/A</u>																				
<u>0</u> = Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>30'</u>)																				
1. <u>none</u>																				
2.																				
3.																				
4.																				
5.																				
<u>0</u> = Total Cover																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Salicornia depressa v. virginica</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>OBL</u>																	
2. <u>Distichlis spicata</u>	<u>5</u>		<u>FACW</u>																	
3. <u>Juncus carnosa</u>	<u>5</u>		<u>OBL</u>																	
4. <u>Triglochin maritima</u>	<u>10</u>		<u>OBL</u>																	
5.																				
6.																				
7.																				
8.																				
9.																				
10.																				
11.																				
<u>100</u> = Total Cover																				
Woody Vine Stratum (Plot size: <u>5'</u>)																				
1. <u>none</u>																				
2.																				
<u>0</u> = Total Cover																				
% Bare Ground in Herb Stratum <u>0</u>																				

Remarks:

SOIL

Sampling Point: SP AZ

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	7.5YR 2.5/1	95	none	-	-	-	mucky peat	10% charcoal
4-16	5YR 3/1	95	none	-	-	-	muck	5% charcoal

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):
 Type: none
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <i>profound!</i>	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

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

Water Table Present? Yes No Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 5"

Wetland Hydrology Present? Yes No

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

Remarks:

Photo # 44

SP A3

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

Project/Site: L H T R City/County: Island Co. Sampling Date: 8/14/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP A3
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 6, T 30N, R 2E
Landform (hillslope, terrace, etc.): flat area between communities Local relief (concave, convex, none): slight convex Slope (%): 1
Subregion (LRR): A Lat: 120.997 Long: 41.2542 Datum: NAD 83
Soil Map Unit Name: 1053 - Duganella muck, 0-29% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
Remarks: Mapped soil unit is off - should be in 3001 - Hoypu = sandy loam, 3-25% slopes

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, and Woody Vine Stratum. Includes species names like Pseudotsuga menziesii, Salix scouleriana, and Rubus ursinus. Includes dominance test and prevalence index worksheets.

Remarks: 1/2 radius 30' shrubs/tree to stay within distinct community boundaries
Full radius 5' herbaceous and vine

SOIL

Sampling Point: SP A3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	2.5Y 5/2	90	None	—	—	—	loamy sand - occasional gravels	
8-12	10YR 2/2	90	None	—	—	—	sandy loam - occasional gravels	
12-18	10YR 3/2	90	7.5YR 4/4	1	CS	M	gravelly sandy loam	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: none

Depth (inches):

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>	<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches):

Water Table Present? Yes No Depth (inches):

Saturation Present? Yes No Depth (inches):

(includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

While wetland and upland communities are very distinct, the boundary is in a flat area that changes from wetland to upland gradually within a few feet, thus depending on where soil is probed in this area, redox may be present w/in 12" of surface (very transitional plane).

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

Project/Site: LHR City/County: Island Co. Sampling Date: 8/14/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPA4
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 6, T30N, R2E
Landform (hillslope, terrace, etc.): basin salt marsh Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): A Lat: 120.9904 Long: 41.2516 Datum: NAD 83
Soil Map Unit Name: 1053-Dugwalla muck, 0-2% slopes NWI classification: EQU5P
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [X] 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 [X] No
Hydric Soil Present? Yes [X] No
Wetland Hydrology Present? Yes [X] No
Is the Sampled Area within a Wetland? Yes [X] No
Remarks: plot inside salt marsh

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30) Absolute % Cover 0 = Total Cover
Dominant Species? Indicator Status
1. none
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
Herb Stratum (Plot size: 5) Absolute % Cover 100 = Total Cover
Dominant Species? Indicator Status
1. Salicornia depressa var. virginica 90 [check] OBL
2. Agrostis gigantea T FAC
3. Deschampsia caespitosa T FACW
4. Juncus spp. 2
5. Distichlis spicata 5 FACW
6. Cuscuta salina var. salina T NOL
7. Triglochin maritima 5 OBL
8.
9.
10.
11.
Woody Vine Stratum (Plot size: 5) Absolute % Cover 0 = Total Cover
1. none
2.
% 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: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
Prevalence Index worksheet: Total % Cover of: OBL species x 1 = FACW species x 2 = FAC species x 3 = FACU species x 4 = UPL species x 5 = Column Totals: (A) (B)
Prevalence Index = B/A = N/A
Hydrophytic Vegetation Indicators:
[X] 1 - Rapid Test for Hydrophytic Vegetation
[X] 2 - Dominance Test is >50%
3 - Prevalence Index is <= 3.0
4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants
Problematic Hydrophytic Vegetation (Explain)
Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes [X] No

Remarks:

SOIL

Sampling Point: SP A4

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 3/1	95	none	-	-	-	peaty muck	
8-12	7.5YR 2.5/1	95	7.5YR 5/6	2	C	M	sandy cl/ly	w/ gravels
12-14	7.5YR 6/1	95	none	-	-	-	sandy clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):
 Type: Sandy clay
 Depth (inches): 12

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
Primary Indicators (minimum of one required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

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:

JMS SP 15

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP 15
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec. 5, T30N, R2E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): A Lat: 121.1528 Long: 41.1697 Datum: NAD 83
 Soil Map Unit Name: 2010-Whidbey-Hoyaus complex, 2-15% slopes NWI classification: PFOC
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: <u>Site observations do not concern that this is PFOC as mapped by the NWI.</u>			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30-1/2 r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. <u>Picea sitchensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Pseudotsuga menziesii</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Alnus rubra</u>	<u>5</u>		<u>FAC</u>	
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = <u>N/A</u>
<u>45</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30-1/2 r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rosa nutkana</u>	<u>5</u>		<u>FAC</u>	
2. <u>Gaultheria shallon</u>	<u>85</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Crataegus douglasii</u>	<u>5</u>		<u>FAC</u>	
4. <u>Holodiscus discolor</u>	<u>5</u>		<u>FACW</u>	
5. _____				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.
<u>100</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Agrostis gigantea</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Potentilla sp.</u>	<u>10</u>		<u>-</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks:
Half radius on tree/sapling plot due to abrupt and topographically-defined community boundary.

SOIL

Sampling Point: SPA5

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/2	100	— none	—	—	—	Organic litter, well decomposed	
0-8	10YR 4/2	95	— none	—	—	—	10cm with gravels	
8-13	10YR 3/3	95	— none	—	—	—	fn sandy lm - occasional gravel	
13-14	10YR 4/3	95	— none	—	—	—	Sandy cl lm	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP A6
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 5, T30N, R2E
 Landform (hillslope, terrace, etc.): within marsh basin Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): A Lat: 121.1508 Long: 41.1673 Datum: _____
 Soil Map Unit Name: 1053 - Duganella muck, 0-2% slopes NWI classification: E2EMN

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 <input checked="" type="checkbox"/>	No _____	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No _____
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No _____			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No _____			
Remarks: <u>plot inside salt marsh</u>					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea sitchensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = <u>N/A</u>
<u>40</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>N/A</u>				
2. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Salicornia depressa v. virginica</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0' _____ 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.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5</u>)				
1. <u>None</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
2. _____				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: <u>Reduced to 15' radius tree/shrub (to stay out of adjacent upland community vegetation) stratum</u>				

SOIL

Sampling Point: SP A6

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 2/2	100	None				praty muck	
8-14	10YR 2/1	100	None				muck	
14-16	GREY 5/10Y	80	10YR 5/4	15	C	PL, M	clay	5% org in natural

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: Clay

Depth (inches): 14"

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

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

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

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

up

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP B1
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 5, T30N, R2E
Landform (hillslope, terrace, etc.): Terrace above adjacent wetland Local relief (concave, convex, none): Convex Slope (%): 2
Subregion (LRR): A Lat: 121.1809 Long: 41.1446 Datum: NAD 83
Soil Map Unit Name: 2010 - Whidbey - Hoypus complex, 2-15% slopes NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [X] 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
Hydric Soil Present? Yes No
Wetland Hydrology Present? Yes No
Is the Sampled Area within a Wetland? Yes No [X]
Remarks: site observations do not concur with PFOC as mapped by the NWI

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, Woody Vine Stratum, and % Bare Ground. Includes Dominance Test worksheet and Prevalence Index worksheet.

Remarks: Herb 1/2 radius to avoid topographically determined wetland community.

SOIL

Sampling Point: SP B1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-18	7.5YR 2.5/2	—	—	None	—	—	Sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input checked="" type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

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

Restrictive Layer (if present):
 Type: none
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks: *All though potential for TF2, does not meet hydrophytes or wetland hydrology criteria.*

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/14/17
 Applicant/Owner: U.S. Navy – NAVFAC State: WA Sampling Point: SP B2
 Investigator(s): J. Miller, B. Leonard Section, Township, Range: Sec. 5, T30N, R2E
 Landform (hillslope, terrace, etc.): depression on terrace Local relief (concave, convex, none): concave Slope (%): 2
 Subregion (LRR): A Lat: 121.1811 Long: 41.1436 Datum: NAD 83
 Soil Map Unit Name: 2010 – Whidbey-Hogans complex, 2-15% slopes NWI classification: PFOC
 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>N/A</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>none</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2.				Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3.				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4.				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = <u>N/A</u>
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Rubus spectabilis</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2.				
<u>100</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)				
1. <u>no herbaceous layer</u>				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
<u>0</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15</u>)				
1. <u>none</u>				
2.				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>80%</u>				

Remarks: tree stratum not considered as it is rooted in upland community in non-hydric soils

SOIL

Sampling Point: SP 82

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 2.5/1	100	—	None	—	—	muck	histic
8-10	7.5YR 5/2	95	—	None	—	—	sandy clay loam	
10-14	7.5YR 5/2	95	10YR 5/6	2	C	M	sandy clay	with gravels

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):
 Type: 10
 Depth (inches): sandy clay w/ gravels

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

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:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/15/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP C1
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 5, T30N, R2E
 Landform (hillslope, terrace, etc.): terrace above adjacent wetland Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 121.2074 Long: 41.0992 Datum: NAD 83
 Soil Map Unit Name: 2010-Whidbey-Hoyupus complex, 2-15% slopes NWI classification: PFOC
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Remarks:
Site observations do not concur with PFOC as mapped by NWI. Tsuga heterophylla and Abies grandis were observed near this plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>20</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)	
1. <u>Alnus rubra</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
<u>90</u> = Total Cover					
Sapling/Shrub Stratum (Plot size: <u>20</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Rubus spectabilis</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. <u>Sambucus racemosa</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
<u>30</u> = Total Cover					
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Mniamanthemum canadense</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>		Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. <u>Lysichiton americanus</u>	<u>3</u>	_____	<u>OBL</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
<u>28</u> = Total Cover					
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>none</u>	<u>0</u>	_____	_____		
2. _____	_____	_____	_____		
<u>0</u> = Total Cover					
% Bare Ground in Herb Stratum <u>72</u>					

Remarks:
Lysichiton americanus was stunted and yellow in contrast with large robust individuals in adjacent wetland. 20' radius on trees/shrubs chosen so as not to include adjacent wetland community.

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
12-0					none			organic litter
0-8	7.5YR 2.5/2	70%	and 7.5YR 2/1	30%	[No REDOX]			loamy sand
8-18	7.5YR 3/1	80	and 7.5YR 3/2	20%	[No REDOX]			loamy sand w/ gravels
18-20	7.5YR 3/1	90						course sand

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):
 Type: none
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:
Although potential for TF2, does not meet hydrophytic vegetation or wetland hydrology criteria.

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes _____ No <u>X</u>	Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>
Water Table Present? Yes _____ No <u>X</u>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u>	Depth (inches): _____	

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/15/12
 Applicant/Owner: U.S. Navy - NAYFAC State: WA Sampling Point: SP-C2
 Investigator(s): L. Miller, D. Leonard Section, Township, Range: Sec. 5, T30N, R2E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 121.2062 Long: 41.0983 Datum: NAD 83
 Soil Map Unit Name: 2010-Whidbey-Hypnum complex, 2-15% slopes NWI classification: PFOC
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>60</u>	<u>✓</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. <u>Picea sitchensis</u>	<u>30</u>	<u>✓</u>	<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Prevalence Index worksheet:
<u>90</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)				OBL species <u> </u> x 1 = <u> </u>
1. <u>Rubus spectabilis</u>	<u>30</u>	<u>✓</u>	<u>FAC</u>	FACW species <u> </u> x 2 = <u> </u>
2. <u>Thuja plicata</u>	<u>42</u>	<u>✓</u>	<u>FAC</u>	FAC species <u> </u> x 3 = <u> </u>
3. <u>Picea sitchensis</u>	<u>2</u>	<u> </u>	<u>FAC</u>	FACU species <u> </u> x 4 = <u> </u>
4. <u>Alnus rubra</u>	<u>2</u>	<u> </u>	<u>FAC</u>	UPL species <u> </u> x 5 = <u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u> </u> (A) <u> </u> (B)
<u>76</u> = Total Cover				Prevalence Index = B/A = <u>N/A</u>
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators:
1. <u>Maianthemum dilatatum</u>	<u>5</u>	<u> </u>	<u>IFAC</u>	<u> </u> 1 - Rapid Test for Hydrophytic Vegetation
2. <u>Carex obnupta</u>	<u>55</u>	<u>✓</u>	<u>OBL</u>	<u>X</u> 2 - Dominance Test is >50%
3. <u>Athyrium filix-femina</u>	<u>5</u>	<u> </u>	<u>FAC</u>	<u> </u> 3 - Prevalence Index is ≤3.0 ¹
4. <u>Lysichiton americanum</u>	<u>5</u>	<u> </u>	<u>OBL</u>	<u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> 5 - Wetland Non-Vascular Plants ¹
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>70</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5'</u>)				
1. <u>Rubus ursinus</u>	<u>3</u>	<u> </u>	<u>FACU</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>3</u> = Total Cover				
% Bare Ground in Herb Stratum <u>27</u>				

Remarks: Rubus ursinus appears rooted in adjacent community and Maianthemum dilatatum appears growing on thatch/litter above saturation. A. filix-femina on upper margins.

SOIL

Sampling Point: SP C2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR 2/1	100	— none	—	—	—	loam	histic epipedon
9-16	10YR 5/1	99	none	—	—	—	sandy clay loam	with gravels
16-18	7.5YR 4/1	95	7.5YR 5/6	5	CS	M	sandy clay	cemented
18-20	10YR 5/1	99	none	—	—	—	sandy clay	cemented

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)
<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Redox Dark Surface (F7)

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

Restrictive Layer (if present):
 Type: cemented sandy clay
 Depth (inches): 18

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)

Field Observations:

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

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

Saturation Present? Yes No Depth (inches): 18

(includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/16/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPDI
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec. 5, T30N, R2E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR): A Lat: 121.2499 Long: 40.9660 Datum: NAD 83
 Soil Map Unit Name: 2010 - Whidbey - Hoypus complex, 2-15% slopes NWI classification: PFOC
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: <u>FAC plant species are indicative of this broad riparian fringe to wetland D. Site observations do not concur with NWI mapping of PFOC.</u>			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)
1. <u>Alnus rubra</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Prunus virginiana</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
3. _____				
4. _____				
<u>80</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = <u>N/A</u>
1. <u>Alnus rubra</u>	<u>15</u>		<u>FAC</u>	
2. <u>Rubus spectabilis</u>	<u>65</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
<u>80</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	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.
1. <u>Malanthemum canadense</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>5</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. _____				
<u>35</u> = Total Cover				
% Bare Ground in Herb Stratum <u>85</u>				

Remarks: moss 10% in herb stratum

SOIL

Sampling Point: SP 01

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/3	60%	7.5YR 4/3	40%			gravelly sandy loam	
8-12	10YR 4/2	90	(10% gravel color)				gravelly sandy loam	
12-14	7.5YR 4/2	95	(5% sand color)				loamy sand	

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

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

<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Depleted Dark Surface (F7)	
	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>	<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/16/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPD2
 Investigator(s): L. Miller, B. Feunnd Section, Township, Range: Sec 5, T30N, R2E
 Landform (hillslope, terrace, etc.): marsh basin Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): A Lat: 121.2458 Long: 40.9667 Datum: NAD 83
 Soil Map Unit Name: 1053-Dugwalla muck, 0-2% slopes NWI classification: E2EMP
 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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15</u>)				Prevalence Index = B/A = _____
1. <u>None</u>				
2. _____				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 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.
3. _____				
4. _____				
5. _____				
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>15</u>)				
1. <u>Schoenoplectus tabernaemontani</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Agrostis gigantea</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Derchampsia caespitosa</u>	<u>5</u>		<u>FACW</u>	
4. <u>Distichlis spicata</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
5. <u>Comarum palustre</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>125</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>None</u>				
2. _____				
<u>100</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks: Plot radius size reduced for trees and shrubs in order to avoid including adjacent upland terrace/riparian community.

SOIL

Sampling Point: SP 22

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-14	10YR 2/1	80%	7.5YR 3/1	20%	(not redox)		peaty muck w/ some non-decom	posed wood
14-18	10YR 3/2	95	10YR 4/6	5%	C	M	gravelly loamy sand - cemented	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: cemented gravelly loamy sand
 Depth (inches): 14"

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input checked="" type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): 15
 Saturation Present? Yes No Depth (inches): 12
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks: Surface water visible nearby in adjacent marsh near spring (hydro source).

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
 Applicant/Owner: U.S. NAVY - NAVFAC State: WA Sampling Point: SP PFO1
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 7, T80N, R2E
 Landform (hillslope, terrace, etc.): hillslope - slight Local relief (concave, convex, none): NONE Slope (%): 0
 Subregion (LRR): A Lat: 121.0272 Long: 40.9232 Datum: NAD 83
 Soil Map Unit Name: 1006 - Semiahmoo muck, 0-2% slope NWI classification: PFOC
 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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks:					

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea sitchensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Picea sitchensis</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Tsuga heterophylla - rooted on logs - N/A (discounted)</u>	_____	_____	_____	OBL species _____ x 1 = _____
3. <u>Rubus spectabilis</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	FACW species _____ x 2 = _____
4. <u>Spiraea douglasii</u>	<u>5</u>	_____	<u>FACW</u>	FAC species _____ x 3 = _____
5. <u>Gaultheria shallon - rooted on logs - N/A (discounted)</u>	_____	_____	_____	FACW species _____ x 4 = _____
<u>30</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Agrostis gigantea</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. <u>Carex obnupta</u>	<u>8</u>	_____	<u>OBL</u>	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
3. <u>Distichlis spicata</u>	<u>4</u>	_____	<u>FACW</u>	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
4. <u>Unknown grass</u>	<u>5</u>	_____	_____	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. <u>Oenanthe sarmentosa</u>	<u>1</u>	_____	<u>OBL</u>	<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹
6. <u>Vicia americana - growing on logs - discounted</u>	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u>Potentilla sp.</u>	<u>2</u>	_____	<u>?</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. <u>none</u>	_____	_____	_____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: SP PFO1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 2.5/1	100	none	-	-	-	peaty muck	
8-16	10YR 4/1	95	7.5YR 4/6	5	CS	M	sandy gravelly clay	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: sandy gravelly clay
 Depth (inches): 8

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- 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)
- 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)

- 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? Yes No Depth (inches): 9
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

Wetland E - Sample plot pair

SP PFO2 (Wetland E)

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

Project/Site: LHR City/County: Island Co, Sampling Date: 8/20/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP PFO2
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 7, T30N, R2E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1
Subregion (LRR): A Lat: 121.0645 Long: 40.8971 Datum: NAD83
Soil Map Unit Name: 3017 - Everett - Alderwood complex, 3-25% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30) Absolute % Cover Dominant Species? Indicator Status
1. Alnus rubra 70 V FAC
2.
3.
4.
= Total Cover
Sapling/Shrub Stratum (Plot size: 30)
1. Rubus spectabilis 40 V FAC
2. Sambucus racemosa 10 V FACU
3.
4.
5.
= Total Cover
Herb Stratum (Plot size: 5)
1. Tiarella trifoliata 50 V FAC
2. Maianthemum canadense 20 V FACU
3. Carex deweyana 5 FAC
4.
5.
6.
7.
8.
9.
10.
11.
= Total Cover
Woody Vine Stratum (Plot size: 5)
1. Rubus ursinus 60 V FACU
2.
= Total Cover
% Bare Ground in Herb Stratum 15 duff covered
Remarks: moss 10%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (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 x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is <= 3.0
4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants
Problematic Hydrophytic Vegetation (Explain)
Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes No X

SOIL

Sampling Point: SP F02

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
+2-0	duff & organics / root wads							
0-16	7.5YR	2.5/2	90%	(10% color is gravel)		gravelly loamy sand		

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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:

extra data: not part of sample, plot pair SP/EI

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/17/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP/EI
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 8, T30N, R2E
 Landform (hillslope, terrace, etc.): top of slope Local relief (concave, convex, none): none Slope (%): 1%
 Subregion (LRR): A Lat: 121.1635 Long: 40.8204 Datum: NAD 83
 Soil Map Unit Name: 1006 - Semiahmoo muck, 0-2% slopes NWI classification: PFOC

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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			

Remarks: *This sample plot confirms muck soil and high dry season water table. T. heterophylla tree stratum is discounted as trees were planted after logging the original forest and presumably established on downed logs, slash and thick duff and provided shallow adaptive roots*

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Tsuga heterophylla</i>	80	N/A	FACU	
2. <i>discounted</i>				Total Number of Dominant Species Across All Strata: <u>0</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____				Prevalence Index worksheet:
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. <i>Gaultheria shallon</i>	1		FACU	OBL species <u>1</u> x 1 = <u>1</u>
2. <i>Vaccinium parvifolium</i>	1		FACU	FACW species _____ x 2 = _____
3. _____				FAC species <u>1</u> x 3 = <u>3</u>
4. _____				FACU species <u>2</u> x 4 = <u>8</u>
5. _____				UPL species _____ x 5 = _____
<u>2</u> = Total Cover				Column Totals: <u>4</u> (A) <u>12</u> (B)
Herb Stratum (Plot size: _____)				Prevalence Index = B/A = <u>12/4 = 3</u>
1. <i>Lysichiton americanus</i>	1		OBL	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <i>Adiantum aleuticum (pedatum?)</i>	1		FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>2</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Woody Vine Stratum (Plot size: <u>30</u>)				
1. <i>none</i>				
2. _____				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>6%</u>				

Remarks: 90% moss

SOIL

Sampling Point: SPE1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
+6-0	<i>duff</i>							
0-8	<i>7.5 YR 2.5/1</i>	<i>95</i>	<i>none</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>muck</i>	<i>Undecomposed wood 5%</i>
8-22	<i>5 YR 2.5/1</i>	<i>95</i>	<i>none</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>muck</i>	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input checked="" type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): 7
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): 5

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/17/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP E2
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 8, T 30N, R 2E
 Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): CONCAVE Slope (%): 5
 Subregion (LRR): A Lat: 121.0776 Long: 40.8234 Datum: NAD 83
 Soil Map Unit Name: 1006 - Semiahmoo muck, 0-2% slopes NWI classification: PFO
 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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>				
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>				
Remarks:						

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:			
1. <u>Picea sitchensis</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)		
2. <u>Alnus rubra</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Total Number of Dominant Species Across All Strata:	<u>3</u> (B)		
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)		
4. _____	_____	_____	_____				
<u>70</u> = Total Cover							
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:			
1. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>			Total % Cover of:	Multiply by:
2. <u>Holodiscus discolor</u>	<u>20</u>	<input type="checkbox"/>	<u>-growing on log so discounted</u>	OBL species _____	x 1 = _____		
3. _____	_____	_____	_____	FACW species _____	x 2 = _____		
4. _____	_____	_____	_____	FAC species _____	x 3 = _____		
5. _____	_____	_____	_____	FACU species _____	x 4 = _____		
<u>40</u> = Total Cover				UPL species _____	x 5 = _____		
				Column Totals: _____	(A) _____ (B) _____		
				Prevalence Index = B/A = _____			
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:			
1. <u>Adiantum aleuticum (pedatum?)</u>	<u>1</u>	<input type="checkbox"/>	<u>FAC</u>			1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 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.	
2. <u>Dryopteris sp.</u>	<u>2</u>	<input type="checkbox"/>	<u>assume FAC</u>				
3. <u>Cicum macrophyllum</u>	<u>2</u>	<input type="checkbox"/>	<u>FAC</u>				
4. _____	_____	_____	_____				
5. _____	_____	_____	_____				
6. _____	_____	_____	_____				
7. _____	_____	_____	_____				
8. _____	_____	_____	_____				
9. _____	_____	_____	_____				
10. _____	_____	_____	_____				
11. _____	_____	_____	_____				
<u>5</u> = Total Cover							
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
1. <u>none</u>	_____	_____	_____				
2. _____	_____	_____	_____				
<u>0</u> = Total Cover							
% Bare Ground in Herb Stratum <u>95</u>							
Remarks:							

SOIL

Sampling Point: SPEZ

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
#3-0	duff		none	-	-	-		
0-8	10YR 3/1	95	none	-	-	-	muck (dry)	some nondecomposed wood - 5%
8-10	10YR 3/1	95	none	-	-	-	sandy clay loam	
10-14	10YR 3/1	95	none	-	-	-	sandy clay	
14-16	10YR 2/1	60	marked with 10YR 3/1-40%				sandy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: 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 Soils³:

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

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

Restrictive Layer (if present):

Type: sandy clay
 Depth (inches): 10"

Hydric Soil Present? Yes No

Remarks:

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 Visible 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): 15
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): 13

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPE3
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 8, T.30N, R.2E
 Landform (hillslope, terrace, etc.): terrace above basin Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 121.0647 Long: 40.8598 Datum: NAD 83
 Soil Map Unit Name: 3017 - Everett - Alderwood complex 3-25% slopes NWI classification: none
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Picea sitchensis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
<u>60</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Total % Cover of: _____ Multiply by: _____
1. <u>Vaccinium parvifolium</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	OBL species _____ x 1 = _____
2. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
<u>25</u> = Total Cover				Column Totals: _____ (A) _____ (B)
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index = B/A = _____
1. <u>Dryopteris sp.</u>	<u>1</u>	_____	<u>assume FAC</u>	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.
2. <u>Polystichum munitum</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
3. <u>Gelum macrophyllum</u>	<u>1</u>	_____	<u>FAC</u>	
4. <u>Tolmiea menziesii</u>	<u>3</u>	_____	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>30</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. _____	_____	_____	_____	
<u>25</u> = Total Cover				
% Bare Ground in Herb Stratum <u>druff covered 70%</u>				

Remarks: miss 20% cover

SOIL

Sampling Point: SP E3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
+3-0								duff
0-5	5YR 2.5/2	50	5YR 2.5/3 (50%)				loam	high organic component
5-7	5YR 2.5/2	95	none					fine sandy clay loam
7-13	7.5YR 3/3	99	none					fine sandy clay loam
13-16	10YR 2/1	95	none					fine sandy clay loam
16-18	10YR 4/2	99	none					fine sandy clay loam

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPE4
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec B, T.30N, R.2E
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): none Slope (%): 3
 Subregion (LRR): A Lat: 121.0652 Long: 40.8989 Datum: NAD83
 Soil Map Unit Name: 3017 - Everett Alderwood Complex, 3-25% slope NWI classification: none

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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 1/2 radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Picea sitchensis</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
2. <u>Tsuga heterophylla</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Total Number of Dominant Species Across All Strata:	<u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>33</u> (A/B)
4. _____	_____	_____	_____		
Total Cover: <u>80</u>					
Sapling/Shrub Stratum (Plot size: <u>30 1/2 radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. <u>Gaultheria shallon</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Total % Cover of:	Multiply by:
2. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	OBL species _____	x 1 = _____
3. <u>Ribes divaricatum</u>	<u>10</u>	_____	<u>FAC</u>	FACW species _____	x 2 = _____
4. <u>Tsuga heterophylla</u>	<u>10</u>	_____	<u>FACU</u>	FAC species _____	x 3 = _____
5. <u>Linhaea borealis</u>	<u>1</u>	_____	<u>FACU</u>	FACU species _____	x 4 = _____
Total Cover: <u>71</u>				UPL species _____	x 5 = _____
Herb Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Column Totals: _____ (A) _____ (B)	
1. <u>Polystichum munitum</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index = B/A = _____	
2. <u>Tellima grandiflora</u>	<u>5</u>	_____	<u>FACU</u>	Hydrophytic Vegetation Indicators:	
3. <u>Galium aparine</u>	<u>5</u>	_____	<u>FACU</u>	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
4. <u>Athyrium filix-femina</u>	<u>5</u>	_____	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
Total Cover: <u>55</u>					
Woody Vine Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1. <u>Rubus ursinus</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>		
2. _____	_____	_____	_____		
Total Cover: <u>5</u>					
% Bare Ground in Herb Stratum <u>20</u>					

Remarks: Moss 25% cover;
10' radius on herb and vine strata chosen to capture representative community and 1/2 radius for tree and shrub strata to avoid wetland plant community adjacent

SOIL

Sampling Point: SPE4

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
+4-0	duff							
0-4	5YR 2.5/1	95	none	-	-	-	loam	high organic
4-12	7.5YR 2.5/1	100	none	-	-	-	clay loam	
12-16	10YR 2/2	99	none	-	-	-	sandy clay loam w/ gravel	
16-20	N/A (parent material, pebbles)						very cobbly gravelly sand	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: cobbles, gravels

Depth (inches): 16"

Hydric Soil Present? Yes No

Remarks: Low chroma matrix in upper horizons are not due to prolonged saturation but rather high organic input from conifer needles. Soil has reddish color due to parent material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

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:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPES
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 8, T30N, R2E
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): A Lat: 121.0664 Long: 40.8968 Datum: NAD 83
Soil Map Unit Name: 1006 - Semiahmoo muck, 0-2% slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [X] 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 [X] No
Hydric Soil Present? Yes [X] No
Wetland Hydrology Present? Yes [X] No
Is the Sampled Area within a Wetland? Yes [X] No
Remarks:

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, and Woody Vine Stratum. Includes dominance test worksheet and prevalence index worksheet. Data includes species like Picea sitchensis, Tsuga heterophylla, and Rubus spectabilis.

Remarks:

SOIL

Sampling Point: SPE5

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 2/1	100	None	—	—	—	sandy mucky loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input checked="" type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u>None</u> Depth (inches): <u>—</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>unknown</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Areas of open water with floating *O. sarmentosa* and woody debris over muck soils.

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP F1
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec. 8, T30N, R2E
 Landform (hillslope, terrace, etc.): terrace above PFO Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): A Lat: 121.0460 Long: 40.9141 Datum: NAD 83
 Soil Map Unit Name: 3017-Everett-Alderwood complex, 3-25% slopes NWI classification: none
 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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
4. _____				
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>20</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Ribes acaerfolium</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Linnaea borealis</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>12</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Urtica dioica</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. <u>Carex deweyana</u>	<u>24</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	<input type="checkbox"/> 2 - Dominance Test is >50%
3. <u>Ranunculus repens</u>	<u>4</u>		<u>FAC</u>	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
4. <u>Poa sp. (?)</u>	<u>9</u>	<u>assume</u>	<u>FAC</u>	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. <u>unknown grass</u>	<u>10</u>		<u>?</u>	<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹
6. <u>Maianthemum canadense</u>	<u>1</u>		<u>FACU</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u>Trifolium trifoliatum</u>	<u>2</u>		<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. _____				
9. _____				
10. _____				
11. _____				
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>20</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. <u>Rubus ursinus</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____				
<u>40</u> = Total Cover				
% Bare Ground in Herb Stratum <u>5</u> Moss <u>15%</u>				

Remarks: Strata radii adjusted to reflect upland community and avoid adjacent wetland community.

SOIL

Sampling Point: SP F1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	duff							
0-2	10YR 3/3	90	plus sand color	-	-			gravelly sandy loam
2-24	N/A		sand color parent material	-	-			gravelly sand

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: None
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology indicators:

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

Secondary Indicators (2 or more required)

- 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)
- 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)

- 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 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:

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

Project/Site: LHTR City/County: Island CO Sampling Date: 8/20/12
Applicant/Owner: US Navy - NAWFAC State: WA Sampling Point: SP F2
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 8, T30N, R2E
Landform (hillslope, terrace, etc.): Swale on hillslope Local relief (concave, convex, none): CONCAVE Slope (%): 1
Subregion (LRR): A Lat: 121.0497 Long: 40.9153 Datum: NAD83
Soil Map Unit Name: 3017-Everett-Alderwood complex, 3-25% slope NWI classification: none
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:			

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
1. <u>Alnus rubra</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2.				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
3.				
4.				
5.				
6.				
Sapling/Shrub Stratum (Plot size: <u>15</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 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.
1. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2.				
3.				
4.				
Herb Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>Carex obnupta</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2.				
3.				
4.				
Woody Vine Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2.				
% Bare Ground in Herb Stratum <u>10</u>				

Remarks:

SOIL

Sampling Point: SP F2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	99	10YR 5/4	1	CS	PL	sandy loam w/ organics, gravels	
2-16	10YR 4/1	10YR 3/1					loamy gravelly sand	(Redox: CS PL - 2%)

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

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

<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):
 Type: none
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
	<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (Includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	

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

Remarks:

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

Project/Site: LHTR City/County: Island Co Sampling Date: 8/20/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP 61
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): swale on hillside Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 121.0254 Long: 40.9117 Datum: NAD 83
 Soil Map Unit Name: 3017 - Everett-Alderwood complex, 3-25% slopes NWI classification: none
 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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. <u>Alnus rubra</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)																
2. _____				Total Number of Dominant Species Across All Strata: <u>4</u> (B)																
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
4. _____																				
<u>90</u> = Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:																
1. <u>Alnus rubra</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Total % Cover of:</td> <td style="width:40%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
2. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>																	
3. _____																				
4. _____																				
5. _____																				
<u>40</u> = Total Cover																				
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:																
1. <u>Carex obnupta</u>	<u>95</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	<ul style="list-style-type: none"> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0¹ <input type="checkbox"/> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p>																
2. <u>Polystichum munifolium</u>	<u>5</u>		<u>FACU</u>																	
3. _____ (growing on hummocks - old log or stump?)																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
<u>100</u> = Total Cover																				
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?																
1. <u>none</u>				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
2. _____																				
<u>0</u> = Total Cover																				
% Bare Ground in Herb Stratum <u>0</u>																				

Remarks:

SOIL

Sampling Point: SP 61

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR3/2	95	(5% sand color)		-	-	sandy gravelly loam	
3-13	7.5YR 4/2	95	10YR 5/6	5	C	M	sandy clay loam w/ gravel	
13-14	10YR 6/1	95	7.5 YR 4/4	5	C	M	sandy gravelly clay	
<i>refusal</i>								

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: cemented gravelly sandy clay
 Depth (inches): 14

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/20/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP62
 Investigator(s): L. Miller Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 121.0284 Long: 40.9132 Datum: NAD83
 Soil Map Unit Name: 3017 - Everett - Alderwood complex, 3-25% slopes NWI classification: none
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. <u>Alnus rubra</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Tsuga heterophylla</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
3. _____				
4. _____				
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Sambucus racemosa</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
<u>25</u> = Total Cover				
Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 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.
1. <u>Tiarella trifoliata</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Mianthemum canadense</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Carex deweyana</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
4. <u>Polystichum muntonium</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>65</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. _____				
<u>20</u> = Total Cover				
% Bare Ground in Herb Stratum <u>25 diff covered</u>				

Remarks: Moss 10%

SOIL

Sampling Point: SP 62

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
<u>0-2</u>	<u>duffy end organics</u>							
<u>0-16</u>	<u>7.54R 2.5/2</u>		<u>none</u>				<u>gravelly</u>	<u>loamy sand</u>

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/22/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP HI
 Investigator(s): L Miller, B. Leonard Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A Lat: 120.9510 Long: 40.8633 Datum: NAD 83
 Soil Map Unit Name: 3019- Everett - Alderwood complex, 15-40% slopes NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u> No <u>X</u>	
Remarks:		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 1/2 radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. <u>Alnus rubra</u>	<u>70</u>	<u>✓</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Sapling/Shrub Stratum (Plot size: <u>30 1/2 radius</u>) <u>70</u> = Total Cover				
1. <u>Rubus spectabilis</u>	<u>30</u>	<u>✓</u>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x 1 = <u> </u> FACW species <u> </u> x 2 = <u> </u> FAC species <u> </u> x 3 = <u> </u> FACU species <u> </u> x 4 = <u> </u> UPL species <u> </u> x 5 = <u> </u> Column Totals: <u> </u> (A) <u> </u> (B) Prevalence Index = B/A = <u> </u>
2. <u>Linnæa borealis</u>	<u>5</u>	<u>✓</u>	<u>FACU</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Herb Stratum (Plot size: <u>10 1/2 radius</u>) <u>35</u> = Total Cover				
1. <u>Tiarella trifoliata</u>	<u>20</u>	<u>✓</u>	<u>FAC</u>	
2. <u>Urtica dioica</u>	<u>3</u>	<u> </u>	<u>FAC</u>	
3. <u>Polystichum munitum</u>	<u>15</u>	<u>✓</u>	<u>FACU</u>	
4. <u>Agrostis sp.</u>	<u>5</u>	<u> </u>	<u>assume FAC</u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Woody Vine Stratum (Plot size: <u>10 1/2 radius</u>) <u>43</u> = Total Cover				
1. <u>Rubus ursinus</u>	<u>5</u>	<u>✓</u>	<u>FACU</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
% Bare Ground in Herb Stratum <u> </u> <u>5</u> = Total Cover				

Remarks: moss 20%
10 feet chosen to better capture representative groundcover and 1/2 radius to avoid adjacent wetland

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		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5YR 2.5/2	95%	none				gravelly coarse sandy loam	
3-12	10YR 2/2	95%	none				gravelly coarse sandy loam	
12-20	5YR 3/2	90%	5YR 4/6 in drifts	10%	not redox		but sand lens color	

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

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

<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: None

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/22/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP H 2
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope w/ swale Local relief (concave, convex, none): slight concave Slope (%): 0
 Subregion (LRR): A Lat: 120.9525 Long: 40.8623 Datum: NAD 83
 Soil Map Unit Name: 3019 - Everett-Alderwood complex, 15-70% slopes NWI classification: NONE
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: <u>swale</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>30</u>	<u>✓</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Prevalence Index worksheet:
<u>30</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)				OBL species <u> </u> x 1 = <u> </u>
1. <u>Rubus spectabilis</u>	<u>25</u>	<u>✓</u>	<u>FAC</u>	FACW species <u> </u> x 2 = <u> </u>
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FAC species <u> </u> x 3 = <u> </u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x 4 = <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x 5 = <u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u> </u> (A) <u> </u> (B)
<u>25</u> = Total Cover				Prevalence Index = B/A = <u> </u>
Herb Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators:
1. <u>Carex obnupta</u>	<u>100</u>	<u>✓</u>	<u>OBL</u>	<u> </u> 1 - Rapid Test for Hydrophytic Vegetation
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>X</u> 2 - Dominance Test is >50%
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> 3 - Prevalence Index is ≤3.0 ¹
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> 5 - Wetland Non-Vascular Plants ¹
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>95</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>5</u>)				
1. <u>none</u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>5</u>				

Remarks:

SOIL

Sampling Point: SP H2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
±2-0	tight roots and undecomposed organics							
0-8	5YR 2.5/1	—	—	—	—	—	course sandy muck	
8-16	5YR 3/1 (50%) with 5YR 3/2 (50%)							course loamy sand (marbled)
16-18	sand color mixed grays and reddish lens with gravels							
18"	Refusal							

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

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

Indicators for Problematic Hydric Soils³:

- | | |
|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input checked="" type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) |

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

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

Restrictive Layer (if present):

Type: gravelly loamy sand, cemented
 Depth (inches): 18

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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:

Note: unable to excavate to 24" to check for dry season water table

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/22/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SPII
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 7, T30N, R2E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): A Lat: 120.9923 Long: 40.8370 Datum: NAD 83
Soil Map Unit Name: 3019 - Everett-Alderwood complex, 15-40% slopes NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X
Is the Sampled Area within a Wetland? Yes No X
Remarks:

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, and Woody Vine Stratum. Includes dominance test worksheet and prevalence index worksheet. Species listed include Alnus rubra, Tsuga heterophylla, Picea sitchensis, Sambucus racemosa, and Rubus spectabilis.

Remarks: moss 10%

SOIL

Sampling Point: SP I1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	5YR 2.5/2	100	none	-	-	-	course sandy loam	
5-6	7.5YR 3/2	90	10YR 5/3-10% (not redox, rather sand color)					course sandy loam
6-18	10YR 3/3	80	10YR 6/3-20% (not redox, rather sand lens)					course sandy loam w/ gravels

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

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

Indicators for Problematic Hydric Soils³:

- | | | |
|--|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Horizon boundaries diffuse, wavy

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____
Water Table Present? Yes _____ No _____ Depth (inches): _____
Saturation Present? Yes _____ No _____ Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/22/12
 Applicant/Owner: U.S. NAVY - NAVFAC State: WA Sampling Point: SP 12
 Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec. 7, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope w/ swale Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A Lat: 120.9908 Long: 40.8393 Datum: NAD83
 Soil Map Unit Name: 3019 - Everett-Alderwood complex, 15-40% slope NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: <u>Swale with lower area in middle</u>					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>70</u>	<u>✓</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Prevalence Index worksheet:
= Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)				OBL species <u> </u> x 1 = <u> </u>
1. <u>Rubus spectabilis</u>	<u>30</u>	<u>✓</u>	<u>FAC</u>	FACW species <u> </u> x 2 = <u> </u>
2. <u>Sambucus racemosa</u>	<u>10</u>	<u>N/A</u>	<u>FACU</u>	FAC species <u> </u> x 3 = <u> </u>
3. <u>rooted in upland - discounted</u>	<u> </u>	<u> </u>	<u> </u>	FACU species <u> </u> x 4 = <u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	UPL species <u> </u> x 5 = <u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Column Totals: <u> </u> (A) <u> </u> (B)
= Total Cover				Prevalence Index = B/A = <u> </u>
Herb Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> 5 - Wetland Non-Vascular Plants ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex obnupta</u>	<u>80</u>	<u>✓</u>	<u>OBL</u>	
2. <u>Polystichum munitum</u>	<u>15</u>	<u>N/A</u>	<u>FACU</u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u>rooted on hummock</u>	<u> </u>	<u> </u>	<u> </u>	
5. <u>one foot above level</u>	<u> </u>	<u> </u>	<u> </u>	
6. <u>of swale - discounted</u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
= Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
Woody Vine Stratum (Plot size: <u>5</u>)				
1. <u>none</u>	<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
= Total Cover				
% Bare Ground in Herb Stratum <u>5</u>				

Remarks:

6 ps level of accuracy may be low due to heavy canopy

Sampling Point: SP I 2

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 2.5/1	(80%)	10YR 5/6	(20%)			← not redox but sand mix	course sandy loam

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input checked="" type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present): Type: <u>cemented cobbles & gravels in sand</u> Depth (inches): <u>8"</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: cemented layer provides perched morphology.

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/23/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP J1
 Investigator(s): L. Miller Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): Slight gradual hillslope local relief (concave, convex, none): None Slope (%): 1
 Subregion (LRR): A Lat: 120.9582 Long: 40.8310 Datum: NAD83
 Soil Map Unit Name: 3019 - Everett - Alderwood complex, 15-40% slopes NWI classification: None
 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Tsuga heterophylla</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Picea sitchensis</u>	<u>5</u>		<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>17</u> (A/B)
4. _____				Prevalence Index worksheet:
<u>45</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)				Total % Cover of: _____ Multiply by: _____
1. <u>Tsuga heterophylla</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	OBL species _____ x 1 = _____
2. <u>Rubus spectabilis</u>	<u>10</u>		<u>FAC</u>	FACW species _____ x 2 = _____
3. <u>Sambucus racemosa</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	FAC species _____ x 3 = _____
4. _____				FACW species _____ x 4 = _____
5. _____				UPL species _____ x 5 = _____
<u>60</u> = Total Cover				Column Totals: _____ (A) _____ (B)
Herb Stratum (Plot size: <u>10</u>)				Prevalence Index = B/A = _____
1. <u>Carex dawsoniana</u>	<u>5</u>		<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polystichum munitum</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Tiarella trifoliata</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
4. <u>Driopteris carthusiana</u>	<u>1</u>		<u>FAC</u>	
5. <u>Mianthemum canadense</u>	<u>10</u>		<u>FACW</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>71</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>10</u>)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. _____				
<u>5</u> = Total Cover				
% Bare Ground in Herb Stratum <u>None</u> Moss <u>40%</u>				

Remarks: 10 foot radius in herb and vine strata chosen to better capture the upland characteristics of the community.

SOIL

Sampling Point: SP F1

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2.5/2	100	none	-	-	-	sandy loam w/ high organics	
2-5	10YR 2.5/2	95	(cobbles are other colors)				gravelly sandy loam - few cobbles	
5-14	10YR 3/3	95	(cobbles other colors)				sandy loam - few cobbles	
14-20	10YR 3/2	95	10YR 4/4	1	CS	M	fine sandy clay loam - few gravel cobbles	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: None

Depth (Inches): _____

Hydric Soil Present? Yes _____ No

Remarks:
Diffuse horizon boundaries.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No

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

Remarks:

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

Project/Site: LHTR City/County: Island Co Sampling Date: 8/23/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP J2
 Investigator(s): L. Miller Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): swale on hill/slope Local relief (concave, convex, none): concave Slope (%): 5
 Subregion (LRR): A Lat: 120.9548 Long: 40.8311 Datum: NAD83
 Soil Map Unit Name: 3019-Everett-Alderwood complex, 15-40% slopes NWI classification: none
 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks:		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Picea sitchensis</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Alnus rubra</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
4. _____	_____	_____	_____	
= Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
Herb Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 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.
1. <u>Carex obnupta</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Polystichum munifolium</u> →	<u>20</u>	<input type="checkbox"/>	<u>N/A FACU</u>	
3. <u>discounted -</u>	_____	_____	_____	
4. <u>rooted on tree 1 foot</u>	_____	_____	_____	
5. <u>above soil surface</u>	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
= Total Cover				
Woody Vine Stratum (Plot size: <u>10</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>Rubus ursinus</u>	<u>1</u>	<input type="checkbox"/>	<u>FACU</u>	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum <u>10</u>				

Remarks:

SOIL

Sampling Point: SP J2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5YR 2.5/1	95	none	-	-	-	fine sandy loam w/ orga	
2-4	7.5YR 2.5/2	95	none	-	-	-	fine sandy loam	
4-10	7.5YR 3/2	95	10YR 4/4 & 10YR 4/6	5%	(med.)	CS M	fine loamy sand	
10-16	10YR 4/2	95	10YR 4/6 (med)	5	CS	M	sandy clay loam w/ gravels, cemented	

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

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

<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: sandy clay loam w/ gravels cemented

Depth (inches): 12"

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	

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

Remarks: although refusal prevented excavation to 24" (for dry-season water table), this pit was moist at 12 inch bgs in contrast to other pits excavated in this forest community [outside of the large PFOC wetland E].

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/23/12
 Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: SP KI
 Investigator(s): L. Miller Section, Township, Range: Sec 7, T30N, R2E
 Landform (hillslope, terrace, etc.): slight hillslope Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): A Lat: 120.9524 Long: 40.8391 Datum: NAD 83
 Soil Map Unit Name: 3019 - Everett-Alderwood complex, 5-40% slopes NWI classification: none
 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 <input type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>80</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30</u>)				
1. <u>Sambucus racemosa</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. <u>Rubus spectabilis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>10</u>)				
1. <u>Polystichum munitum</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. <u>Tiarella trifoliata</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>	
3. <u>Maianthemum canadense</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>55</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>10</u>)				
1. <u>Rubus wirtgenii</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. _____	_____	_____	_____	
<u>5</u> = Total Cover				
% Bare Ground in Herb Stratum <u>35</u> (moss 10%)				

Remarks: 10' radius chosen to better represent herb and vine strata

SOIL

Sampling Point: SPKI

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
t2-0	duff		none	-	-	-		
0-2	10YR 2.5/2	95	none	-	-	-	sandy loam w/ roots	
2-4	10YR 2.5/2	90	(cobbles, gravels 10%)	-	-	-	sandy loam with cobbles and gravels	
4-15	10YR 3/3		none	-	-	-	sandy loam with cobbles and gravels	
15-24	10YR 3/2	99	10YR 7/4	1	CS	M	fine sandy clay loam	

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

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

Restrictive Layer (if present):

Type: none
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Very diffuse horizon boundaries

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____
 Water Table Present? Yes _____ No _____ Depth (inches): _____
 Saturation Present? Yes _____ No _____ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/23/12
 Applicant/Owner: U.S. Navy - NAVFAE State: WA Sampling Point: SP K2
 Investigator(s): L. Miller Section, Township, Range: Sec. 7, T30N, R2E
 Landform (hillslope, terrace, etc.): hillslope w/ swal Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR): A Lat: 120.9494 Long: 40.8405 Datum: NAD83
 Soil Map Unit Name: 3019 - Everett - Alderwood complex, 15-40% slopes NWI classification: none
 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>Alnus rubra</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)	
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
4. _____				Prevalence Index worksheet:	
<u>70</u> = Total Cover					Total % Cover of: _____ Multiply by: _____
Sapling/Shrub Stratum (Plot size: <u>30</u>)					OBL species _____ x 1 = _____
1. <u>Rubus spectabilis</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		FACW species _____ x 2 = _____
2. _____					FAC species _____ x 3 = _____
3. _____				FACU species _____ x 4 = _____	
4. _____				UPL species _____ x 5 = _____	
5. _____				Column Totals: _____ (A) _____ (B)	
_____ = Total Cover				Prevalence Index = B/A = _____	
Herb Stratum (Plot size: <u>10</u>)				Hydrophytic Vegetation Indicators:	
1. <u>Carex obnupta</u>	<u>95</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
2. _____					<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
3. _____					<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
4. _____					<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. _____					<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹
6. _____					<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
7. _____					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
8. _____					
9. _____					
10. _____					
11. _____					
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Woody Vine Stratum (Plot size: <u>10</u>)					
1. <u>Rubus ursinus</u>	<u>1</u>		<u>FACW</u>		
2. _____					
<u>0</u> = Total Cover					
% Bare Ground in Herb Stratum <u>5</u>					

Remarks: 10' radius on herb and vine strata chosen to better capture community characteristics.

SOIL

Sampling Point: SPKZ

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	99	none	-	-	-	fine sandy loam w/ organics, roots	
2-5	10YR 2/2	99	none	-	-	-	sandy loam w/ cobbles	
5-14	10YR 3/2	95	10YR 4/4	5%	med-C, CS-M	10YR 4/6	fine loamy sand	
14-20	10YR 4/2	90	10YR 4/4	5%	med-C, CS-M	10YR 4/6	sandy clay with cobbles cemented	
							→ cobbles different color than matrix	

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

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

Indicators for Problematic Hydric Soils³:

- | | | |
|--|---|---|
| <input type="checkbox"/> Histosol (A1) | <input checked="" type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: sandy clay w/ cobbles - cemented
 Depth (inches): 14"

Hydric Soil Present? Yes No

Remarks:

redox in medium size concentrations and coated sand grains

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

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:

moist soil

Test pit (not sample plot pair)

TP 1

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

Project/Site: LMTB City/County: Island Co. Sampling Date: 8/22/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: TP 1
Investigator(s): L. Miller, B. Leonard Section, Township, Range: Sec 5, T30N, R2E
Landform (hillslope, terrace, etc.): top of terrace Local relief (concave, convex, none): convex Slope (%): 2
Subregion (LRR): A Lat: 121.2546 Long: 40.9361 Datum: NAD 83
Soil Map Unit Name: 2010-Whidbey-Hoyana complex, 2-15% slopes NWI classification: PFOC
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X 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.

Table with 3 rows: Hydrophytic Vegetation Present?, Hydric Soil Present?, Wetland Hydrology Present? and 1 row: Is the Sampled Area within a Wetland? with Yes/No columns and checkboxes.

Remarks: This was one of several formal (data recorded) and non-formal (data sheets not completed) soil pits excavated for purpose of determining whether hydric soils occur in areas marked as PFOC by the NWI.

VEGETATION - Use scientific names of plants. occur in areas marked as PFOC by the NWI.

Large table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, Woody Vine Stratum, and Dominance Test worksheet. Includes species names like Alnus rubra, Sambucus racemosa, Rubus spectabilis, Ribes sanguineum, Rosa nutkana, Linnæa borealis, Polystichum munitum, Tiarella trifoliata, Rubus ursinus and various codes (FAC, FACU, NOG).

Remarks: mass 30%

SOIL

Sampling Point: TPI

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	7.5YR 2.5/1	95	none	—	—	fine sandy loam	dark soil due to decomposing duff	
1-18	7.5YR 2.5/2	95	none	—	—	fine sandy loam w/ gravels and cobbles	refusal due to cobbles	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: Cobbles

Depth (inches): 18

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
	<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes No

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

Remarks:
Did not dig to 24" due to rocks. No indication of seasonal flooding (although mapped by NWI as PFOC) such as moss line on trees, rack line, drainage patterns, etc.

Test-pit (not sample plot pair)

TP 2

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

Project/Site: LHTR City/County: Island Co. Sampling Date: 8/23/12
Applicant/Owner: U.S. Navy - NAVFAC State: WA Sampling Point: TP 2
Investigator(s): L. Miller Section, Township, Range: Sec. 7, T30N, R2E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3
Subregion (LRR): A Lat: 120.9677 Long: 40.8210 Datum: NAD83
Soil Map Unit Name: 3019-Everett-Alderwood complex, 5-90% slopes NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [X] 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.

Table with 2 columns: Hydrophytic Vegetation Present?, Hydric Soil Present?, Wetland Hydrology Present? and Is the Sampled Area within a Wetland?
Hydrophytic Vegetation Present? Yes [X] No
Hydric Soil Present? Yes No [X]
Wetland Hydrology Present? Yes No [X]
Is the Sampled Area within a Wetland? Yes No [X]

Remarks: This test pit was sampled in a small area with Carex obnupta in proximity to wetland scales with Carex obnupta that did meet wetland criteria. This patch of C. obnupta did not meet wetland criteria, however.

VEGETATION - Use scientific names of plants.

Table with columns: Stratum (Tree, Sapling/Shrub, Herb, Woody Vine), Species, Absolute % Cover, Dominant Species?, Indicator Status, and Dominance Test worksheet. Includes handwritten entries for Alnus rubra, Rubus spectabilis, Ribes sanguineum, Carex obnupta, and Polystichum munitum.

Remarks: moss 5%

SOIL

Sampling Point: TP2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	7.5YR 2.5/1	90	none	-	-	-	Sandy loam w/ organics	
1-9	7.5YR 3/2	90	none	-	-	-	Sandy loam w/ gravels	
9-24	7.5YR 3/2	60%	7.5YR 4/2	40%	no redox		loamy sand w/ gravels	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
	<input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if present):
 Type: none
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)

Field Observations:

Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): _____
Water Table Present?	Yes _____ No <u>X</u>	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____ No <u>X</u>	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

Remarks: Excavated to dry season water table. Sample plot does not meet 2 of 3 wetland criteria.